ling, others frequently follow suit resulting in a confused overlay. However, at slow speeds the individual whistles can be isolated. During these whistle sessions the individual contours were retained, and as they overlapped each other it was obvious that each animal was making its individual whistle. As our contours 4 and 5 varied only in the initial rise or fall of the warble, only the overlaid whistles of these two animals proved that they were distinctive and not variations of one contour.

On the basis of these observations we do not intend to state arbitrarily that a single animal has a vocabulary of a single somewhat variable whistle contour. However, this distinctive whistle occupied much more than 90 per cent of the total whistle vocabulary of any one animal during this three-week period following capture. Very rarely, however, an unfamiliar whistle was recorded. We do wish to point out, however, that our work to this point indicates a definite tendency toward an individualized whistle. Further investigation of this point is contemplated in the immediate future.

The whistle constitutes only one of the many phonations emitted by *T. truncatus*. Squeals, chirps, squeaks, squawks, barks, yelps, grating sounds, and echo-location bursts are common ones. Although some of these have been clearly shown to be used for echo-location[4], others such as the squawk, even though containing very rapid pulses, may be indicative of the emotional state of the animal and not an echo-location device. Much work remains to be done in analysing these sounds in relation to behaviour.

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Correlations between the Architecture of Shoots and the Particular Fragments of them found as Fossils

OBSERVATIONS were made on plausibly-coniferous fossil shoots in silicified floras from arid southern central Australia. Such floras are found in an indurated siliceous matrix superficially resembling silcrete[1], but occurring as eroded stones on various landsurfaces. The fossils, loosely oriented according to apparent bedding planes, are undistorted natural moulds of very high fidelity, often carrying details of surface morphology down to the microscopic dimensions of cell outline. They are not well expressed on fresh fracture faces, but only on weathered faces, by differential erosion. Of the plant debris fossilized within the matrix, one might expect the array presented at the surface of the eroded stony fragments to be dictated by chance, at the vagaries of erosion and weathering. However, the particular kind of fragment (branched or not, terminal or not, etc.) was found to be correlated with the architecture (and hence with the systematic status) of the shoot, despite fragmentation.

Correlations between characters of presentation and characters of shoot architecture were sought among 76 fossil shoots (of 21 different kinds) on characters including, on one hand, length of fossil, whether branched or not, and whether terminal or not, and on the other whether phyllotaxis was spiral, decussate, etc. Results of contingency comparisons between some of these features are given in Table 1.

Table 1

A	B	a	b	c	d	χ^2 (Yates's correction)	Exact probability (Fisher's method)
Branches	Tips	8	4	2	62	30·362	0·00000106
Branches	Spiral	5	60	6	5	13·113	0·00070659
Tips	Spiral	5	60	8	3	23·663	0·00000917
Length	Branches	4	7	26	39	0·011	—
Length	Tips	3	10	27	36	1·033	—
Length	Spiral	28	37	2	9	1·509	—

Association between characteristics A and B evaluated by χ^2 (Yates's correction) and by Fisher's exact method[2]. (Lengths greater than mean length were rated positive.)

		A +	A −
B	+	a	b
	−	c	d
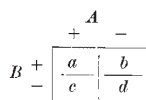
From Table 1 it is clear that, while the frequencies of branching, terminal nature and non-spiral phyllotaxis in the assemblage are low, nevertheless branching and the presentation of natural terminations are positively associated, both are negatively associated with spiral phyllotaxis, and all three characteristics are independent of fossil length.

In defining the 21 kinds, branching was precluded from discriminatory attributes since its absence from a fossil was regarded as probably due to fragmentary presentation (mean shoot length 19·4 mm, *S.D.* 9·4). This analysis shows, however, that branching or the lack of it correlates with highly discriminatory plant attributes, namely phyllotaxic kinds, and is independent of the length of shoot presented, in this group of fossils. Branching is thus revealed as a discriminatory plant attribute in this assemblage. The small axis diameters of all 76 fossils suggest that all the debris was more or less terminal, so the correlation between only branched non-spiral phyllotaxis and the exhibition by fossils of natural shoot terminations is surprising. Branching admittedly increases the probability of observing a tip but not, in our opinion, to a degree sufficient to account for the degree of correlation observed. Rather, the data indicate differences in the habit and shoot abscission characteristics of the original plants.

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A Middle Palaeocene Primate

PRIMATES are unknown before the middle Palaeocene. From deposits of this age (see here) in Montana, Wyoming, and Germany, nine genera and ten species are at present recognized[1–5]. I have elsewhere[6] shown that *Adapisoriculus*, which is present at Walbeck[1], is a tupaiid but that tupaiids are probably not phyletically close to primates. I regard the Picrodontidae as primates[7]. Bear Creek could be Torrejonian to Graybullian in age (unpublished work) but is not here included in the middle Palaeocene. The species to be described here is one of the most primitive known and therefore has a bearing on the origin of primates.

Mckennatherium libitum, new genus and species: Type and only known specimen; A.M.N.H.* No. 35437, left