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NEW QUATERNARY FOSSIL SITES NEAR
SWARTKLIP, CAPE PROVINCE

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(With 7 plates and 2 figures)

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INTRODUCTION

During April, 1966, students from the Department of Geology, University of Cape Town, discovered an horizon containing fossil bone in the sand- and limestone cliffs near Swartklip on the False Bay coast. Subsequent investigations revealed the existence of fossil-bearing deposits at three localities—Site I, the most prolific occurrence, and Sites II and II Extension, two separate exposures of a single horizon (fig. 1).

Earlier, Singer & Fuller (1962) had reported on an assemblage of fossil bone from a fallen block of the cliff-face in the Swartklip (Zwartklip) area. This discovery is herein referred to as the 'Singer/Fuller Occurrence'.

All the fossil material recovered from these occurrences is almost certainly at least broadly contemporary, and it is the purpose of the present report to place on record the material from the three new sites which had been recovered up to July, 1966. The fossils, which are housed in the South African Museum (Natural History), Cape Town, have in many cases been incompletely classified, largely because of the lack of adequate comparative material. It is hoped

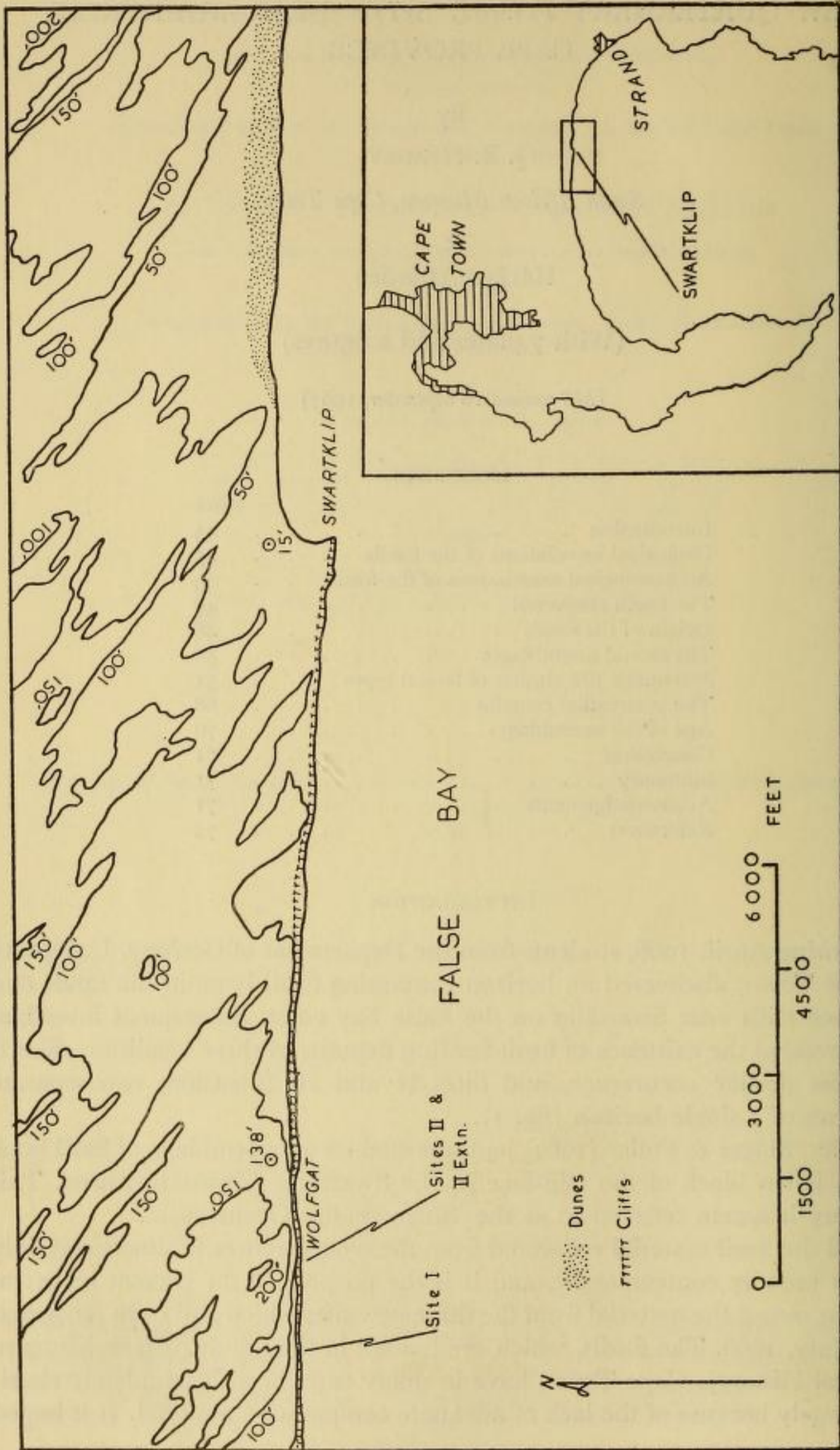


FIG. 1. Map showing location of new fossil sites near Swartklip, C.P. (Adapted from Trig. Survey Sheet no. 3418 B6).

to refer back to these specimens as detailed osteological studies of their modern and fossil counterparts progress.

GEOLOGICAL ASSOCIATIONS OF THE FOSSILS

The geology of the Swartklip deposits has already been recorded in some detail (Singer & Fuller, 1962). The fossils at the new sites occur in an irregular horizon of unbedded calcareous sand and grit, at approximately 60 feet above sea-level. At Site I an extensive talus slope has developed from beneath the small overhang in which the fossil horizon is exposed, and it was from the rubble of this scree that most of the fossils were recovered (pl. 1A, B). The deposits are, for the most part, incompletely consolidated, and their instability limited the collection of *in situ* fossils.

The fossiliferous horizon at Site I is clearly distinguishable from the overlying and underlying horizontally bedded deposits (fig. 2), and it appears to fill what was once a low cave. Comminuted marine shells occur in great quantities throughout the deposits incorporating the fossil horizon, and they are clearly marine in origin, although they may well have been redistributed in part by subsequent wind action. Their age is uncertain, but Singer & Fuller consider that they cannot post-date the 'Riss/Würm' interglacial. It is unlikely that they are older, since they would have had to withstand marine erosion during the high sea-level of that period, which is improbable in view of their relatively unconsolidated nature. The fossil deposits are clearly younger, but geological evidence can provide no closer estimate of age.

Overlying the horizontally bedded sands are discontinuously developed horizons of calcrete ('calcareous tufa' of Singer & Fuller) and calcareous sands, partially consolidated reddish-brown sand and unconsolidated white sand, all of which reflect the more recent geological and pedological history of the area. Shells of land snails occur within these deposits, which are aeolian in origin, and the calcareous and ferruginous characters reflect chemical changes within the soil body subsequent to its accumulation. The calcrete has resulted from the induration of the calcareous sands.

The geology at Sites II and II Extension is similar in most respects.

Singer & Fuller concluded that the fossils recovered by them probably came from a crevice in the cliff formation and that the occurrence post-dated the cliff sands, but pre-dated the calcrete. Observations at the new sites confirm the former speculation, but do not necessarily support the latter. At none of the sites is there evidence for a vertical opening through the deposits which has been sealed by the calcrete. At Site I there is a strong suggestion that the 'cave' opening was in a gully to the east of the fossiliferous deposit. The formation of the calcrete, therefore, had no direct effect on the 'cave' opening, and the fossils do not necessarily pre-date its formation.

ARCHAEOLOGICAL ASSOCIATIONS OF THE FOSSILS

A single undiagnostic silcrete flake was recovered from the talus slope at Site I, but no material of an archaeological nature was found definitely asso-

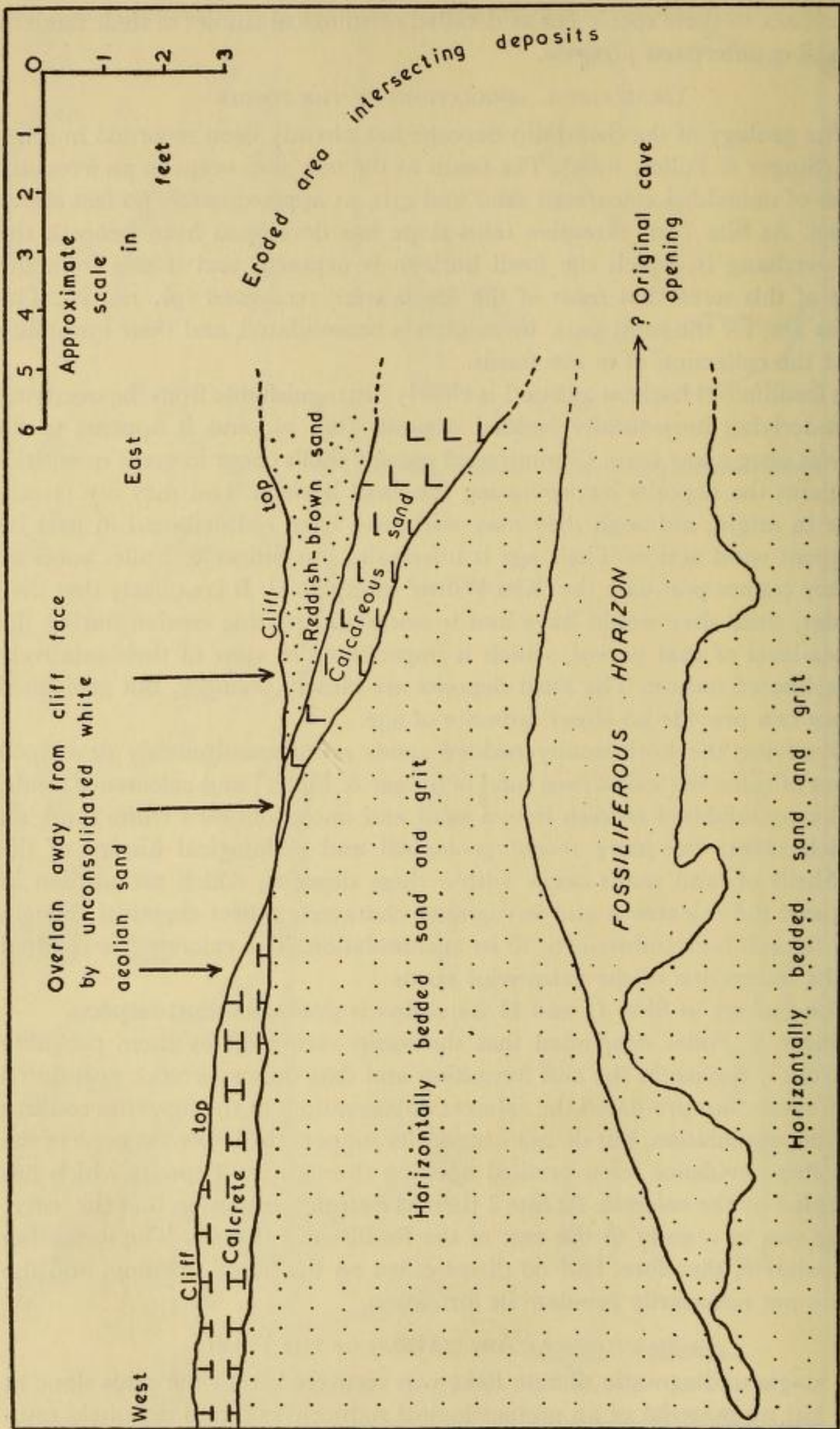


FIG. 2. Sketch section of Site I.

ciated with the fossils at this locality.

At Site II Extension, approximately 2 feet above the fossils, is a clearly defined horizon, apparently an old land surface, from which several flakes and numerous marine shells were recovered. This midden dates probably from the Late Stone Age, and may be indirectly associated with the fossils (*vide infra*).

From Site II a complete ostrich-egg, with a single perforation on its surface, was recovered (pl. 1C), and this resembles the 'water-containers' known from Late Stone Age contexts, and still used today by the Bushmen of the Kalahari Desert. The perforation is irregular and appears to have been made by being chipped away with a sharp object. This is the technique commonly employed in the manufacture of ostrich-egg water containers (Maggs, 1966), although in the present instance the perforation has not been rounded out.

If indeed this specimen is a water-container, its association with the fossils might be coincidental, having been buried into the fossil horizon from the Late Stone Age living floor immediately above.* These containers were, and still are, buried when being stored.

None of the fossils show any evidence of human interference, neither artificially produced fractures (spiral fractures, punctate marks, flaking, etc.), nor wear through use having been observed.

There is, therefore, no certain evidence for associating the fossils with human activity.

THE FOSSILS RECOVERED

The fossils were, in general, extremely well preserved. This is accounted for by the alkali nature of the deposits, and by the original protection afforded them in the caves from natural destructive agencies such as wind, water and temperature changes.

Damage to the specimens has been largely post-fossilization, and occurred mainly as a result of the collapse of deposits from the cliff-face, and their subsequent exposure to the atmosphere. Absorption of salts from the sea air, and their later crystallization within the fossils has resulted in lamination and cracking of some specimens.

The fossils are not heavily mineralized, and this rendered the preparation of those specimens in well consolidated matrix very difficult.

They occurred most commonly towards the base of the horizon, with several pockets of concentration, and usually lay horizontally in the deposit. Several instances were noted where elements of the skeleton were in articulation or only slightly separated. Since no systematic excavation was undertaken it was not possible to assess the frequency with which this occurred. This feature is a further indication of accumulation under protected conditions.

* The living floor was not actually detected at Site II, but since it and Site II Extension are exposures of the same horizon on either side of a small spur, it is almost certainly present.

ORIGIN OF THE FOSSILS

The lack of positive cultural associations, taken in conjunction with the small size of the caves, indicates that some agency other than man was responsible for the bone accumulations. The nature of the fossils described by Singer & Fuller (1962) prompted the observation that, 'they could well have been deposited on the floor of a small cave or rock shelter used as a lair'. This view is supported by observations made in the present study.

In southern Africa an animal lair containing bones immediately suggests that the porcupine (*Hystrix africaeaustralis*) is, or was, the occupant. In the present instance this possibility was discounted, since the assemblages contained no gnawed bones. Porcupine lairs contain a high proportion of bones which show gnaw marks (Hendey & Singer, 1965).

Alternatives were sought among the Carnivora. One of the most striking features of the assemblages was the variety of carnivores represented. In the mammalian fauna of a region the numbers and types of carnivores form a relatively small percentage of the total, and this balance is usually reflected in the faunal assemblages of fossil sites (table 1). The situation at Swartklip suggests that the lairs were inhabited by a number of carnivores over a period of time, and that the assemblages contain the remains of animals which died there.

TABLE 1
THE VARIETIES OF CARNIVORA FROM SITE 1 COMPARED WITH THOSE FROM
OTHER SITES IN THE CAPE PROVINCE

	Swartklip Site 1	Open Sites		Cave Sites*	
		Melkbos	Hopefield	A.K. 1	A.K. 2
Animal lairs	×				×
Human activity evident ..		×	×	×	
Varieties of carnivora ..	7	3	12	6	2
Other mammals (excl. micro- fauna)	8	14	38	11	11
Carnivora as % of total ..	47	18	24	35	18

* Hendey & Singer, 1965.

Perhaps the most significant evidence in support of the 'lair theory' is provided by the official name, Wolfgat, of the area in which the sites are located (fig. 1). This Afrikaans word, which literally translated is 'wolf-hole', but in free translation means 'hyena-lair', is an example of the naming of localities after animals, an extremely common practice amongst the early European settlers in South Africa (Sargent, 1954). The use of the term 'wolf' for hyenas is now largely an anachronism, but it does persist in the common Afrikaans names of these animals, i.e. 'gevlekte wolf' or 'tierwolf' = *Crocuta crocuta*; 'strandwolf' = *Hyaena brunnea*; 'aardwolf' = *Proteles cristatus*.*

* Often classed in a separate family, the Protelidae, but undoubtedly considered a true hyaenid by early non-scientific observers.

Dart (1949) states that 'most South African carnivora, such as the lion, jackal and spotted hyena, actually avoid caverns and live out in the veld, killing their prey and consuming it in the open country. Two South African types, namely the leopard and brown hyena, are attracted by the protection of rock shelters and of fissures. . . .' Remains of the brown hyena occur in both the Site I and Site II assemblages, and since it is also well known as a scavenger on sea-shores, it is the animal considered most likely to have given rise to the name 'Wolfgat'. Furthermore, the presence in the assemblages of isolated bones of large animals, such as the rhinoceros, suggests that at least one of the inhabitants of the lair was a scavenger.

The suggestion that the brown hyena was one of the 'bone-collectors' must, however, be accepted with reservations. Dart (1956) has gone to great lengths to prove that it does not accumulate bones in its lairs, and that it does not defecate in its lairs. Both Sites I and II Extension have yielded coprolites, and although the animal responsible for these was not identified, they were of a size sufficient at least to suggest the brown hyena.

The aardwolf also inhabits burrows, and although it is unlikely to have been responsible for the bone accumulations, being largely insectivorous, it is reported also to be a carrion eater (Miller, 1954; Maberly, 1963).

In any event, it is certain that within historic times there was a lair of a 'hyaenid' in the area where the fossil sites are located. Whether or not this can be related to the fossil occurrences is a matter for conjecture.

Speculations on other possible occupants of the lairs have proved equally inconclusive. The African hunting dog (*Lycaon pictus*), recorded from Site I, does not normally inhabit lairs, but the females do occupy burrows during the natal and early post-natal periods.

The lion (*Felis leo*), although not an occupier of lairs today, must be considered as a possibility simply because of the number of individuals recorded. Remains of the lion are extremely rare at fossil sites in South Africa, whereas at least five individuals are represented in the relatively small Swartklip assemblages.

Fragments of ostrich-eggshell were recovered at all three sites, and unless these are all from broken water containers, which is considered highly unlikely, their presence suggests that eggs formed part of the diet of one of the occupants.

The presence of fossils at and near the top of the fossiliferous horizon is an apparently anomalous situation in the lair theory. There would, however, have been some fall of sand from the walls and roof of the caves, and with the accumulation of sand, bones and other debris in the lair, the occupying animal would have been forced to clear the floor from time to time. In the clearing of new living space, bones would have been thrown up and in some cases reached roof level. This regular disturbance would also account for the completely amorphous character of the sand constituting the fossiliferous horizon.

It is possible that the lair at Sites II and II Extension was occupied at the time that the land surface on which the midden accumulated was in

existence (*vide supra*). If this was the case, there may well be some tenuous link between human activity and the fossils, such as, for example, the scavenging of food remains from nearby human occupation sites by the animal inhabiting the lair at that time.

THE FAUNAL ASSEMBLAGES

An analysis of the material recovered confirms the observation of Singer & Fuller (1962) on the great diversity of faunal types represented in a relatively small total assemblage from a limited area (table 2).

Of the new sites, Site I was the most productive (table 3).

TABLE 2

	Site I	Site II	Site II Extn.	Singer/Fuller Occur.
Class <i>MAMMALIA</i>				
Order <i>ARTIODACTYLA</i>				
Family <i>Bovidae</i>				
<i>Redunca</i> cf. <i>arundinum</i>	×	×	×	×
<i>Hippotragus</i> cf. <i>leucophaeus</i>	×			
cf. <i>Connochaetes</i> sp.	×			×
<i>Antidorcas marsupialis</i>	×	×	×	×
<i>australis</i> n. subsp.				
<i>Raphicerus</i> sp.	×	×		×
Family <i>Hippopotamidae</i>				
cf. <i>Hippopotamus</i> sp.	×			
Order <i>PERISSODACTYLA</i>				
Family <i>Rhinocerotidae</i>				
<i>Diceros simus</i>	×			
<i>Incertae sedis</i>	×	×		×
Family <i>Equidae</i>				
<i>Equus</i> sp.	×			
Order <i>CARNIVORA</i>				
Family <i>Hyaenidae</i>				
<i>Hyaena brunnea</i>	×	×		
Family <i>Felidae</i>				
(?) <i>Felis serval</i>	×			
<i>Felis leo</i>	×	×		
Family <i>Canidae</i>				
<i>Lycaon pictus</i>	×			
cf. <i>Canis</i> sp.	×	×		
<i>Canis</i> cf. <i>mesomelas</i>	×	×		×
Family <i>Viverridae</i>				
(?) <i>Herpestes ichneumon</i>	×			
Family <i>Mustelidae</i>				
<i>Mellivora capensis</i>	?			×
<i>Aonyx</i> sp.				×
<i>Incertae sedis</i> (+1)	×	×		
Order <i>RODENTIA</i>				
Family <i>Bathyergidae</i>				
<i>Bathyergus suillus</i>	×			
<i>Incertae sedis</i> (3)	×			

	Site I	Site II	Site II Extn.	Singer/Fuller Occur.
Class <i>AVES</i>				
Order STRUTHIONIFORMES				
Family Struthionidae				
<i>Struthio australis</i>	×	×	×	
Class <i>REPTILIA</i>				
Order CHELONIA				
<i>Incertae sedis</i>		×		

TABLE 3
THE FOSSIL MATERIAL RECOVERED FROM THE THREE SITES

	Cranial pieces	Min. no. indiv. based on skull	Identified post- cranial pieces	Min. no. indiv. based on Postcranial skeleton	Unident frags.	Complete ostrich egg	Frag. ostrich-eggshell	Frag. tortoise carapace	Coprolites
Site I	270	45	700	25	1630	—	199	—	7
Site II	12	8	100	12	119	1	33	1	—
Site II Extn.	6	3	13	3	34	—	2	—	5
Totals	288	56	813	40	1783	1	234	1	12

SYSTEMATIC DESCRIPTION OF FAUNAL TYPES

The specimen numbers are those in the accession registers for the Swartklip area in the Subdepartment of Quaternary Palaeontology, South African Museum, and all comparative material referred to is in the collections of this museum.

Unless otherwise stated the material described is from Site I. Measurements are in millimetres.

Where possible the nomenclature follows that of Ellerman *et al.* (1953). An exception to this is the use of the generic name *Felis* for the lion, in place of *Panthera* (Herskovitz, 1959).

Family **Bovidae**

Tribe *Reduncini*

Redunca cf. *arundinum* Boddaert

Reedbuck

At Site I a minimum of six individuals were represented, while there was at least one from both Sites II and II Extension.

will certainly be no adequate descriptions of the physical character of the local form available, and reference to the fossil record must therefore be made. The Swartklip fossils do indicate the presence of a springbok differing slightly from the subspecies occurring further north.

In the light of available evidence it is concluded that the Swartklip *Antidorcas* is at least a geographical variant of the extant species, and in view of the location of the sites, the taxon *Antidorcas marsupialis australis* is proposed. However, if the suggested wider relationships of this form can be convincingly demonstrated, its elevation to the species level will need to be considered.

Tribe: *Neotragini*

Raphicerus sp.

The minimum number of neotragine antelope represented in the Site I assemblage was six, while a single individual was represented at Site II.

The two extant South African species of *Raphicerus*, namely *campestris* (steenbok) and *melanotis* (grysbok), cannot be satisfactorily distinguished on osteological grounds. Both are found in the south-western Cape Province today, and the Swartklip specimens show no significant differences from the living forms.

Singer & Fuller (1962) stated that the *Raphicerus* specimens recovered by them had closer affinities to the recent forms than to the fossil form from the Elandsfontein site.

Family **Bovidae**: *Incertae sedis*

Almost one hundred skull fragments and isolated teeth, mostly incomplete, from the Site I assemblage were not classified, but none suggested the presence of an antelope other than those already listed.

Family **Hippopotamidae**

cf. *Hippopotamus* sp.

A single unerupted (? deciduous) tooth, doubtfully ascribed to the hippopotamus, was included in the Site I assemblage.

Family **Rhinocerotidae**

Diceros (Ceratotherium) simus Burchell

White Rhinoceros

Remains of the rhinoceros were rare in all the assemblages, and only a single unerupted RP³ (ZW 192) from Site I was identified positively as belonging to *Diceros simus*. This species was not recorded in the south-western Cape Province during historic times, but has been recorded from the Langebaanweg, Hopefield and Melkbos fossil sites.

Diceros sp.

The only other cranial remains of the rhinoceros recovered were four tooth fragments. Owing to their condition it was not possible to assign them to any species.

Six elements of the postcranial skeleton were recovered from Sites I and II, including a radius and ulna (ZW 292 and ZW 1120) found in close association at Site I.

It is generally considered impossible to distinguish the white from the black rhinoceros on the basis of their postcranial skeleton (Hooijer & Singer, 1960), but the specimens from Site I compared closely in size with corresponding elements of the skeleton of a white rhinoceros in the South African Museum (SAM 21379). However, the postcranial material recovered may belong in part, or entirely to the black rhinoceros (*Diceros bicornis*), which was recorded in the area during historic times, and which is commonly found at other fossil sites in the area.

Family **Equidae***Equus* sp.

No cranial remains of this genus were recovered, but several elements of the postcranial skeleton were included in the Site I assemblage. They represent the remains of at least two individuals, an adult and a juvenile.

Family **Hyaenidae***Hyaena brunnea* Thunberg

Brown Hyena

The minimum number of individuals represented in the assemblages was three.

ZW 394—A right premaxilla, probably of an immature adult, with only the I² remaining in position. This tooth is fully erupted, but unworn.

ZW 1311—(table 13, pl. 6A, B)—An incomplete skull of an immature individual from Site II, with associated right and left mandibles (ZW 1312 & ZW 1313). The facial part of the skull is largely intact, but most of the brain-case has been lost. The teeth preserved are as follows:

Left: Roots of I¹ and di³; I² and I³ about to erupt; root and damaged crown of dc; P¹; dp²; dp³; dp⁴; P⁴ about to erupt; M¹ just erupted.

Right: As above, except that the I¹ is intact, only the posterior root of the dp² remains, and the P¹ has been lost.

The right mandible (ZW 1312—pl. 6C) has the following teeth present: I₁; dc̄; dp₂; dp₃; dp₄; and M₁ partially erupted.

The left mandible (ZW 1313) is incomplete, and only the dp₃ and part of the dp₂ are preserved.

ZW 123—An incomplete right mandible with the incisor, both premolars and the first of the molars.

ZW 398—An incomplete left mandible with only the first of the premolars remaining.

ZW 1112—A fragment of left mandible.

ZW 190—A fragment of a left upper incisor.

These specimens were indistinguishable from the corresponding parts of *Bathyergus suillus*, which occurs commonly in the area today.

RODENTIA: *Incertae sedis*

Three incisors (ZW 169, ZW 1205 and ZW 1206) representing three distinct types of rodent other than *Bathyergus* were recovered at Site I.

Family **Struthionidae**

Struthio australis

Ostrich

In addition to the egg and eggshell fragments already mentioned, the following bones of the ostrich were recovered from Site I:

ZW 208—The shaft of a tibia.

ZW 714—The shaft of a femur.

ZW 948—An incomplete right metatarsal of an immature individual.

ZW 1124 A, B, C—Fragments of the distal end of a femur.

Morphologically the specimens were indistinguishable from the corresponding parts of the extant ostrich, but the tibia shaft was somewhat longer than those of the comparative specimens.

CHELONIA: *Incertae sedis*

A single fragment of carapace (ZW 1208) was recovered at Site I.

THE POSTCRANIAL REMAINS

Approximately 86% of all the identified postcranial bones recovered came from Site I (table 2), and a summary of the analysis of this material (excluding non-mammalian remains) is given in table 19.

One of the most striking features emerging from this analysis was the scarcity of postcranial remains relative to the number of individuals represented. In the case of the lion, for example, the disparity was very marked. The appendicular skeleton of the lion is made up of approximately 110 bones, excluding the innominates, patellae and sesamoids. With four individuals represented at Site I, theoretically at least 440 bones should have been

TABLE 19
THE MAMMALIAN POSTCRANIAL REMAINS FROM SITE I

ZOOLOGICAL GROUPS		Scapulae	Humeri	Ulnae/Radii	Metacarpals	Innominate	Femora	Tibiae	Metatarsals	Carpal/Tarsal	Undifferentiated metapodials	Phalanges	Sesamoids & patellae	Vertebrae	Ribs	Unidentified fragments	TOTALS
CARNIVORA	Felidae — <i>Felis leo</i> ..			2							1	1					4
	Other carnivora ..		5	20			7	3		4	22	16					77
PERISSODACTYLA	Equidae		1	1						1		2					5
	Rhinocerotidae ..			2	1				1			2					7
ARTIODACTYLA	Bovidae		19	43	21			17	24	33	35	68					260
		2	1			2	1		2							8
RODENTIA																
UNDETERMINED	20	10	19		66	46	30		9			7	122	10	1630	1969
	TOTALS	20	37	88	22	66	55	51	25	49	59	89	7	122	10	1630	2330

Note: Numbers do not necessarily indicate complete bones.

recovered. There were in fact only parts of three bones recovered—less than 1% of the theoretical total. Other figures calculated on this basis ranged up to 20% in the case of the appendicular skeleton of antelope.

The presence of incomplete skeletons at fossil sites is quite common, and many factors might be responsible. Recent work by Brain (1967) is of special interest in the present instance. He has demonstrated by careful field observation that disproportionate occurrences of bones and parts of bones can result from the destructive chewing of small carnivores—domestic dogs in the study undertaken by him. Since carnivores are thought to have been responsible for the fossil assemblages at Swartklip, they were probably also responsible for the destruction of much of the original assemblage. The main objection to this theory is that none of the bones showed signs of tooth marks. The possibility that subsequent weathering has removed all traces of these is considered unlikely, in view of the excellent state of preservation of the specimens.

Clearly allowance must be made for the method of collection, which resulted in only part of the entire deposit being handled. However, this factor alone cannot adequately account for the persistent shortage of postcranial remains of all categories.

In addition there was almost certainly some selective collecting of bone by the inhabitants of the lairs.

It is probably a combination of these factors which has given the assemblage its present character.

A second feature of the postcranial assemblage was the 'completeness' of the bones. A frequently characteristic feature of bone accumulations resulting from the activities of man is the highly fragmented state of the bone (cf. Dart, 1957, for details and references). There are two basic reasons for man's deliberate fragmentation of bone—firstly, to obtain pieces suitable for the manufacture of tools, and secondly, to remove all edible soft tissue. Although the bones from the Swartklip assemblages were often incomplete, this was the result mainly of post-fossilization damage, and as a whole the assemblages lacked large numbers of small bone fragments and splinters. In this respect at least the assemblages had the appearance of animal lair residues, rather than human occupation site debris (Hendey & Singer, 1965: 212).

AGE OF THE ASSEMBLAGES

The fauna of the sites is essentially 'modern' in character. No extinct genera are present, and most of the forms are indistinguishable from, or closely related to extant species. The fauna clearly post-dates that of the Elandsfontein site, which is usually termed 'late Middle/early Upper Pleistocene' (Boné & Singer, 1965), and corresponds most closely with that of the Melkbos fossil site (Hendey, in press).

Singer and Fuller (1962) suggested that the assemblage described by them was late Upper Pleistocene, and the present study tends to confirm this, although the possibility that the fauna is post-Pleistocene cannot be discounted.

The application of the name 'Wolfgat' to the area in which the sites are located, suggests the possibility that the lairs in which the fossils accumulated were still being occupied after the arrival of the first settlers from Europe in 1652. It is uncertain when this name was first used but it is most likely to have been during the late seventeenth or early eighteenth centuries. However, even by 1649, before the first permanent European settlement, the indigenous fauna of the Cape Peninsula area was much depleted (Sargent, 1954), and it is concluded from the variety of faunal types represented, that at least part of the assemblages accumulated in prehistoric times.

All the available evidence points to the Swartklip fossils being late Upper Pleistocene or Recent in age.

CONCLUSION

The importance of the Swartklip sites lies chiefly in the fact that they have provided the largest range of later Quaternary fossils known from the south-western Cape Province to date. Information on the Quaternary fauna of this region is now coming from the Early or Middle Pleistocene deposits at Langebaanweg, the Middle/Upper Pleistocene site at Elandsfontein and the more recent Melkbos and Swartklip sites. Consequently there is now a proven potential in this limited geographical region for establishing a succession for the Quaternary fauna of southern Africa, a situation unparalleled elsewhere in the subcontinent.

Furthermore the fossils at Swartklip come from sealed deposits where the danger of admixture of earlier and later elements is excluded. This is not the case with the other major sites of the region. The excellent state of preservation of the specimens makes detailed morphological studies of them possible, and there is no doubt that the future exploitation of the sites, and a closer examination of the material already recovered, will provide a great deal of unique and valuable information.

They are potentially the most important fossil occurrences of their kind discovered in southern Africa in recent years.

SUMMARY

The fauna of three recently discovered fossil sites in the south-western Cape, South Africa, is described, accounts being given of nineteen mammalian types, including one new subspecies, *Antidorcas marsupialis australis*.

Brief accounts of the geological and archaeological associations of the fauna are given, and the suggestion made that the fossils accumulated in carnivore lairs.

It is concluded that the assemblages are late Upper Pleistocene or Recent in age.

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Members of the Western Cape Local Centre of the South African Archaeological Society and the University of Cape Town Archaeology Field Club undertook most of the later collecting, and we are especially grateful to Miss E. Speed, who arranged these collecting trips.

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