Built Form and Culture

A Theoretical Appraisal Supported by a Case Study of the Dwelling House in the Gilbert Islands, West Pacific Ocean

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Summary

This study of a traditional Gilbertese dwelling house is part of a larger research project (Hockings, 1985) analysing the relationship between built form and culture in the Gilbert Islands.

The study illustrates the manner in which aspects of the form and construction of the dwelling house were developed. The paper shows how these aspects are interconnected and how they help to elucidate, through artifacts and spatial relationships, certain cultural concerns related, in particular, to the economics, the mythology, the social structure and the philosophy of this culture.

Data were collected during two years of field work on the island of Onotoa, and supported by the existing historical and anthropological literature, in particular the work of Grimble, Maude and Lundsgaarde (see bibliography).

Résumé

Cette étude de la maison des Iles Gilbert (Pacifique du Sud) fait partie d'une recherche qui analyse la relation entre le construit et la culture de cette peuplade.

L'étude illustre la façon dont certaines caractéristiques de la forme et de la construction de la maison sont traditionnellement définies par la population. Il apparaît ainsi comment ces caractéristiques sont intimement liées à la volonté d'expliciter dans des objets et des relations spatiales visibles des éléments économiques, mythologiques, philosophiques, ainsi que propres à la structure sociale de cette société. Les données ont été recueillies pendant un séjour de deux ans sur l'île de Onotoa et sont connectées à la littérature historique et anthropologique existante, en particulier les travaux de Grimble, Maude et Lundsgaarde (cf. bibliographie).

1. Introduction

Vernacular building has long served as a model for modern architecture through its "style-free" approach to the provision of functional space and climatic control, and for its structural honesty and efficiency. More recently it has been seen as a model for a "regional" approach to design, in contrast to "international modernism". This is a continuation of the earlier interest in the use of indigenous materials and technology, only now vernacular solutions are seen not so much as objective solutions to universal

structural and constructional problems as they are examples of local building technology in tune with the immediate environment.

However, vernacular building is also beginning to be seen as a model for the integration of architecture and society. In contrast to the alienation produced by so much contemporary architecture, the apparently close relationship between society and vernacular building has suggested that there could be useful lessons to be learnt. Architects have translated that general interest into a more specific concern as to the links between built form and culture, drawing architectural research into the disciplines of anthropology, sociology and psychology.

This study is part of a larger research project (Hockings, 1985) which began in such a manner. It attempts to present a sound appraisal of the cultural system and its relationship with the built environment. Two years of fieldwork on the Island of Onotoa were used to gather data which would test that proposition and reveal the evolution of the built form/culture relationship specific to the Gilbert Islands. This has resulted in a broad ranging study tracing the early Pacific migrations of the islanders via Samoa to their eventual homeland and covers the next five hundred years of their cultural development, emphasizing the importance of architectural ideas within the process of cultural definition.

This article presents a theoretical proposition relating culture and built form based upon an analysis of pertinent aspects of the Gilbertese dwelling house interpreted within a contemporary anthropological view of the cultural system.

2. The Traditional Gilbertese Dwelling House

2.1. Introduction

The following discussion of certain aspects of the traditional dwelling house represents a very limited description of built form in the Gilbert Islands. It is only when analysis is conducted within the broader contexts of the dwelling compound, the clan estate, the village and the island as a whole that one can fully apprehend the extent to which built form operates as a component within, for example, such cultural institutions as kinship, politics, religion and social life. It does, however, exemplify the case study, concentrating on the pertinent aspects of form and structure.

The various references to Gilbertese cosmology and ritual practice are outlined in detail in Grimble (1922, 1933-34), Maude (1963, 1980), and Hockings (1985). The data on which his discussion is based were collected during fieldwork on the island of Onotoa, supplemented with information contained in the works of Grimble and Maude. Information was collected partly through structured interviews conducted in the Gilbertese language, partly from clan records which have come into existence this century with the introduction of a script, and partly through chance recording of pertinent discussions occurring during ceremonials and informal conversations. All the information came in a form familiar to "oral" historians where knowledge is arranged in memory packets. Each packet has a prescribed text and is passed on from generation to generation without alteration or interpretation. Data in such a form (unfamiliar in most contemporary cultures) was of course ideal for this study for it has in its very nature the status of "cultural knowledge", and avoids the necessity to reconstruct cultural constructs from individual expression. Individual versions, whilst therefore in substantial agreement, were, however, often incomplete as a result of cultural decay. In most cases, relatively complete descriptions were eventually achieved through mul-

tiple interviews. The minor textual variations which occasionally occurred were found to be either the result of clan allegiance, or of extended knowledge in the possession of various specialist groups within Gilbertese society.

2.2. Bata Plan Form

The traditional domestic compound was known as the *mwenga*. It contained one or more dwelling houses *(bata)*, these being the primary residential structures. In addition a *mwenga* would contain a storehouse, cooking hearth, drying racks and, if close to the lagoon shore, a canoe shed (see Figure 1).

Though the proportions of the rectangular *bata* were fixed by rule, its floor area was not. The area varied according to the size of the family to be accommodated, but was expressed in terms of the length of the longitudinal side rather than the area itself. Thus a house described as an eight metre *bata* was approximately eight metres long. *Bata* ranged in size from five to eight metres in one metre increments. *Bata* proportions were sub-divided into three major categories, Tokaboua, Tokabeti, and Tokamamao, and each category contained three further subdivisions. Categories specified the breath for any given length of *bata* as follows:

Category	Sub-division	Breadth
Tokaboua	Tentaua	5 / 9 L
	Tauauta	11 / 18 L
	Tengaonio	2 / 3 L
Tokabeti	(unknown)	13 / 18 L
	(unknown)	7 / 9 L
	(unknown)	5 / 6 L
Tokamamao	Taberantekai	8 / 9 L
	Tewenako	17 / 18 L
	Kareamata	1 L

2.3. Significance of Bata Plan Form

Each category, it was supposed, carried important implications for the inhabitants of *bata* built with those proportions.

Residents of a Tokaboua *bata* would be principally concerned with the material possessions.

(i) Tentaua (selfishness)

The inhabitants of this type of *bata* would tend to develop extreme attitudes of selfishness and possessiveness. Though thrift was encouraged in Gilbertese society, selfishness, particularly toward family and *mwenga* residents, was socially unacceptable. However, it was also thought that should an individual not build this style he

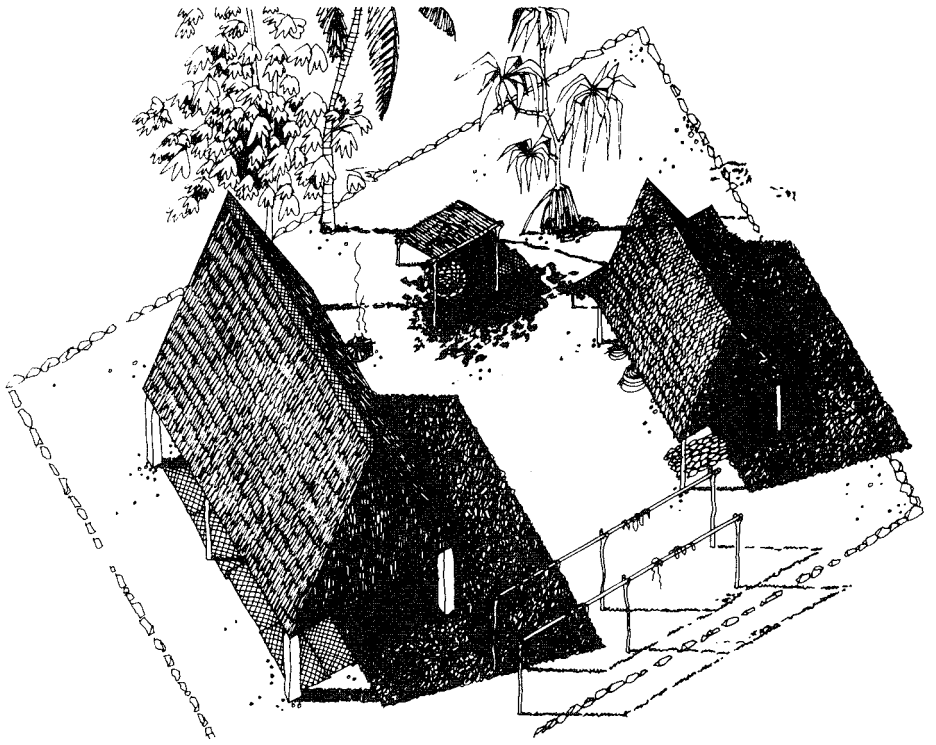


Fig 1 Traditional domestic compound in the Gilbert Islands. It is known as the *mwenga* and contains one or more dwelling houses *(bata)*, these being the primary residential structures. In addition a *mwenga* will contain a storehouse, cooking hearth, drying racks and, if close to the lagoon shore, a canoe shed.

Fig. 1 Complexe domestique traditionnel des Iles Gilbert. Connu sous le nom de *mwenga* et composé d'une ou deux maisons *(bata)* qui sont en premier lieu des habitations. En plus, un *mwenga* comprendra un magasin, un coin cuisine, des séchoirs et s'il est près de la plage un hauvent protégeant les canoës.

was liable to find himself continually giving away food and other possessions. As a way out of this dilemma, it was possible to construct a storehouse to Tentaua dimensions, thereby guaranteeing its bountifulness and security without encouraging selfish attitudes in the *bata* residents themselves.

(ii) Tauauta

This was a more acceptable *bata* proportion. The inhabitants of this type of *bata*, whilst willing to give away some of their possessions, would nevertheless keep the greater percentage for themselves.

(iii) Tengaonio

Whilst inhabitants of this style of *bata* might frequently receive material gifts, they would have no concern for thrift and continually give away food and other possessions.

Inhabitants of a Tokabeti style *bata* developed, as their primary concern, the maintenance and appearance of their *mwenga*, at the expense of hard work and the collection of food. Though further details could not be elicited, the point being made was that, though by no means idle, the inhabitants were over-zealous in their concern for the tidiness of the *mwenga* to the detriment of other tasks essential to the welfare of the *mwenga* occupants.

Finally, inhabitants of a Tokamamao style *bata*, it was thought, would not even remain there for long, and visitors, upon entering, would immediately feel uncomfortable and wish to leave.

(i) Taberantekai

The occupants of a Taberantekai *bata* would gradually lose all concern for the future. They would engage in activities at will without concern for the specific needs of the *mwenga* and develop a philosophy of living for the moment.

(ii) Tewenako

In this case, an extension of the above, the occupants would become totally idle.

(iii) Kareamata

Having completed the *bata*, its occupants would simply wander off into the bush until they died of starvation.

What was the purpose of ascribing these deterministic themes to particular *bata* proportions? There were certainly no major advantages, in terms of either layout or structure, to be offered by any one of the nine possible plan arrangements. Even should one have stood out above the others, a more direct way of specifying this would have been to nominate a single fixed rule which gave the desirable length to breadth ratio. Similarly, if the desire was the promotion of uniformity in *bata* proportions, whatever the proportion might have been, that end could have been more simply achieved by a fixed rule. The point was not therefore the promotion of a functionally advantageous proportion for the *bata*.

Alternatively, the purpose of the practice could have been as it was literally stated: a means of ensuring the prevalence of a particular type of behaviour amongst *mwenga* members. In this sense, it would have been a type of magic, a belief in a mysterious deterministic link between household form and behaviour. In a society

where nearly every thought and action was believed to be linked to spiritual forces guided by ritual practice, this hypothesis appears reasonable if teleological. However, should this have been so, only those proportions which determined desirable behavioural attitudes would need to have been specified. Both the Tokabeti and Tokamamao *bata* produced obviously undesirable behavioural attitudes and, indeed, *bata* were never constructed to these proportions. What then was the point in specifying proportions which would result in the prevalence of such attitudes when obviously they would never have been chosen?

A more reasonable explanation can be drawn from a recognition of the fact that those aspects of lifestyle which were supposedly affected were of an economic nature. More precisely, there were the two principal components of any economic system - the means of acquiring wealth (in this case labour), and the management of wealth (property).

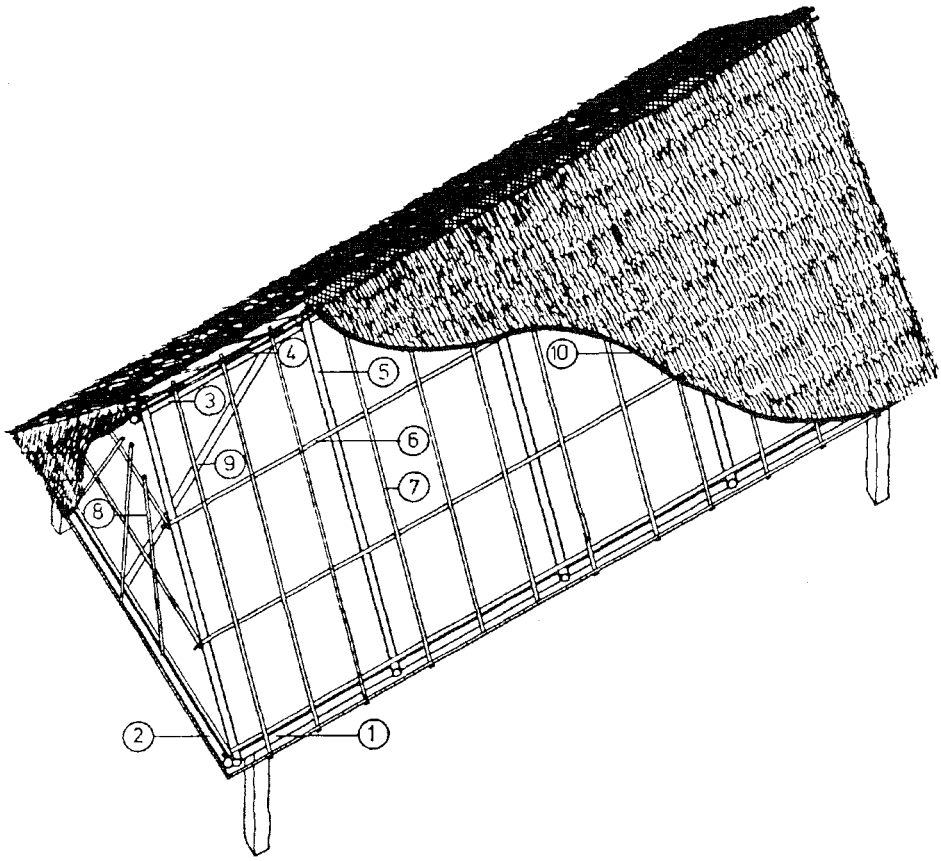
The *mwenga*, as a group of individuals, was the primary economic group within Gilbertese society. Each *mwenga* was self-sufficient in terms of those resources necessary for daily existence, and between them the members of a *mwenga* gathered the full range of their food requirements, firewood, and water supply. All their tools, household equipment, weapons, and clothes were manufactured at home. The maintenance of the *mwenga*, and, in most cases, the maintenance of the health and security of *mwenga* residents were carried out by those residents themselves.

Only for major tasks such as the construction of houses and canoes, or where sickness or death resulted in labour shortage, might the *mwenga* find it necessary to enlist outside help. Even then it was only close kin whose aid would be sought. It was appropriate therefore that it was the *mwenga* buildings themselves in which the broad principles of economic management were symbolically encoded.

The three subdivisions of the Tokamamao type *bata* all possessed as their theme the necessity for consistent and conscientious labour for the maintenance of the prosperity and well-being of *mwenga* residents. The Tokabeti *bata*, whose sub-divisions could not be ascertained, stressed the necessity for maintaining a balance between labour aimed at providing those resources consumed by *mwenga* residents and that directed at the care and upkeep of the *mwenga* establishment itself. Finally, the Tokaboua *bata* in its three sub-divisions indicated the various consequences of differing attitudes toward property ranging from extreme possessiveness to unnecessary generosity.

It is argued therefore that the collection of specified relationships between *bata* proportion and economic attitude was primarily a means of symbolically outlining the major principles of economic thought within a fixed reference frame. The specific relationship between a single economic attitude and its corresponding *bata* length/breadth ratio was unimportant compared with the position of that relationship within the larger system. The three major divisions and nine sub-divisions of length/breadth ration represented a fixed logical set of alternatives. The principles of economic thought, on the other hand, existing only in the human mind, were a more difficult set of concepts to grasp, particularly in a culture without a written language.

Moreover, in the harsh conditions of the Gilbertese environment, it was undesirable that the principles of resource management be open to full-scale experimentation - mistakes in this area could easily be fatal. However, coupled symbolically with the logical set of length/breadth ratios, the major principles and alternatives of economic thought and action became themselves easily grasped, taught, and remembered, logical and complete. What was achieved was the tying of a set of abstract concepts to a real-



1 wall plate
2 end wall plate
3 ridge plate
4 ridge purlin
5 rafters
6 purlins
7 battens
8 end battens
9 end brace
10 thatch

Fig. 2 Basic structural elements of the *bata* - the Gilbertese dwelling house.

Fig. 2 Eléments structurels de base de la *bata* - l'habitation des Iles Gilbert.

world base from which they could be readily understood and acted upon by the society as a whole.

The second important point to emerge from a consideration of this custom was that, though the names of the nine *bata* styles and their corresponding economic manifestations were available and generally known to at least the adult males (that is, those individuals who were responsible for organizing the economic tasks of the *mwenga*) of Gilbertese society, the specific length/breadth ratios corresponding to these styles were not in the same category of "general" knowledge. These details, along with most of the other lore associated with *bata* building practice, were known only to the specialist builders.

The reasons why this class of specialist originally came into being can only be speculated upon. Unlike canoe building, house building was not an overly complicated business. Any layman with a careful eye would have been capable of producing a physical replica of the other *bata* which existed around him.

It is evident therefore that the specialist builder relied upon the existence of a bulk of esoteric knowledge and ritual practice for the justification of his vocation. Furthermore, by withholding this knowledge from the general public whilst at the same time emphasizing the great control over both evil and benign forces which this knowledge gave, the specialist builder ensured a continuing need for his services. The specific details of the length/breadth ratios which correspond to the nine *bata* sub-types were evidently a part of this esoteric knowledge.

2.4. Bata Structure

The basic structural configuration of the *bata* is given in Figure 2. The rafters were arranged in pairs. They overlapped above the ridge plate, with the eastern rafter overlapping to the north of the western rafter. The number of rafters to one side of the roof was always an odd number, usually three for a small *bata* and five or seven for the larger *bata*. The length of the rafter was a function of the vertical height of the ridge plate above the wall plate. This height varied according to the style of *bata* being constructed, but in accordance with the following rule:

$$\frac{\text{height of ridge above wall plate}}{\text{breadth of } bata} = \frac{\text{breadth of } bata}{\text{length of } bata}$$

Most traditional *bata* possessed an upper story or attic used for a variety of purposes ranging from storehouse to nuptial chamber. The attic was supported on a series of beams resting on, and of similar cross-sectional area to, the wall plate. The attic could extend anything from one quarter to the full length of the roof, the beams occurring at the same centres as the rafters above.

The roof was supported on free-standing columns, one at each corner, and for the larger *bata*, a central column along each longitudinal side. The columns were constructed either from timber or from slabs of coral stone. The height of the column was that which would place the wall plate at such a position that a squatting man with arms fully out-stretched above his head could just touch the underside of it with his fingertips.

Occasionally, particularly where timber rather than stone columns were used, the structure was braced by one or two buttresses (see Figure 3). The stone columns

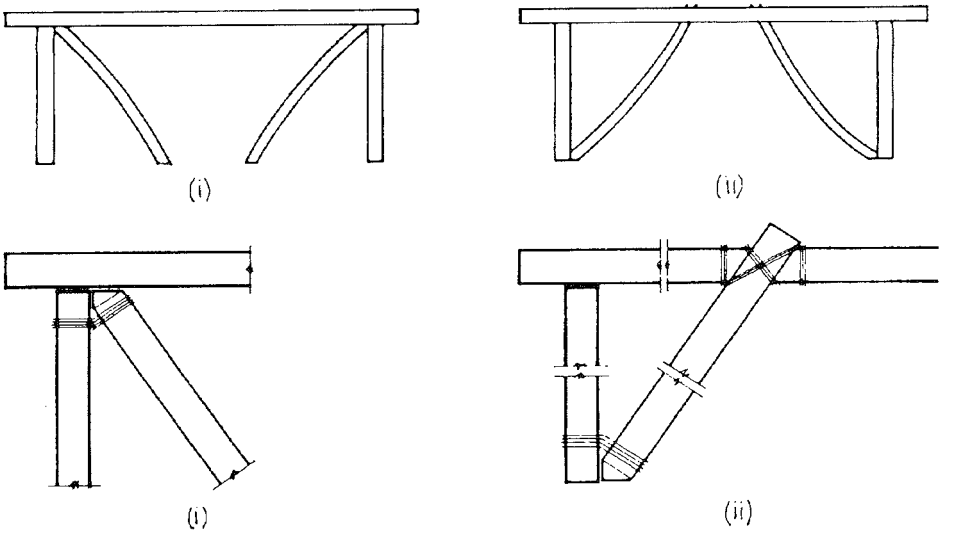


Fig. 3 Where timber rather than stone columns were used for supporting the *bata* roof, the structure was braced by one or two buttresses. Though not as efficient in structural terms because of difficulties in fixing, braces of type (ii) were preferred as they did not obstruct the open sides of the *bata* to the same extent as did type (i). The timber columns were never larger than 250mm in diameter.

Fig. 3 Dans les cas où on avait recours au bois plutôt qu'à la pierre pour les colonnes supportant le toit de la *bata*, la structure était renforcée par une ou deux traverses. Même si elles n'étaient pas aussi utiles du point de vue structurel, les traverses de type (ii) étaient préférées car elles n'obstruaient pas les côtés ouverts de la *bata* au même titre que celles du type (i). Les colonnes en bois ne dépassaient jamais 250mm de diamètre.

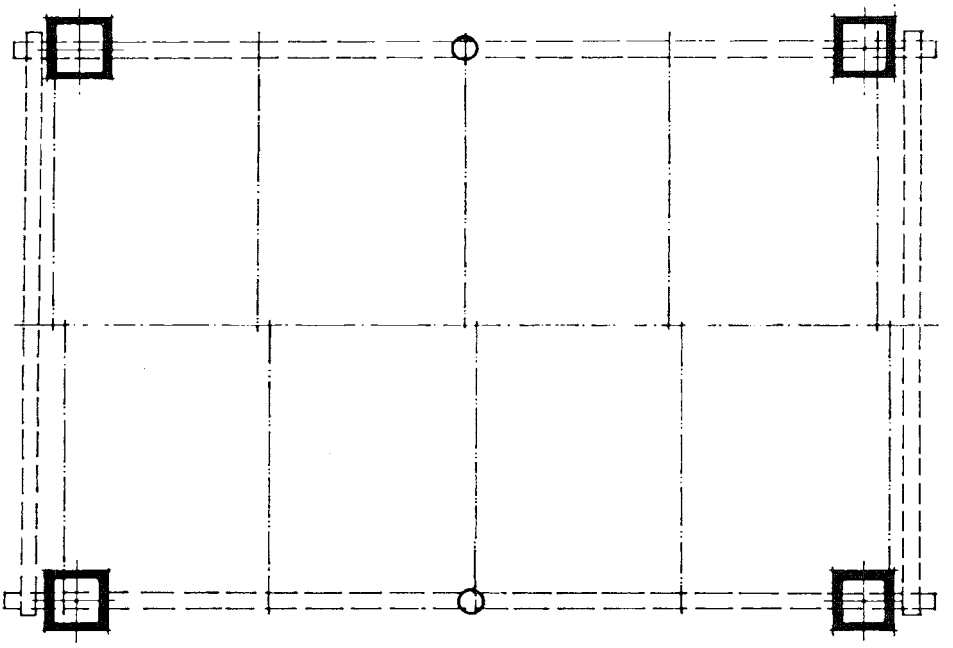


Fig. 4 Plan of a complete traditional *bata*. The roof is supported on free-standing stone columns, one at each corner.

Fig. 4 Plan d'une *bata* traditionnelle complète. La toiture est posée sur des colonnes en pierre indépendantes, une dans chaque angle.

had a wide base, especially in the lateral direction, and were sufficiently stable to withstand the wind forces which were extended on the roof. Timber columns on the other hand, never larger than 250mm in diameter, were much less stable. In addition, the below-ground sections of timber columns were subject to decay, considerably reducing their initial stability. Though not as efficient in structural terms because of difficulties in fixing, braces of type (ii) were preferred as they did not obstruct the open sides of the *bata* to the same extent as did type (i) (see Figure 3).

Stone columns rested on a large flat coral stone footing or a number of smaller stones packed closely together. These footings occurred at a depth of some 300 to 500mm below ground level. Timber columns were supported on a giant clam shell placed at a similar depth to the stone footing described above. The stone columns were generally regarded as the preferable type of post owing to their stability and longer life. However, stone columns were rare in domestic construction in pre-contact days before the advent of metal tools because of the excessive labour required to hew them from the beach rock.

Combining the stability of the stone column with the ease of fabrication of the timber post was an alternative post style known as Te Kimangai. This post was cut from the trunk of a tree but included a substantial base formed by the roots of the tree itself. The roots, cut off level, then rested on a flat bed of coral stones.

The walls of *bata* were not solid but were composed of woven coconut blinds which could be raised or lowered at will. Generally kept in the raised position, they were lowered to give protection from rain or wind, and at night for security and privacy.

The floor of the traditional *bata* consisted of a few centimetres of coral gravel laid over bare earth. Above this was spread one or more layers of woven coconut leaf mat. Where possible these mats were overlaid with finer sleeping mates woven from padanus leaf.

Detailed structural drawings of a complete traditional *bata* are given above and below (see Figures 4, 5, 6 and 7).

2.5. Significance of the Bata as a Structural Form

2.5.1. Environmental Significance

The efficacy of the *bata*-style structure as an environmental shelter is quite evident and similar structures occurred throughout the Pacific. Over the centuries the peoples of Oceania no doubt evolved this basic configuration as a response to their requirements of environmental shelter, and the resources and technology which lay at their disposal. The large number of migratory voyages and the similarity of climatic and environmental conditions encountered throughout the region explains its widespread occurrence.

Though not the concern of this study, the influence of climatic factors had obvious importance in shaping the structural form of the traditional Gilbertese *bata*, and the primary function of the *bata* was undoubtedly the provision of shelter. There nevertheless remained a number of areas where the structural form of the *bata* was of cultural significance.

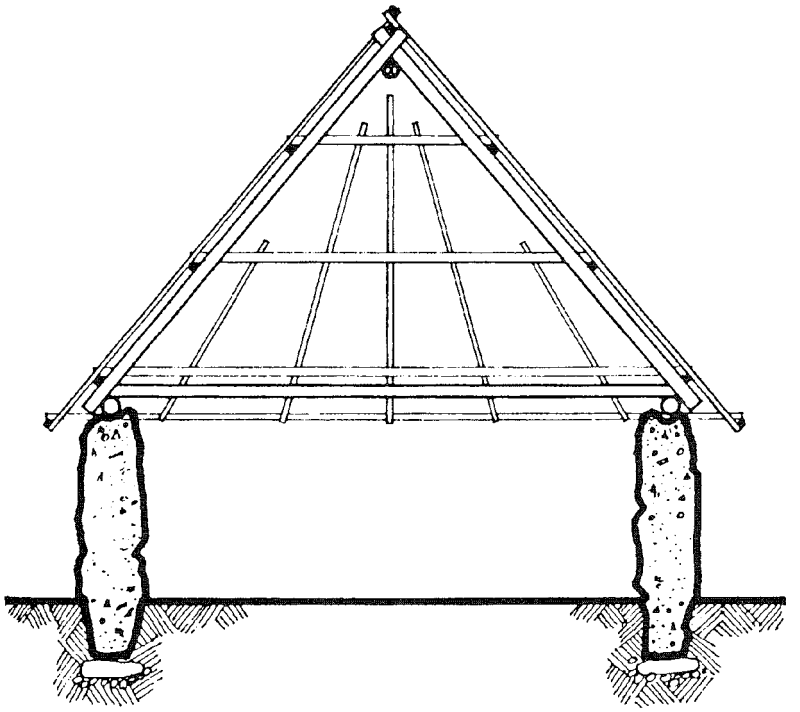


Fig. 5 Cross-section of a traditional *bata*.

Fig. 5 Coupe transversale d'une *bata* traditionnelle.

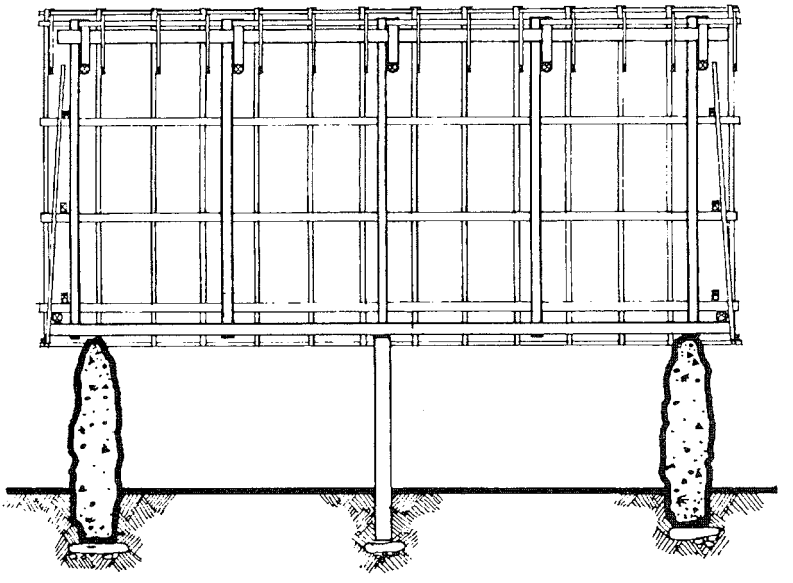


Fig. 6 Longitudinal section of traditional *bata*.

Fig. 6 Coupe longitudinale d'une *bata* traditionnelle.

Fig. 7 Perspective of traditional *bata*.

Fig. 7 Perspective d'une *bata* traditionnelle.

2.5.2. Mythological Significance

As with the *maneaba* (meeting house), which was in many ways the model from which the *bata* structure was derived, a number of the structural members which made up the *bata* bore reference to the mythological ancestors of the Gilbertese people.

There was no single reason why this practice was followed. In some cases, it helped keep the names of some of the most important mythological characters alive in the minds of the Gilbertese by ascribing their names to parts of the *bata*. In other instances, the nature of the relationship which existed between mythological characters was symbolically expressed through the physical relationship of the structural components which formed the *bata*. In yet other instances, the practice served as a means of explaining and ensuring the continuing use of particular methods of *bata* construction.

This latter point needs some further explanation. A frequently occurring theme in the cultural significance of the *bata* structure, whether that significance was mythological, magical, or religious, was the control of evil into two different types. The first was ever present and existed independently of the *bata* structure. It was believed that such a force could be controlled and its harmful effects avoided by measures incorporated in the *bata* structure. The second type of evil force was only brought into play by particular arrangements of the *bata* structure itself.

The measures taken to avoid the first type of force were typically ritualistic in their nature. That is, rather than being taken as a kind of primitive science where such measures were thought to be instrumentally effective, their most important function was their expressive capacity. Primarily, the measures emphasized publicly and ceremonially the fact that evil forces existed and should be controlled. Secondly, they offered a solution as to how to go about controlling them. The Gilbertese would not, however, attempt an empirical test of the effectiveness of these measures in the way that they would test their practical and technological techniques. As put by Beattie (1966),

> "It is simply that there would be no point in doing so, for if and in so far as the central significance of the rite is expressive, it is thus far an end in itself."

Forces of the second type required a different kind of explanation. What the Gilbert Islanders said was that, unless a particular method of *bata* assembly was followed, evil forces would be brought into play. What they implied was that there was a correct and an incorrect way of assembling the *bata*. Forces of the first type were always in existence. In discovering a means of controlling these forces, the *bata* structure itself was occasionally used as an apt vehicle for the purpose. Forces of the second type, on the other hand, were only brought into play by the adoption of incorrect structural procedures. The temptation is therefore to postulate the existence of technologically functional reasons as to why certain structural procedures were regarded as "correct". If such explanations could be found, then the citing of the possibility of incurring the wrath of evil forces would appear to be a means of ensuring the adoption and continuing use of functionally advantageous constructional practices. In the following discussion, where the significance of the structure involves the presence of forces of the second type, such functional explanations are sought.

Each of the four corner columns which supported the *bata* roof was named after, and was purported to embody a particular deity. Each deity was the same as that represented by the corresponding columns in the *maneaba* of the district to which the *bata* belonged (see Figure 8).

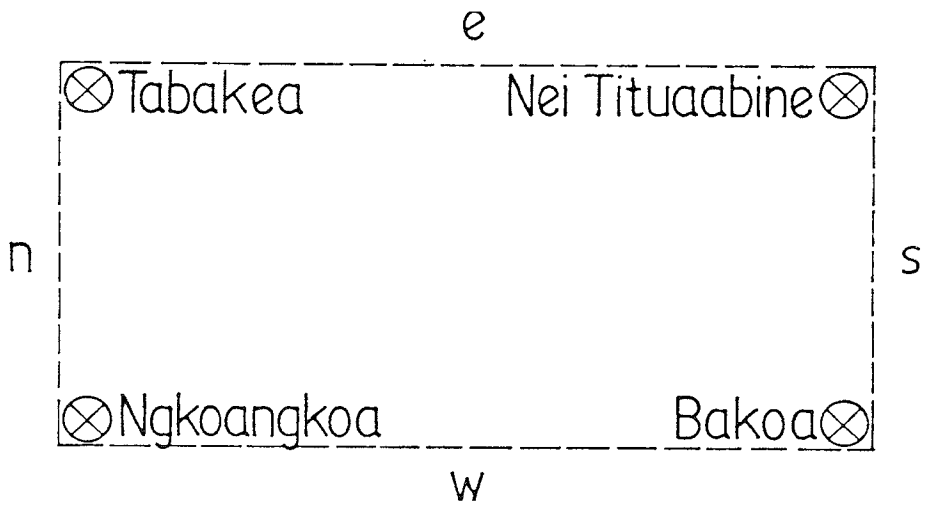


Fig. 8 Each of the four columns which supported the *bata* roof was named after, and was purported to embody a particular deity.

Fig. 8 Chacune des quatre colonnes qui portent la toiture de la *bata* a reçu le nom d'une divinité spécifique que ces colonnes représentent.

Tabakea (land) and Te Bakoa (sea) were expressive of the land/sea opposition, an important distinction in the Gilbertese thought. This opposition depicted the triumph of land over sea and of the land-based human civilization over the pre-human undersea kingdom. As the ocean proper lay to the east of the atolls, it would seem natural that the dividing line between land and sea would have been the eastern shoreline, with the ocean regarded as lying to the east and the land to the west. To the Gilbert Islander, however, it was in fact on the western lagoon shore that the confrontation was regarded as taking place. Two possible reasons for this choice can be suggested. Firstly, most settlements stretched along the lagoon shoreline, and it was the *maneaba* and residential structures as much as the atoll itself which were representative of Tabakea's kingdom. In addition, it was the lagoon shore from which one ventured to sea and at which visitors arrived, and the lagoon waters were where they fished and bathed. In short, it was the lagoon rather than the ocean which figured as the "sea" in everyday life.

Secondly, and at a more obscure level, it was from the west that the inhabitants of the Gilbert islands first arrived; and the atoll on which they settled was the most easterly point of their travels. With the land on which they settled lying to the east, and the oceans which they had crossed lying to the west, it seems not unnatural that the lagoon shoreline should thus be regarded as the point of contact between the two.

Furthermore, there is a possible mythological parallel between (a) the creation of the land and (b) the migrations from the west. According to legend, the land and the peoples which inhabited it originally rose from the sea. Similarly, legendary history has it that the inhabitants of the Gilbert Islands originally came from the west. By overlaying the two, the "sea" and the lands to the west become synonymous, whilst the "land" and the east pair as an opposing couplet. It was because the "sea" lay to the west and the "land" to the east, therefore, that the columns of Te Bakoa and Tabakea lay correspondingly to the west and east of the *bata* structure, though the opposition was diagonal.

The column Ngkoangkoa represents the first of the original beings which the creator Nareau brought to life, his name meaning literally "the-first-the-first". Consequently, this was the first of the four columns to be placed in position and all subsequent construction began from this corner, proceeding in an anti-clockwise direction.

The title, Nei Tituaabine, given to the south-east corner column was derived, as indeed were the names of the other three columns, from the names of corresponding columns in the Tabontebike-type *maneaba* on which the *bata* under discussion were modeled. However, the *maneaba* column, Nei Tituaabine, was connected with the clan Keaki, which occupied the south-east corner of the Tabontebike *maneaba* and whose ancestral deity was Nei Tituaabine. The Nei Tituaabine column therefore derives its name somewhat differently from the other three columns whose names originated independently of the clan seating place associated with them.

It seems somewhat odd that three columns should have been named upon construction of the first *manaeba* and independently of clan divisions, and yet the fourth should be left unnamed until after the clan allocations were completed. Onotoans could proffer no explanation. It may however be possible that, as the Keaki clan were one of the original invaders from Samoa, the usage dates from that earlier period during which the prototype of the Gilbertese *maneaba* was in use on Samoa.

The battens which supported the gable-end thatch were called *kai-ni-maraki* or *kai-ni-maraki-n'atu*, the former term no doubt being a shortening of the latter. This word literally means "the stick-of-the-aching-head". The name comes from a legend concerning one of the original deities who came from Samoa, Ten Nakimoa or Sir Rat. He was reputed to have made his residence at the base of these battens:

> "After residing there for some period, he was overcome by a desire to urinate whereupon he traveled to the top of the central batten to relieve himself without soiling the floor of the *bata*. Such was his haste that on reaching the top of the batten he did not see the rafter above, bumped his head, and developed a severe headache. From that time on it was necessary to stop all battens at the gable ends some distance short of the rafters for Ten Nakimoa's convenience."

A parallel proviso was that the thatch which was laid on the end battens was not to sit tight against the side thatch (see Figure 5). If this practice was not followed it was said that the inhabitants of the house would be subjected to continual headaches and general bad luck. One informant added further that

(a) should the *kai-ni-maraki* touch the rafters or the ridge plate, then the inhabitants of that *bata* would become sick and die; and that

(b) should the space which was left by the short battens be covered by thatch, then the lands of the *bata* residents would become barren.

In either case, it is evident that the type of evil force being brought into play in this circumstance was one categorized above as of the second type.

The gap left in the gable ends performed the valuable function of ventilating the upper ceiling space, facilitating the dispersal of the warm air which would otherwise have collected there. It is suggested, therefore, that a major purpose of this mythological reference was in fact to draw attention to, and to ensure the continuing use of this valuable environmental control device.

A number of features incorporated in the structure of the *bata* were specifically designed to guard against the workings of evil spirits and presences. The effect of these evil forces was to bring ill-fortune, ill-health, or social disruption upon *bata* residents.

The first of these measures was an adjustment to the wall plate. The two plates were called Tabakea and Te Bakoa, the eastern of the two being Tabakea. In this respect they sat in opposition, as did the two columns of the same names which helped support them. To avoid evil forces of Bakoq and to ensure the supremacy of Tabakea over him, the eastern wall plate of Tabakea was shortened by one hand's-width (*nimai-ni-bai*) over its designed length.

The second was an adjustment made to the ridge plate. Not specifically connected with the god Tabakea, but again in order to ensure the good-fortune of the *mwenga,* the designed height of the ridge plate above the end wall plate was similarly shortened by *nimai-ni-bai.*

The diagonal roof brace was known alternatively as *kai-ni-butika* or *kai-n-kaun-taeka.* The latter term may be translated as "the stick-to-make-argument". Inclusion of these braces within the roof structure was believed to have the undesirable consequence of promoting argument amongst *mwenga* inhabitants. This was expressed in a position which these braces occupied - at opposite ends of the *bata*, angled towards each other in a posture of provocation. Again this was an instance where it was believed that harmful effects were actually brought about by an undesirable structural arrangement, and a functional reason why this should have been so can be sought. Such a justification is not however as accessible as it was with the *kai-ni-maraki-n'atu,* for the roof braces served the valuable function of reinforcing the roof structure against longitudinal collapse.

On the other hand, it must be remembered that the *bata* roof was very close to the ground and that, in such a structure, end braces would have been an awkward, impractical, and dangerous obstruction in an otherwise clear ceiling space. The only position in which the end brace could have been secured to the ridge plate without interfering with the roof structure was to its underside. A secure lashing in this position could only have been achieved by housing the end brace into the underside of the ridge plate. This practice, if undertaken, would have severely weakened the tension face of the plate at that point, thus either inviting its collapse or necessitating a compensatory increase in its cross-section and thus in its weight. The coconut fibre sennit which was used to lash all joints together was prone to rot. Every other structural member in the *bata* structure was secured at a number of lashing points so that, should one or even a number of lashings fail, the member would remain in position until the defective lashings were discovered and repaired. The end brace, on the other hand, could only be secured at either end and was in such a position that it would have undoubtedly been leant upon and otherwise used for purposes for which it was not designed. Under these conditions of stress, should even one lashing have failed, the end brace would have plummeted to the *bata* floor. A falling timber of this size could have caused serious injury to any adult, and quite easily killed a small child or baby. In addition, the multiplicity of rafters, purlins, and battens (and even the thatch itself to a minor extent) acted to give a rigid roof structure, rendering the end brace almost redundant. It would appear therefore that the advantages offered by an end brace were so far outweighed by its disadvantages that its inclusion in the *bata* structure was actively discouraged by pointing to its potential to cause argument.

The *kai-ni-mauri* (stick-of-good-health) was a timber which offered no structural advantage but could be included in the *bata* roof purely for the purpose of ensuring the good health and peaceful co-existence of *bata* residents and their visitors. This timber, of approximately 50 x 50 mm cross-section, spanned between the end rafter of the south-east corner and the adjacent rafter to the north, some 300 mm above the wall

plate and parallel to the ground. It was positioned in the south-east corner so that it would lie above the column of Nei Tituaabine, reputedly the goddess of love and peace.

Apart from the advantage which the *kai-ni-mauri* was believed to offer *mwenga* residents, it should also be realized that, because of its visibly prominent position within the *bata* , it served as a visual symbol to other members of the community of the type of values which the residents esteemed. On a broader scale, its very existence (paralleled by the customary form of greeting - *ko na mauri* (may-you-be-in-good-health) as a public declaration, in the absence of similar symbols denoting for example strength, power, or aggressiveness, may be seen as typifying a wider cultural value of camaraderie and mutual respect. This is not to say, of course, that aggression did not occur in social relations, but where magic or ritual was practised to imbue individuals or groups with this kind of attribute, such a practice was conducted in private. That is, cooperation and respect rather than aggression or antagonism were culturally idealized modes of social behaviour.

2.5.2. Social and Philosophical Significance

As previously discussed, the geographical environment in which the Gilbert Islanders lived was seen by them as a basic opposition between land and sea. This binary phenomenon was represented in the gods Tabakea and Bakoa. In turn, their opposition was symbolically expressed in two corner columns bearing their names. A similar social opposition was seen by the Gilbertese in the distinction male/female. The role of the two sexes and their position vis-à-vis one another were again symbolically expressed in the *bata* structure.

The structural members which represented each sex were the rafters, those on each side of the ridge plate representing either sex. The basic opposition of the rafters was recognized as expressing the equally basic difference between the two sexes. Though the two sexes belonged to the same fundamental category of *aomata* (homo sapiens) as the two sets of rafters belonged to the same fundamental category of *oka* (rafter), each sex was nonetheless seen to be as distinct from the other as was each set of opposing rafters.

Having so outlined this basic recognition of difference between the two sexes, the importance of the need for their mutual cooperation was also symbolized. Just as neither set of *oka* alone, but only the combination of the two, was capable of supporting the roof structure of the *bata* and protecting the roof space below, so it was seen that only through the combined efforts of man and woman could the *mwenga* survive and flourish.

The status difference between the two sexes (males were of higher status than women) was expressed by the position of the two sets of *oka* relative to one another. On Onotoa, where the Tabontebike-type *maneaba* predominated, the east and the north orientations were more important than the west and the south. The predominance of east over west in the land/sea opposition has already been noted. The predominance of north over south arose, in all likelihood, from the occupation of the north end of the *maneaba* by the ruling Karongoa clans.

Accordingly, the set of rafters representing the male was the eastern set, while the western set represented the female. Additionally, at the point on the ridge plate where two opposing rafters met, the eastern male *oka* was positioned to the north of the western female *oka* (see Fig. 4).

This practice was followed invariably, with one notable exception. When an individual had many wives, a second *bata* was frequently required to accommodate them exclusively. Then, customary practice was to reverse the *oka* positioning outlined above, expressing the fact that such a *bata* was a women's house where women predominated and status was reversed. The symbolic expression of the male/female distinction contained in the *oka* arrangement, and the resolution of that distinction through the social relationships of role and status, together formed what could be termed a fixed symbol. By that is meant that the relationship between the sign (i.e. the *oka* arrangement) and the message which it conveyed was completely specified and culturally recognized.

In addition to this, however, the *bata* structure served as an open-ended sign from which a number of symbolic expressions could be extracted. The old men, when speaking at public ceremonies, for instance on the occasion of a birth, wedding, or initiation, frequently practised a type of spontaneous poetry. Regarded as cryptic by the younger males, the speech proceeded entirely by analogy. Details of *bata* structure and construction figured prominently in this type of speech, as did details of *maneaba* and canoe construction. In this respect the *bata* served as a loose or open-ended symbol manipulated by the orator as the speech proceeded. In a world where the *bata*, the *maneaba*, and the canoe existed as the only large-scale man-made marks on a predominantly natural environment, their use as symbolic vehicles was perhaps not extraordinary.

Importantly, however, the heavy investment of symbolic reference in the *bata* structure raised it from the level of an anonymous functional object, existing only for the provision of shelter, to that of an object of extensive cultural significance.

3. Conclusion

In this brief discussion, the plan proportion and structural arrangement of the *bata* have been isolated for analysis. Whilst representative, the cultural significance of these aspects only touches upon the complex model which relates the *bata* to Gilbertese culture. Nevertheless, the analysis provides sufficient and typical data from which certain conclusions can be drawn as to the nature of the relationship between form and the cultural system.

3.1. Built Form and Culture

The long history of attempts to distinguish between environmentally influenced behaviour and instinctive behaviour has not been fruitful. The generally accepted position today is to treat all hereditary predispositions as being to varying extents influenced by environment, and, conversely, to regard the learning process as being inextricably linked to the biology of the species (Murphy, 1972, 46). One cannot therefore, postulate the relationship between built form and culture in a manner which depicts certain environments as settings in which cultural behaviour takes place. However, one can postulate a notion of the relationship via the model which depicts culture as a normative system composed of mental constructs whose function is cognitive, and whose aim is to rationalize reality.

In the discussion of the form and structure of the *bata*, a number of such mental constructs were identified. They related, in those examples, to aspects of economic management, to mythological characters and their inter-relationships, and to social themes such as the relationship between the sexes and the differentiation of status.

Some stand as isolated constructs, others are arranged into sets with an internal consistency. All, however, are properly seen as part of the cultural system. What distinguishes them from the full range of constructs which composes the cultural system in its totality is the fact that they make reference to built form.

It is this reference which both defines and describes the relationship between culture and built form. From a theoretical stand-point, the proposition can be generalized to define the relationship in the following manner - built form is related to culture via those specific cultural constructs which make reference to built form. In particular, the full extent of the relationship within any given culture is described by the totality of those constructs which properly belong to that cultural system and which bear reference to built form.

The particular cultural constructs sited in the discussion of the *bata* are not norms which relate to behaviour. It is in fact only when discussion moves to other aspects of the *bata* and more particularly to discussion of the *mwenga* and the clan estates that such constructs begin to play a prominent role. This does not however, affect the logic of the conclusions. Moreover, as such norms are cognitive rather than motivational, then it is clear that the existence of such a norm in the cultural domain does not of necessity always imply corresponding conjunction of behaviour and environment in social action. Nevertheless, that group of cultural constructs which do bear reference to aspects of built form will form a rationalization and standardization of a particular society's behaviour in relation to its environment. Actual behaviour in relation to particular environments will be in terms of the dialectic resolution of individual motivation, forces and circumstances within the domain of social action itself, and the cultural constructs which relate to behaviour in those environments.

In summary, then, the first conclusion as to the relationship between built form and culture would be that, in so far as those communally shared constructs which make up the cultural system bear reference to built form, then taken together, those constructs document the nature and extent to which, within a particular society, built form has been rationalized within its cultural system. Put simply, man models his relationship with the environment within the cultural system in the same manner as he models his relationship with other men.

The second conclusion would be that, in so much as the built environment is a part of the domain of social behaviour, and specific phenomena within this domain play their part in the resolution and evolution of the cultural domain, then built form and culture are also in this sense related. In other words, whilst the cultural models of built form and models of behaviour connected with it, the two domains are certainly not independent. The former may be a rationalization of the latter, but manipulations of man-environment relations in the latter will perhaps prompt revision of the models of man-environment relations which make up the former.

These conclusions are outlined in far greater detail in the major study of Gilbertese architecture (Hockings, 1985) which established the extent to which the relatively stable traditional culture was composed of constructs which bore reference to built form. That is, it established the traditional built form/culture relationship. Certain pertinent examples of that relationship have been isolated in this paper. The radical transformations to traditional society brought about through European contact at the turn of this century provided the opportunity to test the second conclusion, and to establish the degree to which new behaviour patterns and new architectural forms prompted revisions within the traditional man-environment model. That study revealed the gradual evolution of Gilbertese culture, and the role played by built form within

that process. Built form was not found to be an element shaped by a pre-defined cultural system. On the contrary, built form was an active element used within the process of cultural evolution and definition. And thus, architectural form and meaning were not *post facto* interpretations but rather were developed as part of this broad evolutionary process.

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