11. SITE 300

The Shipboard Scientific Party[1]

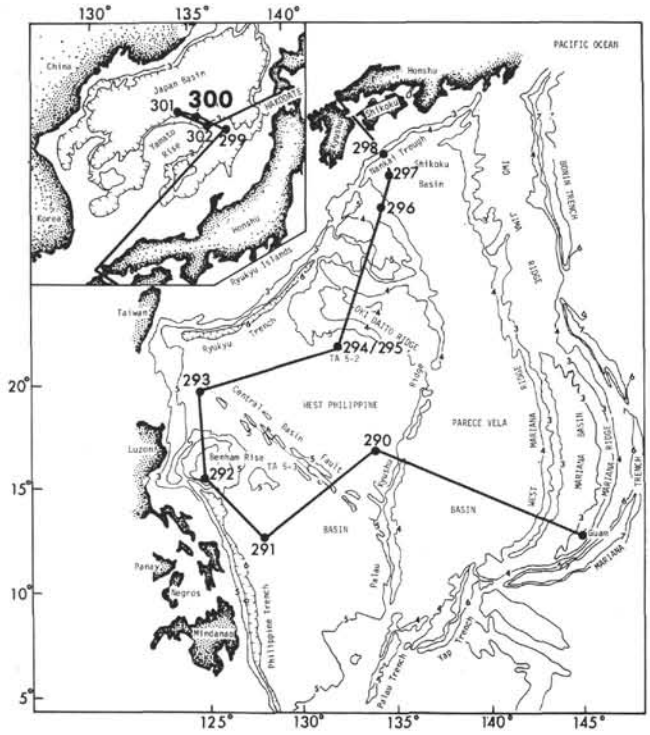

Figure 1. *Location map of DSDP Sites and* Glomar Challenger *tracks in the Sea of Japan. From map: "Topography of North Pacific," T. E. Chase, H. W. Menard, and J. Mammerickx, Institute Marine Resources, Geol. Data Center, Scripps Institution of Oceanography, 1971.*

SITE DATA

Position: 41°02.96′N; 136°06.30′E

Water Depth (from sea level): 3427 corrected meters (echo sounding)

Bottom Felt At: 3426 meters (drill pipe)

Penetration: 117 meters

Number of Holes: 1

Number of Cores: 2

Total Length of Cored Section: 10.5 meters

Total Core Recovered: trace

Percentage of Core Recovery: 0%

Oldest Sediment Cored:
Depth below sea floor: 117 meters
Nature: Silty clay and sand
Age: Late Pleistocene

Principal Results: Site 300 was drilled in the east central Japan Abyssal Plain (or basin) adjacent to Yamato Rise. Encountered difficulty in spudding hole due to surface sand and gravel finally washing to 117 meters through sand to set drill collars. Pipe and core barrel badly stuck due to caving sand; site abandoned due to prospect of further caving and unexpectedly thick sand section. Traces of sediment recovered indicate Pleistocene turbidites perhaps forming active suprafan of Toyama fan-channel system.

BACKGROUND AND OBJECTIVES

Background

The broader goals of drilling in the Sea of Japan have been previously discussed in Chapter 10 where it was noted that the sea can be neatly partitioned in half on the basis of its bathymetry. That portion of the sea lying south of latitude 41°N is composed of a series of basins and ridges, with the Yamato Rise forming a part of the northern boundary of this subarea (Figure 1). The complexity of bathymetry within the basin-rise area has been equated with a more youthful age by some workers, and Hilde and Wageman (1973) have recently suggested that the northeast-southwest Yamato Basin represents a back-arc spreading center where rifting began some 22 m.y.B.P.

Site 299 was originally intended to probe the history of this latter subarea, but unfortunately gas shows caused premature abandonment of this site prior to penetration of the entire sedimentary column. Site 300 was located with a view toward exploring the history of the western half of the Japan Sea which has been repeatedly proposed as the site of initial rifting and spreading in the sea perhaps beginning as early as late Mesozoic time (Hilde and Wageman, 1973; Uyeda and Miyashiro, 1974).

That portion of the Japan Sea lying north of latitude 41°N is dominated by the Japan Abyssal Plain (Japan Basin) which exhibits the relatively simple bathymetry of a wide elongate trough distinguished by an extremely

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flat floor smoothed by turbidite deposits derived principally from the Toyama Trough. Proposed Site 300 was located in the east central portion of the abyssal plain adjacent to the northern flank of the Yamato Rise (Figure 2). *Vema*-28 (LDGO) seismic records indicate that sediments filling this basinal area are at least 1400 meters thick. Again, the seismic section is divisible into an upper reflective sequence which, on the basis of drilling results at Site 299, is assumed to represent Plio-Pleistocene turbidite deposits. An underlying transparent layer is assumed to represent diatom-rich pelagic deposits of Miocene age. *Glomar Challenger* reflection profiles essentially duplicated this picture (Figure 3). It is likely that seismic basement in this area does not represent basalt, but rather a hard sedimentary reflector.

Objectives

One of the major goals at Site 300 was to penetrate to the deepest acoustic reflector in hopes of settling the controversy over whether Cretaceous or Paleogene sediments were ever deposited in this area. These would represent initial deposition in a proto-Japan Sea or possibly a rifted basin as hinted at by Cretaceous non-marine sediments in Korea, Kyushu, and the Asian mainland. As at other sites in the sea, additional major objectives consisted of obtaining as complete a lithologic and biostratigraphic record within basin-fill units as possible in order to reconstruct later phases of basin evolution and planktonic events in the overlying water mass.

OPERATIONS

Site 300 was located in the Japan Basin along the northwest flank of the Yamato Rise (Figure 1). Control for the site location was supplied by a Lamont-Doherty reflection profile (*Vema*-28, 2072-2100) which reveals a smooth acoustic basement dipping westward toward the center of the basin, and to depth approaching 2 km (Figure 2). It was felt that this basement represented older sediments, possibly volcaniclastics, but that sampling would help date early tectonic activity associated with the formation of the basin.

The site was approached on the approximate reciprocal of the *Vema* track (320°) with speed reduced to 6-7 knots for the last 2 hr. We continued beyond the proposed site location to check basement configuration, as it was possible to follow this reflector on an unusually clear *Glomar Challenger* profile (Figure 3). A 13.5-kHz beacon was dropped on the reverse course.

The hole was spudded at 1700 LCT 29 July. The bottom, at 3426 meters, proved to be very hard and completely halted punch penetration after a few meters. The few cc of sediment returned in the core catcher suggested penetration of a manganese-encrusted, coarse, clastic unit. Although the uppermost sediment resisted punch penetration, it was washed fairly easily and led to a coring attempt without circulation at 40.5 meters. Again, no penetration was possible and the attempt was aborted, but not before the sediment had plugged the bit. A single pressure release sufficed to clear the bit, and

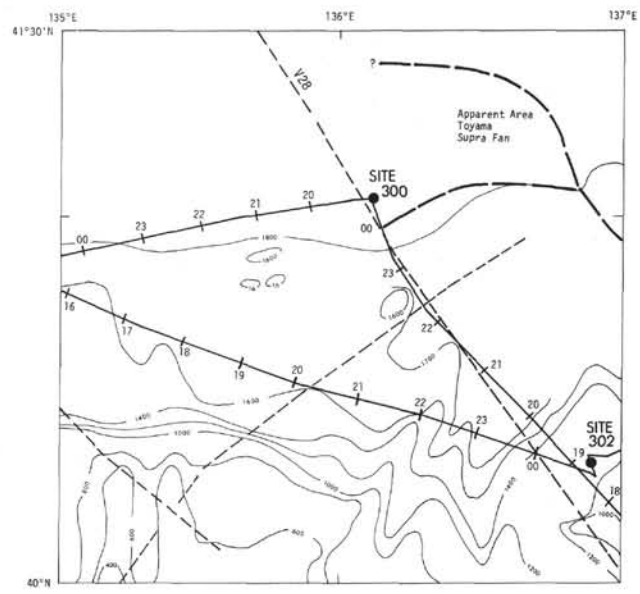

Figure 2. *Bathymetry in vicinity of DSDP Site 300 (in uncorrected fathoms) updated from Chase and Menard (1969) using* Glomar Challenger *and LDGO* (Vema-28) *data.*

the hole was washed to 107.5 meters where another core (Core 1) was attempted. This time, the coring interval was completed (Table 1), but during the retrieval, the hole collapsed, sticking the pipe and blocking circulation. Nothing could be done to remedy this situation until core was retrieved. However, it was then found that the core barrel was jammed and could not be unlatched.

After the sand line was on deck, withdrawal of pipe was accomplished, but only on the second attempt with an application of a 450,000 lb force. The bit was brought to the mudline, but all attempts to regain circulation failed, and the decision was made to abandon the hole and the site. The rationale behind this move was that similar bottom conditions would be found over a wide area apparently because we were near the dispersal area of the Toyama Channel. The string was then pulled, and we then steamed for Site 301 further west along the eastern flank of the Japan Basin. Available data here indicated that the turbidites were finer grained and thinner.

LITHOLOGY

Site 300 is located on the eastern Japan Abyssal Plain in the Sea of Japan. A surface punch core was attempted at a depth of 3427 meters and only a small amount of sediment was recovered in the core catcher. In order to seat the subbottom assembly, the hole was washed to 107.5 meters where a core was taken. Trace amounts of sand and silty clay were recovered from the core catcher and the bit face.

The punch-core recovery consisted of a silty clay with 40% silt and 60% clay. Contained within the clay were pebbles up to 2 cm in length consisting of granite, pumice, and black manganese crusts. The silt component was chiefly quartz and feldspar. The material

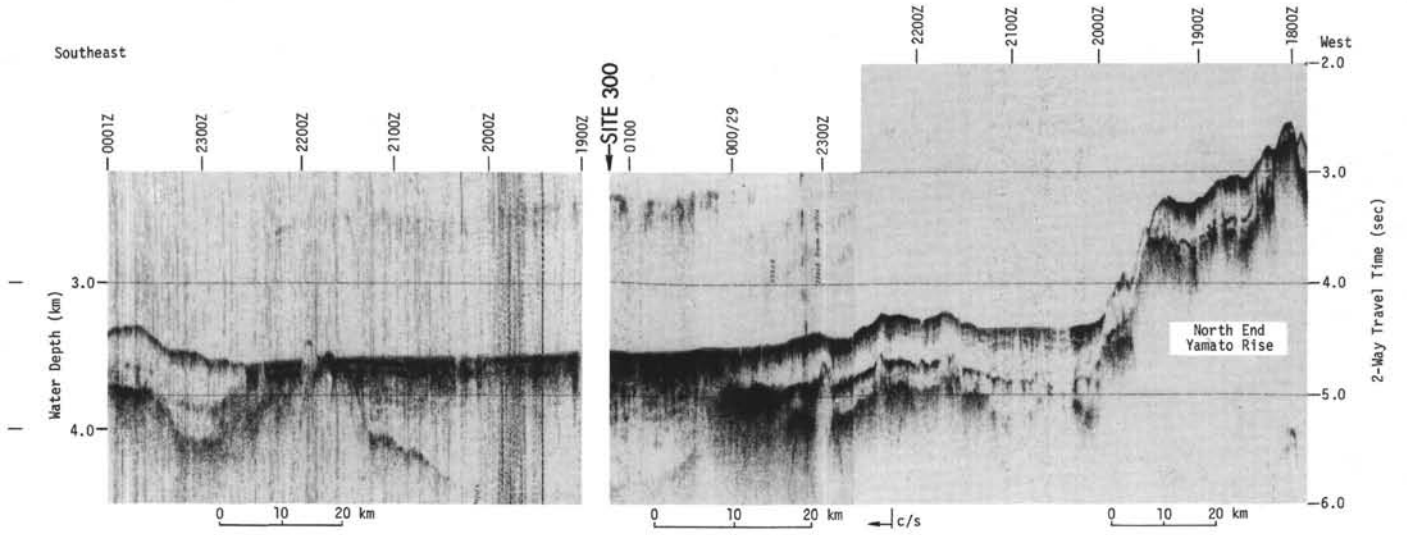

Figure 3. Glomar Challenger *seismic reflection profile approaching and departing Site 300. Note highly reflective surficial sediments in the area of the Toyama suprafan.*

TABLE 1
Coring Summary, Site 300

Core	Cored Interval Below Bottom (m)	Cored (m)	Recovered (m)	Recovered (%)	Remarks
1	0.0-1.0	1.0	0.0	0	Punch core
Wash	1.0-107.5				
2	107.5-117.0	9.5	0.0	0	
Total	117.0	10.5	0	0	

recovered in Sample 2, CC and from the bit face consisted of a diatom silty clay, sand, and silty clay. The diatom silty clay contained up to 30% diatoms. The sand consisted primarily of quartz, feldspar, and lithic fragments. The age of the material recovered was late Pleistocene.

The beacon signal at this site gave some indication of bottom current motions; however, the sample obtained from Core 1 had a strong H_2S odor.

PALEONTOLOGIC SUMMARY

Introduction

Drilling at Site 300 penetrated 117 meters into loose sandy turbidites before this site was abandoned due to caving. Core 1 (0-1 m) contains a late Pleistocene/Holocene(?) diatom flora. Core 2 (105.5-117 m) contains rare late Pleistocene diatoms and common calcareous nannofossils indicative of a late Pleistocene/Holocene age.

Calcareous Nannofossils

The influence of cold-water currents is reflected in the sparse nannofossil recovery from Core 1. Only a few heavily overgrown specimens of *Coccolithus pelagicus* were recovered. However, a relatively normal, well-preserved, Holocene-late Pleistocene nannofossil assemblage consisting of *Emiliania huxleyi*, *E. ovata*, rare *Gephyrocapsa caribbeanica*, common *G. doronicoides* and *G. oceanica*, and *Umbilicosphaera cricota* was recovered from Core 2. This sample can be assigned to the *E. huxleyi* Zone with considerable confidence.

Foraminifera

Cores 1 and 2 contain moderately well-preserved Holocene (?)-late Pleistocene planktonic foraminifera. Faunas are dominated by sinistral coiling specimens of "*Globigerina*" *pachyderma* and represent a subarctic biofacies. Varying numbers of benthonic foraminifera are also present in these sediments including species displaced from shallower horizons.

Radiolarians and Silicoflagellates

Sediments retained in Sample 1, CC yield only cold-water forms commonly found from surface sediments of the subarctic Pacific. Although Sample 2, CC is barren of Radiolaria, sediments retained in the bit contained a few specimens of *Botryopyle* spp. Core 1 and sediments retained in the bit sample following Core 2 contain rare specimens of the silicoflagellates *Distephanus speculum* and *D. octangulatus*, together with reworked Tertiary species. Sample 2, CC failed to yield any silicoflagellates.

Diatoms

Cores 1 and 2, and a sample collected from the bit sample following Core 2, are of late Pleistocene age. Diatom assemblages from Core 1 are characterized by the following subarctic extant species: *Actinocyclus curvatulus*, *Coscinodiscus excentincus* var. *leasareolatus*, *Denticula seminal*, and *Rhizosolenia heketata*. Some reworked and extinct species of *Thalassiosira antique*, *T. nidulus*, *T. zabelinae*, and *Denticula kamtschatica* were also recovered.

Two samples from Core 2 are dominated by reworked and extinct species of the following Miocene

species: *Actinocyclus ingens*, *Coscinodiscus endoi*, *C. vetustissimus*, *Denticula hustedtii*, *Goniothecium tenni*, and *Rouxia californica*.

SUMMARY AND INTERPRETATIONS

Site 300 was located in the east central portion of the Japan Abyssal Plain (or Japan Basin) adjacent to the north flank of the Yamato Rise. Difficulty was encountered in taking an initial punch core due to the presence of coarse sand and gravel at the surface. Only traces of this material were recovered. The hole was then washed, apparently through sand, to 117 meters in order to seat drill collars. Attempted retrieval of a second core was halted by caving in the hole, a stuck pipe, and a stuck core barrel, forcing abandonment of this site due to the prospect of further caving in the unexpectedly friable sand section. The small sample of sediment recovered from 117 meters indicates this unit represents late Pleistocene/Holocene turbidite (channel?) deposits derived *via* the extensive distributary fan system emanating from the Toyama Trough. Diatom floras in two samples from Core 2 are dominated by reworked Miocene species, in all likelihood, transported from exposures along western Honshu. Abandonment of this site with only minimal penetration precludes any major conclusions although the traces of sediment recovered contain evidence of the subarctic-arctic nature of late Pleistocene planktonic floras and faunas in this portion of the Japan Sea. Lack of any definitive biostratigraphic boundaries did not allow an estimate of sedimentation rates to be made at Site 300.

REFERENCES

Hilde, T.C. and Wageman, J.M., 1973. Structure and origin of the Japan Sea. *In* Coleman, P.J. (Ed.), The Western Pacific: New York, Crane, Russak, and Co., Inc., p. 415-434.

Uyeda, S. and Miyashiro, A., 1974. Plate tectonics and the Japanese Islands: Geol. Soc. Am. Bull., v. 85, p. 1159-1170.

Site 300 Hole Core 1 Cored Interval: 0.0-1.0 m

AGE	ZONE	FOSSIL CHARACTER: FORAMS	NANNOS	RADS	SILICO. DIATOMS	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE PLEISTOCENE	Denticula seminae (D)	Cg	Rp	Fm	Fm / Ag	Core Catcher				CC	5GY 4/1

Only a trace amount of material recovered in core catcher. Color - dark green gray (5GY 4/1). H_2S odor noticeable.

Silty clay matrix with silt, sand and pebbles. Pebbles up to 2 cm include: granite, pumice, black Mn crusts.

SILTY CLAY
Smear: CC

Texture	Composition
60% Clay	30% Feldspar
40% Silt	25% Clay minerals
	20% Quartz
	9% Sponge spicules
	6% Radiolarians
	5% Diatoms
	5% Pyrite
	1% Mica
	Tr% Heavy minerals

Heavy minerals include amphiboles.

Explanatory notes in chapter 1

Site 300 Hole Core 2 Cored Interval: 105.5-117.0 m

AGE	ZONE	FOSSIL CHARACTER: FORAMS	NANNOS	RADS	SILICO. DIATOMS	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE PLEISTOCENE	Emiliania huxleyi / Denticula seminae (D)	Cm	Cg	Rm	Rm / Ag	Core Catcher				CC	5GY 4/1

Trace of core catcher material and material in bit - hole abandoned.

DIATOM SILTY CLAY
Smear: Bit

Texture	Composition
70% Clay	40% Clay minerals
25% Silt	30% Diatoms
5% Sand	15% Feldspar
	5% Quartz
	3% Pyrite
	3% Radiolarians
	2% Heavy minerals
	2% Glauconite
	1% Sponge spicules
	Tr% Mica

SAND
Smear: CC

Texture	Composition
95% Sand	50% Quartz, feldspar
5% Silt	30% Lithic fragments
	10% Pyrite, opaques
	5% Heavy minerals
	3% Micarb
	2% Glauconite

SILTY CLAY
Smear: CC

Texture	Composition
63% Clay	49% Clay minerals
30% Silt	20% Feldspar
7% Sand	7% Pyrite, opaques
	5% Quartz
	5% Micronodules
	3% Diatoms
	3% Heavy minerals
	3% Mica
	2% Micarb
	1% Glauconite
	1% Sponge spicules
	1% Radiolarians
	Tr% Nannofossils

Explanatory notes in chapter 1