East Asian Shorelines on the Piri Reis map of AH 919 (AD 1513)

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ABSTRACT

The western part of the AH 919 (AD 1513) map is considered by most authors to depict the region of the Caribbean. However, Columbus believed he had been to Asia and Piri Reis wrote that the names in the western area of his AH 919 (AD 1513) map were obtained from Columbus. We considered it was necessary to re-investigate the shorelines depicted in this part of the map. We have used computer superposition to re-investigate the shorelines depicted in the western area of the map. The results suggest that the map depicts shorelines of East and Southeast Asia from the east side of the Kamchatka Peninsula in the north, to northwest Borneo in the south. Interesting results include that the Territory of Antilia is eastern China opposite Taiwan, and Island Antilia is Taiwan but showing bays of Puerto Rico; the authors suggest that the large western island is an erroneous depiction of southern Japan. Based on the superpositions and other supporting geological information, the authors suggest that the western source map used by Piri Reis (whether of Turkish origin or from Columbus) depicted shorelines which were charted prior to the Islamic and Christian eras.

INTRODUCTION

The Piri Reis AH 919 (AD 1513) map fragment (41, 51) was found during renovations of the Topkapi Palace Museum in 1929 (16, 20, 21, 28, 35, 44). The western region is thought to represent the Caribbean (16, 21, 28, 44). Hapgood (16) using a separate Grid "B" for this area identified the western continent as Central America in the vicinity of the Yucatan Peninsula and the coasts further south were suggested to be those of both Central and South America even though some locations were identified twice. The large western island he identified as Cuba.

The identifications made by others (21, 28, 44) are usually based upon inscriptions written by Piri Reis and attributed by him to Qulūnbū (Columbus). These suggest that the northwestern coasts are the shorelines of Cuba (in continuity with the coasts of Panama further south) and the large western island is Hispaniola (20, 21, 28, 35, 44, 45). Columbus however believed he had been to Asia (21, 28, 37). In this paper we investigate Asia as a possible origin for the mainland depicted in the western area of the map. The results presented in this paper are essentially similar to those we have reported elsewhere (5).

METHODS

The shorelines in the western region were traced and digitized (8) and superimposed using a custom computer program written by the authors in Java over various projections of Asia and using data of the shorelines and isobaths taken from the GEBCO Digital Atlas (9). The superpositions were made using geographical coordinates of provisionally identified features on the map. For Figures 1-4 the superpositions were made using the locations shown in Table 1. For Figures 5-7 and figure 9, the superpositions were performed by "eye".

Figure	North Reference Location	South Reference Location
1 (northern section) 4	Cape Lopatka, Kamchatka 50° 53' 9"N, 156° 40'	Korean Archepelago 34° 40' 56"N., 125° 25' 31"E
1 (middle section)	Korean Archepelago 34° 40' 56"N, 125° 25' 31"E	Eastern Hainan Island 18° 38' 49" N., 111° 1' 39"E
1 (southern section)	Northern tip of Laut Island 4° 46'N, 108° E	Paleo-Baram River Estuary 4° 35' N, 113° 58'E
2	Wu-shih-pi, Taiwan 23° 13' 45" N, 121° 24' 0"E	Eastern Hainan Island 18° 38' 49" N, 111° 1' 39"E
3	Northern tip of Laut Island 4° 46'N, 108° E	Paleo-Baram River Estuary 4° 35' N, 113° 58'E

Table 1. *Geographical coordinates of reference points used in the superpositions of Figures 1, 2, 3 and 4.*

RESULTS

SUPERPOSITION OVER EAST ASIA

A number of superpositions over Asia were made. One such superposition using a simple conic (standard parallel = 36^o) is shown in (5). This showed that the map seemed to be a reasonable representation of East Asia but the shoreline of the map superimposed to the east in the most northern part of the map.

Subsequently a superposition of the map in three sections was made over a plate carrée projection of East and Southeast Asia (Fig. 1). Note that in Fig. 1, the three sections are superimposed using different scales (see inset). The map depicts coasts from the east side of the Kamchatka Peninsula (near 60^{o}N) to the vicinity of Northwest Sabah but omits the coasts of Indochina.

A rectangular peninsula considered previously to be Yucatan (16) or Castle Veragua, Panama (28) superimposes over the Korean Peninsula, but there is a small extension southward onto the Korean Strait. However the bay just to the west superimposes over the deep water of Cheju Strait (19, 43). The Yellow Sea is not depicted.

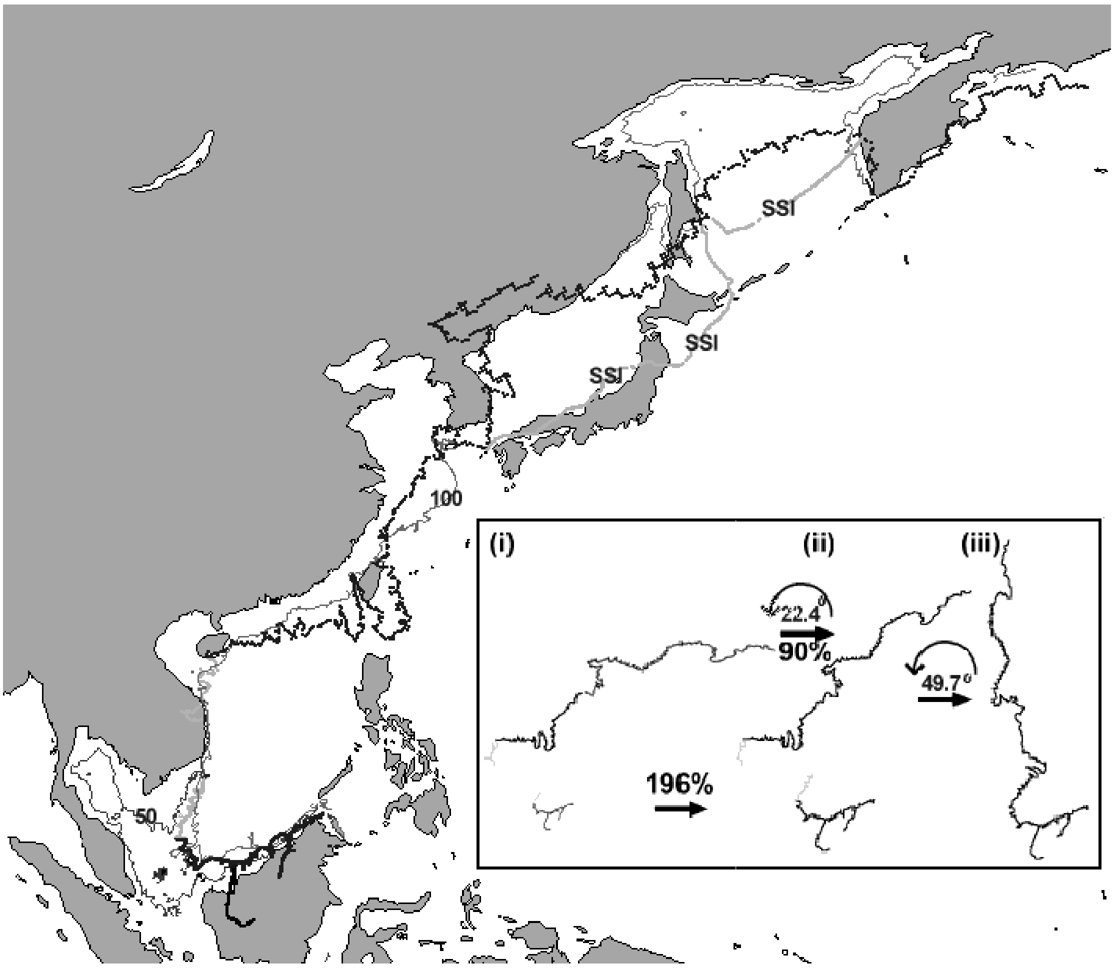


Figure 1. *Superposition of the northwest shoreline of the map in three sections (see METHODS) over a plate carrée projection of East Asia and South-East Asia. SSI: eastern edge of coloured sea suggested to represent seasonal sea ice. Some 50m and 100m isobaths are shown. Inset: Schema suggesting compilation errors: (i) the shoreline of the map as shown in the main panel, (ii) reduction of the scale of the coasts north of Cheju Strait to 90 percent and their counter-clockwise rotation by 22.4^o and an increase in the scale of the Sunda Shelf coasts to 196 percent, (iii) counter-clockwise rotation of the coasts north of the Paleo-Red River by 49.7^o and joining the coast of Nanhailand (at the Paleo-Red River) to Sundaland (at the mouth of the Paleo-Chao Phraya River) resulted in an omission of the paleo-coasts of Indo-China and the appearance of the coastlines as depicted on the map.*

Further south, the middle section of the map superimposes over the shorelines of the East China Sea and the northern South China Sea, westward up to the mouth of the Paleo-Red River (Paleo-Gulf of Tonkin). Following reposition of the map (after the omission of a finger shaped peninsula, an additional Taiwanese peninsula, see below), the map shoreline

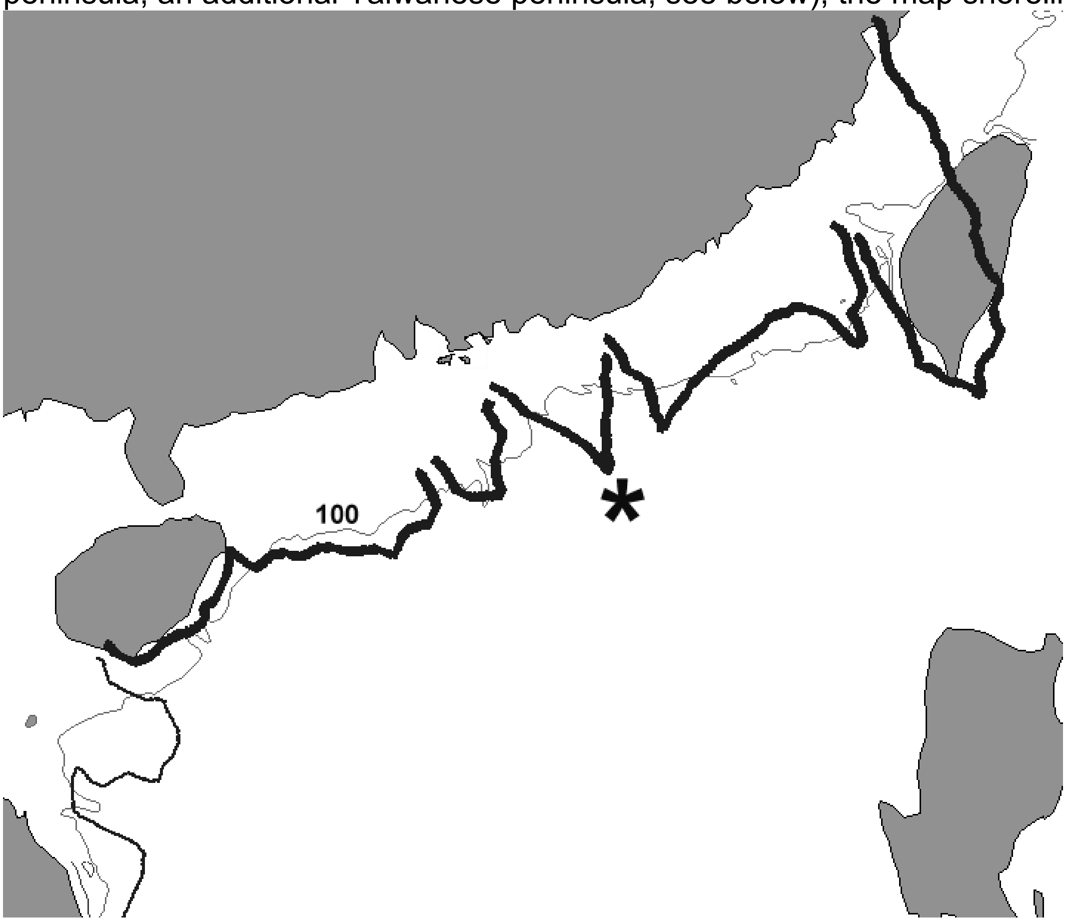


Figure 2. *Reposition (compared to Figure 1) of the superposition of the coastline of the map over the northern part of the South China Sea. The 100m isobath is shown.* *** *this peninsula appears to have undergone rapid tectonic subsidence, see section* ***"THE TWO ANTILIAS"****.*

(Fig. 2) superimposes over the area of the once exposed South China Sea shelf, (*Nanhailand)* (40).

NORTHERN SHORELINE OF SUNDALAND

Figure 3 shows a superposition of the southern section of the western region over the South China Sea from the mouth of the Paleo-Chao Phraya River (in the west) to the vicinity of Northwest Sabah (in the east). Bays and rivers on the map correspond to probable features along the northern shoreline of the Sunda Shelf when this was exposed *(Sundaland).*

The bay of the 1513 map at the northwest end of the southern section superimposes in Fig. 3 over the mouth of the Paleo-Chao Phraya River, a paleo-river system once draining the eastern side of the Malaysian Peninsula and southern Thailand (Fig. 4 of (50)). A bay immediately to the south is superimposed (in Fig. 3) over a trough whose water depth is greater than 100m today and once was the Estuary of the Paleo-Anambas Valley River (11, 14).

Further south still, a third bay is superimposed over the mouth of the Molengraaff River (North Sunda River), a river system which once drained Sundaland and adjacent areas of southwest Kalimantan and eastern Sumatra (7, 30, 46).

The map coastline then turns to the east where a river is depicted running southward with a reverse “J-shaped” course. We suggest that this is a depiction of the Paleo-Lupar River of Western Borneo (see page 159 in 4). The map coastline course then heads northeasterly, where a depicted bay we suggest is the estuary of the Paleo-Baram River whilst a southward running river further north is the Paleo-Trusan River.

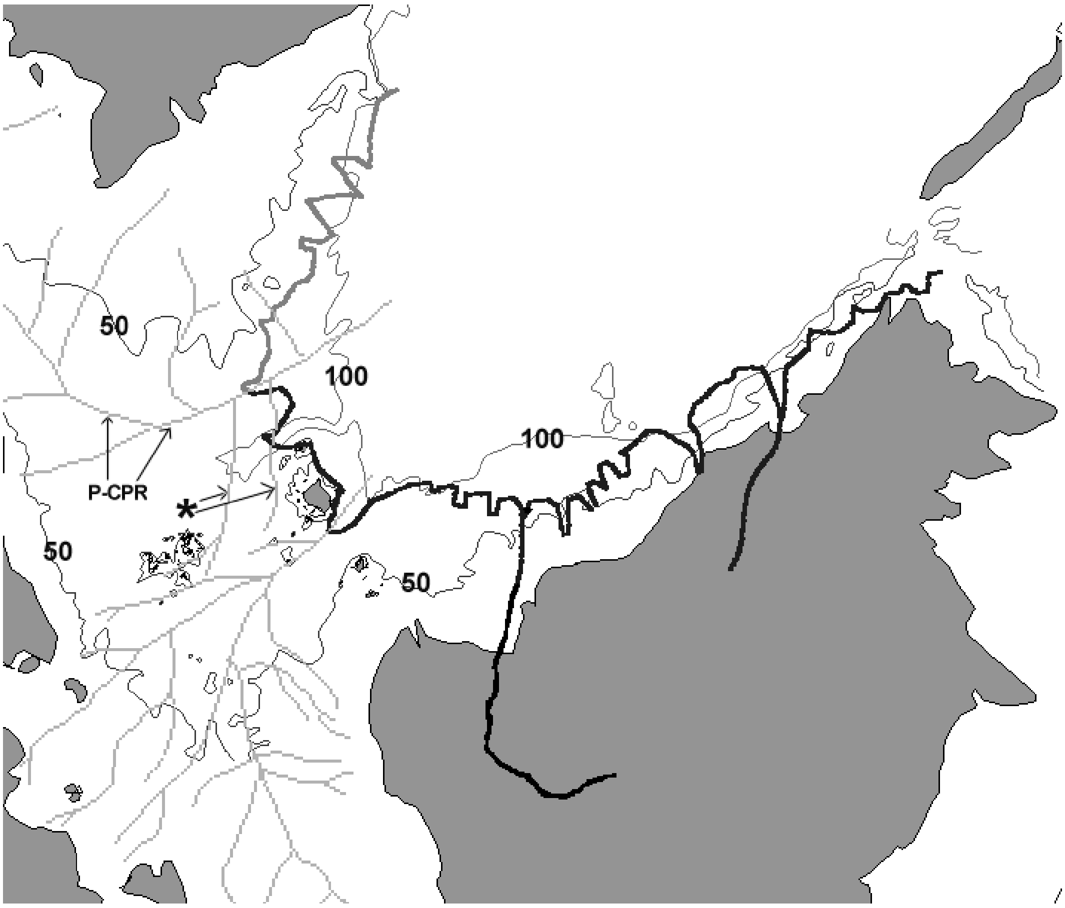


Figure 3. *Superposition of the Sunda Shelf area (shown at a greater scale than in Figure 1). Some 50m and 100m isobaths are shown. . The rivers shown on Sundaland are those described by Tjia (50). Label "P-CPR" indicates the course of the Paleo-Chao Phraya River. Two tributaries of the Paleo-Chao Phraya River, indicated with the "*", cross the Anambas Valley and are not in agreement with the results of Haile (11); tributaries of the Paleo-Chao Phraya River which appear not to cross the Anambas Valley are depicted in Figure 1 of (48).*

The map in the region of the mouth of the Molengraaff River lies near the site of a core (#18308 site coordinates, latitude 3^{o} 17.83'N., longitude 108^{o} 47.143'E) obtained by *SONNE 115* which contained mangrove sediments 80.3m below sea-level which were laid down during melt water pulse 1A (MWP-1A, circa 14,300 years BP) (15, 24, 46). This period (during the late Pleistocene when sea-levels rose rapidly (15, 24)), is compatible with the map shoreline as superimposed (in Fig. 1) over the waters in the Korean Strait which today are 90m or more in depth and with the omission of the Yellow Sea (19, 43) and with the presence of a land bridge between Taiwan and the continent.

SEDIMENT DEPOSITION AND HYDRO-ISOSTASY

The coastlines on the map in the area of the Paleo-Huang (Paleo-Yellow) and Paleo-Changjiang (Paleo-Yangtze) Rivers (Fig. 1) and to the east of the

Paleo-Lupar River (Fig. 3) superimpose over bathymetric depths between 60m and 70m. These depths are less than at the mouth of the Molengraaff River due to a combination of voluminous sediment deposition during the late Pleistocene and Holocene from the Paleo-Huang and Paleo-Changjiang (6, 26, 34, 43, 52) and Paleo-Rajang Rivers (47) and the effects of hydro-isostasy. An investigation into the latter in the South China Sea has indicated that sea-floor depression has been, since 15,000 B.P., up to 10m less in the region along the coast of Sarawak than along the northern border of Sundaland in the vicinity of the mouth of the Molengraaff River (25).

OKHOTSK AND EAST SEAS

The results we have described above indicate that the mainland in the northwest quadrant of the map depicts the coasts of East Asia and South East Asia as they may have appeared when sea level was lower. Between the Kamchatka Peninsula and the Korean Peninsula however, the map shoreline seems aberrant (Figure 1). The shoreline of the map between Kamchatka and North Korea runs through the southern Okhotsk Sea between the 55th and the 51st parallels and through the northern part of the East Sea (Sea of Japan) in the vicinity of the 43rd parallel (Figs. 1 & 4).

During the period of MWP-1A, however, the northern Okhotsk Sea ((36) and (22), see Fig. 33b, page 95, i.e. page 102 in the "pdf" file) and the Gulf of Sakhalin and the northern East Sea, north of the 44th parallel (18) were permanently covered with ice. The map shoreline here is depicted as crenellated; shorelines on the map with this appearance are discussed below. We suggest the shoreline depicts here (Fig. 4) the edge of the permanent sea-ice in the northern Okhotsk and northern East Seas.

A colour-shaded sea (Fig. 4, the eastern edge is labeled "SSI" in Fig. 1), and previously considered to represent sandy shallows (28), is seen at its southern end to lie east of North Korea and its eastern side follows the northern shoreline of Honshu from around 40^{o}N to the eastern corner of the rectangular peninsula of the Korean Peninsula and therefore the southern-end of the colour-shaded sea is probably the East Sea. During the late Pleistocene the climate was drier and colder and the East Sea was subject to

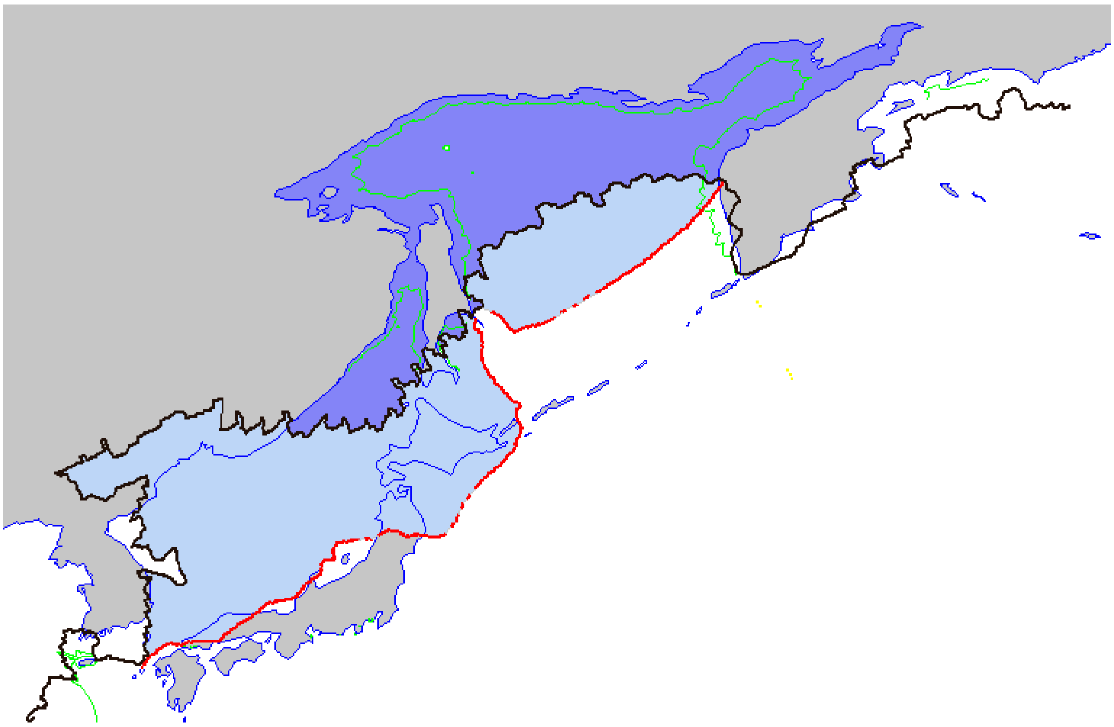


Figure 4. *The map shoreline depicts the east coast of Sakhalin Island and the edge of permanent sea ice in both the northern Okhotsk Sea and northern East Sea.*
Dark Blue: *Permanent sea-ice present in the northern Okhotsk Sea, the Gulf of Sakhalin and the northern East Sea during the late Pleistocene.*
Light Blue: *Seasonal sea ice in the southern Okhotsk Sea, the southern East Sea and east of Hokkaido, the latter due to a cold Oyashio current during the late Pleistocene.*
See Fig. 9 for the explanation for the erroneous encroachment of sea ice onto North Korea.

ice formation. The volume of the northward flowing warm sea-water through the Tsushima Strait was reduced by the latter's narrowing due to a low sea level (sill depth today of Tsushima Strait is 130m (23)), and this limited amount of warm salt water was mixed with fresh water from the outflow of the Paleo-Yellow River (38). As a consequence, the salinity in the East Sea was low (12, 23, 38, 39) and with the colder temperatures, winter sea-ice expanded.

Colour-shaded sea is present along the edge of the permanent sea ice of the Okhotsk Sea; it is also present to the east of Hokkaido (Fig. 4). During the late Pleistocene the warm current flowing through the Tsugaru Strait between Hokkaido and Honshu was greatly diminished due both to the lowered sea level within the Tsugaru Strait and by the reduced Tsushima current (23) from the south. The ocean current on the east side of Hokkaido was consequently in "coastal mode" resulting in the east coast of Hokkaido being bathed by the cold Oyashio current from the northeast (23). The latter may have actually reversed the current flow through the Tsugaru Strait with the consequence that the Oyashio current may have reached the East Sea during the late

Pleistocene (38). We therefore suggest that the colour shaded sea (Fig. 4) depicts a dangerous zone from a sailor's point of view (seasonal sea-ice and icebergs) in the southern East Sea and the seas east of Hokkaido and along the ice barrier of the Okhotsk Sea.

JAPAN

An island considered to be Hispaniola by Hapgood ((16), see his Fig. 18, # 30) but Puerto Rico by Kahle and McIntosh (21, 28) lies east of the rectangular shaped peninsula which superimposed over the Korean Peninsula in Fig. 1. Figure 5 shows a superposition of this island over Kyushu. This island therefore appears to be Kyushu (rotated). Features of the island are numerated in Fig. 5 and identified in Fig. 6D.

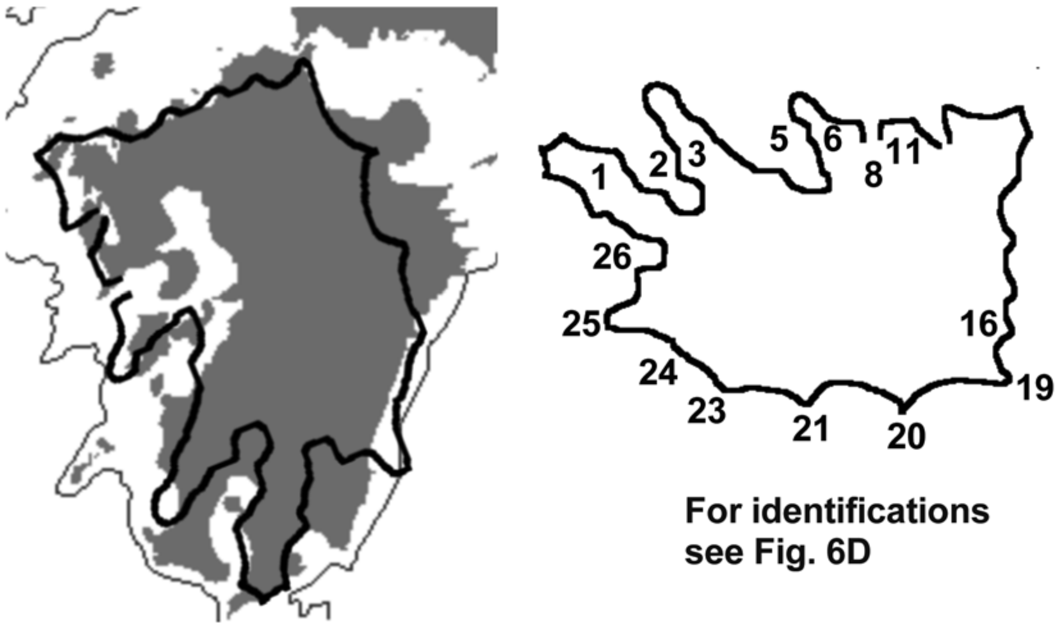
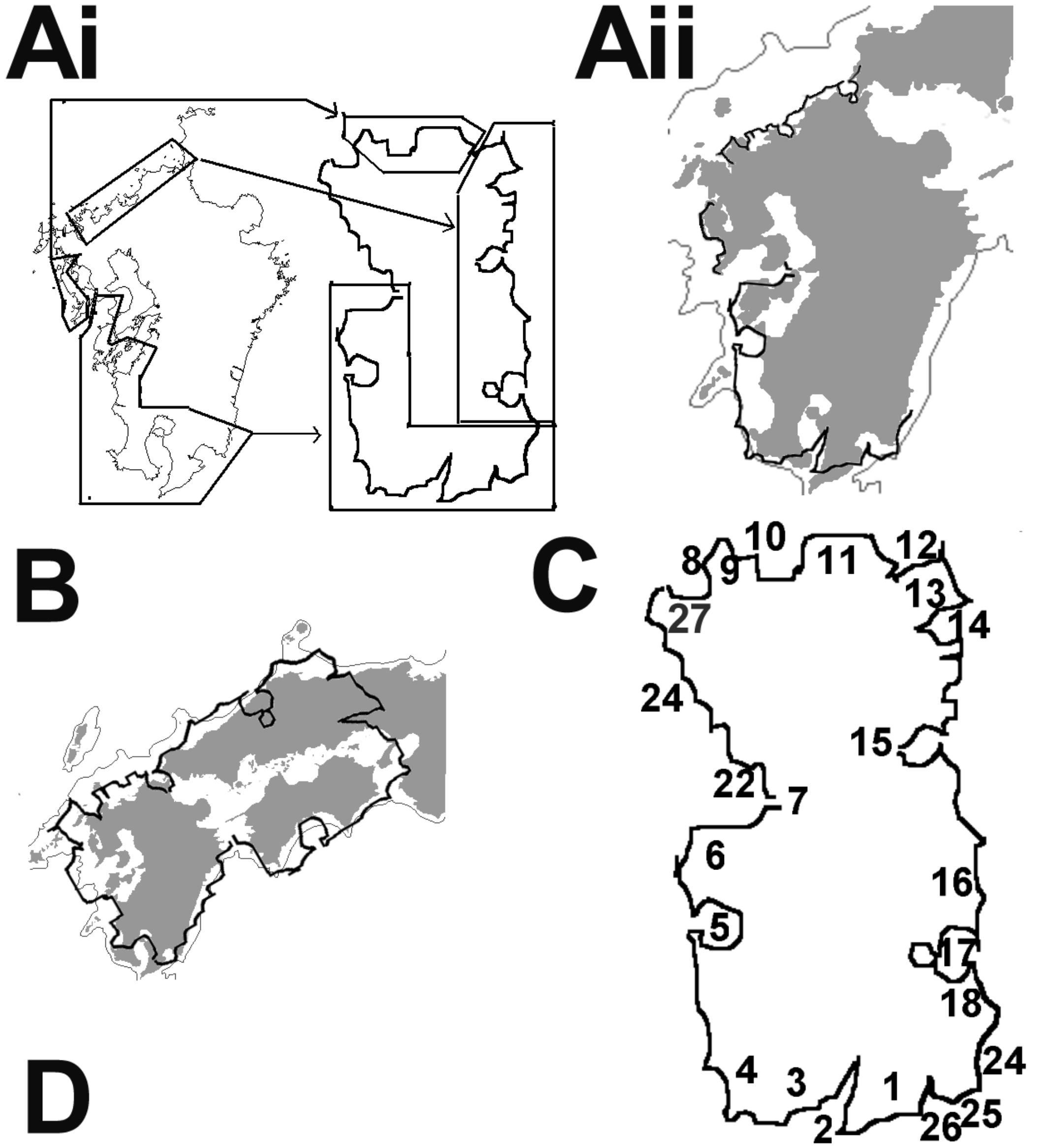


Figure 5. *Left: Superposition of the island (lying east of the Korean Peninsula) over Kyushu. The 100m isobath is shown. Right: Identifications (see Fig 6D).*

North of Kyushu and lying to the east of the colour-shaded sea which above we identified as the East Sea (Sea of Japan), is a large "western" island commonly known by the name given to it by Piri Reis, that is, the *Island of Spain*. This island has been identified previously as Cuba (16), Hispaniola (20, 21, 28, 35, 44, 45) or possibly the Great Bahama Bank (13). Columbus considered this to be Cipango (Japan, see (1, 21, 28, 37)). It has an appearance similar to Cipango as depicted on several other Renaissance Charts (16, 21, 28). We suggest that those Renaissance mapmakers were probably correct because, as one can see on the Fig. 6B, the *Island of Spain* looks grossly like the outline shape of a late Pleistocene southern Cipango. Some coastlines were not altered by the compilator: it is the case of the coast



D

1 Ōsumi Peninsula
2 Kagoshima Bay
3 Satsuma Peninsula
4 West coast of Satsuma Pen.
5 Yatshushiro Sea
6 Amakusa Islands
7 Hayasaki Strait
8 Tachibana Bay
9 Nagasaki Peninsula
10 Iozima Island
11 Nishionogi Peninsula
12 West coast of Higashi-matsuura Peninsula
13 Higashi-matsuura Peninsula
14 Karaatsu Bay
15 Hakata Bay
16 North Coast of Fukuoka Pref.
17 Hibiki Bay (south)
18 Shoreline of Hibiki Bay Yamaguchi Prefecture Honshu
19 Kammon Kyo
20 Kunisaki Peninsula
21 Jizo Cape
22 Bungo-suido
23 Tsurumi Cape
24 Shoreline of the Hyuga Sea
25 Toi-misaki Cape
26 Shibushi Bay
27 Paleo-South Kyushu (see Figure legend **)

Figure 6 (previous page). *Ai, Schema and Aii, superposition of suggested coasts on Kyushu*. *B, superimposition of the Island of Spain on a late Pleistocene shoreline of southern Japan possibly used as a compilation "template". The 100m isobath is shown in Aii and B. C and D, Identification of features of Kyushu and Western Honshu. ** Paleo-South Kyushu represents the exposed coasts during the late pleistocene, south of Cape Toi-Misaki together with an exposed area corresponding to Shibushi Bay in continuity further west with the Ōsumi Peninsula. Notations in Figure 6D are also applicable to Fig. 5.*

between features 22 and 27 (in Fig. 6C) which corresponds to the 14 000 BP shoreline between "Bungo-suido" and Shibushi Bay; note the latter was exposed and therefore not a bay at the time.

However, a close examination of the other shorelines reveals that they are probably the result of an erroneous compilation of Kyushu on this outline of southern Japan. Figure 6Ai shows a schema of suggested compilation errors and Fig. 6Aii shows the superpositions of the shorelines of the *Island of Spain* (from possibly when relative sea levels were between -5m and -20m), over the southern areas of Japan.

A confusion between the identities of Cipango and Hispaniola occurred as early as five or six years prior to the 1513 map when Johannes Ruysch wrote on his 1507-1508 world map that he was of the opinion that what the Spaniards call Spagnola (Hispaniola) is really Cipango (33). See also the discussion (below) in section "COMPILATION ERRORS".

THE TWO ANTILIAS

McIntosh (28) noted that, "*The Piri Reis map is apparently the only map to give the name "Antilia" to both the legendary island and the western continent*". Piri Reis wrote that the western mainland is called the *territory of Antilia*, (map inscription no. 3 (16, 21, 28, 41)). This mainland is superimposed over eastern China in Fig. 1, adjacent to a finger shaped peninsula superimposed over Taiwan; the latter is an erroneous addition at this site and is described further below.

The modern identity of island *Antilia* is uncertain and there are some who have considered this island to be fanciful (42). Figure 7 shows a superposition of Piri Reis's island of *Antilia* (see map inscription No. 16, (16, 21, 28, 41)) over Taiwan. The outline shapes are similar. So considering the juxtaposition of the *territory of Antilia* with the site of Taiwan today then island *Antilia* is likely to be *principally* Taiwan.

The east coast of island *Antilia* (Fig. 7) has a crenellated appearance. We suggest that this appearance is used in several places on the map (eg over the shoreline which we suggested above represents the edge of permanent sea ice in the Otkohsk and northern East Seas), when the exact details of the features were probably unknown to the cartographer. The features on the

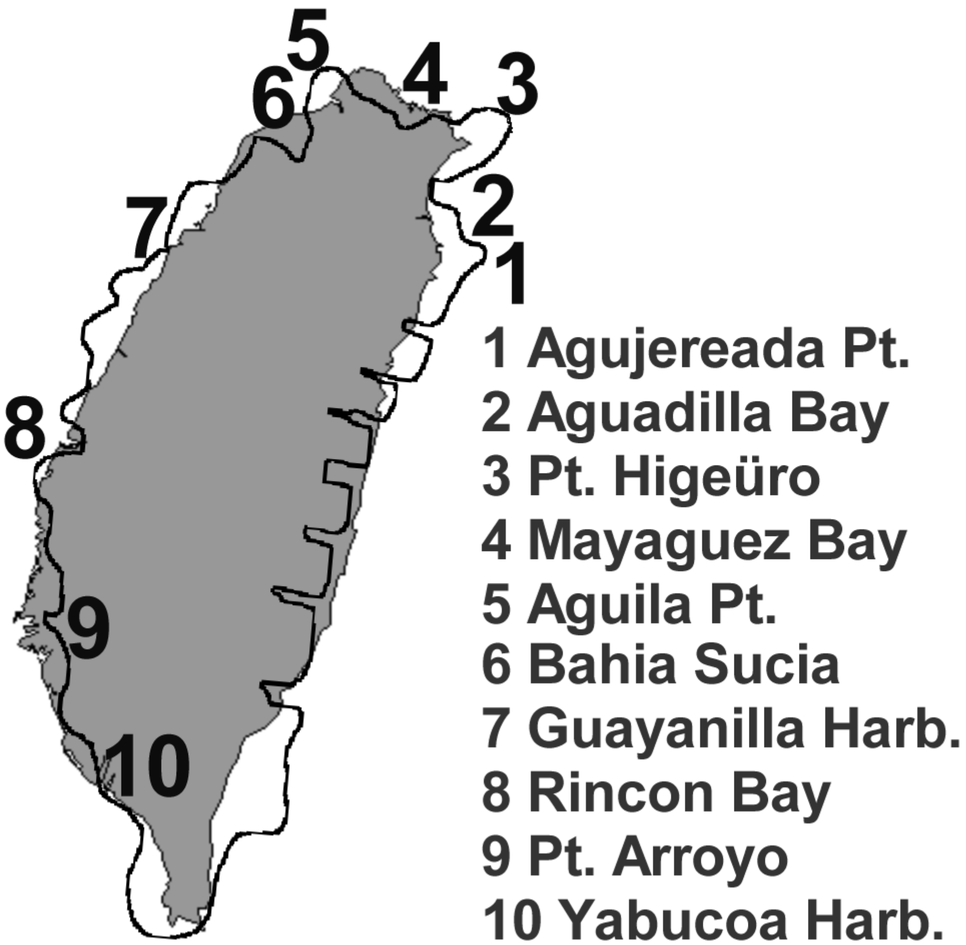


Figure 7. *Superposition of island Antilia over Taiwan. Numbered features are those of Puerto Rico.*

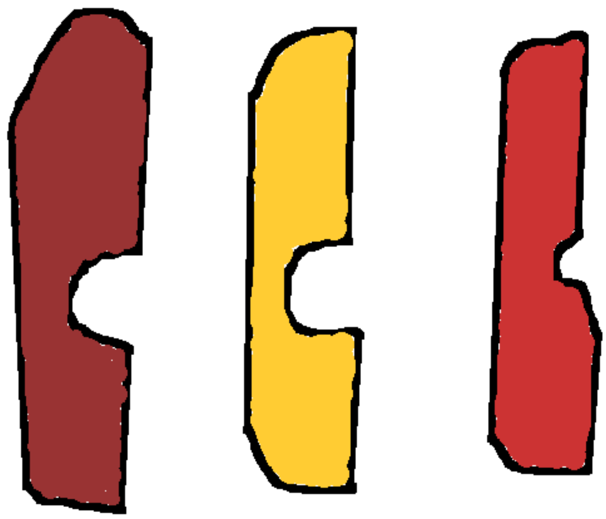


Figure 8. *Three coloured features named Tris matos.*

north and west coasts of island *Antilia* however do not precisely match features of Taiwan (recent or ancient). However if one rotates Taiwan about 90^o counter-clockwise, the outline shape of Taiwan appears crudely similar to Puerto Rico. We propose that this has confused a compilator (probably someone earlier than Piri Reis) who has, as a consequence depicted the bays on the north and west sides of island *Antilia*, as respectively the bays on the west and south coasts of Puerto Rico. From close examination of these bays (particularly Rincon Bay) and comparing these with near-shore isobaths on the south side of Puerto Rico (32), we suggest that the bays depicted on Puerto Rico appear to those present when relative sea levels around Puerto Rico were between -5m and -10m; the latter occurred circa 6,300 - 7,400 years B.P. (25). Based on comparison with isobaths (34), the small island lying to the northwest of island *Antilia* we suggest is the Pescadore Islands depicted when sea level was between -20m and -40m (late Pleistocene to early Holocene). We note that the island *Antilia* on the 1424 Pizzigano Chart has been suggested to be Puerto Rico (29) or Taiwan by R.H. Fuson, (13).

TRIS MATOS

There are 12 parrots drawn in the western area of the map; one difficult to see parrot sits on an island adjacent to Cape Lopatka (see Fig. 10). Kahle (21) wrote in 1933: “I think it may be assumed that all the parrot islands originate from the map which Columbus used on his first voyage ” and “Apparently to prevent confusion between the islands originally on the map and those that Columbus had actually discovered, the former were distinguished by parrots”. Kahle considered however that the large western island, Cipango, had been altered to represent Española (Hispaniola) (21). We consider however this island to actually represent Cipango as it was depicted on an earlier map (see above and also below).

One parrot sits on the most easterly of the three stylized and similar shaped features named *Tris matos* (Fig. 8). We suggest that *Tris matos* are not depictions of islands but are cartographic symbols indicating, perhaps by their colours, the merging or splicing together, (from a Turkish nautical term meaning to splice together rope ends (28)) onto the map, the islands with accompanying parrots. It is possible that *Tris matos* were a creation by Piri Reis when drawing his 1513 map. Alternatively, the *Tris matos features* could have already been depicted on the source map, together with a name of similar meaning (perhaps devised by Columbus) and Piri Reis translated this into Turkish using nautical terminology. Thus with the exception of *Tris matos*, we are in agreement with Kahle (21) in that the (other) islands with parrots are likely to be from an earlier source map.

COMPILATION ERRORS

As mentioned above, we suggest that there has been an omission of coastline between the mouth of the Paleo-Red River of *Naihailand* and the mouth of the Paleo-Chao Phraya River of *Sundaland* (Fig. 1 and inset). The resulting compilation has resulted in the western shoreline on the map having a north-south orientation (Fig. 1 inset).

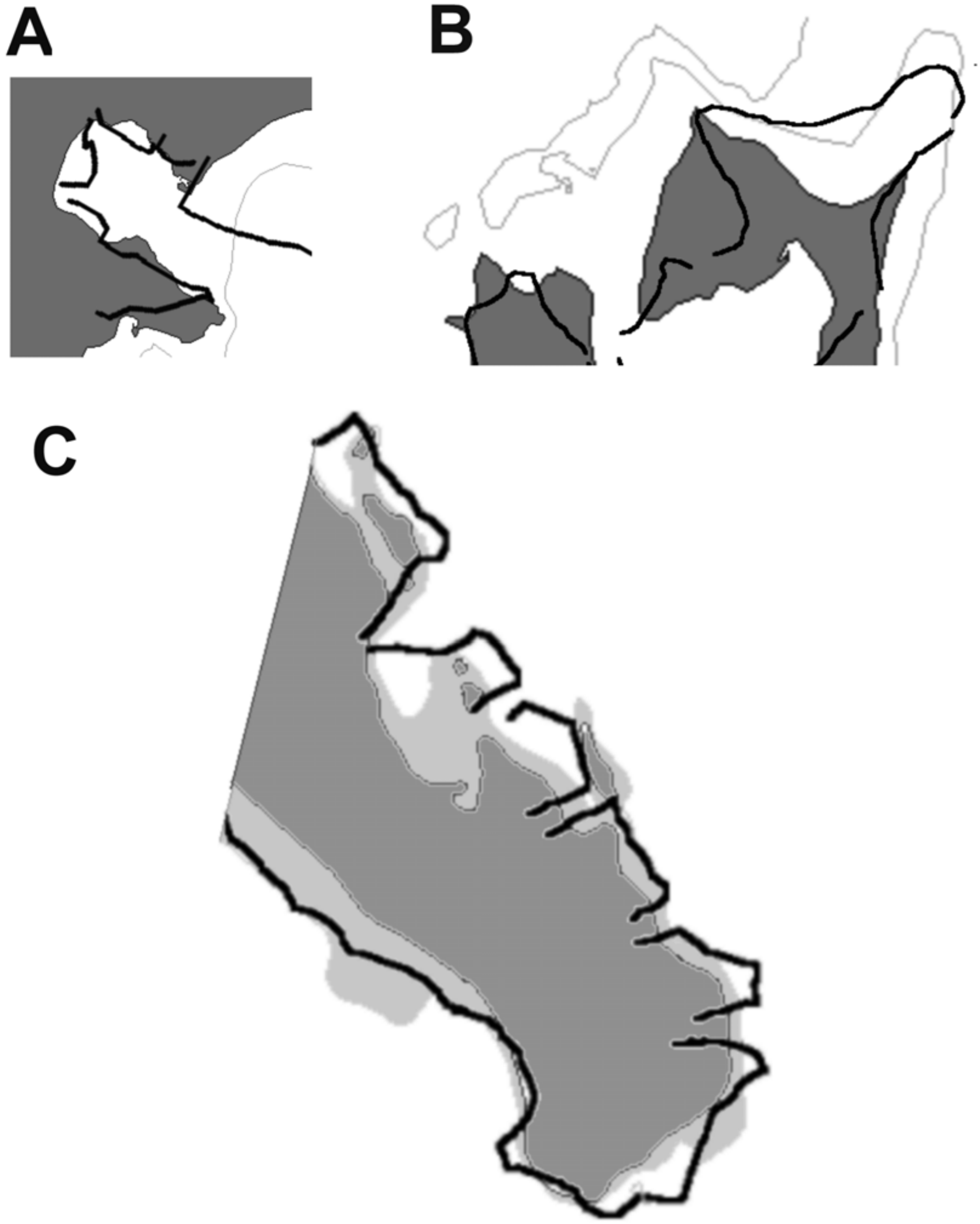


Figure 9. *A, superposition of the shoreline (superimposed over North Korea in Figure 1) over Uchiura Bay and the Kameda Peninsula of southern Hokkaido. B. Superposition of shoreline superimposed over South Korea in Figure 1, over the Tsugaru and Shimokita Peninsulas of northern Honshu. The 200m isobath is shown. C Superposition of the finger-shaped peninsula over the southern tip of Baja California (dark grey) and surrounding water shallower than the 200m isobath (light grey).*

In addition there are two areas where the shorelines from correct latitudes but wrong longitudes have been depicted. Shorelines on either side of the Tsugaru Strait between Hokkaido and Honshu (Fig. 9A, 9B) have been substituted as the East Sea shorelines of North and South Korea. Note the peninsula which we suggest is the Kameda Peninsula of Piri Reis (Fig. 9B) lies at the same latitude (in Figs 1 & 4) as the Kameda Peninsula of Hokkaido. As the coastal zones of northern Honshu and southern Hokkaido are not depicted at their true location on the map of Piri Reis, we suggest they belong to a part of the map (including northern Honshu and Hokkaido) which has been broken up into fragments, the original longitude of which was impossible to determine. As a consequence, the fragments comprising those coastal zones were used erroneously to complete the continental shoreline after a longitudinal shift and some rescaling.

Thus we suggest good maps of Japan were drawn (possibly by Incipient Jomon (17) or Jomon cartographers, see below) between 14,000 BP and the mid to late Holocene. Compilators, probably during historical times, erroneously used some fragments from those maps: they rotated the remaining fragment(s) of the oldest map (circa 14,000 BP southern Japan) and added details to its shorelines (to fill some gaps) by using some fragments of more recent maps of the same zone. As they were unaware of the sea-level fluctuations, the resultant compilations were poor and resulted in the various depictions of Cipango as seen on the 1513 map and other Renaissance charts.

In the superposition of Fig. 1, a finger-shaped peninsula superimposed over Taiwan. This peninsula neatly superimposes over the southern tip of Baja California (Fig. 9C), when sea level was lower than today. Note, both Taiwan and Baja California lie on the Tropic of Cancer. We suggest that Baja California (before Magellan sailed through his strait) has been added to the East Coast of China as an additional Taiwanese Peninsula.

We have repositioned the superposition of the map over the northern part of the South China Sea after omitting the finger-shaped peninsula (see METHODS and Fig. 2). The map coastline now follows more closely the 100m isobath along this coast (27, 34) from Taiwan to the south side of Hainan Island and the bays on the map are now superimposed over the mouths of the Paleo-Pearl River (27). A V-shaped peninsula (marked by an asterisk in Fig. 2) is superimposed over the Vereker Banks on Dongsha Rise; the latter is an area that has undergone rapid tectonic submergence up to 15m per thousand years since the end of the last ice-age (27).

The misalignment of Taiwan “proper” in Fig. 2 suggests that it was rotated counter-clockwise to “accommodate” the insertion of Baja California into the East China shoreline. Depicted lying to the west of Taiwan are the Pescadore Islands during the late Pleistocene (see Fig. 10, feature No. 16).

IDENTIFICATIONS

The features depicted in the western region of the 1513 map are identified in Fig. 10.

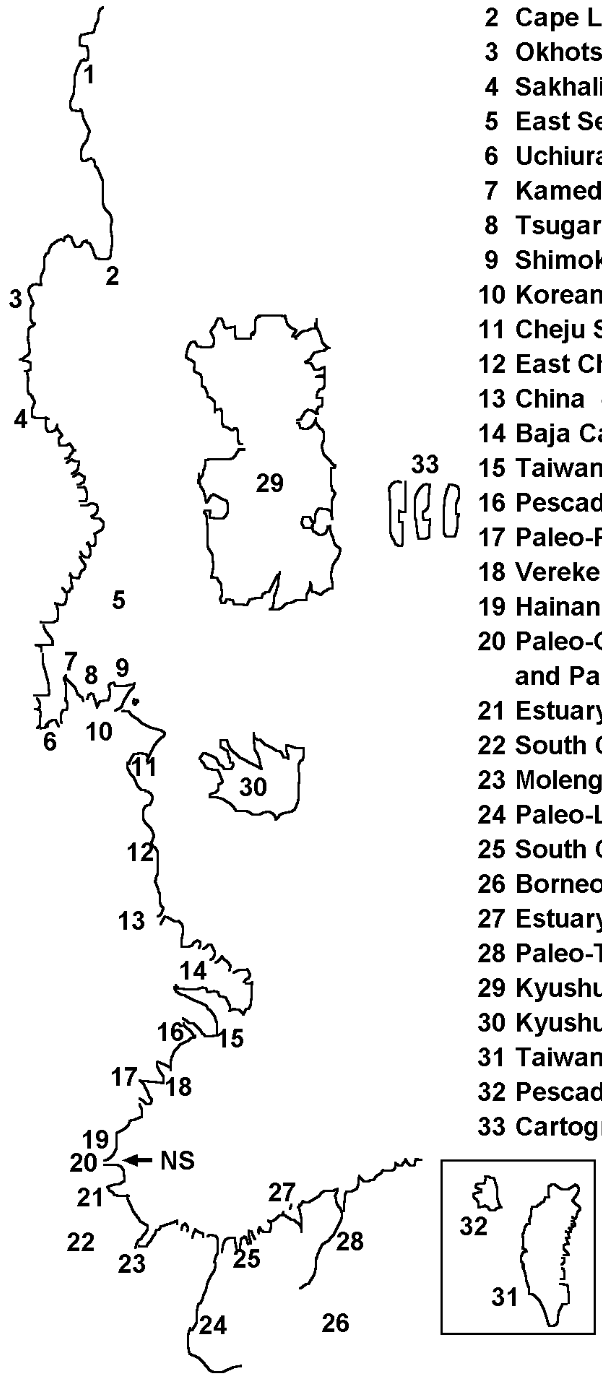


Figure 10. *Features and some selected islands depicted in the northwest part of the map. Inset: island Antilia with neighboring island.*

CONCLUSIONS

We conclude that the western area of the 1513 map does not depict shorelines of the Caribbean (16, 21, 28, 44, 45) but depicts the shorelines of East and Southeast Asia when sea-level was lower during the late Pleistocene and early Holocene. In this regard we suggest that Hapgood (16) was partly on the right track when he suggested that some source maps were very ancient.

It is possible that the source maps were of Turkish origin (see (1)). If the source maps were from Columbus, they are not only the result of his sailing (21, 31). It is more likely that they were charts that had inspired him and underpinned his conviction that he had reached Asia (21, 49).

From whence the original source map came is pure speculation. Developed upper Paleolithic cultures are known to have been present in East Asia (2, 3) and others have suggested the presence in Asia (13) or Southeast Asia (40) of cultures with technical expertise. As a late Pleistocene maritime civilization is indicated however, much of its archaeology would be now submerged. A gouge used for boat-making and hence sea-faring capability has however, been recovered from an upper Paleolithic site on Kyushu and dated at 13,000 B.P. (17) and the Incipient Jomons were known to have mastered pottery earlier than this date (17). Were the Incipient Jomons the originators of the original source maps?

It is a pity that a large part of the Piri Reis 1513 map has not been recovered (21, 28). We believe that it is possible that other areas of the map fragment (and perhaps other Renaissance Portolan style charts) may have ancient origins and that their re-evaluation might prove profitable.

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