

Outline.

The object of the field work was to visit areas where the onlap of Tertiary deposits on to basement is exposed in the vicinity of Adelaide, and to describe, as far as possible, the origin and nature of the ^{non marine} sediments considered to be equivalent to the North Maslin Sands of the Noarlunga and Willunga Basins. The examination of new exposures in quarries to the NE of Adelaide, in the Highbury and Golden Grove areas was undertaken, since these exposures now reveal vertical sections of up to 100ft in the Eocene non marine sands, which otherwise outcrop poorly.

Summary of Previous Work.

Reynolds (1953) defined the North Maslin Sands, and designated the Noarlunga Sand cos workings at Maslin Bay as the type area.

Subsequent to this work Dailly & Woodward mapped respectively the Tertiary outcrops of the Noarlunga and Willunga Marginal Basins and in so doing recorded further exposures of this formation.

Dailly's mapping shows that the lignite seams known from bores near the township of Noarlunga, occur in this formation, since outcrops of the overlying marine Eocene formations were recorded in the cliffs of the Oukapaninga River adjacent to the shafts.

A specimen of lignite from the dumps at the shafts was examined by Dr Cookson in Melbourne. Specimens of hystrichosphaerids which indicate a marine influence, were found in the sample and a tentative dating of middle to upper Eocene was given.

To the east, but separated from this sequence by faulting, deposits of gravels were mapped lying unconformably on Precambrian and dipping

southwards apparently beneath the Eocene marine beds of the Wilkunga Basin. These are the ferruginous grits in the Bakers Gully area from which specimens of fossil wood and imprints of leaves had been collected previously.

The two principal bores in the Adelaide Basin, The Graydon Bore & the Kent Town Bore, ^{intersected} ~~crossed~~ the equivalents of the North Maslin Sands overlying bedrock, beneath upper Eocene marine beds.

Traces of lignite which occur in these basal sands of the Kent Town Bore were correlated from with those known from bores in the Hope Valley and Paradise areas. A boring program by the Mines Dept which had been designed to show the extent and thickness of the lignite seams, revealed that the lignitic horizons cease at the line of the Hope Valley Fault.

Little new data on the subsurface extent of the marine Eocene in this area to the north east of the City has been made known since Miles' Bulletin on the Adelaide Plains Basin was published, (1952) and the evidence is not yet complete enough to map its limits. In the above Bulletin the fossiliferous marine limestones and glauconitic sands described as now accepted as the equivalents of the Upper Eocene Blanche Point Marls of the Aldinga section, were described as Miocene.

Unofficial reports suggest that marine Eocene has been encountered recently (July 1959) in bores at Northfield. If this report is correct then the northwestern limit of these deposits must be further extended.

It appears from the published bore data that the marine Eocene lies directly on the Precambrian at places in the Gilles Plains area. This appears to be evidence of the irregular character of the Precambrian surface which was ~~blanketed~~ ^{and} by the non marine deposits prior to the upper Eocene marine transgression.

Thus the marine ^{beds} transgress the topographic highs

and come to ^{lie} directly ~~of~~ on the Precambrian.

Movements were apparently taking place on the Para Fault during the deposition of the basal Tertiary sands as the base of the marine sequence in the Croydon bore is 482' above Precambrian bedrock, whereas the same horizon in the Kent Town bore is underlain by only 53 feet of the non marine deposits.

The maximum known thickness of this formation on the Para Block north of the City is less than 200 ft so it appears that the greater thickness of pre-marine Eocene in the Croydon bore is due to differential downwash rather than to infilling of a topographic low.

A comparison of the sequence of the Croydon bore with that in the City area where the Pliocene lies directly on the marine Eocene, indicates that considerable uplift of the eastern block must have taken place prior to the deposition of the Pliocene limestones in this area. Glaesner (1953) suggests that a thickness of the order of 1300 feet was removed by erosion from this area.

The furthest extent inland of the Pliocene ^{marine} deposits appears to be in the vicinity of the University and further east these ^{probably} change to non marine deposits, but the late Tertiary and ~~the~~ Cenozoic strata to the north east of the City of Adelaide have not been studied in detail.

The geology of the Hope Valley - Golden Grove area has been studied and described by both M Wade & Cochrane and other isolated areas in the Tertiary and adjacent Precambrian of this ~~area~~ ^{region} have been considered by geologists of the Mines Dept, in relation to economic deposits of building sand and clay.

These workers did not suggest a direct correlation of the deposits on either side of the Hope Valley Fault, but Glaesner has stated that the lignite forming swamps were probably confined to the downthrow side, and in this way these beds ~~can~~ ^{may} be correlated with the basal sands to the east and north, which lack lignitic horizons. These deposits are substantially continuous northwards to Golden Grove and with further. PTO

work it seems likely that the ~~discontinuous~~ deposits of cross bedded sands, gravels and fine silts which extend in a rather discontinuous manner from Barossa to Lynedoch, and beyond to the north eastward through the Barossa Valley, will prove to be a continuation of the same unit. It may then prove useful to extend the use of the ^{formation} name, North Maslin Sands to this northern area. At present such a move seems premature since it is to be remembered that deposits of widely different age may under similar circumstances of continental deposition, approach each other closely in ^{the} nature and appearance of the sediments.

The study of spores and pollen from the deposits of different areas would very probably lead to a better understanding of the age relationships of these ^{scattered continental} deposits.

Observations relating to the Basal Unconformity.

In the region to the south of Adelaide there are several very clear exposures of the base of the North Maslin Sands which have been recorded previously. ^{workers.}

In the type area, the removal of sands has exposed in recent years, a large area of the underlying Permian. The cutting beside the elevator described by Reynolds still remains and the base of the formation as exposed here reveals about a foot of conglomerate in which sub rounded and polished quartz pebbles up to 3" in diameter occur.

The Permian has been exposed over a large area in the ^{floor} of the southern parts of the workings and it appears to have a relatively smooth surface with a depression in the northern section where excavations are now in progress at a somewhat deeper level.

The base is also exposed in a drainage channel cut to ^{the beach} some 50 yds north westward of the elevator. Here, coarse, angular, cross bedded sands lie directly on the Permian without any development of basal conglomerate.

At this exposure Dr Wade observed numerous fine borings in the Permian clay which are infilled by the

overlying sands. Dr. Glessner, who subsequently examined these borings, remarked upon their consistent orientation and suggested that they may be attributable to insects as ^{such} the orientation is not characteristic of ~~other boring organisms~~ ^{worm tubes}. The mouths of the burrows which are from 3 to 5 cms long and up to 5 mm in diameter, are directed ^{apparently} to the SW, apparently opposing the ^{direction of the} currents which deposited the basal part of the formation.

The unconformable contact of the base of the Bakeri gully deposits of ferruginous grits ^{on the Precambrian,} is clearly exposed at one locality in a road cutting about 1 mile south of Clarendon. Here two to four feet of conglomerate with cobbles ranging to 3" in diameter, some sub rounded, but the bulk sub angular to angular, is ~~to be~~ seen to grade upward to lenses of finer fluviatile grits. The Precambrian of this cutting is deeply weathered but the surface of unconformity appears to represent the bottom of a water-course and was very probably fresh rock at the time of accumulation of the basal deposits. On the eastern side of the road cutting a projection of the Precambrian surface is exposed. From the structures in the overlying grits at this point the direction of stream flow appears to have been from the North east west. Photographs 1 & 2 were taken at this locality.

In the quarry at North Christies Beach which exploited the basal Tertiary sands, only some 12'-15' now remains below the Pliocene deposits in the eastern face. Overburden has been spread over the exposed Precambrian which previously revealed an irregular and deeply weathered surface. It was at this locality that the Precambrian below the unconformity was thought to be somewhat ferruginized. The exposure at the base of the Eocene deposits at the northern extremity of the workings has now been completely covered. Plant remains were ~~no~~ known from the Eocene sands at this point and a ferruginous surface zone is developed

at the top of the Eocene beneath the unconformable Pliocene.

In the Happy Valley area two further exposures of the base of the North Maslin Sands are recorded ^{by Daily}. The best exposed, occurs in a drainage channel that runs westward from the SW corner of the reservoir. At this locality 12'-15' of laminated clays and silts lie with clear angular unconformity on the Precambrian.

Rare angular quartz pebbles up to ³/₄ ins occur at the very base in fine sands, and concretionary nodules of ironstone have formed just beneath the contact. PLATES 3, 4

The Precambrian here, as also in the rail cutting to the SW, is clearly much affected by weathering and iron minerals are concentrated in joint planes. It is possible ^{that} in this region ~~that~~ the weathering of the Precambrian is partly attributable to the ^{effects of} Pliocene and recent weathering. Thus the deposits classed tentatively as Pliocene that are exposed to the east in the drainage channel, show irregular patches of alteration and ferruginization of the glauconitic material derived from the marine Eocene, which ^{might} suggest rigorous conditions of weathering during its formation. From the observed eastward dip of the basal unconformity it is seen that these deposits must have been transgressive on to the Precambrian and it is thought possible that part of the weathering of the older rocks may be related to post Eocene conditions.

All the principal exposures in this area to the south are consistent with the idea that the surface of the ~~base~~ ^{base} of unconformity at the base of the North Maslin Sands showed at least moderate local relief. The contrast in nature of sediments in different areas suggests that many environments ^{are} ~~are~~ represented. The age of the ~~base~~ ^{base} of the formation at different points may vary ^{widely} but a ^{wide} general subsidence and rejuvenation of upland areas appears to have occurred about middle or possibly ^{early} upper Eocene time.

At those localities where the Eocene unconformity is exposed, the Precambrian and Permian underlying the North Maslin Sands are decomposed by weathering. This effect may have been increased, ^{however} by post Eocene weathering. ~~However~~ by proximity to the surface during post Eocene cycles of weathering.

A ferruginized zone is known in several places at the top of the formation eg Mt Christies Beach (Maslin sand quarries and Wittons Bluff. It is desirable that the top of the formation in the type area should be more closely examined in an attempt to establish the regional importance of this ferruginized zone. Thus it is important to know if the lateritic or strongly ferruginized zone developed on sands of probable Eocene age in the Lyndoch region can be equated with a constant horizon of ferruginization ~~to~~ in the south, which can ^{here} be dated by marine deposits.

Rock samples from the exposure in the drainage channel at Hope ^{the} Happy Valley and also from the outcrop at Wittons Bluff were washed and examined.

No microfossils were found in either sample although previously brackish water foraminifera were apparently recorded from Wittons Bluff.

Specimens collected from the southern areas included:

1. Samples of the coarse fractions of the sands at each exposure.
2. Specimens showing the base of the unconformity in the type locality
 - a. Taken from the elevator pit showing basal ^{strat.} conglomerate
 - b. Taken from the drainage channel NW of the elevator showing closely spaced burrows in parallel alignment in the Permian clays underlying the basal Tertiary sands.
 - c. Specimens of fossil wood collected at map reference 649596 (Echunga Sheet)
 - d. Two specimens from locality m. ref. 651605 showing leaf imprints and wood fragments in ferruginous grits.

Specimens from each of the above areas were previously known. However one of the specimens of fossil silicified wood shows very clearly a number of insect borings. Abundant material seems to be available at both localities although very little collecting has been done, particularly at the latter locality.

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The Eocene is marked by a discontinuous horizon of small angular pebbles of about $\frac{1}{2}$ " diameter.

The sands at the base are strongly cross bedded and of very coarse grain. ^{PLATE 5} The underground workings of the Adelaide potteries approach to within a few hundred yards of this point from the east. Mines Dept Geologists who have inspected these drives say that it is very difficult to differentiate between ^{reworked} reported Eocene clays and the weathered bedrock in situ. This suggests that

the material quarried adjacent to the oval at Yatala Vale may be a low horizon of the Eocene deposits. Here the micaceous silty clay is apparently reworked Precambrian which has remained close to its source and it probably grades downwards to weathered shale. less than a mile to north

^{of this exposure at Yatala Vale} ~~is~~ the only other known exposure of the basal unconformity is exp to be seen in a disused sand pit. Projections of the irregular surface

of the Precambrian have been exposed in two ~~of~~ places in the floor of the workings. Here also the older rocks are deeply weathered.

These exposures of the base of the Tertiary sequence in this region north of the Torrens suggest that the old land surface was very deeply weathered prior to the rejuvenation which resulted in the deposition of the thick sequence of non marine clastics in middle to upper Eocene times.

This observation is supported by the bore records of the Paradise-Hope Valley area where clays decomposed slates and weathered bedrock of considerable thickness have been logged.

Although deeply weathered it is also clearly apparent that the land surface blanketed by these deposits showed at least moderate relief. This is supported by the basal deposits which differ strikingly in nature over only a very

short lateral distance
THE ~~ON~~ NATURE OF THE EOCENE DEPOSITS

The Eocene sands are quite well exposed in numerous pits at various localities throughout the region from the Towns River to Golden Grove. The chief exposures are marked by a red cross on the accompanying map.

The deposits have a very characteristic appearance when they are exposed in quarries as there is little change in the general nature of the sediments throughout the area. In detail however individual exposures reveal a marked heterogeneity of bedding structures and grain size. Individual lenses or tongues of clay which occur in the sands can only be traced for a few hundred feet at most before they are truncated by subsequent deposits. They are normally thin 3"-3ft and are rarely thicker than 6-8ft. ^{PLATE 697} The sands are usually coarse with very angular grains about 1mm in diameter and they are practically everywhere strongly cross-stratified so that individual beds do not persist.

Current bedding studies in both the Highbury - Tea Tree Gully and Golden Grove areas revealed that there is no consistent orientation in direction of dip of foresets of the current bedded deposits and it was observed that there is great variability in the scale of the cross bedded units. This suggests very variable conditions of deposition where current strength & direction where current strength and direction were not maintained for more than a short period.

Sorting is usually rather poor although irregular patches of medium grained well sorted sand occur in the southern areas both to the north of Highbury in the Adelaide Potteries open cut (PLATE 8) and to the east in the ~~the~~ southern parts of Dubne's quarries. These sands are white and micaceous with clay lumps and show the development of successive layers with consistently oriented small scale cross bedding. Similar

deposits occur in the basal portion of the quarry in the North Maslin Sands at the type area in Maslins Bay. Here the consistent direction of facing of the foreset laminae suggest transport of the sand by long continued currents moving from the SW.

There is relatively little coarse material (exceeding one inch in diameter) in the exposures south of Tea Tree Gully although near the base of the formation in Mole's Quarry, and at a depth of 80-100' in the Adelaide Pottery's workings 1 1/2 miles to the north, lenses in the sands are composed of angular fragments of quartz about 4mm in the longest dimension. In the sands exposed in ^{Halls} Duhres quarry 1/2 mile east of Duhres, angular cobbles and fragments of quartz up to 3" in diameter occur in one lens and there are also several tongues of gravelly sands.

In the Golden Grove area the sands seem to be generally coarser than those of the southern area and conglomeratic horizons are relatively more common particularly in the two most southern quarries. ^{PLATE 9, 10} In the pit where the Precambrian ^{is} was described ⁽⁴⁾ the Eocene deposits are remarkable for their coarse nature. Angular and subrounded pebbles and cobbles in lenticular bodies of conglomerate comprise much of the deposit. The character of the deposits in the area varies rapidly between neighbouring pits but a lack of knowledge of the contours of the Precambrian surface makes its significance difficult to interpret.

In most of the areas the sands are clayey and normally flakes of mica and blebs of white pipe clay are included in them. Where they have remained exposed in a cutting or quarry face oxidation imparts a strong red colouration to the deposits and tends to obliterate the sedimentary structures. This effect is particularly noticeable in the Golden Grove area where the photograph.

(plate 11) was taken after removing the surface crust. The beds of coarser grain size as a rule are more consolidated and ferruginous than those finer sands which are restricted to the higher horizons in the southern quarries.

Rebbles occurring in the deposits are usually quartz and they are invariably very little rounded. Quartz crystals derived from the Tertiary quartzites are relatively common near the base of the deposits and are particularly abundant at Golden Grove. Very few pebbles of Precambrian quartzite occur in the sands even though there are all indications of strong fluvial conditions.

Distribution of the Tertiary sands:

The mapping of the limits of the sands is made difficult by the poor outcrop of the Precambrian near the unconformity, but the available evidence, with the exception of the vicinity of Modbury has been incorporated in the map presented by Wade¹⁹⁵³. Subsequent maps published in Mining Reviews have restricted the area of the deposits in this region consistent with the outcrop of Precambrian quartzite and flaggy shale in the paddocks 1/2 mile to the north west of the Hope Valley Reservoir.

The thickness of the deposit in different areas is not of great significance with respect to the conditions of deposition but it gives some indication of subsequent deformation and is quoted on the map for each locality. Thus the greatest thicknesses are now preserved in the SE along the axis of the syncline from Tea Tree Gully to Highbury east.

The highest deposits of the Eocene section appear to be those exposed in Dubnis quarry and the Adelaide Pottery workings at NW Highbury. The top of the Eocene has been removed by pre-Pliocene erosion at both these localities and it is considered that the top of the formation is not

preserved anywhere in the area.

Bones to basement sited at the Adelaide Pottery workings and also to the east on the 700ft contour in the new subdivision of Vista would be of great value in clarifying the form of the syncline and the distribution of the Eocene sands.

The evidence is in favour of the interpretation that the deposits were originally much more extensive and are now preserved in a broad shallow syncline of the Precambrian which is complicated by faulting along the eastern margin. The structure is asymmetrical with shallow dips on the western flank and sharply flexed eastern boundary.

Exposure of the Eden Fault

In Hall's quarry at east Highbury about $\frac{3}{4}$ mile south of the feature known as the Gurr Emplacement, the quarry face in the Eocene sands has been worked back to expose the faulted contact with the Precambrian. FIG 1

The Eocene sands are seen in near vertical attitude within 20 feet of the fault line and at one point overturning of a segment of the Eocene has occurred. The highest horizons of the sands can be traced from the flat lying deposits of the quarry proper, in an even flexure to an attitude of about 60° near the fault.

The Precambrian is brecciated in a zone of about 6ft at the contact which dips very steeply to the west.

The Post Eocene Deposits.

The differentiation of the later Tertiary and ~~Quaternary~~ ^{Quaternary} deposits in the area is not complete as outcrops and sub-surface data are limited.

The uppermost 20-40ft in Dubnes quarry (altitude approx 500-550 ft) is an unfossiliferous medium grained clayey sandstone with rare sub-rounded quartz pebbles and a mottled appearance due to irregular iron staining. It rests with unconformity upon the Eocene of the lower levels of the quarry although the contact is not clearly exposed.

This horizon appears to be continuous with the deposits about 150 feet higher in the sand pits on the south flank of the Gun Emplacement $\frac{1}{2}$ m to the north east, which have a lateritic surface developed at an altitude of approx 700-750 feet.

Mottled clayey sandstones with quartz pebbles which are exposed in a road cutting at Whlestone (altitude 400') and appear to be directly of Precambrian, and also a strongly ferruginized deposit of a similar nature outcropping at about 750 feet behind Vista, can possibly be correlated with these sediments.

Other ferruginous sandstones of a similar nature lithology are seen less well exposed north of Tea Tree gully (900ft) and ~~at about 700ft~~ in the road cutting at about 700 feet $\frac{1}{2}$ mile south of Yatala Vale.

Dr Glaessner has suggested ~~that~~ that the surface of the Gun Emplacement is of probable Pliocene age and in the absence of other evidence relating to the age of these deposits, this lateritized or strongly ferruginized surface is tentatively correlated with that of the Pliocene of the Noarlunga and Willunga Basins. In that area the Pliocene lies with slight angular unconformity on the earlier Tertiary strata and it is itself seen to be folded in the cliffs at Moana.

It is therefore interpreted that the levels of the outcrops and exposures from the area examined, indicate upwarping in the north and flexure along the eastern margin.

Three other other exposures of a similar type of material are recorded from the Hope Valley Reservoir area at altitudes of 305', 360', 375'.

The deposit revealed in the pit on the north side of the reservoir is pebbly and has a ferruginized surface overlain by ^{Pleistocene - Recent} ~~Cambrian~~ silts. Although bores in this region have not recorded any substantial thicknesses of post Eocene deposits it is suggested these may represent the equivalent of the ?Pliocene at 700ft at the Yum Emplacement and that the difference in level is attributable to post Pliocene movements particularly on the Hope Valley fault.

From the rough sections included with the report it can be seen that the ?Pliocene is interpreted as a deposit of about 100 feet in thickness which has subsequently been removed from the north and west of the area and which dips gradually in a southward direction.

Further ferruginized deposits which may be related to this ? Pliocene surface outcrop to the west of Golden Grove at 600ft and also to the east. (Crossed out). Still further exposures are to be ~~found~~ expected in ^{the} area north of Tea Tree Gully and to the east of Yatala Vale.

The outcrop west of Golden Grove is an ironstone developed on the Eocene gravels at the pit where the Precambrian is exposed. ~~in the base~~ of the quarry a second exposure occurs ^{capping} an adjacent hill. There is however no development of post Eocene non marine beds in this area and it is suggested that the Pliocene history of this region, which is close to the Para Fault, was dominated by erosion.

Later Cainozoic deposits.

Post Tertiary sediments of the area are of minor importance and were not examined in detail.

Resorted sands observed in creek running on the southern side of the road from ~~the~~ Hope Valley to the Gun Emplacement are considered to overly Pliocene and to represent resorted material. This section however warrants closer study as it provides an exposure of the sediments between about 475' and 600 ft. The level of the Pliocene-Eocene ^{unconformity.} thin grey and yellow sands cover much of the area to the east of the road from Tea Tree Gully to Golden Grove. These appear to be wind blown and probably do not exceed about 10ft in thickness.

Specimens.

A sample of coherent grit or very coarse angular ssite was collected at about 60 feet from the surface in the open cut worked by the Adelaide Potteries at Highbury north.

A specimen of white pipe clay, silty and homogeneous with no sign of bedding was collected in Potteries Industries Clay pit south of Tea Tree Gully.

Two specimens of ? Pliocene sandstone were collected from the upper material of Dukne's Quarry.

Illustrations

Fig 1 Diagram showing the exposure of the Eden Fault in Holl's quarry, East Highbury

Fig 2 Sketch illustrating postulated relationships of material above Eocene in Dukne's Quarry with ? Pliocene of The Gun Emplacement.

PLATE 1. Base of the grits which outcrop in Baker's Gully. Photograph taken in road cutting 1m. south of Clarendon (The Precambrian is in shadow. Gradation in grain size from the base upward is evident)

PLATE 2. East side of same road cutting showing a projection of the Precambrian on the unconformity. Hammer lies along base of the grits infilling the depression.

PLATE 3. Base of the North Maslin Sands in the drainage channel, SW corner of Happy Valley Reservoir.

PLATE 4 Same enlarged showing broken ironstone concretion and occasional angular pebbles in the Eocene sands which are here silty and finely bedded.

PLATE 5. Quarry Highbury North. (LOCALITY NO 3) Showing current bedding ^{3ft. above base of} in basal Eocene sands. Scale calibrated in inches

PLATE 6 Central part of "James quarry" (Ivan Dayman's) looking east. Photograph shows irregular white clay and silt bands in iron stained sands of Eocene age - Golden Grove. Scale 3ft

PLATE 7 Same locality northern portion of quarry. Scale 3ft

PLATE 8 Fine to medium grained current bedded sands in upper part of Adelaide Potteries Open cut Sth of Tea Tree Gully

PLATE 9 Conglomeratic horizon in equivalent of the North Maslin Sands Golden Grove Marsson's quarry. Scale calibrated in inches. Note angularity of cobbles

PLATE 10 Photograph of current bedding in Strahan's quarry north of Golden Grove. Medium to fine grained sand. Rule calibrated in feet.

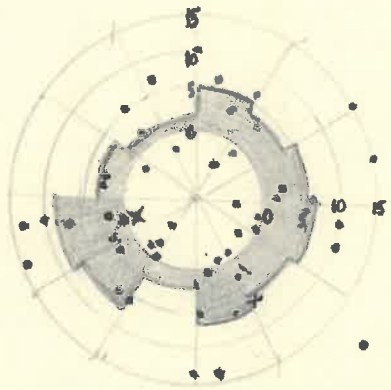
PLATE 11 Denton's Quarry Golden Grove. Illustrating crust of loose material cemented by ^{hydrrous oxides} oxides & hydroxides of iron which previously obscured current bedding.

PLAN Showing quarries in the Eocene sands and also the location of topographic profiles.

DIAGRAMS Results of current bedding studies in the area south of Tea Tree Gully

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ADELAIDE POTTERIES.
OPEN CUT
Highbury North

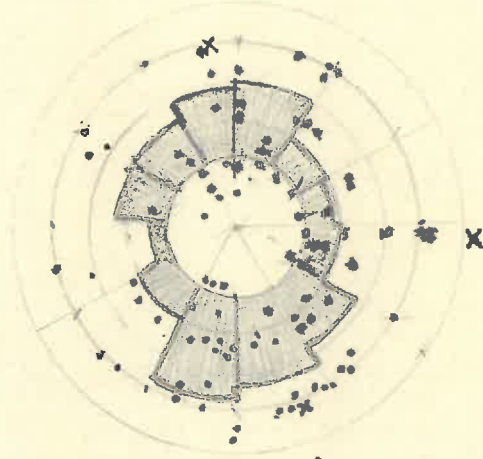
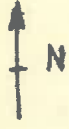


Compass Histogram of foreset readings showing
Distribution of dip directions.
Poles plotted on 18cm stereo net

References

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The soils & Geology of Adelaide & Suburbs 1954
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Appendix Micropal. Examination of Willunga Bore
Glaessner & Woodard.
Supplementary note on Willunga Basin Sediments.
by NH. Ludbrook. 1956.
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"The Geology of the Adelaide City area prepared by Geol Survey of SA.
- Cochrane GW 1953 Brown Coal deposits in the Paradise-Hope Valley Golden Grove Area *Mining Review* 94 p 78
- Wade ME 1953 Proposed testing for clay & sand in the Hope Valley - Golden Grove area *M Review* 94 p 44

DUHNE' AND SON
QUARRY
HIGHBURY EAST



References in Mining Reviews of Department of Mines SA
related to Eocene deposits.

Lignite Noarlunga MR 6 p 23, 7 p 15, 8 p 14, 9 p 17, 33 p 78
37 p 29, 30, 50, 38 p 38, 39 p 44 45 p 102
39 p 24 includes a map showing boreholes

Lignite Nth Adelaide 6 p 34

Lignite Hope Valley 33 p 24 34 p 41, 42 35 p 13

Clay deposits.

Survey track manufacture & list of reports 94 p 98

White clay ~~at~~ various places

Golden Grove 95 p 74, 104 p 48, 107 p 27-41

Tea Tree Gully 105 p 74

Sand

Rock Products Sands & Gravel Resources vicinity
of Adelaide 97 p 142

Sand Noarlunga 47 p 32, 50 p 100 81 p 85

Christies Beach Sand 93 p 99

Hope Valley-Golden Grove 94 p 44, 96 p 43

Tea Tree Gully 104 p 72

Tripoli deposit Hundred of Kondoparinga 92 p 46

PLAN SHOWING SIGNIFICANT EXPOSURES OF EOCENE SANDS AND LINES OF SECTIONS.

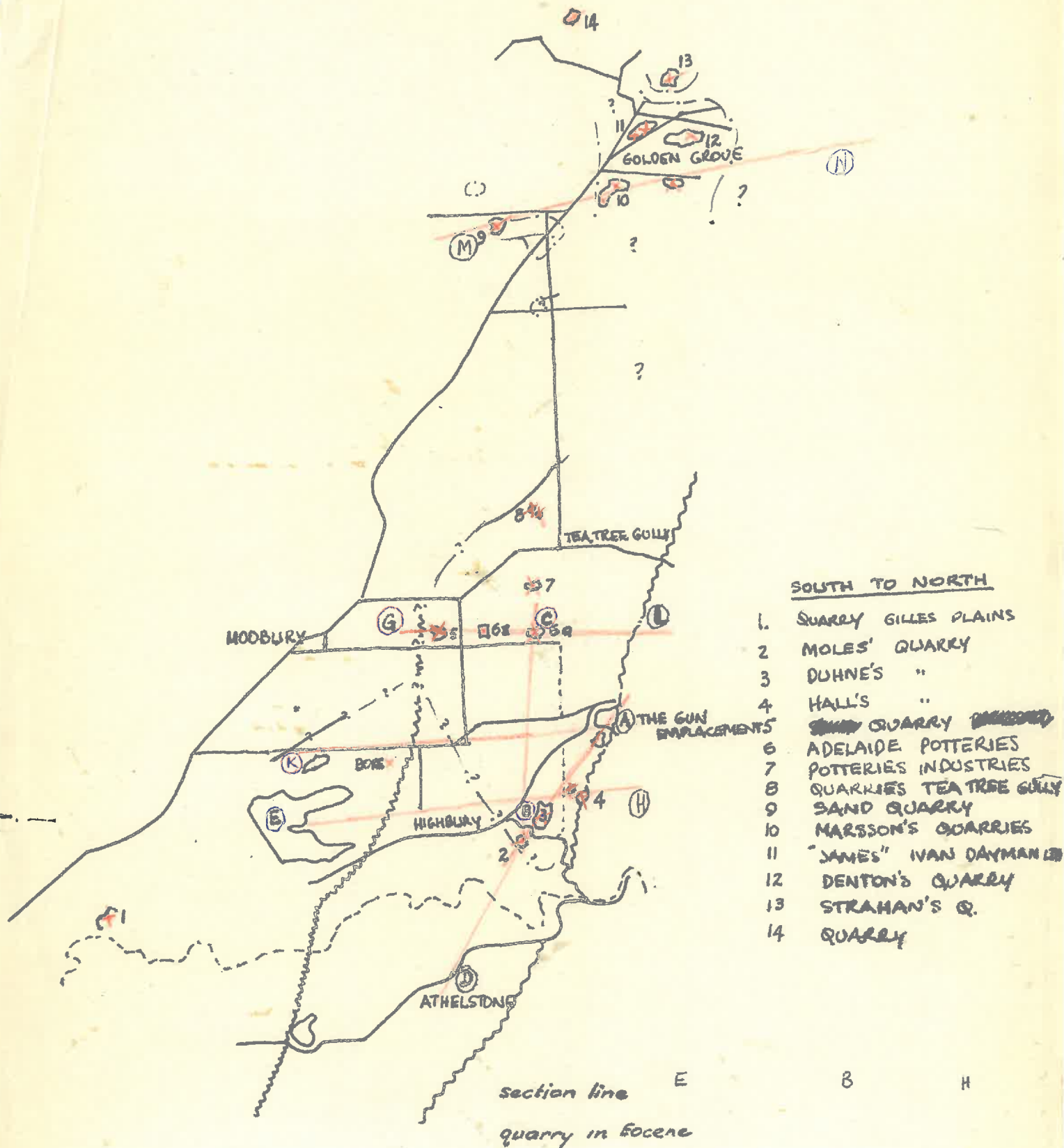


PLATE 1



PLATE 2



PLATE 3



PLATE 4



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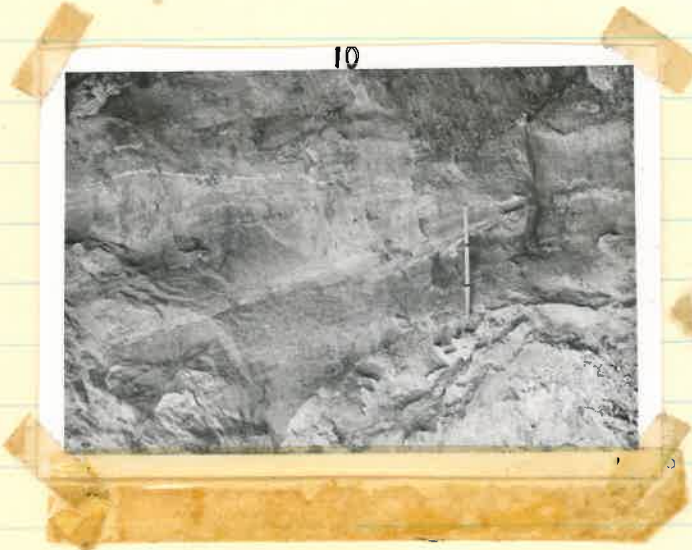
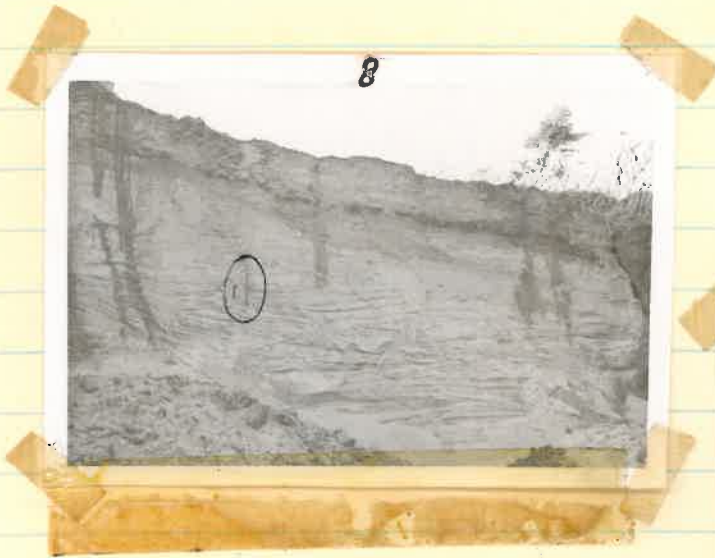
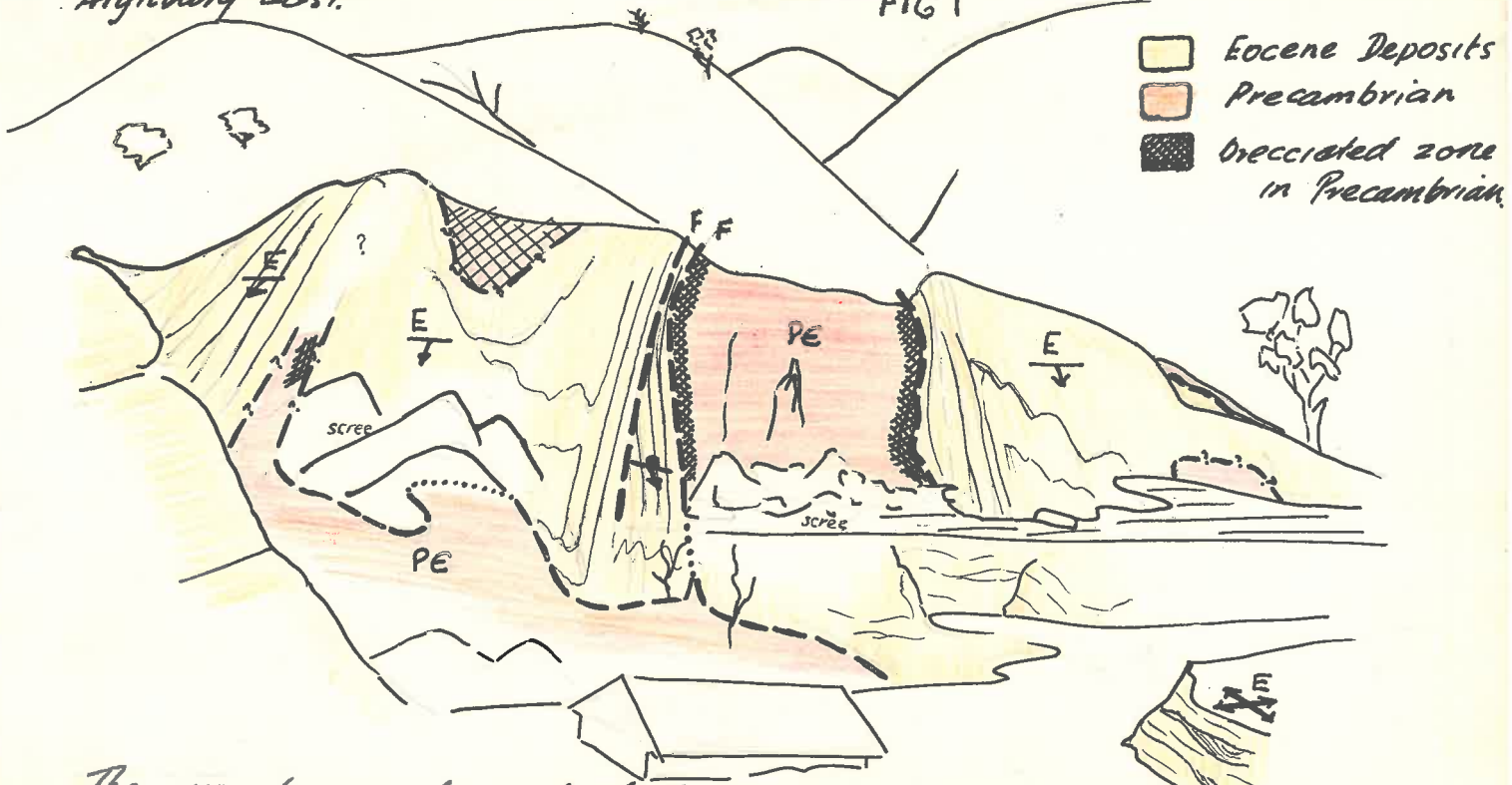


Diagram illustrating the exposure of the Eden Fault in Hall's quarry
 Highbury East. FIG 1



The oversteepened part of the Eocene is interpreted as a faulted wedge

FIG 2

Panorama showing Pliocene deposits and quarries in Eocene Sands at Highbury East looking northeastward from the Torrens River towards the 'Gun Emplacement'

- Pliocene mottled sands
- Eocene white sands & clays
- Precambrian qtz & shales.

