NOTICE OF GENERAL MEETING

The eighth General Meeting of the Society for 1979 will be held in the Museum Education Building, North Terrace, Adelaide at

8.00PM MONDAY, 22 OCTOBER 1979

AGENDA

1. Apologies.

2. Minutes of meeting held Monday, 24 September, 1979, to be confirmed. A copy of these minutes is attached.

3. Papers and Journals
   Papers and Journals from other Societies and Organizations will be tabled at the meeting.


5. Films.
   The following films will be screened at the meeting.

   1. 'THE BUSHMAN - NOMADS OF THE DESERT IN THE DRY SEASON.'
      A film detailing the life of the Kalahari Bushmen of Southern Africa and their quest for food and water.

   2. 'BALI - ISLAND OF THE GODS.'
      A view of farming and everyday life on Bali.

   3. 'THE YANOMANO TRIBES IN WAR AND PEACE.'
      Details the way of life of people along the tributaries of the Amazon and the Orinoco Rivers and borders Venezuela and Brazil.

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PATINATION AND WEATHERING IN RELATION TO
AUSTRALIAN ARCHAEOLOGY.

by

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WEATHERING AND PATINATION.

Alterations of the rocks and rock surfaces with which, or upon which the aboriginal inhabitants had worked, have been studied with a view to determining the ages of the designs marked on the rocks, or of the stone artifacts. In order to use these criteria it is necessary first, to define the forms used and to agree on such definitions, secondly, to determine if possible, the rate at which such alterations are produced, and thirdly, what variants of the environment influence the processes and their products.

Four terms, the first two more frequently, are used commonly in Australia to indicate such alterations. They are :- WEATHERING, PATINATION, DESERT VARNISH, DESERT POLISH.

WEATHERING is the geological term for a process which includes the changes that occur in a rock exposed to atmospheric conditions such as changes of temperature, variations of available water in the form of rain or dew and the atmospheric gases and other materials dissolved in the water. Under various conditions changes will take place in the minerals composing the rock, thus producing new minerals, and by various means causing the rock to crumble, thereby exposing more of the materials to the process. The result in general is a gradual change inwards from the surface of the rock either even and gradual where controlled by the porosity of the material, or highly irregular where crevices and fractures exist along whose walls the alterations have taken place.

Whatever the types of materials involved, the effects of weathering and of its products - given the same rock types and conditions - can be recognized by the increasing depths of alteration in situations where the weathering processes have operated for longer periods of time.

A common and well known feature and product of specialized weathering is the off-white or cream-coloured crust developed on flints in many localities in Australia and elsewhere. The South-East of South Australia offers excellent opportunities for a study of this process. In this region flint pebbles, boulders and the artifacts made from them by the aboriginal inhabitants, occur over large areas and in varied environments, and in the case of the pebbles and boulders have been subjected to weathering processes over periods ranging from scores of thousands of years to the present, enabling all stages of the processes to be examined. (Campbell, Cleeland and Hossfeld, 1946, pp 474 and 475). (Mitchell 1947). (Hossfeld 1950).

Investigations have been made into the process of flint weathering and have been ascribed to the partial solution of the silica by predominantly alkaline solutions.

The use of the term PATINATION has been extended beyond its original meaning. It has been and is being used very loosely by archaeologists, for alterations from the surface inwards of rocks, stones and artifacts. It has been applied more extensively to the flints and the artifacts made from this material and similar materials, because of the wide application and the interest in the
alteration of the surfaces of flint. This is due notably to the extensive use of these materials by Primitive Man, and also to the relative ease with which flints, under suitable environment, can develop alterations from the surface inwards. No obvious attempts have been made to distinguish patination from weathering, and apparently authors regarded the two terms as synonymous (Sollas 1913, Basedow 1941, Howchin 1921, 1934; Campbell and Noone 1943; Mitchell 1947, and others).

For the purpose of discussion of age, either relative or absolute, of stone relics of aboriginal occupation, clear definitions of the terms to be used are necessary and distinctions between them must be well understood. As defined by the present writer, patina is not weathering, but is an extremely thin surface film or skin, too thin for measurement except by special laboratory technique.

Except for the rare instances, where the effects of weathering are in their early stages and noticeable as a thin film only of altered material on the surface, there is no difficulty in distinguishing patina from weathering.

In view of the fact that the weathered zone has been observed to range in thickness from an initial film or veil to inches and even greater, with all gradations in between, and in some instances affecting the whole rock mass, it is obvious that the off-white to cream-coloured alteration zone developed in exposed flint must be distinguished from patination. If specimens in which the whole of the rock has not yet been weathered are broken across, a core of dark and apparently unchanged flint is seen surrounded by a zone of light-coloured weathered material. A noticeable feature is the approximate reproduction of the outer surface by the unaltered core of the original shape of the specimen, whether beach pebble or human artifact.

Sollas in his excellent discussion does not distinguish between weathering and patination and used them as equivalent terms.

However, he distinguishes an inner and outer patina. He writes:— "The white crust is evidently a residual effect of solution but the patina is something besides. Its outer-most part is an extremely thin impervious film or skin"..."It is to the presence of this skin that the patina owes what little lustre it possesses...."

In the writer's opinion patination is a process which results in products different from those of weathering and is, in the great majority of instances, easily distinguishable. As defined herein, patination of rock and mineral surfaces is the formation of a thin veil or coating, generally of molecular thickness, produced on the surfaces of unaltered material or on the weathered crust of the rock or minerals. As can be seen in many specimens from the Lower South East Region of South Australia, relatively freshly broken flint pebbles exhibit a white weathered crust or zone which may or may not possess a patinated glossy surface ranging in colour from off-white through cream to yellow and orange, and, if weathering has not affected the whole of the interior of the stone, exposes a core of the original dark flint (brown to dark grey to black).

In cases where flaking has occurred at different times the colour of the flaked surface ranges from the original dark gray to black on the newest surface through blue, greyish blue, grey and white on progressively older surfaces, their relative ages determinable by overlapping areas of flake removal.
Such bluish surfaces (Blue patinas of Sollas, 1913), can be found also where flakes occur on former native campsites, all of them at least 100 years old. On some sites all flakes have developed this thin film but of varying thicknesses probably depending on the age of manufacture. Such a film is not patination but the initial stage in the weathering process.

Patination of materials other than flint is of importance in other areas. In the drier areas of the interior of South Australia, patination affects for example, the surfaces of slates, limestones, quartzites and igneous rocks, but although it forms a veil or coating on weathered and unweathered rocks, it is distinct from the weathered crust where such a feature exists.

Variations in the thin veneer have received distinctive names and commonest being known as DESERT POLISH. The glass and lustre of this form of patination are produced by the frictional action of wind-blown sand and dust.

Another coating referred to by previous authors is known as DESERT VARNISH. A good example occurs at Kallemurra Waterhole on the north bank of Cooper's Creek east of Innamincka, the location of numerous petroglyphs. Both the original cream-coloured semiquartzite and the designs gouged in its surface are coated with a black material. Its thickness is variable but averages about 1/5 of a millimetre. The coloured component of the coating consists of manganese oxide with strong traces of iron oxide. The thickness and nature of the coating are such that they cannot be referred to as a patina, especially as the surface of the coating exhibits in places the lustre of patination imposed on it since the coating was formed.

Lime many of the petroglyphs in South Australia the surface features, whether they be patina or desert varnish, have developed again in those places where they were destroyed when the grooves were made.

For archaeological purposes it is important to determine the rates of formation of these surface features and to reach agreement on the definitions and meanings of the terms employed.

This topic was discussed in more detail in a paper which is awaiting publication.

REFERENCES


