made of another cobble segment (Fig. 2B). Cortex is preserved on the right lateral margin of the piece, forming an abrupt edge at nearly right angles to the horizontal plane of the flake. Retouch departs from this cortical edge and invades a restricted area of the right side of the dorsal surface. Repeated massive to diminutive expanding and stepped-expanding flake removals have produced a concavity at the juncture of the dorsal surface and the cortex, which could almost be called a steep notch if one were to regard the cortical surface as the base of the worked edge. The flake is 9.4 cm long, 5.7 cm wide, and 2.9 cm thick. Although the piece is a convincing artifact, it might very well have gone unrecognized as such had we not first discovered the chopper.

Most previous attempts to find stone artifacts in situ in mid-Pleistocene deposits in Java have focused on those made of fine-grained siliceous rocks. Thus far, these efforts have produced pieces whose artifactual nature is dubious at best. Convincing artifacts in such raw materials, which may derive from mid-Pleistocene deposits but whose association with those deposits remains questionable, are of course known (*3*). Some large boules of igneous rock, including many of seemingly natural origin and a very few which may be artifactual, have also been collected from mid-Pleistocene fossiliferous levels. The discoveries at Sambungmachan suggest that as more attention is given to all classes of raw materials, including the volcanic rocks so common in Javan sediments, we can expect at last to obtain more knowledge of the technological equipment of early hominids in Java.

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References and Notes

1. The artifacts are now deposited in the collections of the National Archaeological Research Center in Jakarta.
2. T. Jacob, in *Paleoanthropology*, R. H. Tuttle, Ed. (Mouton, The Hague, 1975), pp. 311-325.
3. See, for example, G. H. R. von Koenigswald *Raffles Mus. Bull. B* **1**, 52 (1936); H. Movius, *J. World Hist.* **2**, 257 and 520 (1955); R. P. Soejono, *Asian Perspect.* **5**, 217 (1962); H. R. van Heekeren, *The Stone Age of Indonesia* (Verhandelingen van het Koninklijk Instituut voor Taal-, Land- en Volkenkunde, Nijhoff, The Hague, 1972).
4. We thank the U.S. National Academy of Sciences; the Universities of California, Chicago, and Utah; the College of Medicine of Gadjah Mada University; the National Archaeological Research Center, Jakarta; and the Geological Survey in Bandung for making this study possible.

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Regional Implications of Triassic or Jurassic Age for Basalt and Sedimentary Red Beds in the South Carolina Coastal Plain

Abstract. *Whole rock potassium-argon ages for samples of subsurface basalt recovered near Charleston, South Carolina, are interpreted to indicate a Triassic or Jurassic age for the basalt and underlying sedimentary red beds. This age is consistent with existing evidence indicating that an early Mesozoic basin is present in the subsurface of a large part of the coastal plain of South Carolina, Georgia, Florida, and Alabama.*

The presence of subsurface early Mesozoic rocks beneath Cretaceous sediments of the South Carolina coastal plain has been suggested (*1-3*). Whole rock potassium-argon ages for samples of basalt from deep wells near Charleston, South Carolina, are the first isotopic ages to confirm the presence of Triassic or Jurassic volcanic and sedimentary rocks in South Carolina. The new potassium-argon ages also support the Triassic or Jurassic age assigned to a more widespread subsurface province of little-deformed sedimentary red beds and mafic igneous rocks in the southeastern United States.

Subsurface continuation of rocks of the Appalachian orogen beneath the southeastern Atlantic and eastern Gulf coastal plains has been a traditional concept in North American geology. However, research done during the past 25 years has shown that this coastal plain "basement" is actually composed of several geologic provinces containing diverse rock types of different ages and tectonic origins. Data presented as early as 1951 (*4, 5*) indicate that "basement"

Table 1. Whole rock potassium-argon ages of subsurface Triassic or Jurassic igneous rocks in South Carolina, Georgia, and northern Florida. Locations of numbered wells are shown in Fig. 1; USGS, U.S. Geological Survey. Samples from well 1-2 were analyzed twice; ages are the averages of the two analyses.

Well No.	Sample	Rock and depth (m)	K_2O (%)	$^{40}Ar_{rad}$ (10^{-10} mole/g)	$^{40}Ar_{rad}$ (%)	Age ($\times 10^6$ years)
1-1	Clubhouse Crossroads 1; R. F. Marvin, USGS analyst (*13*)	Basalt, 772	0.625	0.8968	83	97.0 ± 4.2*
1-1	Clubhouse Crossroads 1; R. F. Marvin, USGS analyst (*13*)	Basalt, 785	1.40	2.309	85	111 ± 4.0*
1-2	Clubhouse Crossroads 2; M. A. Lanphere, USGS analyst	Basalt, 818.7	0.992 ± 0.015	3.010 3.054	85.3 80.1	204 ± 4.1
1-2	Clubhouse Crossroads 2; M. A. Lanphere, USGS analyst	Basalt, 842.3	0.355 ± 0.004	0.8702 0.8643	56.3 55.2	162 ± 3.2
1-2	Clubhouse Crossroads 2; M. A. Lanphere, USGS analyst	Basalt, 907.4	0.259 ± 0.018	0.7266 0.7368	60.0 63.5	186 ± 3.7
2	Mobil I.C., offshore Franklin County, Fla., Mobil Lab (*10*)	Diabase, 4354 (four samples)				186 ± 11* 190 ± 9* 199 ± 12* 208 ± 12*
3	Stanolind No. 1, J. H. Pullen, Mitchell County, Ga. (*7*)	Diabase, 2219				186 ± 5*
4	Hunt No. 2, Superior Pines, Echols County, Ga. (*7*)	Diabase or basalt, 1260				195 ± 15*

*Published ages have been recalculated based on the following decay constants: $\lambda_e = 0.581 \times 10^{-10}$ year^{-1}; $\lambda_\beta = 4.962 \times 10^{-10}$ year^{-1}; $^{40}K/K_{total} = 1.167 \times 10^{-4}$ mole/mole.

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rocks in the subsurface of eastern Alabama, central and southern Georgia, and northern Florida can be divided into three main provinces (Fig. 1): a northern province consisting of strongly deformed crystalline rocks representing the Appalachian orogen; a central province consisting of little-deformed sedimentary red beds, basalt, and diabase of presumed Triassic age; and a southern province composed of little-deformed Paleozoic sedimentary rocks and underlying crystalline rocks of presumed Paleozoic and Precambrian age. Lower Mesozoic volcanic rocks are also spatially associated with the southern province. Felsic volcanic rocks in eastern Georgia and rocks of uncertain composition in South Carolina (Fig. 1) bear an unknown relationship to the three main provinces. Later studies (*6–10*) confirmed the existence of these provinces and better defined their extent and ages. The inference of an early Mesozoic age for rocks of the central province is supported by three sets of potassium-argon ages in Georgia and Florida (Table 1). In addition to sequences in the central province, other smaller subcrops of presumed Triassic age have been either documented or suggested to occur within the bounds of the northern province (*3, 11, 12*).

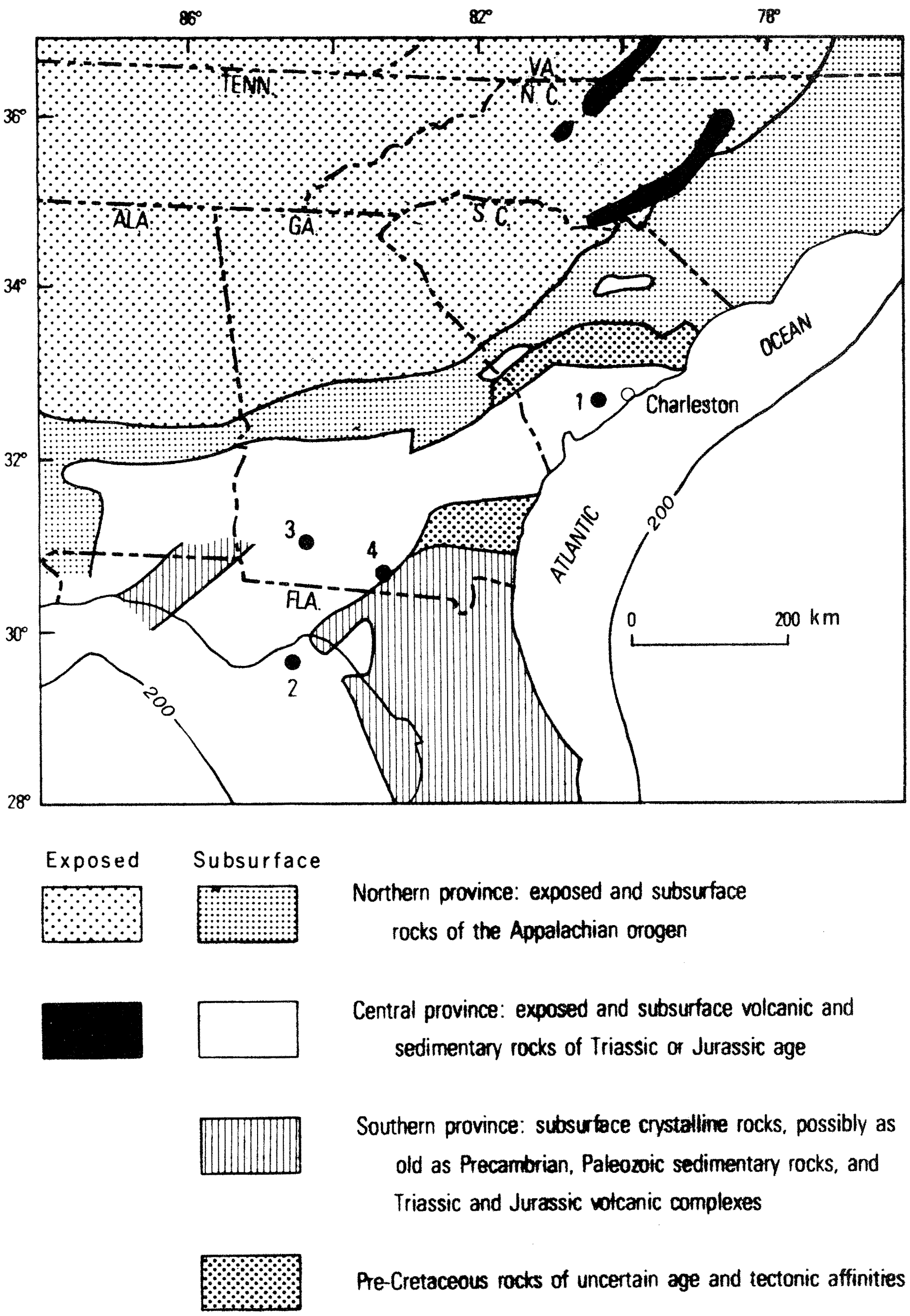

Fig. 1. Distribution of major tectonic provinces beneath the coastal plains of the southeastern United States. Province boundaries are highly generalized from data in many sources (*1–12*). Numbered wells refer to dated samples in Table 1. The bathymetric contour shown is 200 m below mean sea level.

Two recent studies (*1, 12*) have extended the central early Mesozoic province into eastern Georgia and southeastern South Carolina (Fig. 1) on the basis of aeromagnetic, gravity, and deep-well data. Included in these data are the three deep test holes drilled by the U.S. Geological Survey at Clubhouse Crossroads (32°54′N, 80°19′W), Dorchester County, South Carolina. At Clubhouse Crossroads, beneath a sequence of Upper Cretaceous, Tertiary, and Pleistocene sedimentary units 750 to 775 m thick (*13, 14*), as much as 257 m of subaerial basalt flows overlies a minimum of 120 m of red sandstone, mudstone, and conglomerate.

Previously reported potassium-argon ages for two samples of Clubhouse Crossroads 1 basalt (Table 1) suggested a middle Cretaceous age (*13*). The potassium-argon ages are compatible with Cenomanian fossils (*14*) in sediments immediately overlying the basalt, but these ages are now considered as minimum values because of the observed mineralogic and chemical alteration of the dated samples. In a study of the Clubhouse Crossroads 1 basalt (including the dated samples), Gottfried *et al.* noted such chemical alteration effects as high and variable H_2O and CO_2 contents (*2*). These investigators reviewed the problems inherent in potassium-argon dating of altered basalts and concluded that the Clubhouse Crossroads 1 basalt could be considered only as pre-Late Cretaceous in age.

Three dated samples from Clubhouse Crossroads 2 are less geochemically altered and have yielded older ages than the Clubhouse Crossroads 1 basalt (Table 1). Despite the clustering of ages from Clubhouse Crossroads 2, the lack of a linear relationship between age and depth reflects the observed, relatively minor, chemical and mineralogic alteration of the dated samples.

The ages of the Clubhouse Crossroads 2 basalt are within the range of ages typically found for eastern North American "Triassic" basalts and diabases (*15*). Recent isotopic dates and fossil data suggest that some of these traditional "Triassic" basalts and interlayered sedimentary rocks are actually Early Jurassic in age (*16–18*). In view of the difficulties in interpreting potassium-argon ages of altered rocks (*15, 19*) and the spread in the ages of the South Carolina basalts, no precise age assignment is made for the Clubhouse Crossroads basalt and underlying red beds. The age assignment used herein for this sequence is Late Triassic to Early Jurassic.

Chemical characteristics of the basalt and the lithology of the red beds suggest correlations and hence relative age determinations for these rocks. The abundances of major, minor, and rare-earth elements in the Clubhouse Crossroads 1 basalt have been compared with the compositions of other basalt types by Gottfried *et al.* (*2*). Conclusions from their comparison (*2*, p. 110) are that the studied basalts are quartz normative tholeiites and that " . . . they are related in space and time to the (Triassic and Jurassic) tholeiitic province of eastern North America and have features in common with quartz normative tholeiitic suites found on other rifted continental margins." Preliminary geochemical data for basalts from Clubhouse Crossroads 2 and 3 support these conclusions.

Tenuous correlation of the unfossiliferous (*20*) red bed sequence beneath the basalt with the lithologically similar continental Newark Group (Upper Triassic and Lower Jurassic) (*17*) of eastern North America is compatible with the ages measured on the basalt. The red beds below the Clubhouse Crossroads basalt bear a general lithologic similarity to exposed rocks of the Newark Group. The upper 7 m of the Clubhouse Crossroads red beds consists of reddish, very-fine-grained to fine-grained, current-bedded arkosic sandstone overlying 31 m of structureless red mudstone. The basal 82 m are composed of interbedded red mudstone and coarse-grained to conglomeratic, arkosic, red sandstone. Sorting is poor in the coarse-grained rocks, and textural and mineralogic immaturity is indicated by the abundance of feldspar, quartz-feldspar lithic fragments, and polycrystalline quartz. The primary sedimentary structures displayed by these rocks are compatible with interpretations of continental environments of deposition. Unfossiliferous, predominantly red, continental siliciclastic rocks are typical of the Newark Group, and lithologic similarity to this sequence has been used to suggest an early Mesozoic age for other red bed sequences buried beneath the coastal plain (*3*).

The isotopic and geologic data summarized above support reports that suggest the presence of a large early Mesozoic basin (graben?) extending across the southeastern United States from the eastern Gulf Coast to the Atlantic Coast, and perhaps offshore (*21*). This basin is much wider than its exposed counterparts in the Appalachians and is filled by at least 1800 m of red sedimentary rock and tholeiitic basalt at its southwestern end (*22*) and perhaps by as much as 1500 m in South Carolina (*23*).

The origin of this large feature is ascribed to crustal extension producing continental fragmentation and subsequent events just prior to and during the early stages of the opening of the modern Atlantic Ocean. Van Houten (*19*) has suggested a succession of such tectonic events. Three of these events, (i) initial fragmentation and basin-filling of a central Atlantic arch (Late Triassic and earliest Jurassic), (ii) extrusion of basaltic lava after basin-filling began (Early Jurassic), and (iii) injection of postdeformational dikes (Early Jurassic), appear to be recorded by rocks in the South Carolina and Georgia subsurface (*24*). The final events in this succession, (iv) open-marine flooding of a Jurassic central-Atlantic rift, (v) production of oceanic crust, and (vi) large-scale continental separation, are apparently not represented by rocks of the South Carolina–Georgia basin. The presence of different types of pre-Mesozoic rocks on either side of this South Carolina–Georgia basin (*25, 26*) suggests that this zone of crustal extension may have been a primary tectonic boundary since at least the late Paleozoic.

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References and Notes

1. P. Popenoe and I. Zietz, *U.S. Geol. Surv. Prof. Pap. 1028* (1977), p. 119.
2. D. Gottfried, C. S. Annell, L. J. Schwarz, *ibid.*, p. 91.
3. I. W. Marine and G. E. Siple, *Geol. Soc. Am. Bull.* **85**, 311 (1974).
4. P. L. Applin, *U.S. Geol. Surv. Circ. 91* (1951).
5. J. Bridge and J. M. Berdan, *Fla. Geol. Surv. Guideb. Assoc. Am. State Geol. 44th Annu. Meet. Field Trip* (1952).
6. E. D. McKee, S. S. Oriel, K. B. Ketner, M. E. MacLachlan, J. W. Goldsmith, J. C. MacLachlan, M. R. Mudge, *U.S. Geol. Surv. Misc. Geol. Invest. Map I-300* (1959); G. V. Cohee *et al.*, *Tectonic Map of the United States* (1:2,500,000) (U.S. Geological Survey and American Association of Petroleum Geologists, Washington, D.C., 1962); C. Milton and V. J. Hurst, *Ga. Geol. Surv. Bull.* **76**, 1 (1965); M. N. Bass, *Mem. Am. Assoc. Pet. Geol.* **11**, 283 (1969); C. W. Copeland, *Ga. Geol. Surv. Bull.* **87**, 61 (1974); T. L. Neathery and W. A. Thomas, *Trans. Gulf Coast Assoc. Geol. Soc.* **25**, 86 (1975); T. M. Chowns, *Ga. Acad. Sci. Bull.* **34**, 81 (1976).
7. C. Milton and R. Grasty, *Bull. Am. Assoc. Pet. Geol.* **53**, 2483 (1969).
8. C. Milton, *Fla. Bur. Geol. Geol. Bull.* **55**, 1 (1972).
9. D. D. Arden, *Ga. Geol. Surv. Bull.* **87**, 111 (1974).
10. R. S. Barnett, *Trans. Gulf Coast Assoc. Geol. Soc.* **25**, 122 (1975).
11. I. W. Marine, *Bull. Am. Assoc. Pet. Geol.* **58**, 1825 (1974).
12. D. Daniels and I. Zietz, *U.S. Geol. Surv. Open-File Rep. 78-261* (1978).
13. G. S. Gohn, B. B. Higgins, C. C. Smith, J. P. Owens, *U.S. Geol. Surv. Prof. Pap. 1028* (1977) p. 59.
14. J. E. Hazel *et al.*, *ibid.*, p. 71.
15. R. L. Armstrong and J. Besancon, *Eclogae Geol. Helv.* **63**, 15 (1970).
16. Armstrong and Besancon (*15*) have questioned whether any potassium-argon dates on eastern North America "Triassic" basalts and diabases record the actual time of igneous activity. They suggest that the dates actually record a period of widespread zeolite facies metamorphism. R. D. Dallmeyer [*Geology* **3**, 243 (1975)], using the $^{40}Ar/^{39}Ar$ dating method, has shown that chill-zone diabase samples from the Palisades sill, New Jersey, have probably not lost significant argon and that $^{40}Ar/^{39}Ar$ dates of about 193×10^6 years match those from the potassium-argon biotite studies of G. P. Erickson and J. L. Kulp [*Geol. Soc. Am. Bull.* **72**, 649 (1961)]. Dallmeyer concluded that temperatures produced by low-grade metamorphism would have been too low to reset argon clocks and that about 193×10^6 years was the correct time of intrusion of the Palisades sill. Citing the apparent discordance of this age with absolute age brackets for the Triassic period, as well as the fossil evidence (*17, 18*), Dallmeyer also concluded that 193×10^6 year ages actually are within the Jurassic Period. A paleomagnetic study of eastern North American mafic dikes of presumed Triassic age by J. de Boer [*J. Geophys. Res.* **72**, 2237 (1967)] has shown that fossil magnetic directions of the dikes do not coincide with either Late Triassic or Early Cretaceous paleomagnetic directions. De Boer suggested a Jurassic age for these intrusions. Cornet and his colleagues (*17, 18*) and P. E. Olsen and P. M. Galton [*Science* **197**, 983 (1977)] have shown, on the basis of paleopalynological and paleoichthyological data, that parts of the "Triassic" Newark Group in New Jersey, Connecticut, Massachusetts, and Virginia are of Early Jurassic age.
17. B. Cornet and A. Traverse, *Geosci. Man* **11**, 1 (1975).
18. ——, N. G. McDonald, *Science* **182**, 1243 (1973).
19. In a summary paper, F. B. Van Houten [*Bull. Am. Assoc. Pet. Geol.* **61**, 79 (1977)] commented that the available radiometric dating was of little use in making detailed temporal studies of eastern North America Late Triassic and Early Jurassic igneous activity.
20. Mega- and microfossils were not observed in the red beds. Eight samples processed for palynomorphs were barren (R. A. Christopher, unpublished data).
21. W. P. Dillon, C. K. Paull, R. T. Buffler [*Am. Assoc. Pet. Geol. Program Abstr.* (1977), p. 92; W. P. Dillon and C. K. Paull, *U.S. Geol. Surv. Misc. Field Studies Map MF-936* (1978)], in a study of seismic reflection profiles from the northern Blake Plateau and adjacent continental shelf, interpreted a strong smooth reflector that correlates to a high-velocity refractor (5.8 to 6.2 km/sec) as a volcanic layer of Early Jurassic age. The reflector is found in only a limited geographic area offshore from Charleston, S.C.
22. A major element analysis of diabase from a well in Taylor County, Florida (Humble Oil and Refining G. H. Hodges well No. 1), reported by Milton (*8*), is very similar to analyses of Clubhouse Crossroads basalt. Barnett (*10*) reported 1143 m of red sedimentary rock and tholeiitic basalt from the Hunt Petroleum J. T. Stalvey well, Lowndes County, Georgia. Arden (*9*) estimated a thickness of about 1800 m for "Triassic rocks" in northwestern Florida.
23. H. D. Ackermann, *U.S. Geol. Surv. Prof. Pap. 1028* (1977), p. 167; unpublished data. Of two refracting horizons in the subsurface near Charleston, the higher horizon is identified as the top of the Clubhouse Crossroads basalt (encountered in test holes) and the lower as the top of pre-Mesozoic(?) crystalline basement. The vertical distance between the two horizons is as small as 650 m at the Clubhouse Crossroads test holes and as large as 1500 m in surrounding areas.
24. Sets of northwest-trending and north-trending linear aeromagnetic highs in North Carolina and South Carolina have been interpreted as diabase dikes of presumed Triassic or Jurassic age by Popenoe and Zietz (*1*).
25. Fossils from gently dipping, unmetamorphosed sedimentary rocks from beneath the Florida and southern Georgia coastal plains have Ordovi-

cian, Silurian, and Devonian ages [(5); D. Carroll, *U.S. Geol. Surv. Prof. Pap. 454-A* (1963); R. F. Goldstein, F. H. Cramer, N. E. Andress, *Trans. Gulf Coast Assoc. Geol. Soc.* **19**, 377, (1969); N. E. Andress, F. H. Cramer, R. F. Goldstein, *ibid.*, p. 369; R. E. McLaughlin, *Ga. Geol. Surv. Inf. Circ. 40* (1970); F. H. Cramer, *J. Geophys. Res.* **76**, 4754 (1971); (26)]. The similarity of Silurian-Devonian pelecypod faunas from Florida and Georgia deep wells to pelecypod faunas in Bohemia and Poland (26) and the absence of metamorphic fabric in the Florida Paleozoic rocks suggests that the "Florida basement block" did not have the same depositional and deformational history as the Paleozoic rocks of the Appalachian orogen 150 km to the north.
26. J. Pojeta, Jr., J. Kriz, J. M. Berdan, *U.S. Geol. Surv. Prof. Pap. 879* (1976).
27. Deep drilling and related investigations by the U.S. Geological Survey in the Charleston, S.C., area are supported by the U.S. Nuclear Regulatory Commission, Office of Nuclear Research, under agreement number AT (49-25)-1000. Manuscript approved for publication by the director, U.S. Geological Survey.

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Australopithecine Enamel Prism Patterns

Abstract. *Following a recent suggestion that tooth enamel prism shape differs within Hominoidea, the teeth of a number of extinct and extant hominoid species were analyzed by scanning electron microscopy. The enamel prism patterns of some gracile and robust australopithecine specimens from Sterkfontein, Swartkrans, and Kromdraai are recorded. The characteristic arrangements of enamel prisms in all modern and extinct hominoid species were found to be essentially similar. The implications of enamel prisms for phylogenetic deduction in Hominoidea are discussed.*

Recent electron microscopic work has shown that the division of tooth enamel into prisms is primarily due to the repetitive orientation of the minute crystallites which compose the inorganic part of the enamel. Analysis of the different patterns assumed by the enamel prisms in various mammalian dentitions has led several workers to conclude that enamel structure permits designation to particular taxonomic groups (*1*). Boyde (*2-4*) has summarized and added much to the state of knowledge of the distribution of prism patterns in mammals (Fig. 1). A recent scanning electron microscopic study of the teeth of selected hominoid primates has suggested that the extant pongids have a prism pattern distinctly different from that of *Homo sapiens* (*5*). Gantt *et al.* (*5*) applied this technique of prism analysis to the Miocene hominoid *Ramapithecus* in an attempt to shed light on the controversial phylogenetic status of this primate (*6*). They recorded a prism pattern for *Ramapithecus* (*5*) which is similar to that of *H. sapiens* (Fig. 1c) and unlike the circular or hexagonal patterns which they described for the pongids (Fig. 1a). It was noted that prism patterns may be of potential use for functional analyses as well as phylogenetic and taxonomic purposes (*5*).

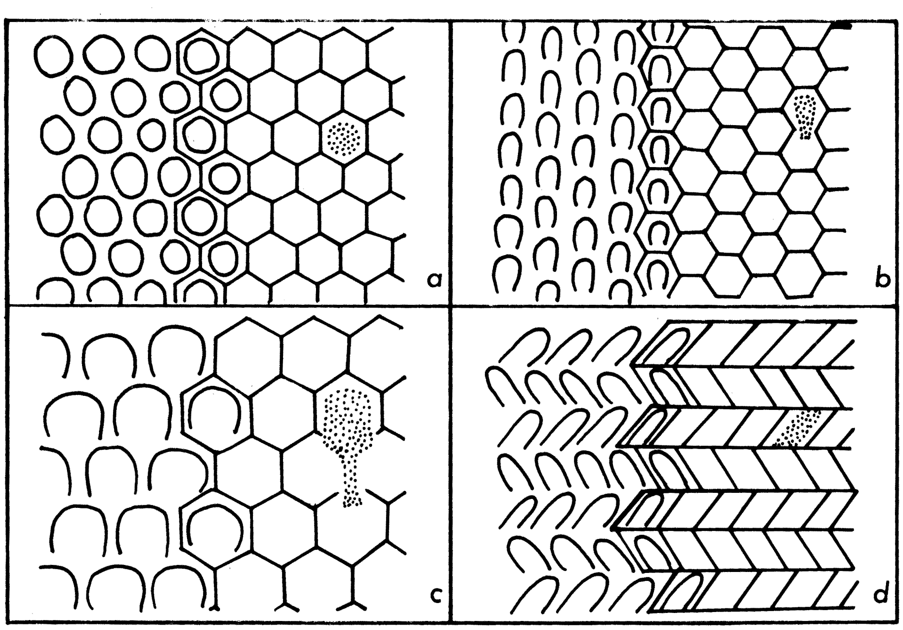

Fig. 1. Schematic representation of prism patterns in the enamel of mammals. Each diagram shows on the left the prism boundaries or sheaths, which represent planes of abrupt change in crystallite orientation within the enamel; on the right the secretory territories of the ameloblasts; and in the middle the relationship of prism sheaths to the secretory territories. The stippling represents the areas which are defined as prisms in the various patterns. (a) Pattern 1, predominant in members of the orders Cetacea (Odontoceti), Insectivora, Chiroptera, and Sirenia. (b) Pattern 2, in Ungulata and Marsupialia, also in primates. (c) Pattern 3, in Primates, Carnivora, and Proboscidea. (d) Pattern R (modified pattern 2), in rodent incisors. Only in pattern 3 enamel (c) is all the enamel attributable to prisms; although they are of exactly the same composition, we refer to interprismatic regions in the other prism patterns. [Adapted from figure 1 in (*2*) and figures 5 to 8 in (*4*)]

The purpose of the study reported here is to record the enamel prism patterns found in several australopithecine specimens from the Transvaal limestone caves, to compare them with those found in other hominoids, and to discuss the potential of prism patterns for phylogenetic deduction in the Hominoidea.

The gracile australopithecine sample which was examined included STS 21 (RM^2), STS 4 (LM_2), STS 49 (LP^3), and STS 1881 (LM^3) from Sterkfontein Member 4. The sample of robust australopithecine teeth comprised SK 855 (LM_3), SK 74c (RP^4), SK 875 (fragment), and SK 879 (fragment) from Swartkrans Member 1 and TM 1603 (LM^3), TM 1517 (LM^2), two recently excavated teeth KB 5223 (LM_1), and a heavily worn molar fragment (KB 5222) from the Kromdraai australopithecine site (*7, 8*). The extant comparative series included a number of permanent premolars and molars of *Pan troglodytes* (N = 2 individuals), *Gorilla gorilla* (N = 1), *Pongo pygmaeus* (N = 3), and *H. sapiens* (N = 4). The specimens were prepared for examination in the microscope as outlined previously (*5*), and examined in a JEOL JSM-35 scanning electron microscope at various magnifications. On each specimen all available surfaces (occlusal, buccal, lingual, mesial, and distal) were studied. In each case the tooth was rotated so that the heads of prisms were perpendicular or nearly perpendicular to the electron beam.

On all hominid and pongid specimens pattern 3 (Fig. 1c), also referred to as the keyhole pattern, was found to predominate on all surfaces examined (Figs. 2a, 3a, and 4a). Other prism configurations (Figs. 2, b and c, 3b, and 4b) were encountered on the teeth of each species, but these occurred in isolated patches only. In both hominids and pongids of the present sample pattern 1 (Fig. 1a) was restricted to the occlusal surfaces, and apparently associated with cuspal convexities (Figs. 2b and 3b). Prism configurations which approached those of pattern 2 (Fig. 1b) were present in patches on teeth of each species,

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