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Relief and Deposits of Assumption Island, Seychelles, Indian Ocean

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ABSTRACT

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The geomorphology of Assumption Island is distinguished by elevated marine terraces formed when the island was an atoll. Two high marine terraces (III: 10–14 m elevation; II: 4–8 m elevation) composed of reefal limestones, correspond to two or possibly three peaks of transgression of the world ocean during the Riss-Würm (Isotopic Stage 5), that are confirmed by ^{230}Th/^{234}U dates of 127 ± 2.7 ka, 125 ± 1.8 ka, 110 ± 4.0 ka, 96 ± 3.0 ka and 82 ± 2.7 ka. Low Marine Terrace I at 2–3 m elevation, was formed during two phases of Holocene transgression. Calcarenites from the base of the lower terrace were deposited during the first phase, while an upper unit was emplaced during the second. Accumulation of a large volume of Holocene sand in eastern Assumption Island occurred as detrital material was blown from the exposed shelf during the end of the Late Würm-Early Holocene.

ADDITIONAL INDEX WORDS: *Atoll, calcarenite eolian relief, karst topography, marine terrace, marine transgression, sea-level change.*

INTRODUCTION

Assumption Island, located at 10°S Latitude, 46°E Longitude, of the Aldabra group in the southwestern Somali Basin (Figure 1), is a small elevated carbonate platform situated on one of five submarine seamounts that rise from a depth of 4,000 m (KOSMININ *et al.*, 1982). This island is devoid of a central lagoon and has an elongated form (6 km by 1.6 km) oriented NE-SW, with a salient on the NW side. This configuration may possibly be explained by prevailing wind and wave directions of the winter monsoon. The topography of Assumption Island demonstrates pronounced raised high marine terraces (III: 10–14 m elevation; II: 4–8 m elevation), a low raised marine terrace (I: 2–3 m elevation), and a modern marine abrasion platform. Adjoining the low marine terrace and eroding eolian deposits are modern accumulation forms. Maximum relief on the island is on the southeast end, where dunes reach 32 m elevation.

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DISCUSSION

High Terraces

The higher parts of the elevated former atoll are composed of two geomorphic surfaces, Marine Terraces II and III, which probably correspond to two or three different marine transgressions. A pronounced scarp is evident between these surfaces in the eastern part of the island.

Marine Terrace III

Marine terrace III is at an elevation of 10–14 m above sea level (a.s.l.). Its base is composed of reef limestone (with large corals showing signs of solution), well recrystallized and compactly cemented. The middle part of the section is the emergent part of the terrace, represented by coarser-size, compactly cemented limestone breccia with horizontal seams of calcarenites. The surface of this unit is strongly corroded, with the formation of karren relief. Phosphorite has accumulated within the depressions so formed. The upper portion of the section is composed in the lower parts of shallow lagoonal calcarenites, giving way to algal limestones with a pronounced carbonate crust at the top.

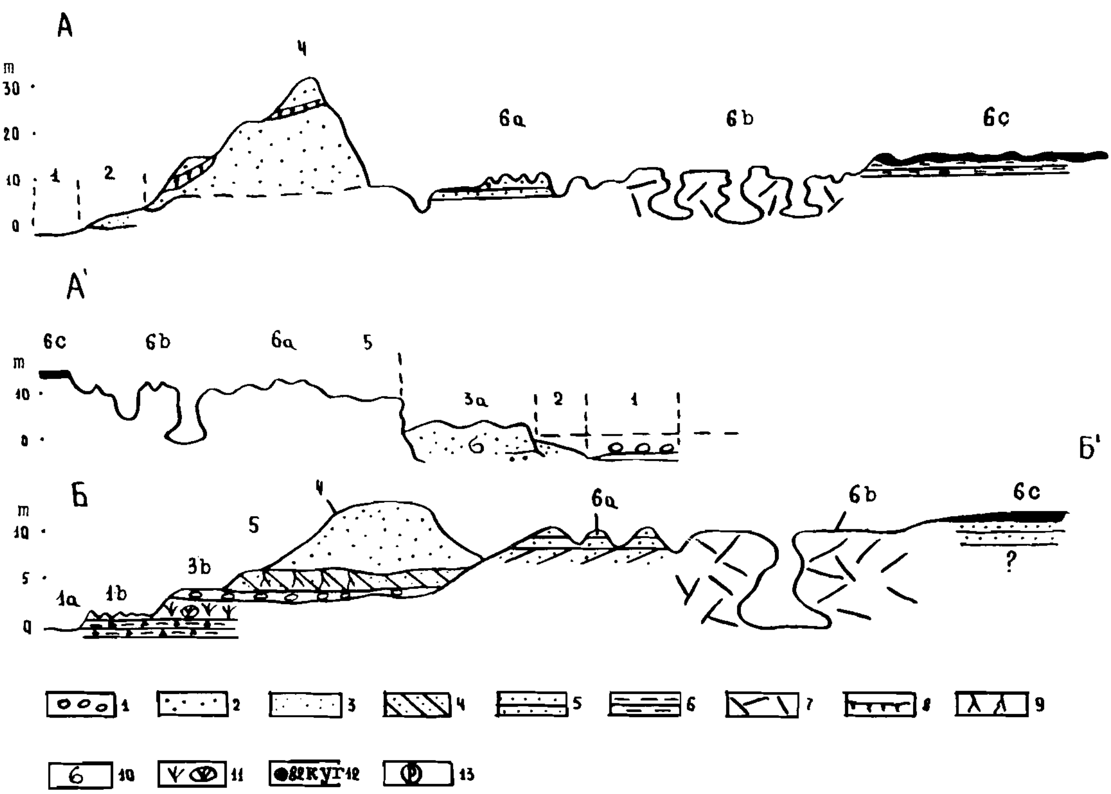

Figure 1. Principal geological-geomorphological profiles of Assumption Island. A-A'—Southern section (azimuth 240°); B-B'—Eastern section (azimuth 300°). Lithofacies: (1) boulders, (2) gravel, (3) sand, (4) cross-laminated calcarenites, (5) fine-grained limestones, (6) carbonate crust, (7) coarse-grained limestone, (8) soils, (9) plant remains, (10) shells, (11) fossil corals, (12) radiometric dates, and (13) phosphorites. Geomorphological Environments: (1) reef-flat, (1a) horizontal bench surface, (1b) karst bench ("champignon" surface), (2) beach, (3) Holocene level, (3a) accumulative terrace (I), (3b) raised beach, (4) dunes, (5) 4–6 m terrace (Marine Terrace II), (6) 10–14 m terrace (Marine Terrace III), (6a) karren relief, (6b) karst caves and pits, and (6c) carbonate plateau.

Marine Terrace III is characterized by karst forms of different types (with the exception of submerged surfaces). These range from large poljes (up to 150 m in diameter) and numerous collapse dolines to karrens. Large-scale karst relief (dolines and large sinkholes with freshwater lakes) is intensively developed within limestone breccia zones, and is surrounded by the former surface of lagoon accumulation (Figure 1).

The geological and geomorphological development of the high terrace is similar to that of the highest terrace (8 m) on Aldabra Island (STODDART *et al.*, 1971; TAYLOR *et al.*, 1979; TRUDGILL, 1979).

Age determinations of the terrace limestones were implemented with radiocarbon and ^{230}Th/^{234}U methods at the Institute of Geochemistry and Physics of Minerals, The Ukranian Academy of Sciences (Kiev). Samples were collected in the reference section (Figure 1) on the southeastern coast of Assumption Island, where ancient limestones were exposed at a sea cliff of the 4–6 m abrasion (?) terrace. There the following deposits were distinguished (top to bottom) (Figure 2).

(1) Eolian sand (0.5 m).
(2) Weakly lithified calcarenites with well-pronounced cross-lamination, steep at the base of the bed, gentle at the top, and near vertical, branching formations suggestive of roots (mangrove vegetation?) (− 1.5 m).
(3) Carbonate crust (chemogenic or algal limestones) containing well-rounded boulders and pebbles of coral limestone (0.1 m).
(4) Reef limestone with *in situ* corals and with lenses of coarse-size coral sandstone at the base and top of the bed (− 1.9 m).

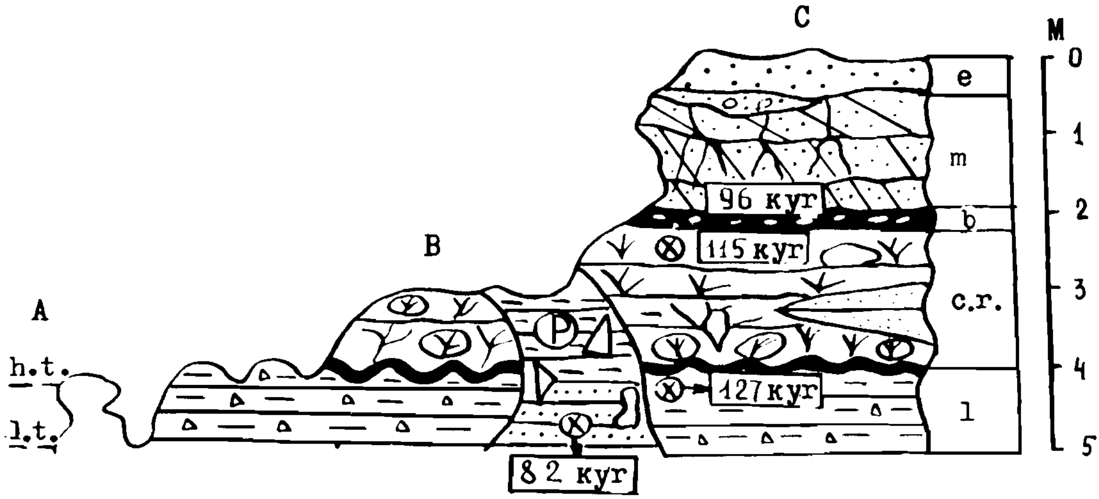

Figure 2. Geological makeup of Marine Terrace II (6–8 m a.s.l.) of Assumption Island. Lithologic symbols as explained in Figure 1. (A) modern bench (reef-flat), (B) raised bench, (C) Marine Terrace II. Facies: (e) eolian, (m) marsh, (b) bench, (c.r.) coral reef, (l) lagoon, (h.t.) level of high tide, (l.t.) level of low tide.

(5) Light-colored limestone with light grey patches, compact with coarse cross-laminations, containing abundant poorly-rounded large coral detritus at various orientations both at the contact of laminae and within lenses of compact marly (?) material (– 1.0 m).

In this section, younger weakly lithified calcarenites (units 2–3) overlie older reef limestones (units 4–5) similar to rocks exposed in abrasion cliffs of Marine Terrace III in the southern part of the island and in sinkholes in the interior limestone plateau.

A series of ^{14}C dates were obtained on coral detritus taken from the lower part of the terrace (units 4–5) (Table 1). These dates, ranging from 20,923 to 36,023 BP, nominally correspond to the Middle Würm, when the position of eustatic sea level was −15 to −20 m (CURREY, 1968; BOWEN, 1981; KAPLIN, 1977; LABEYRIE, 1984). STODDART *et al.* (1971) suggested tectonic stability in the Aldabra archipelago, including Assumption Island during Pleistocene. We decided to cross-check this series of ^{14}C dates with $^{230}Th/^{234}U$ dating of samples. The dates obtained (115 ± 1.8 ka, 127 ± 2.7 ka) allow us to place the time of the elevated coral reef formation in the Riss-Würm (Sangamon) marine transgression (Q^{1}_{III}), corresponding to oxygen-isotope substage 5e (BOWEN, 1981; SHACKLETON and OPDYKE, 1973; LABEYRIE, 1984).

Similar $^{230}Th/^{234}U$ dates (118 to 136 ka) were obtained from corals from the 8 m terrace on Aldabra Island (TAYLOR *et al.*, 1979), which had initially been radiocarbon dated within the interval 26 to 39 ka (BRAITHWAITE *et al.*, 1973). An analogous age was established for the 10 m terrace in the Praslin-LaDigue Islands (MONTAGGIONI and HOANG, 1988).

Carbonate Crust

An additional sample of chemogenic limestone (low-magnesium calcite crust) was collected from the top of the lagoonal section in Marine Terrace III from western Assumption Island. The date (110 ± 4 ka) cannot be interpreted simply. If it

Table 1. *C^{14}-dates from section 3171 (south-eastern coast of Assumption Island).*

Sample No.	Fauna Composition	C^{14}-date	Laboratory Index, Ki
I/3171-AB	Pectinia flactuca (1 layer)	36,023 ± 1,997	2,483
I/3171-AB	Pectinia flactuca (2 layer)	23,500 ± 383	2,493
II/3171-AB	Coniopora norfolkensis (1 layer)	25,087 ± 502	2,482
II/3171-AB	Coniopora norfolkensis (2 layer)	20,923 ± 278	2,481

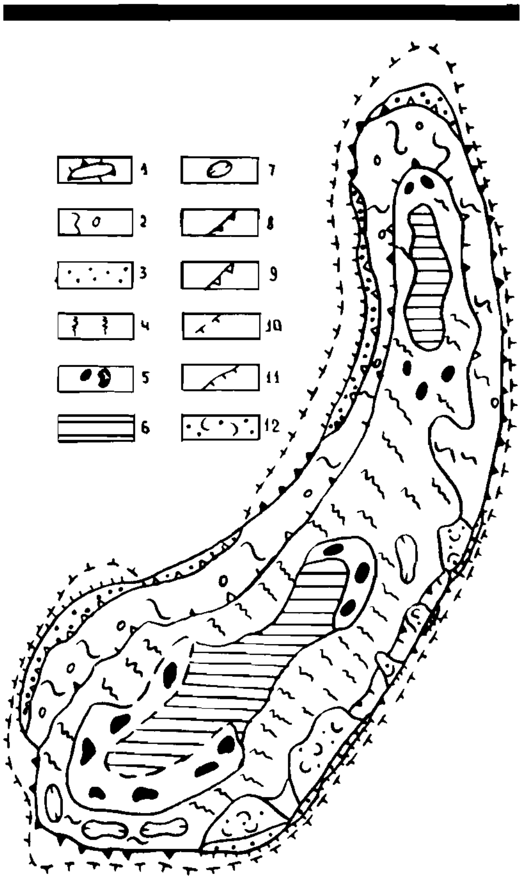

Figure 3. Geomorphological sketch map of Assumption Island. (1) edge of Marine Terrace III, (2) Marine Terrace II, (3) Marine Terrace I, (4) coral reef, (5) karst cave, (6) limestone plateau, (7) poljes, (8) active cliff, (9) inactive cliff, (10) abrasion platform edge, (11) eroding shoreline of ancient eolian accumulation forms, and (12) eolian relief.

is supposed that this date corresponds to oxygen isotope stage 5c (about 103 ka), then it should be assumed that in Riss-Würm time sea level twice rose to 10 m a.s.l. That is in conflict with the data for marine terraces in Barbados Island, California, the Bagam Islands, and other coasts of the world ocean (GUILCHER, 1974; BOWEN, 1981; LABEYRIE, 1984).

Study of thin sections of the carbonate crust shows evidence of cryptocrystalline texture without organic remains, and clearly evident algal limestones underlying chemogenic limestone. The corrosion of the algal limestone surface observed in contact with the carbonate crust, as well as the presence of marine mollusks in this level as laminae of widely dispersed shell detritus, indirectly indicates the nature of this sedimentation interval. The concretions in the carbonate crust provide evidence of its post-sedimentation origin. The dated sample contained similar autochthonous carbonate concretions.

Marine Terrace II

Marine Terrace II (6–8 m a.s.l.) is morphologically pronounced on the eastern coast of Assumption Island. It was formed as a result of abrasion of Marine Terrace III limestones and the accumulation of shallow marine sediments. In the described reference section, deposits that fix the height of sea level at 4–6 m a.s.l. are composed of marsh-facies calcarenites, both underlying and overlying beach boulders and pebbles. The ^{230}Th/^{234}U date obtained (96 ± 3 ka) allows us to place the terrace within the Riss-Würm, and to compare its time of formation with Barbados II (BROECKER *et al.*, 1974) and oxygen isotope substage 5c (SHACKLETON and OPDYKE, 1973; LABEYRIE, 1984).

The problem of finding the peak Riss-Würm transgression corresponding to substage 5a and Barbados III, at about 82 ka (BROEKER *et al.*, 1974; LABEYRIE, 1984) for Assumption Island must be decided in the following manner. Marine Terrace II (6–8 m a.s.l.) on Assumption, as at the 4 m level on Aldabra Island, has traces of a marine abrasion surface, in which karst processes have produced a well-developed system of karrens. In addition, older karst caves within the basic Marine Terrace II deposits at the 4–6 m terrace section are filled with younger shallow marine calcarenites and covered with calcarenite soils with phosphorite lenses. The age of these calcarenites, in which are formed poljes within the 4–6 m terrace, is 82 ± 2.7 ka by the ^{230}Th/^{234}U method. This date can't be simply interpreted because of the insufficiently clear geologic position of this calcarenite. It is possible that in this case there is a simple rejuvenation of the deposit's isotopic age. Nevertheless, this date corresponds well with the level of the third and youngest peak, oxygen isotope substage 5a, of the Riss-Würm transgression (LABEYRIE, 1984).

Marine Terrace I

The youngest terrace on Assumption Island (Marine Terrace I, elevation 2–3 m a.s.l.) is mainly developed along the western coast of the island, opening toward the winter monsoon. Along the eastern coast this terrace is recognized primarily within eolian deposits. Here erosion of more ancient eolian sands has allowed accumulation and formed dune ridges. In the northern island Marine Terrace I is observed as a cuspate foreland formed by the northeast longshore drift, a consequence of southeast wind-generated waves (Figure 3).

The following deposits were described in a section of Marine Terrace I on the western coast of Assumption Island (from top to bottom):

(1) Carbonate sand, poorly sorted, dark grey, containing humus. Pronounced horizontal lamination. (− 0.2 m).
(2) Carbonate sand and silt, poorly sorted, light grey, with shell detritus. (− 0.3 m).
(3) Carbonate sand, poorly sorted, containing humus with plant roots. (− 0.1 m).
(4) Carbonate sand, poorly sorted, light grey with numerous small detrital shell and coral fragments. (− 0.1 m).
(5) Carbonate sand, poorly sorted, dark grey, containing humus with plant roots. (− 0.1 m).
(6) Carbonate sand, poorly sorted, yellow-white, with small shell fragments and rounded coral detritus. (− 0.3 m).

The calcarenites, represented by horizontally laminated carbonate sands with well-rounded coral pebbles and boulders, are exposed on the *socle* (toe) of the low marine terrace, which has a strongly corroded surface. An increase in calcarenite grain-size, corrosion, and dissection of the surface from type "pave" to "champignon" (classification of relief from TRUDGILL, 1979) obtain towards the outer boundary of the bench (reef-flat). A similar change of bench surface morphology is indirect evidence of modern abrasion reworking of the ancient bench, decreasing its height and forming a new surface corresponding to recent sea level.

Beachrocks of Assumption Island, composing the socle of the low terrace, and the surface of the reef-flat were established to have different ages, although some investigators consider the beachrock to be only the result of recent lithification of beach and reef-flat sediments (KOSMININ *et al.*, 1982). Although we do not consider the complex problem of beachrock formation in tropical islands in detail, we give examples indicating the different ages of lithified rocks exposed in the low marine terrace (raised beach) and the modern reef-flat of Assumption in the following section.

(1) Raised and modern benches, cut into Riss-Würm limestones, are found in the southeastern portion of the island. Here the coral relief of the modern bench is the ancient "champignon" type, exposed at the contact of Units 4 and 5 from Marine Terrace I. The exposed ancient beach has become the submerged edge of the island. Here the exact spatial coincidence of narrow, shallow channels within the bench surface and in the socle of the low marine terrace were observed. The most significant preservation of ancient bench surfaces with relict relief microforms is observed in place where compact limestones, characterized by karren relief, are covered by coarse-grained calcarenites.

(2) There are strongly eroded, coarse-size calcarenites with *Tridacna* shells, rare corals and weakly lithified carbonate sand lenses in the socle of Marine Terrace I and the modern reef-flat of western Assumption Island. This type of beachrock differs strongly from the Riss-Würm calcarenites and reef limestones in the extent of lithification and structure of the deposits. Its formation is likely related to the peak Holocene transgression. A ^{230}Th/^{234}U date of 9.5 ± 0.2 ka from mollusk shells in the outer raised beach deposits corresponds to the Early Holocene, however, when the level of the world ocean was between − 30 to − 40 m. Therefore, it appears that reworked older calcarenites are exposed in the socle of Marine Terrace I. The presence of this reworked material is connected to the active transport of detrital shell material from the nearshore. Similar mixing of different age shell material has been noted on the western Atlantic shelf (MACINTYRE *et al.*, 1978) and was determined by us to be active under modern storm swells of the Puavr and Farcuar coasts in this part of the Indian Ocean.

In the description of formation of the low terrace socle (properly, the beachrock) and its loose deposits, two different stages of accumulation are present, which probably distinguish subaerial phases in periods of lowered sea level in the early Subboreal. The strongly corroded bench surface, both within the recent reef-flat and terrace socle, provides evidence of this supposition. An increase in thickness of unconsolidated deposits (to more than 2.5 m) in the inner part of Marine Terrace I is indirect evidence of lowering of relief on the bench, reworking in the Middle Holocene of deposits in contact with the abrasion cliff (Figure 2). The infill of this eroded bench with carbonate sands occurred during the second half of the Holocene, when the low marine terrace, widely distributed in the islands of the western Indian Ocean, formed. ^{14}C dates obtained from deposits on this terrace fall within the interval of the last 3,500 years (PARUNIN *et al.*, 1984; STODDART *et al.*, 1971). Therefore, the age of Marine Terrace I, including its loose sand cover and the moderately lithified calcarenites described from the terrace section, is accepted as being Middle Holocene in age, on the grounds of being analogous to those of adjacent islands in the western Indian Ocean.

A series of ancient coastal ridges, evidence of sufficiently intensive coastal accumulation, are evident on the leeward parts of these islands. These are distinguished on the low terrace surface of western Assumption Island in the field and on aerial photographs. On the eastern and southern coasts of the island, accumulation of sand was observed on a smaller scale. Here loose deposits cover the strongly corroded surface of the raised bench, reworked from various different-aged calcarenites. The most extensive development of the low terrace on the leeward margin of the island is clearly spatially coincident with the region of development of ancient eolian relief (Figure 3).

Eolian Relief and Deposits

Eolian relief of Assumption Island is found in two morphologically different and presumably different age groups. The first generation, represented by large wind accumulation forms, is observed on the eastern coast of the island, where a dune ridge stretches over 1.5 km (Figure 3). Large ridges up to 23–32 m elevation have an asymmetric form with steeper western and northwestern slopes. In plan view separate forms of eolian accumulation are reminiscent of large parabolic dunes, with the windward slope now eroded away. Deflation basins with northwestern extension of axes were found. The dunes' origin is connected to dispersion of sand generated through marine erosion of the coast.

The second generation of small eolian accumulation forms is observed on the surface of the low marine terrace. They are represented by small sand ridges (up to 1.5 m high) parallel to the modern coastline on both the southern and northern ends on the island. They formed as stable aerodynamic features on the surface of the beach and bench from sand transported onshore at low tide.

If the small sand ridges are of Late Holocene age, then the formation of dune ridges on the windward coast of Assumption Island must be connected to a different paleogeographic environment. First, besides wind regime, there must be a considerable source of detrital material to supply the accumulation of large masses of sand (about 1.5–2.0 million m^3). There is no such source of detrital material in the coastal zone of Assumption now, and it is likely that it was absent throughout the Middle-Late Holocene. In contrast, the presence of a large volume of ancient eolian sand, eroded by the sea, promoted formation of the Middle Holocene accumulation terrace. The contiguity of this terrace to large eolian forms indirectly attests to its greater age. The only large source of sand in Assumption was exposed shelf sands, now below sea level. The largest shelf areas were uncovered to the east and southeast of the present coast of Assumption, to the level of − 110 to − 130 m (CURRAY, 1968; KAPLIN, 1977; GUILCHER, 1974). Therefore, during the Late Würm-Early Holocene period even a small thickness of sand deposits, exposed over a considerable area of exposed shelf, could have allowed transport of a large volume of sand to the present Assumption shoreline under conditions of semiarid climate and wind regimes similar to the present. Interruption of wind flow at the topographic features of the present coast allowed formation of dune ridges on the windward coast. Attenuation of eolian transportation during rise of sea level and some decrease of climatic aridity resulted in the formation of forest soils on the dune surface, represented by dark grey, poorly consolidated, humus-bearing loamy sand horizons and lenses within the eolian section. The amount of silt in the soils varies from 5.4–17.4%, which exceeds the content of this fraction in the eolian sands.

Overlying these ancient soils are approximately three eolian deposits repeatedly laid down in Middle-Late Holocene time (last 4,500 years), probably due to varying causes. This accumulation was probably connected first with active transport of sand from offshore sources during small-scale fluctuations of sea-level (1.5–2.0 m). Second, they could be due to dispersal of sand from dune fronts undergoing active abrasion of the coast during small transgressions (0.5–1.5 m amplitude). The fact that buried soils are obtained only in the leeward slopes or saddles between dunes suggests the mechanisms above. Not excluded, however, is the possibility that modern active dispersal of sand is a consequence of intensive anthropogenic influence, primarily through destruction of aboreal vegetation.

The unconsolidated sediments of Assumption Island are represented mainly by carbonate sands

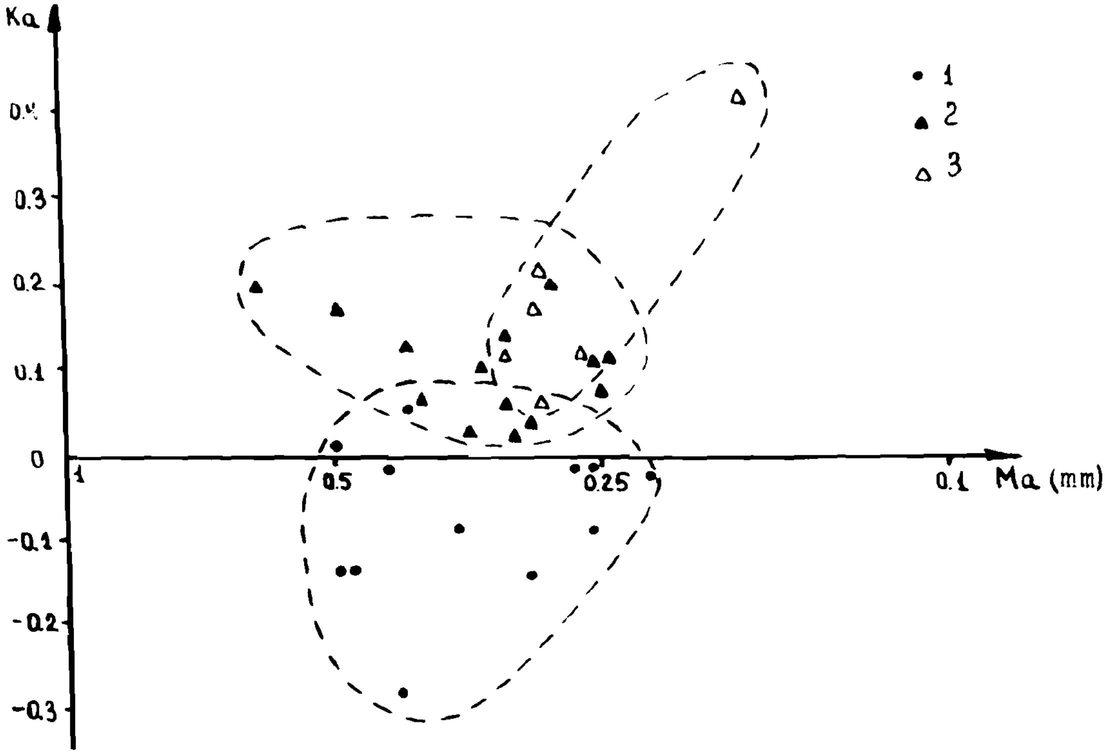

Figure 4. Granulometric texture of Assumption Island deposits: Ka (skewness) versus Ma (mean grain size). (1) beach sands, (2) eolian sands, and (3) soils.

and, in rare cases, by lag surfaces of pebbles composed of detrital coral, large shells and gravel-sized shell fragments, fine- or cryptocrystalline limestones, and calcarenite. Granulometric composition of the sand reflects conditions of formation within a dynamic breaker zone, and multiple cycles of reworking and rapid reduction of detrital material to fragments within the reef-flat. This is shown by the predominance of well-sorted (1.68–1.44) medium and fine sand (Ma from 0.5 to 0.24 mm) (Figure 4). Modal fractions of sediment from beach terraces and eolian sands are 0.2–0.25 mm; 0.25–0.315 mm; 0.315–0.4 mm; and 0.4–0.5 mm. Coarser sediments are observed in sand beds in the Marine Terrace I section.

In spite of common features, the textural distinction between beach and eolian sand characteristics is possible using plots of skewness versus mean grain size (Ka − Ma) and skewness versus sorting (Ka − σ). The important character is skewness. Beach sediments are characterized by negative or nearly symmetrical skewness (− 0.28 to + 0.05), while eolian sands are characterized by positive skewness (0.2–0.3). Positive values of skewness for beach sands are usually found on the back beach, where sands are reworked by eolian processes. Such a distinction of beach and eolian sands probably occurs because of mixing of different layers within the eolian transport stream, as well as additional reduction to fragments during transport.

Minimal silt content is characteristic of both beach and eolian deposits. The exceptions are horizons of buried soils where accumulation of particles (to 17.4%) occurs due to weathering processes. Therefore, soils are characterized by poor sorting (1.67–3.52) and a more positive skewness (ka = 0.11 − 0.42) than beach and eolian sand.

CONCLUSIONS

Modern processes in the coastal zone of Assumption Island are primarily controlled by a deficit of detrital material, most being derived from active abrasion of the coast which usually consists of loosely consolidated material. More active accumulation occurred during Middle-Late Holocene rise of sea level, when accumulative terraces formed presumably at the expense of abrasion of the windward coast and through the import of detrital material on the leeward coast. This does not rule out a major source of longshore drift during the Holocene being carbonate material accumulated in dune ridges of eastern Assumption Island, originally transported from the shelf during the last great regression of the world ocean.

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□ RÉSUMÉ □

La géomorphologie des îles de l'Assomption est caractérisée par des terrasses marines élevées qui se sont formées quand l'île était un atoll. On distingue deux hautes terrasses (III à 10–14 m, et II à 4–8 m) qui sont constituées de calcaires coralliens et correspondent à deux ou peut-être trois pics de la trangression Riss-Würm des océans du monde (niveau isotopique 5). Ceçi est confirmé par les datations ^{230}Th/^{234}U de 127,000 ± 270 ans, 125,000 ± 180 ans, 110,000 ± 400 ans, 93,000 ± 300 ans et 82,000 ± 270 ans. La basse terrasse marine I est à 2–3 m, elle s'est formée pendant deux phases de la transgression holocène. Les calcarénites de la base de la plus basse terrasse se sont déposées durant la première phase, et l'unité supérieure se mettait en place durant la seconde. L'accumulation d'un grand volume de sables holocènes dans la partie Est des îles de l'Assomption eut lieu alors que les matériaux détritiques étaient soufflés depuis le plateau continental exposé au cours de la fin du Würm tardif et du début de l'Holocène.— *Catherine Bousquet-Bressolier, Géomorphologie E.P.H.E., Montrouge, France.*

□ ZUSAMMENFASSUNG □

Die Geomorphologie von Assumption Island wird durch gehobene marine Terrassen bestimmt, die sich geformt haben, als die Insel ein Atoll war. Zwei hohe marine Terrassen (III: 10–14 m hoch; II: 4–8 m hoch) bestehen aus Riffkalk und entstanden bei 2 oder 3 Transgressionsspitzen des Weltozeans während des Riss/Würm-Interglazials (Isotopenstufe 5), wie Thorium-Uran-Daten von 127 ± 2.7 ka, 125 ± 1.8 ka, 110 ± 4.0 ka, 96 ± 3.0 ka und 82 ± 2.7 ka belegen. Eine untere marine Terrasse I in einer Höhe von 2–3 m wurde während zweier holozäner Transgressionsphasen geformt. Kalkeranite an der Basis der unteren Terrasse wurde während der ersten Phase, eine weitere Einheit während der zweiten abgelagert. Große Mengen holozäner Sande im Ostteil von Assumption Island wurden aus dem Schelf während seiner spätglazial-frühholozänen Exposition ausgeweht. *Dieter Kelletat, Essen, Germany.*

□ RESUMEN □

La geomorfología de la isla Assumption se distingue por elevadas terrazas marinas formadas cuando la isla era un atolón. Dos de las altas terrazas marinas (III y II de 10–14 y 4–8 m de altura respectivamente), arrecifes de caliza, corresponden a dos o posiblemente tres picos de la transgresión del océano mundial durante la Riss-Würm (etapa isotópica 5), confirmadas por fechados con $^{230}Th/^{234}U$ de 127 ± 2.7 ka, 125 ± 1.8 ka, 110 ± 4.0 ka, 96 ± 3.0 ka y 82 ± 2.7 ka. La terraza marina baja, I, con 2–3 metros de altura, se formó durante dos fases de la transgresión del Holoceno. Durante la primera fase se depositaron calcarenitas en la base de la terraza menor, mientras que la unidad superior fue emplazada durante la segunda. Sobre la región este de la isla Assumption se halla una gran volumen de arena acumulado, llevado por el viento como material detrítico de la plataforma continental expuesta, durante el fin del Würm Tardío-Holoceno Temprano.—*Néstor W. Lanfredi, CIC-UNLP, La Plata, Argentina.*