This map now shows that Alpha (see Fig. 2c) is roundish, is about 1000 km across, has a great deal of structure, and has its brightest area at the southwestern edge. The resolution of the map is, at best, about twice as good as a naked eye view of the moon. With such resolution, it is not possible to distinguish between mountains, craters, fields of boulders, extensive lava flows, or other such geological formations.

A similar but smaller bright region is located at 14°N, 11°E. A much smaller, unresolved, but very bright point is found at 19°S, 60°W. These bright features are well separated as to north-south ambiguity. However, several more such areas in the western longitudes are not so separated (see Fig. 2b).

In addition to discrete bright features, there are also discrete areas that are radar dark. They are roundish and about 300 km across. Examples are located at 29°S, 9°W and at 18°S, 10°W.

The lack of echoes from these regions can be attributed either to intrinsic radar absorptivity of the material or to unusual smoothness of the surface. In the case of smoothness, radar waves may be reflected strongly, but they would not be directed toward Earth. This question could be resolved if the sub-Earth track were to cross one of these interesting regions.

In addition to the discrete features, large generalized dark and bright areas are to be seen on the map. These areas are not uniform, but they have appreciable structure. Two of the large dark areas, at 25°S, 25°W and at 19°N, 38°W, have small bright points located centrally within them.

During the next inferior conjunction of Venus, the sub-Earth track will be about 12° farther north, which will enable us to obtain data to fill in the runway. Furthermore, we may have increased radar capability, which will allow significantly greater resolution.

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Rubidium-Strontium Date of Possibly 3 Billion Years for a Granitic Rock from Antarctica

Abstract. *A single total rock sample of biotite granite from Jule Peaks, Antarctica, has been dated by the rubidium-strontium method at about 3 billion years. The juxtaposition of this sector of Antarctica with Africa in the Dietz and Sproll continental drift reconstruction results in a possible geochronologic fit of the Princess Martha Coast of Antarctica with a covered possible notheastern extension of the African Swaziland Shield, which contains granitic rocks that are also 3 billion years old.*

A specimen of biotite granite (*1*) from the remote Jule Peaks (Juletoppane Mountain), Antarctica (72°23′S, 5°33′W; see Fig. 1), has been isotopically analyzed for rubidium and strontium for its radiometric age as related to Gondwanaland reconstructions.

Table 1. Rubidium and strontium isotopic analyses of total rock biotite granite from Jule Peaks, Antarctica (sample No. 1143).

Dissolution	$^{87}Sr/^{86}Sr$*	$^{87}Rb/^{86}Sr$	^{87}Rb (μM/g)	^{86}Sr (μM/g)
1	0.7760	1.64	0.504	0.307
2	0.7768	1.64	0.501	0.305

* Normalized to $^{86}Sr/^{88}Sr$ ratio of 0.1194.

The results of the isotopic analyses are listed in Table 1. An age of 3.06 ± 0.08 billion years was calculated by using the decay constant $\lambda_\beta = 1.47 \times 10^{-11}$ yr^{-1} (*2*) and an *assumed* initial $^{87}Sr/^{86}Sr$ ratio of 0.704 (*3*). If this assumption is correct and the Rb/Sr system of the analyzed specimen has remained closed, the Jule Peaks biotite granite represents the oldest rock reported from Antarctica.

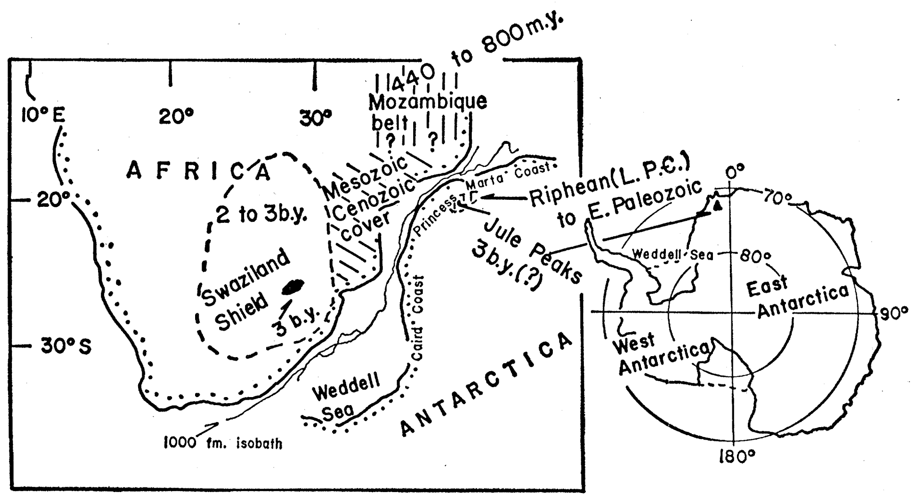

Fig. 1. Possible geochronologic fit of 3-billion-year rocks between Africa and Antarctica. Juxtaposition of Africa and Antarctica according to Dietz and Sproll (*4*) (m.y., million years; b.y., billion years).

Table 2. Generalized stratigraphy in region of juxtaposition of Africa and Antarctica in continental drift reconstruction (m.y., million years; b.y., billion years).

Southern Africa (*6*)	Antarctica (*1, 6*)
Recent through Cretaceous marine and terrestrial deposits.	
Early Jurassic and late Triassic volcanic rocks of uppermost Karroo System.	Late Paleozoic to Jurassic sedimentary and volcanic rocks of Upper Beacon and Ferrar Groups.
Early Paleozoic to late Precambrian metamorphic and granitic rocks of Mozambique Belt; about 440 to 800 m.y.	Early Paleozoic to late Precambrian sedimentary and crystalline rocks; K-Ar minimum (?) ages, about 400 to 550 m.y.
Precambrian sedimentary rocks of the Waterberg-Loskop Systems dated at about 1400 to 1800 m.y.	Precambrian Ahlmannrygg Group sedimentary-volcanic sequence cut by 1700 m.y. mafic sills, the Borg Metamafics, which are intruded by the 1030 m.y. Jörgen Intrusions.
Early Precambrian granitic and metamorphic rocks of the Swaziland Shield; 2 to 3 b.y.	Early Precambian granitic rock, Jule Peaks, 3 b.y. (?).

Table 2 presents a generalized stratigraphic comparison of the major rock units encountered in Africa and Antarctica if the continents are brought in juxtaposition in a continental drift reconstruction (4). Although additional total rock rubidium-strontium isochron data are clearly needed, it is postulated that the 3-billion-year geochronologic province of Swaziland, South Africa (5), may extend to the northeast beneath the Mesozoic and Cenozoic cover to join the Antarctic continent along the Princess Martha Coast (Fig. 1).

The rock specimen was collected by D. S. Soloviev "from a granitic massif which occurs among doleritic and basaltic rocks of unknown but possibly late Precambrian age, the contacts with the latter being concealed under ice cover" (1). The analyzed rock powder was taken from a 65-gram sample of the pinkish, medium-grained biotite (1), which consists of approximately 20 percent dark gray (smokey), slightly strained quartz, 40 percent deuterically (?) altered K-feldspar (orthoclase), 35 percent sericitized sodic plagioclase feldspar, and a minor amount of chloritized biotite. Rubidium and strontium isotopic compositions were measured on a 6-inch (15.24-cm) radius, 60° sector field, triple-filament mass spectrometer with a Faraday cage collector. The ion beams are amplified by vibrating reed electrometers; the mass peaks are displayed on an expanded scale recorder.

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Scleractinian Coral Exoskeletons: Surface Microarchitecture and Attachment Scar Patterns

Abstract. *Scanning electron microscopic studies have revealed the configurations of the growth surfaces of scleractinian coral exoskeletons. Skeletal surfaces exhibit profuse growths of minute elongate aragonite crystals which, on basal and mural surfaces, are punctuated by scars. It is suggested that these scars are sites of attachment for the specialized processes that connect the living tissues of polyps to the nonliving skeleton. Patterns formed by the attachment scars are taxonomically significant.*

Although the internal skeletal structures of scleractinian corals are known from studies with light and transmission electron microscopes (1), information concerning the form and arrangement of aragonite crystals on developmental growth surfaces has been mostly speculative. However, current investigations with the scanning electron microscope show that developing crystals grow in the form of laths, blades, or needles as discrete individuals, in spherulitic arrays (2), or in clusters called fasciculi (3). Growths of crystals usually cover all skeletal surfaces uniformly. Those along the tabulae and walls of the corallite are interrupted only by circular or oval depressions which mark points at which the living polyp is attached to the exoskeleton. These attachment sites and the patterns they form on the wall of the corallite are now described for the first time.

Crystals on developmental surfaces are commonly arranged in fasciculi, which are units approximately 5 to 25 μm in diameter in which the long axes of the crystallites are essentially parallel to one another. Well-developed fasciculi have been observed on the septal surfaces of many scleractinian genera, including *Manicina areolata, Mycetophyllia* sp., *Agaricia agaricites, Eusmilia fastigiata, Diploria clivosa, Isophyllastrea rigida,* and *Acropora cervicornis.* These findings prove the validity of Bourne's (4) contention that the so-called "calcareous scales" described by Ogilvie (5) are actually bundles of crystals with a high degree of preferred orientation, growing on the surface of the skeleton.

In the hermatypic colonial coral *Pocillopora damicornis* (Linnaeus) (Recent: Pacific), fasciculi cover both the basal and mural surfaces of the cup-shaped corallite (see cover). On the basal surface, the profuse growths of fasciculi are interrupted infrequently by circular depressions (Fig. 1A) approximately 10 μm in diameter, which mark sites at which the polyp was attached to the exoskeleton by specialized tissue-like processes. Bourne (4) called these attachment processes "desmocytes"; however, Matthai (6) disagreed with Bourne's conception of "desmocytes," and preferred to call these structures "wedge-shaped mesoglaeal" or "column wall" processes. My study shows that whenever wedge-shaped processes are attached to the skeleton, fasciculi in the areas surrounding them continue to grow upward; thus depressions are left when the processes are removed. At the bottom of the depressions, the attachment surfaces are not smooth like the surfaces of muscle scars on mollusk and ostracod valves; instead, they exhibit vestiges of the rough surface formed by the fasciculi on which the processes are attached.

Although attachment scars on the basal surface of *P. damicornis* are infrequent, discrete, and isolated, those on the walls of the corallite are numerous and frequently coalesced to form large patches of scar surface (Fig. 1, B and C). Most striking is the alignment of scars in rows which extend up the walls of the corallite (area between arrows, Fig. 1B). These rows are spaced approximately ¼ mm apart around the corallite. It has been noted (4, 6) that the attachment processes are concentrated along the outside of the column wall of the polyp exactly opposite the junctions with the mesenteries (7). The scar patterns on the corallite, therefore, can be correlated with the positions of