DISTRIBUTION OF ARTIFACTS AND THE WRECKING PROCESS

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DISTRIBUTION OF ARTIFACTS AND THE WRECKING PROCESS

Since no existing survivor's accounts have been located, the wrecking process must be deduced solely from the distribution patterns of ballast stones, cannonballs, storage jars, gold jewelry and plate fragments, and other artifacts.

Apparently the *Nuestra Señora de la Concepción* first struck the reef just to the east of Agingan Point as indicated by the presence of ballast stones and some porcelain shards, while being driven before west to southwesterly winds. The wind and seas most likely forced the ship along the reef edge for approximately 200m to where the seabed slopes up to meet the vertical-walled fringing reef at a depth of 5m. Here, the majority of the several hundred tons of ballast stones poured out of the stricken vessel and accumulated in the gullies.

In a lightened state, the ship continued to be driven along the reef, releasing the remaining ballast and her porcelain cargo, fragments of which still tumble in each wave along the shore. It is likely that the superstructure was torn from the main hull and was broken up along the top of the reef. Minute fragments of gold were found in many crevices on top of the reef indicating that most of the jewelry was scattered across this shallow shelf and later collected by the Chamorros.

The first signs of the ship's structure appear about 700m from Agingan Point. Here, encrusted remnants of spikes and bolts suggest that sections of the disintegrating ship were left wedged in the reef. But it is another 200m before significant amounts of the ship's contents begin to appear (*Figure 1*).

In a large gully over 800m from the initial point of impact, 18 cannonballs were found, and 50m further three steep-sided gullies contained 26, 8 and 12 cannonballs respectively. The steep sides of the gullies and the seaward ridge kept this iron shot where it fell. However, well over 100 cannonballs also spilled out onto the reef slope and were trapped in faults on the level seabed. There is a very distinct cutoff point here, as if all the shot fell out at once and was therefore stored in one place, before most of the other artifacts were deposited.

Five cannon-lifting dolphins of varying sizes and a cascabel were also discovered at the eastern end of the cannonball concentration. As most of the cannons were salvaged 46 years after the wreck, it can be assumed that the dolphins and the cascabel broke off during typhoon-induced surging or during the wrecking process. Since the cannons of the Manila Galleons were usually stored as ballast, they could be expected to be located in one general area, as was implied in the Spanish salvage accounts. The cannonballs would probably have been stored in a shot room usually located below the main cargo hatch. The fact that the cannon parts were found with the shot supports the "cannon as ballast" theory.

Heavy concentrations of artifacts were found in the gullies for nearly 350m beyond the initial cannonball deposit (*Figure 2*). The end of the pattern ends much as it began, with the encrusted remnants of ship's spikes and bolts scattered thinly along the gullies. None of the ship's structure has survived in this high energy environment of typhoons, strong currents, abrasive coral, and shallow warm water.

Jar Dispersal

As the ship was breaking up along the reef, many of the perhaps 2000 storage jars stowed below and lashed on deck and in the rigging would have been broken. However, it appears that a section of the ship containing storage jars was carried by the currents into 45 to 70 meters of water, where a concentration of over 150 intact storage jars was discovered (*Figure 3*).

The jars were sealed with wooden lids and wax or tallow, tied down with rope-like material fed through the four small handles around the rim. A cross-hatch pattern of rattan around the shoulders of the jars, together with two handles, both protected the jars and allowed them to be carried or secured. The jars settled in the sand, in hollows or against coral ledges. Many were broken, but wave and current-induced sediment movement filled the intact jars, rendering them virtually immobile, in water deep enough to protect them from typhoons for 350 years.

Apart from the intact storage jars and innumerable jar shards, the only other artifacts found in this deep area were a few ship's spikes and bolts, buried under the shifting sands, most with some wood still attached. One piece of wreckage that was deposited in 36m of water was probably a part of the dead wood from the bow, containing a 2.7m long bolt. Only the bolt, some caulking and a small piece of wood remain. Despite extensive searches by submarine, diving bell, ROV and SCUBA divers using metal detectors and water jets, no other contemporary material was found in this deep water area.

The coral growth on many of the jars

attests to their immobility. Those jars lying in open sand in 45m of water were very difficult to distinguish from the surrounding coral outcrops. It was only when a jar was rolled over that the usually clean bottom was exposed. Vigorous and continuing sediment movement at that depth is well illustrated by several large jars that were all but totally buried in the sand, and by one particular jar that, when cleaned out, was found to contain a plastic aeroplane model. It was most likely deposited by a curious octopus, as an octopus, several fish and an eel were found living in the half empty jars.

The jar distribution is shown in the accompanying charts. The greatest concentration occurred along the 45 meter deep ridge with jars rolling down canyons to collect under a massive undercut or come up against coral outcrops. Many jars, presumably with neutral buoyancy, were pushed by the currents along the valleys and canyons until they became trapped against corals or bogged down in the sands. Apart from some spectacular soft corals, the jars inside the undercut, out of the influence of direct sunlight, have remained relatively free of coral. The jars outside the undercut, on the other hand, have been concreted together and often totally overgrown.

Distribution of Gold and Other Artifacts

The distribution of gold artifacts is graphically illustrated in the Distribution Histograms and they give further indications of the wrecking process. All of the gold is in the form of jewelry, apart from a few torn pieces of plate. Most of it has been badly damaged by the action of coral rubble during storms. Over the years the gold pieces worked their way down to bedrock, lodging in crevices and even in the back of undercuts where they were protected from further damage. With the heavy weight of gold there is usually minimal lateral movement once a piece enters a gully or trap. So in most cases it can be assumed that the location of the gold was relatively close to where it fell initially.

Strangely enough, apart from ceramic shards and ballast stones, the first artifacts to appear along the wreckage trail were five fragments of gold plate found in three adjacent gullies. The fragments may well be part of a plate and ewer set, perhaps the gift from the King of Spain to the Emperor of Japan. This set was wrongly appropriated by the Spanish Governor of Manila, whose nephew was captaining the *Concepción* back to Acapulco. Such a valuable piece may well have been in the hands of a wealthy passenger attempting to escape the stricken vessel.

The gold has been broadly categorized into buttons, beads, simple chain, complex chain, plate, etc., and then subcategorized. There are eleven types of spherical buttons, for example, and by studying the Distribution Histograms, it can be seen that they were probably stored onboard separately according to type. Button types C, F, G, and H are most profuse around Gully 8, whereas button type AA is found predominantly in Gully 19 and button type E has accumulated in Gullies 15 and 16. Over seventy-five percent of button type A and sixty percent of button type B were found along the toe of the reef, compared to less than nine percent for all the other button types.

Of the eleven different types of gold bead, all but types G, H, J and K were found almost exclusively in the crevices at the toe of the reef. Bead type J was concentrated in Gullies 15 and 16, but the other three types were scattered.

The gold chains, both simple and complex, were found predominantly in small lengths, single links or even parts of links. Apart from the complex chain type C, which had a marked concentration in Gully 8, and the small linked simple chain, which accumulated primarily in Gully 1, the pieces of chain were quite scattered, perhaps the result of several complete chains breaking up. The Distribution Histograms do not represent the amount of chain in each gully, but rather the number of pieces. In Gully 1, for example, one complete mass of small linked simple chain weighing over 1.2kg and comprised of thirty-two loops tied together with gold wire, was found at the back of an undercut. This is more than all the other pieces of simple chain put together.

The three types of small, flat-backed buttons with diamonds, although very similar in design, do not appear to have been stored together either. Buttons FD01 were spread between Gullies 4 and 8, whereas buttons FD03 were scattered from Gullies 8 to 16. Type FD02 were spread between these two other types.

Rings also appeared to be relatively well concentrated, inferring that they were more likely a cargo item than from the fingers of some unfortunate passengers. Seventeen rings were found in all and twelve of those were from Gullies 7 to 11. Two were found at the toe of the reef.

Only one other gold item had a definite peak concentration, suggesting separate stowage. That is a cup-shaped button containing, in some cases, a pyramidal stone. Nine of the twelve

pieces found came from Gully 11.

Unique artifacts such as the diamond ornaments, clothing decorations, and filigree pieces do not have a distinct distribution pattern, apart from a general concentration around Gully 9. Two crosses, one with diamonds and one of filigree, were found in adjacent gullies.

The distribution pattern of some of the other artifact types is quite pronounced. Lead shot appeared all along the gullies and at the toe of the reef, however there is a very marked peak in Gullies 14 and 15. There are three main types of shot: musket, arquebus, and spring shot (only holes remain in the spring shot as the iron coil corroded long ago); all three were well mixed.

Eighteen individual Chinese coins and two small concreted stacks were found well buried and semi-concreted to the coral in Gully 17, some in good condition, others little more than green marks on the white coral. Only three other Chinese coins were found and these were in adjacent gullies, so the chances are that they all came from one bag, perhaps carried as a curio by one of the passengers. Very few other artifacts came from Gully 17.

Eight Chinese keys or pieces of keys were excavated. Seven of these came from the main artifact concentration between Gullies 8 and 15. The other was well to the southeast in Gully 56.

What appear to be brass bobbins used for lace making were also found mainly around Gully 8 and a little to the east. There are six of them in this region, one 80m to the northwest in Gully 4 and one 200m to the southeast in Gully 45.

The concentration of sounding leads quite definitely indicates that they were stored in one place on the vessel. All nine sounding leads were found at the southeast end of the trail of wreckage, making them one of the last items to be deposited. Two of the leads have the stamped characters "9 LBS" and "14 LBS." The "LBS" indicates the Spanish "libras," which is almost exactly equal to the imperial pound and the actual weight bears this out.

Hundreds of porcelain and stoneware shards were found throughout the site, mostly loose in the sand and rubble, but in some cases concreted into the coral. Apart from a few small pockets containing a dozen or so pieces, there were no significant concentrations. Many pieces of blue and white porcelain were found on the small beach inshore of Gullies 5 to 9. The churning of the waves on the beach through the tidal cycle continuously exposed new pieces. There are several other small beaches along the bay, but this was the only one with a significant amount of porcelain.

A contemporary anchor was found lying proud of the seabed, 40m from the toe of the reef opposite Gully 17. The anchor appears to have been moved, probably during World War II, as there are storage jar shards concreted to the upper side, suggesting that it has at least been turned over; therefore, nothing can be deduced from its present location.

Figure 1

ARTIFACT DISTRIBUTION
N
Gullies with Ballast Stones
18 HOLE PROFESSIONAL GOLF COURSE UNDER CONSTRUCTION INSHORE
JAPANESE MAJOR GUN BUNKER
ACHIGAN PT
SHORELINE
BEACH
Top of reef (0-1m)
Gully 4
Gully 3
Gully 1
Gully 2
Gully 5
Gully 6
OBYAN PT
Gullies (3-6 m) (To be surveyed and excavated)
12 m toe of reef
Canyon
20 m
45 m
70 m
Storage jar area
LEGEND
- PORCELAIN SHERD
- STORAGE JAR
- STORAGE JAR SHERDS
- PESTLE
- CANNON PART
- KEEL BOLT PIECE
- SPANISH ANCHOR
- CANNON BALL
- LEAD SHOT
- COPPER ALLOY OBJECT
- BALLAST STONES
- DECORATIVE ITEMS (GOLD)

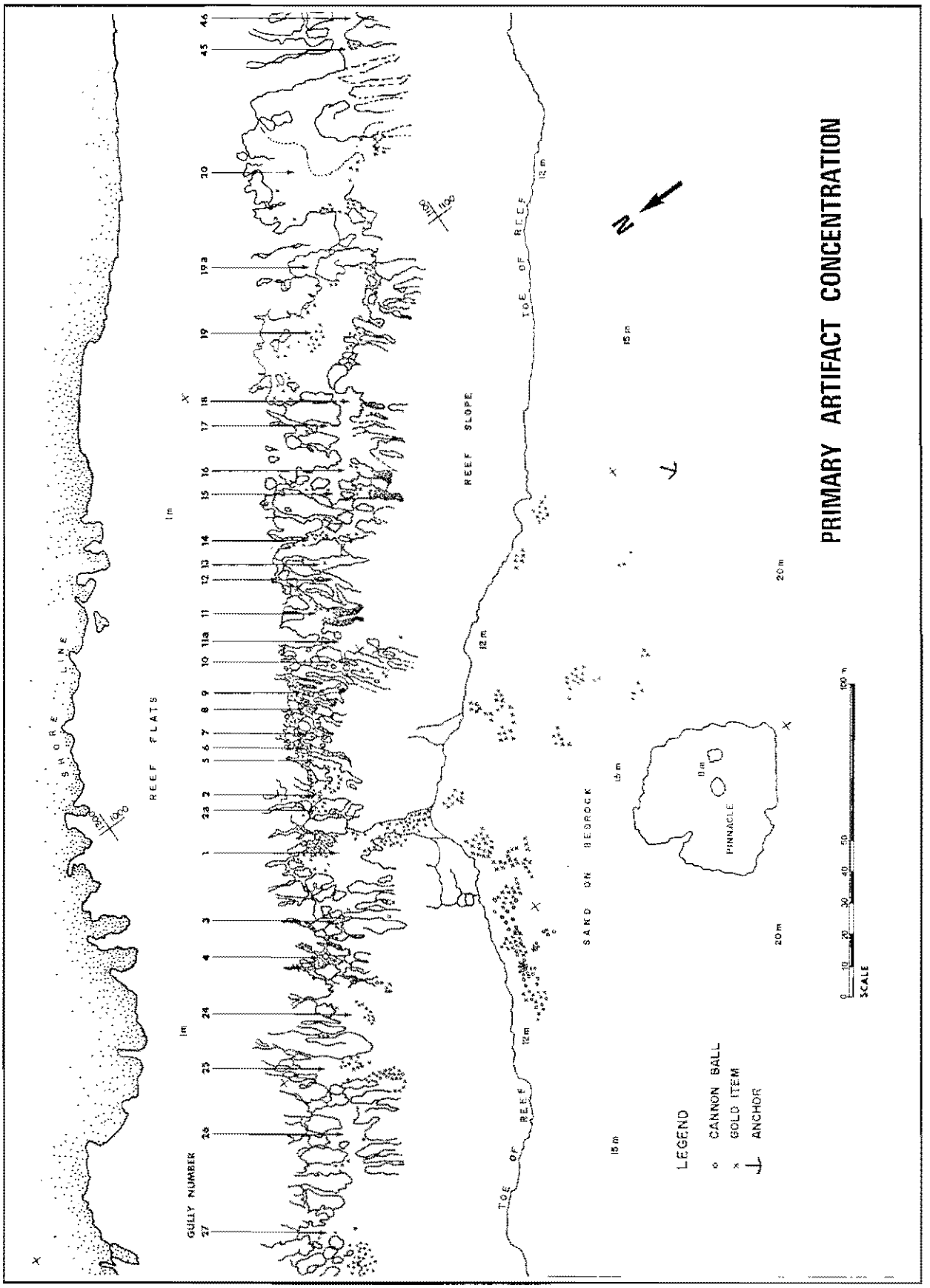

PRIMARY ARTIFACT CONCENTRATION
SHORE LINE
REEF FLATS
REEF SLOPE
TOE OF REEF
SAND ON BEDROCK
PINNACLE
GULLY NUMBER
LEGEND
CANNON BALL
GOLD ITEM
ANCHOR
SCALE
N

Figure 2

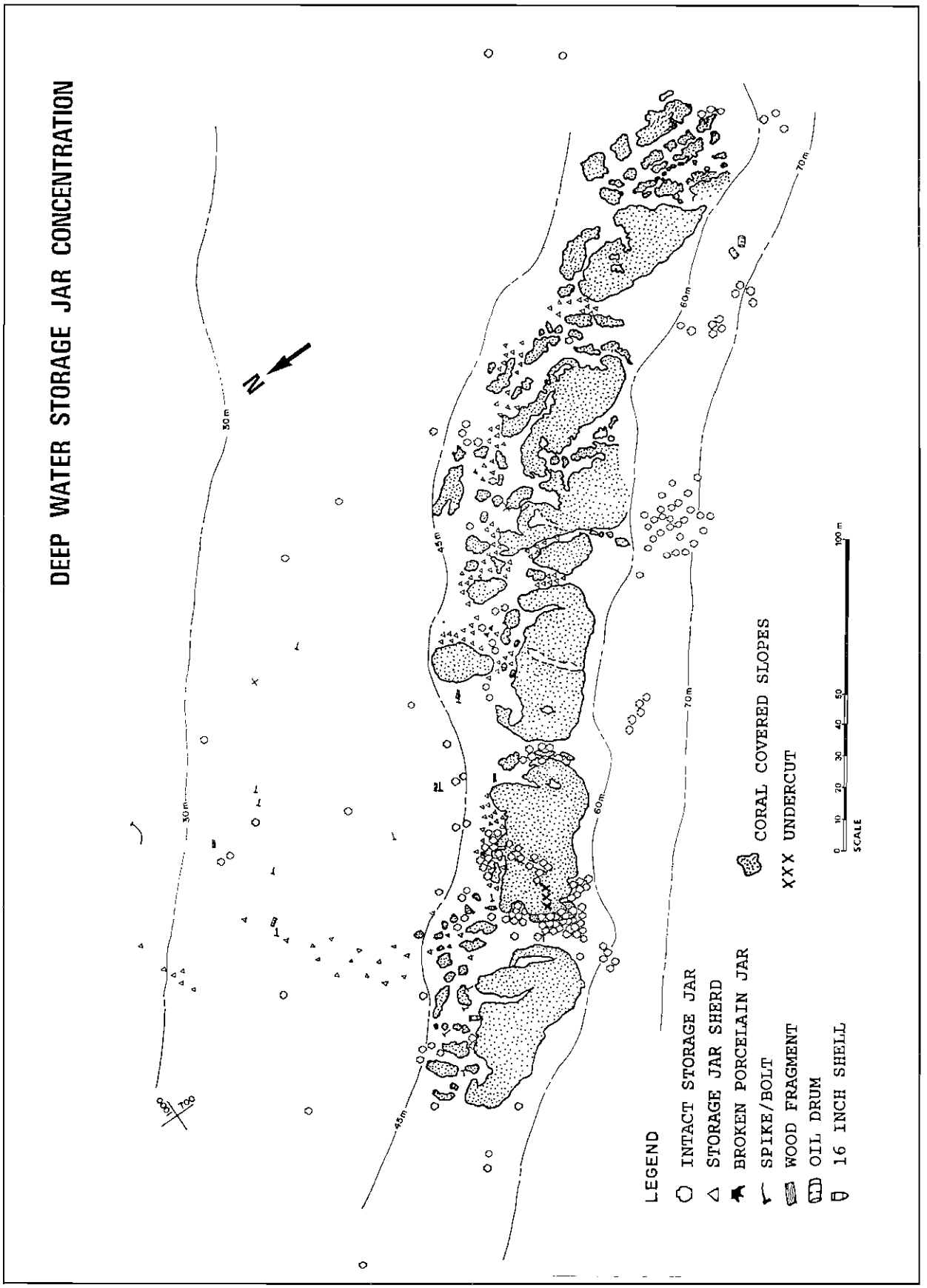
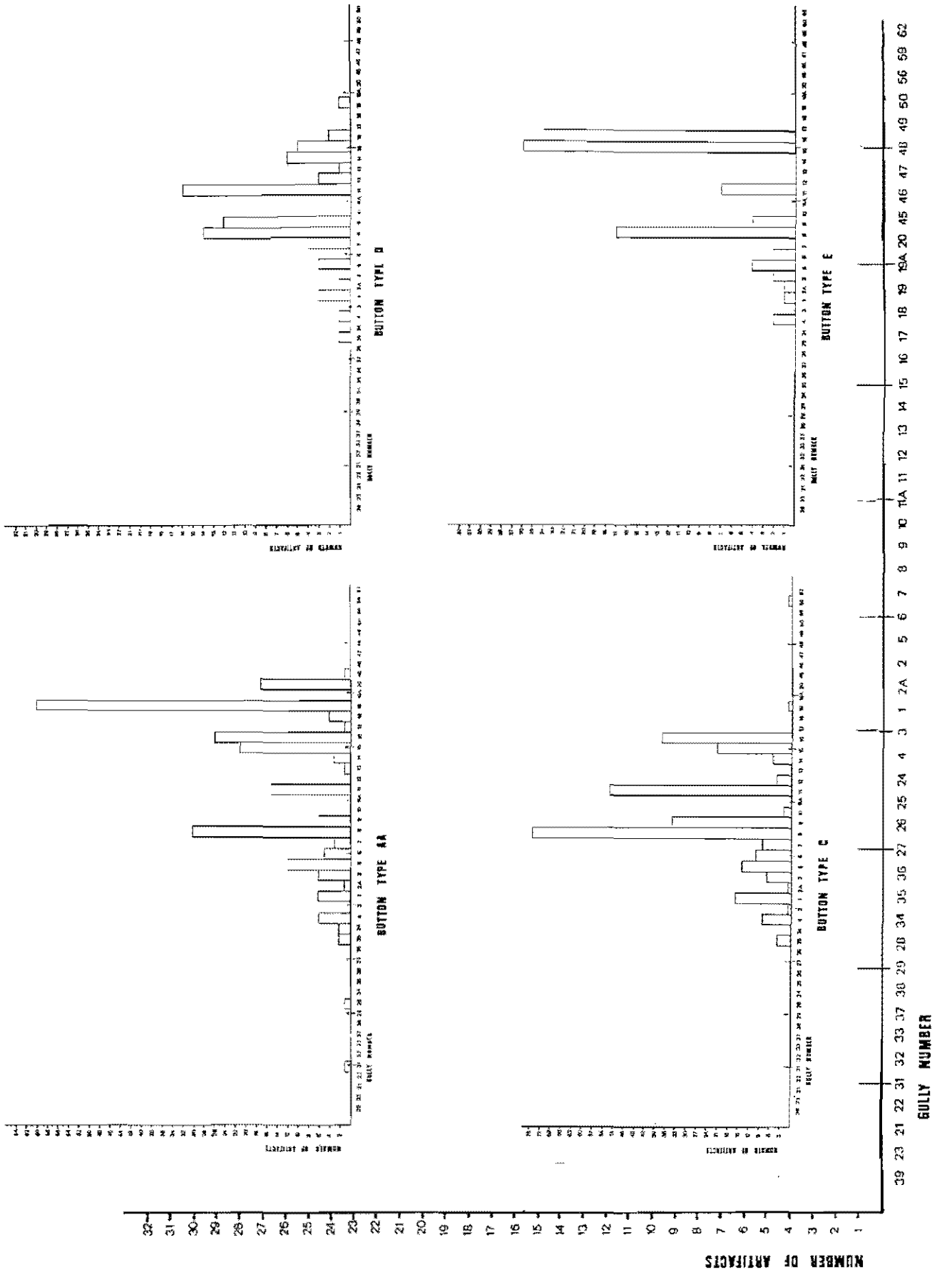
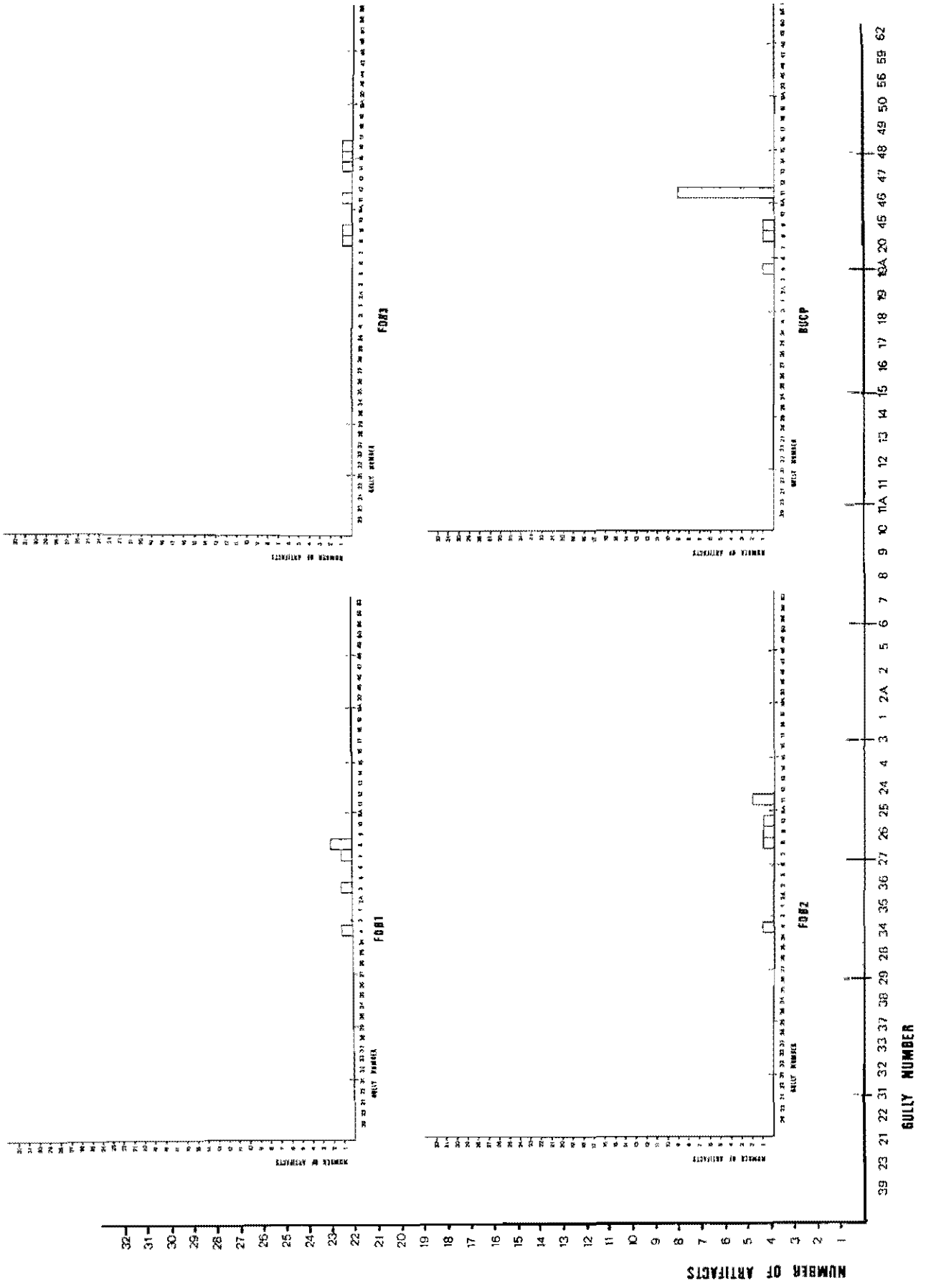

DEEP WATER STORAGE JAR CONCENTRATION
N
30m
45m
60m
70m
LEGEND
INTACT STORAGE JAR
STORAGE JAR SHERD
BROKEN PORCELAIN JAR
SPIKE/BOLT
WOOD FRAGMENT
OIL DRUM
16 INCH SHELL
CORAL COVERED SLOPES
XXX UNDERCUT
SCALE
0
10
20
30
40
50
100 m

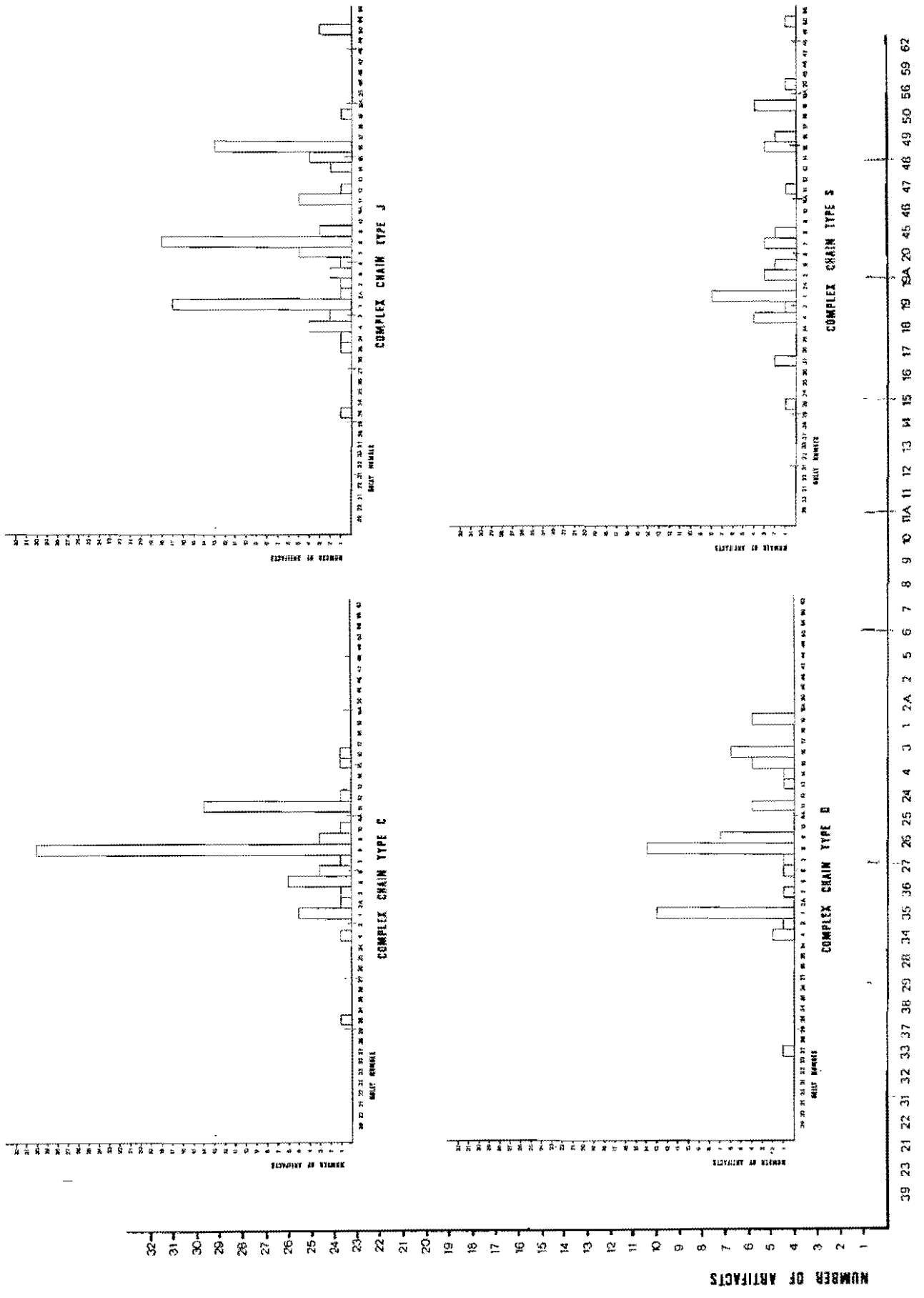
Figure 3

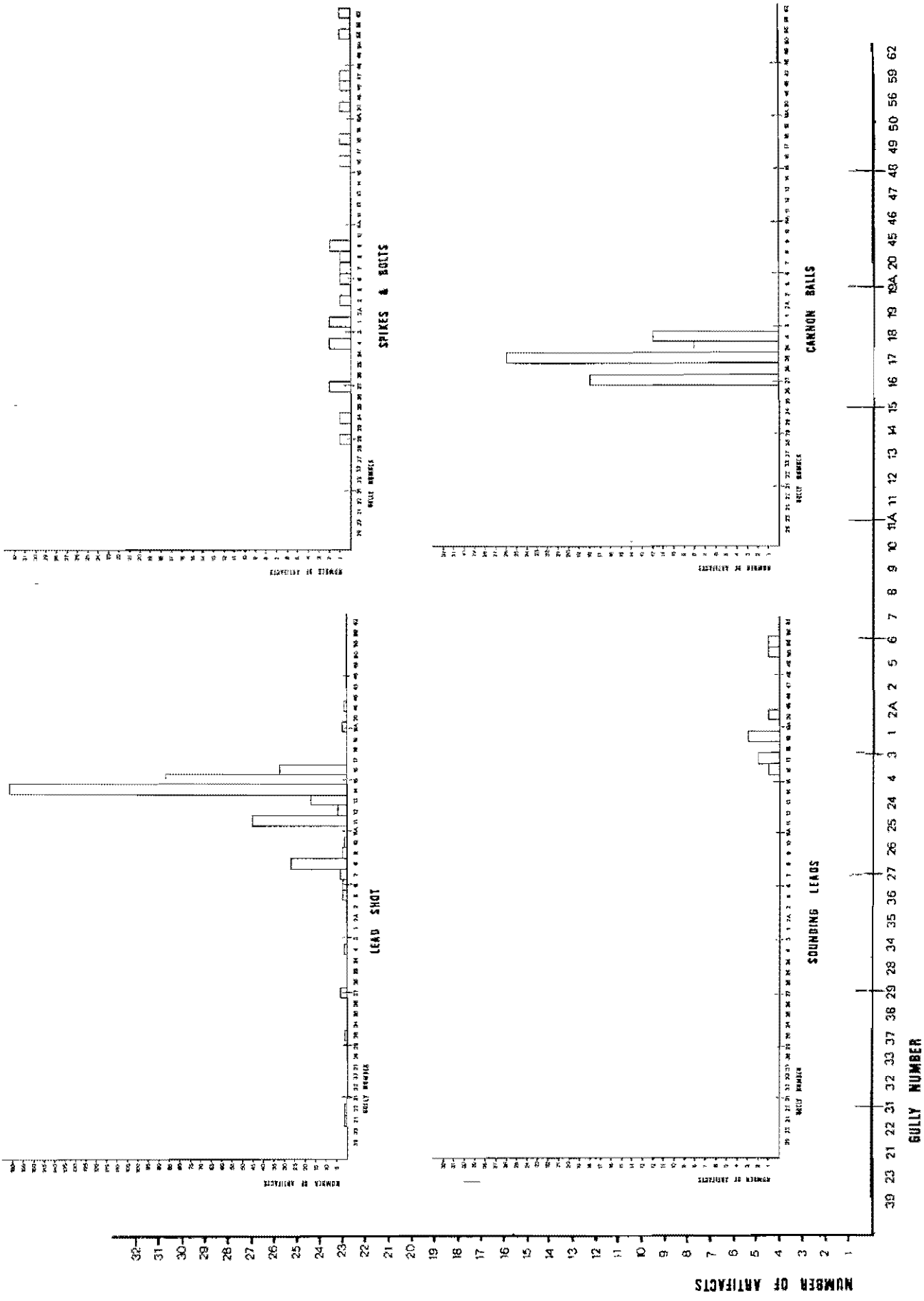

BUTTON TYPE D
BUTTON TYPE E
BUTTON TYPE AA
BUTTON TYPE C
NUMBER OF ARTIFACTS
GULLY NUMBER

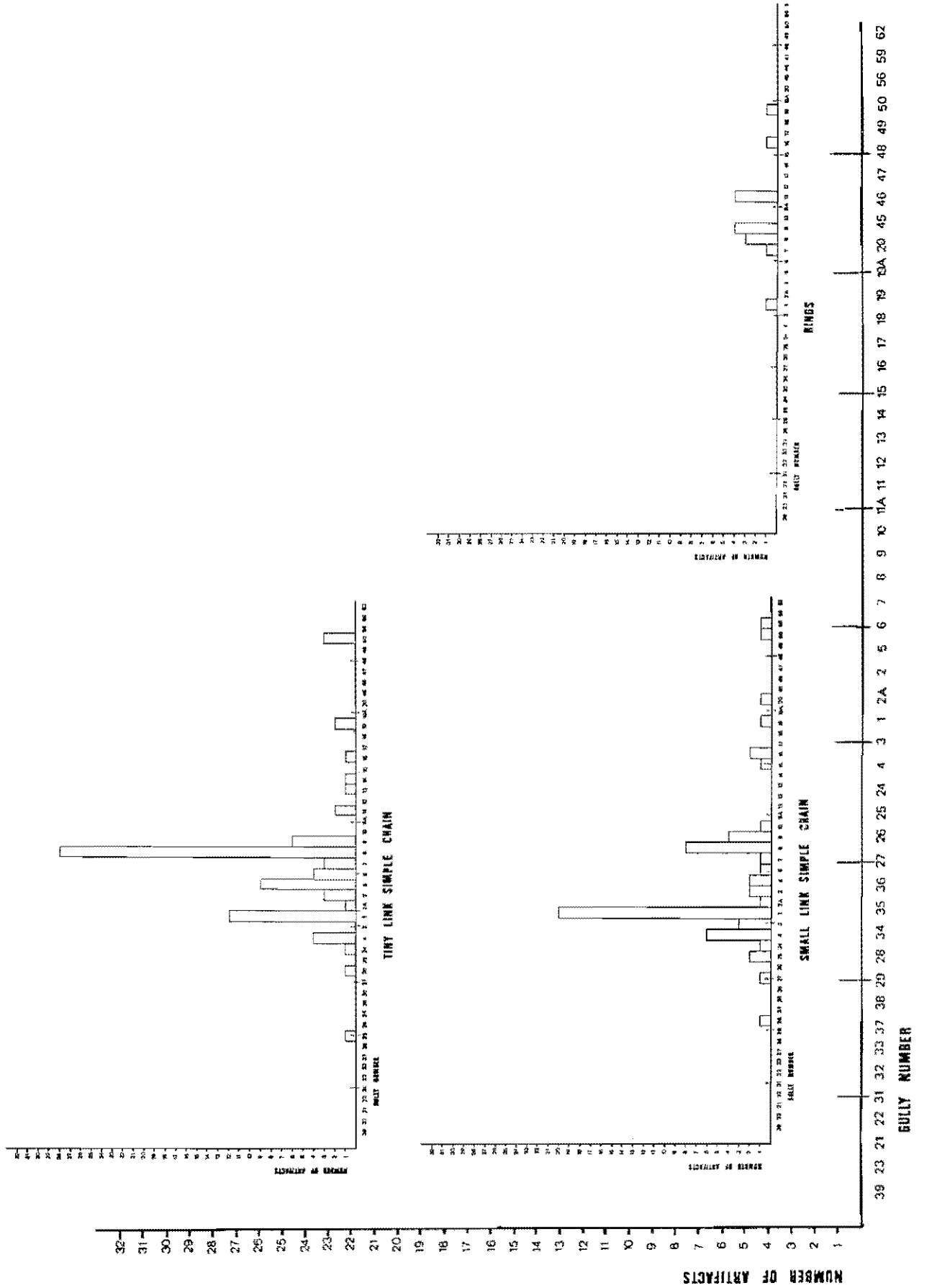
DISTRIBUTION HISTOGRAMS


FGB3
BUCP
FGB1
FGB2
NUMBER OF ARTIFACTS
GULLY NUMBER

DISTRIBUTION HISTOGRAMS


COMPLEX CHAIN TYPE J
COMPLEX CHAIN TYPE S
COMPLEX CHAIN TYPE C
COMPLEX CHAIN TYPE D
NUMBER OF ARTIFACTS
GULLY NUMBER


SPIKES & BOLTS
CANNON BALLS
LEAD SHOT
SOUNDING LEADS
NUMBER OF ARTIFACTS
GULLY NUMBER


TINY LINK SIMPLE CHAIN
SMALL LINK SIMPLE CHAIN
RINGS
NUMBER OF ARTIFACTS
GULLY NUMBER