the presence of centers of ossification in the cartilage of the developing malleus. The process of ossification of the malleus was found to start in the goniale (anterior process) and to proceed into the lamina and head of the developing malleus (*4*).

Serial sections of the temporal region in *Rousettus, Taphozous,* and *Gerbillus,* moreover, reveal that at a certain stage (the 16-mm head stage in *Rousettus,* the 11-mm head stage in *Taphozous,* and the 13.5-mm head stage in *Gerbillus*) the relation of the anterior process to the cartilage of the developing malleus is similar to that of the dentary to the distal part of Meckel's cartilage. This part of the lower jaw, which lies between the mental foramen and the symphysis mentis, was formerly thought to ossify from a separate center, and the mandible itself was considered as ossifying from 6 centers. The early researches of Fawcett (*5*) and of Low (*6, 7*) on the development of the mandible in man and in other mammals, now widely accepted, indicated that the mandible is formed from a single center, which appears near the mental foramen about the sixth week of fetal life. By the tenth week the portion of Meckel's cartilage that lies below and behind the incisor teeth is surrounded and invaded by the membrane bone.

In all the species examined by the writer the malleus was found to ossify in a manner not dissimilar to that of the distal part of Meckel's cartilage. The identity of the process in the two cases may be summarized as follows: The single center of ossification of the mandible—namely, the dentary—appears near the mental nerve. The portion of Meckel's cartilage in front of the mental foramen is surrounded and invaded by the membrane bone. For the malleus there is also a single center, the anterior process, which in the early stages develops around the chorda tympani nerve. The portion of Meckel's cartilage behind the foramen for the chorda tympani is surrounded and invaded by the membrane bone.

Reference may, however, be made to the following observations: Haines (*8*) found that the angular in some teleosts (*Mugil, Sardina,* and *Trigla*) invades the perichondrium and the posterior end of Meckel's cartilage to form the joint surface, the articular. Kingsley (*9*) referred to the peculiar method of ossification of the articular in Amphibia: ossification starts first as ectochondral bone which later invades the cartilage.

Should we speak of centers of ossification of the malleus, we would have to seek in the anterior process the sole center. For it the name "membranous center" is here applied, a term which has been proposed by Fawcett (*5*) for the dentary of the mandible.

Full details of this study will be published elsewhere.

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Barrier Island, Not "Offshore Bar"[1]

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It is time for students of shorelines to standardize their terminology by removing ambiguous terms, discontinuing double uses of the same term for different features and multiple terms for a single feature. The terminology of bordering islands ("barrier sand reefs") and miscellaneous "offshore" bars needs such standardization. Some specific changes are suggested here that seem to be especially needed at this time in view of the widespread attention being given to marine geological problems and the emergence of a specialty of geological oceanography. Other revisions of the terminology of barlike structures, including the modern use of the ancient eolian term "dune" for a somewhat dunelike underwater bar, are not discussed.

Douglas W. Johnson in his shoreline treatise (*1*) gave an extensive analysis of the form and origin of the sandy barrier bar or island of gently sloping shoreline bottoms, such as those of coastal plains. He concluded that the structure originated largely as a bar or bars formed offshore—normally submerged—and that the driving into shallow water of a series of such bars and their up-building there led to the emergence above normal tidal range of a barrier island. Hence, he adopted the term "offshore bar" for the island.

Johnson's hypothesis of the origin of the barrier island and the use—though somewhat ambiguously (*2*)—of his "offshore bar" as a criterion of "emergent shorelines" attracted much attention and fixed the use of the term "offshore bar" in the minds of many geologists. The class of normally submerged bars formed offshore which, in Johnson's view, contributed largely to the origin of the barrier island was left without a specific name, to be called merely *bars.*

Students of modern sedimentation who have not also been closely concerned with the geomorphology or structure of the barrier island itself seem to have overlooked Johnson's appropriation of "offshore bar" and continue to use the term for true bars lying in various offshore positions, typically just beyond and below normal low tide levels. This situation has caused time-consuming confusion, specifically for this writer in some transoceanic correspondence.

Textbooks of geomorphology and geology have not, so far, arrived at a full standardization of coastal terminology. This deficiency is evident in the two current texts on marine geology or geological oceanography. Thus, F. P. Shepard's *Submarine Geology* (*3*) speaks on one page of the barrier island as an "off-

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shore bar," but on another uses the same term for any one of a series of normally submerged bars found at increasing depths on and seaward from a gently sloping beach. Ph. H. Kuenen's *Marine Geology* (*4*) seems to use "offshore bar" only in the Johnsonian sense, but repeats Shepard's figure (*3*, Fig. 33; *4*, Fig. 121) in which a bar is shown in the offshore zone of the beach without providing a specific qualifying term for such a bar. Kuenen's contribution to the confusion in the use of "offshore bar" is to term some of them "sandbanks" (*4*, 270, and Fig. 124), thus attempting to appropriate for a specific technical meaning a term long in wide common use for any kind of sandy beach, dike, or levee. Kuenen's "sandbank" is the ridge in the "low and ball" topography. Such bars have lately been termed "longshore bars" by Shepard (*5*).

The following terminology is proposed to correct the ambiguity and double uses noted:

1. *Offshore bar*: any normally submerged bar formed offshore in marine or fresh waters, found chiefly in the littoral zone. It includes, among other bars, the ridges of the low and ball topography that have been called "sandbanks" by Kuenen and "longshore bars" by Shepard, the latter being here preferred. To term such a ridge a "sandbank" has no more distinctiveness than to call it a "ball."

2. *Barrier island*: the island, or chain of islands of sand, or sand and gravel or shingle, lying offshore on a gently sloping shallow bottom. It is separated from the shore by a coastal lagoon or "sound." Its beach is the main line of resistance of the land to the attack of the major waves of the offshore region, the beach slope forming a profile of equilibrium. The term is used technically and includes, as a single barrier island or *barrier island chain*, such segments in the same alignment as may be separated by tidal inlets or other tidal openings. This barrier is commonly tied to land at one or both ends, either to a stream delta or to a headland of some other origin, as an erosional projection of a drowned coast. The segments of the island or chain may include spitlike peninsulas, the difference between spit and spitlike segment of a barrier island being one of size and individual usage, as in the case of hill and mountain. Synonyms: Barrier beach, offshore bar (Johnsonian sense), and barrier sand island. The term "barrier beach" is not favored because many barrier islands are much more than beaches, being widened by washover fans, tidal deltas, and eolian plains and prograded to form extensive beach plains and cuspate forelands.

3. *Barrier reef*: an organic, commonly partly coralline reef lying offshore from a continent or island much in the position of the barrier island of sand. It includes barrier reefs of islands—commonly volcanic—and such great barrier reefs as that of the northeastern Australian coast. The terminology of coralline reefs is fairly well stabilized and has recently been summarized, with some additions, by Kuenen (*4*, 423–26).

It seems remarkable that our geological terminology is as well organized as it is in view of such obstacles as (1) the characteristic use in English of one word in multiple meanings, (2) the incompleteness in scope of our scientific dictionaries, (3) the general brevity and sketchiness of book indices, and (4) the relative scarcity of detailed treatises of the scope of Grabau's *Principles of Stratigraphy* and Twenhofel's *Treatise on Sedimentation,* in contrast with the abundance of textbooks suitable for review in a one- or two-semester course of graduate or undergraduate instruction. Some of these shorter textbooks of geology present somewhat individualistic terminologies.

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A Device for Air Evacuation from an Autoclave Sterilizer

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In employing autoclave sterilization, it is best to have the substance to be sterilized entirely exposed to steam. If some air is allowed to remain in the chamber of a sterilizer, incomplete sterilization will result.

Obviously, devices for displacement of air have always been taken into consideration, as seen in the construction of almost all sterilizers. The most common ones are the vacuum and the sensitive thermal devices. The former, however, produces only partial vacuum and is time-consuming, and the latter fails to remove that part of air which has mixed with steam. The present device (Figs. 1–4) has been found satisfactory in actual practice.

As the density of steam is smaller than that of air ($18/22.4 < 29/22.4$), and its temperature much higher ($100° > 20°$ C), the ratio of their densities becomes all the greater ($293 \times 18/373 \ll 29$). So as soon as steam is led into the jacket and the chamber, its natural tendency will be to rise and occupy the upper part of the chamber, and the air already there will be pressed to the lower part. Under such circumstances, the supersaturated steam becomes so unstable that it separates into small droplets when it diffuses downward into the dead air space. Likewise, as a result of upward diffusion, the air loses its mixing effect with the steam owing to the condensation of the latter.

If the steam pressure is not high (< 3 psi), and a baffle plate is placed in front of the inlet, the phenomenon of eddy current will be avoided. In this case, the air and steam will not be a mixture, but separate layers, each of which possesses a uniform tempera-