

EXPLORATION OF FORM USING A COCONUT SHELL

A SPECIAL PROJECT REPORT

BY

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GUIDE :

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APPROVAL SHEET

The special project titled 'EXPLORATION OF FORM, USING COCONUT SHELL 'by Vinayak Nabar is approved in partial fulfilment of the requirement for M.Des degree in Industrial Design.

Signature *Aspale*

Date 28.4.83

Guide

IN A NUT SHELL

I have tried to explore the various aspects of animal forms within the limits of a coconut shell.

This involved seeing and exploiting the clues offered by the shell, understanding the essential formal characteristics of the animals and capturing the spirit of form, with optimum efforts within the potentials and limits of the shell, tools and the self.

As a self-imposed constraint I have used the method of subtractive sculpture - achieving the forms by removal of material only; without adding anything to the basic shell form.

EXPLORATION : A PROCESS

Like explorations of several kinds, an exploration of form has been a journey into unknown - with a few things heard and read about, with a few known inlets with unknown destinations, with a few tools and a fragile material, and a mind prone to distractions....but also with a benovolent guidance from time to time and people to people, and with a hand that liked the work....it has also been an exciting journey, full of surprises, full of both pit-falls and rewards.

And the way it happens so many times - one starts in one direction and arrives at a totally unforeseen clearing. The jungle that one thought would be full of trees had also harboured beautiful animals in it.

The intention was to explore various aspects of form, using a material with its inherent potentials and limitations and tools which would act as agents of space while carving out one form from another.

The complexity of the process lay in the fact that one had to be simultaneously aware of the clues of a potential form in the material in hand, minimum essential characteristics of the possible form, distortions allowable

without loss of identity, possibility of materialization with optimum efforts, and integration of finer details with overall form. Additional complexity was imposed by the desire to explore meaningful form by way of removal of material with minimal or no addition to the basic shell form

FORM

Form of an object is visually defined by the interaction of its surfaces with space. Thus form is inseparable from space. Hence exploration of form is also exploration of space around it.

As Archipenko, the sculptor has mentioned 'we may change the forms of solid volume many times but the actual existence of the outlines of the forms beyond which is the beginning of space seems to be unavoidable'.

ASPECTS OF FORM

- Volumes, planes, lines

A form may be composed of these elements individually or in combination. Accordingly a form may be monolithic planar, skeletal, mass-planar etc.

- Visual weight/mass

Solid, monolithic forms look heavier than thin, fragile, delicate forms.

- Surface texture

The degree of surface relief dictates the speed of visual survey of an object. Vision moves faster over a smooth surface than over a textured one.

- Softness/Hardness

Hard forms have well defined, visually impenetrable surfaces that convey durability as against soft forms which have irregular surfaces that allow visual penetration to a varying degree. Soft forms merge easily with background and convey flexibility.

- Openness/closedness

Open forms can be looked into or through. They allow free movement of space in and out of them. While closed forms do not allow vision beyond the surface. They displace space.

- Transparency

Transparent forms allow visual access through the material they are made of. Translucent forms offer partial insight. Opaque forms do not allow visual access.

ENVIRONMENTAL FACTORS

- Spatial position

A form derives its visual strength on the basis of its position in space. Its repose with respect to a frame of reference informs the observer about stability or movement of the form.

- Context

By way of association, the surroundings of the form impart different meanings to it. Whether suspended in air or perched on a branch, moving on sand or floating on water implies a different meaning about the form. A context also offers a comparative scale to form.

- View point

Position of the form with respect to the observer offers a particular view and denies all other unless either the form or the observer moves. The image of the form in the observer's mind depends on what can be seen.

- Effect of Light

A form is always seen in light. Hence what is seen and hidden, what is highlighted and what is underplayed greatly depends on the source of light, its position with respect to the form and level of illumination. For a fixed position of the form and the observer

different images can be generated by changing the source of light.

BASIC MATERIAL

Coconut shell is a hollow, avoid form which is prone to a great degree of variation in terms of sizes, shapes and features. Basically it is a monolithic form made of a thin fragile shell.

Three structural ribs divide the surface of a coconut shell in three segments. Usually symmetrical about a plane passing along one of the ribs, the shell has two equal segments which are smaller than the third segment.

Three eye like depressions at one end of the shell offer a facial expression with great variety.

The shell has a rough outer texture and is made of hard, brittle material with embedded fibers, inner surface is comparatively smoother and shows veination almost like that of a leaf.

Thickness of the shell varies from 5 to 2 mm and reduces away from the ribs.

TOOLS

Tools can be considered as the agents of space as they help modify the form. The process of exploration then becomes an interaction of form with point, line, plane and solid tools.

SEEING

Every coconut is different and offers its own inherent expression. One may use this as a clue and see different forms around it. This requires a simultaneous consideration of these formal clues with essential elements of different forms and their appropriate matching. One needs to see an essence of a form that can be achieved within the limits of materials, tools and certain self-imposed constraints, such as non-additive sculpting.

POTENTIALS AND LIMITATIONS

Seen with an open mind, an apparently mute and limited coconut shell, opens up with limitless and interesting possibilities. The face like features could be exploited to make several animal forms. Even otherwise the curves of the avoid are capable of taking various meaningful shapes.

Once opened up the inner surface too contributes to the

3

overall form. The external surface of the shell is capable of taking highly glossy finish. The natural rough texture can be appropriately used in certain forms.

The only limitation of the coconut shell is that it is fragile and brittle. The rest are the limitations of the tools, and the hands and mind that operate them.

DIFFERENT LEVELS OF EXPLORATION

Abstract form

One may explore the coconut shell on the basis of formal design principles alone and study the behaviour of different aspects of form. The limits of open and closed forms, volumes, planes, lines, surface texture could be explored this way.

Meaningful form

In addition to the principles mentioned above one may also impart meaning to the form. Natural forms such as those of animals, trees in their essential spirit may be captured in the coconut shell.

Useful form

As many tribals have done for centuries one may make useful forms such as spoons, dishes, containers, essence stands out of coconut shells.

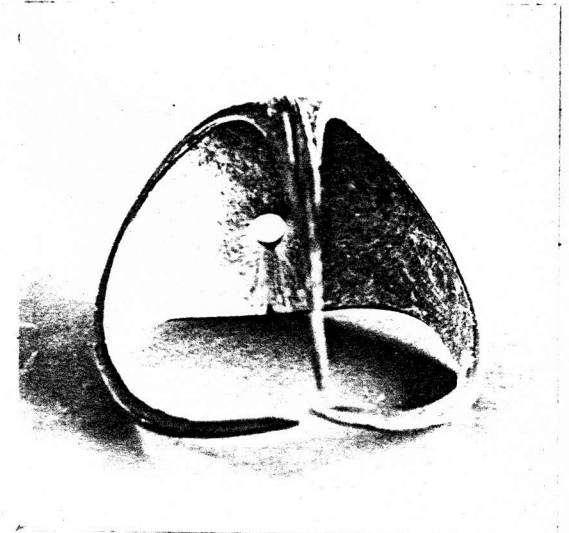
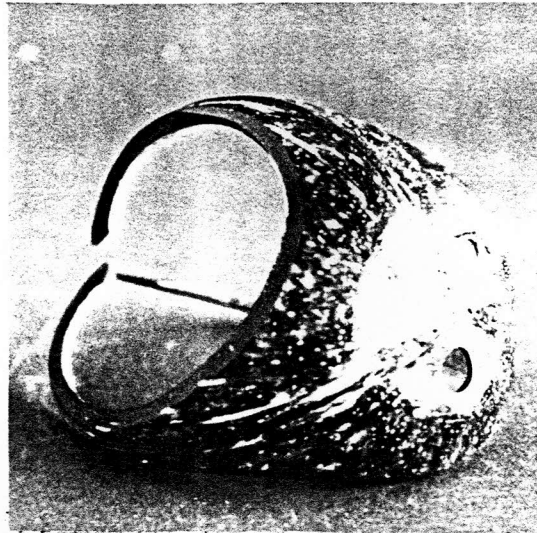
THE CHOSEN PATH

I have tried to explore different animal forms using the inherent facial expressions offered by the coconut shells and essential characteristics of an animal. As a self imposed constraint I have used a method of subtractive sculpture i.e. arriving at the desired form, only through removal of material from the basic shell form and with minimal or no addition.

A MARINE ANIMAL

The inherent facial expression of a coconut shell is retained in this form. The extra material between the ribs is removed in such a way as to give the form an almost planar-linear quality and a streamlined body- two most essential characteristics of most of the marine animals.

The form against a sandy, seabed like environment becomes more meaningful.



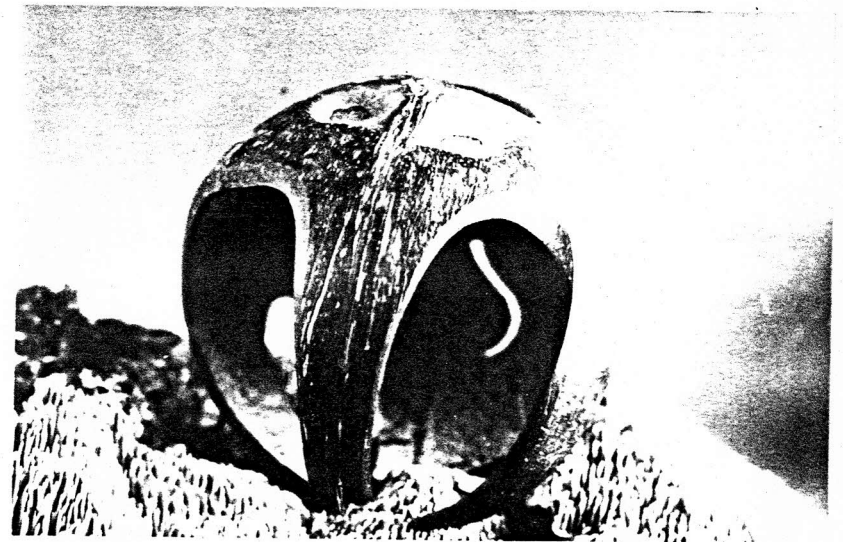
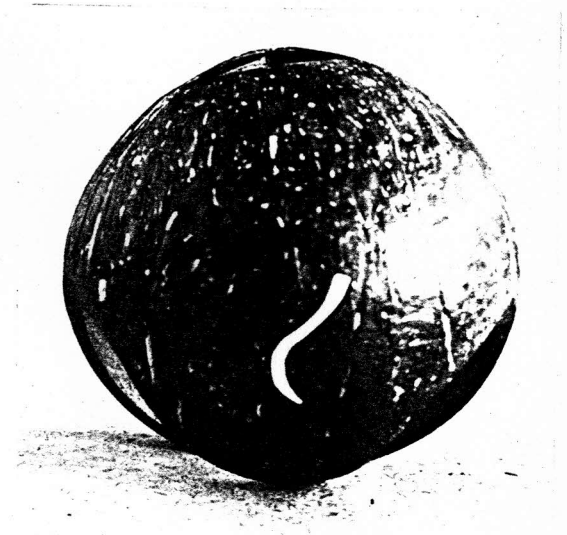
AN ELEPHANT

The monolithic form of an elephant was carved out of a coconut shell. The upward turned eyes and the trunk along one of the ribs give the essential character to the elephant. The sense of movement was created by subtle staggering of the legs. The cut edges were chamfered to different widths to add to the bulk within the limited thickness of the shell. A tail was cut out instead of adding. The rough texture of the shell was retained as it matches the rough skin of a pachiderm.



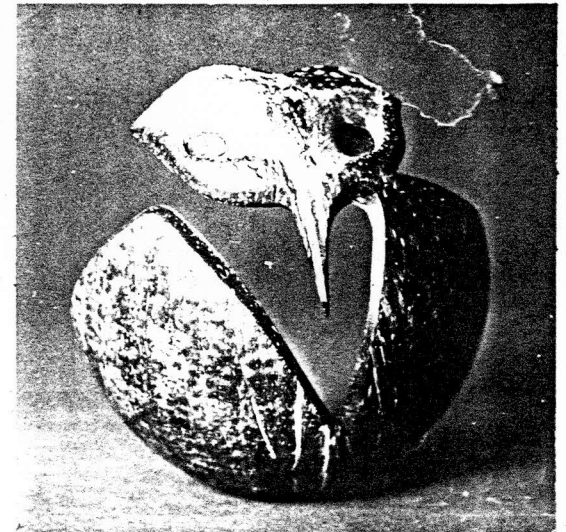
The back view of the elephant emphasises its bulk with the curled tail as the only clue to the animal. The third eye of the coconut was removed so as to avoid confusion and to create a negative form of the back of the head.

The elephant on a grassy ground gives a contextual strength to the form.



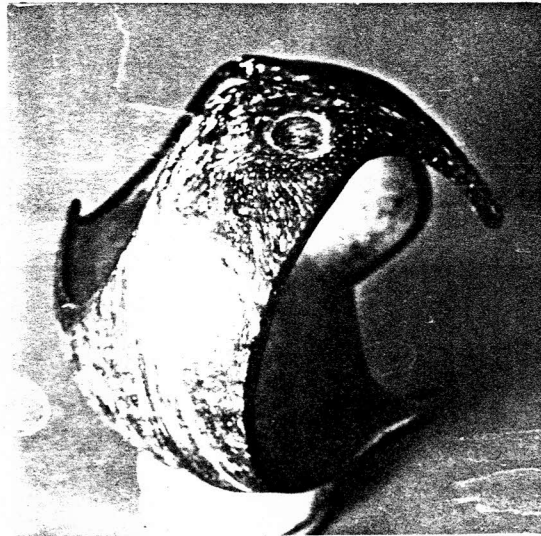
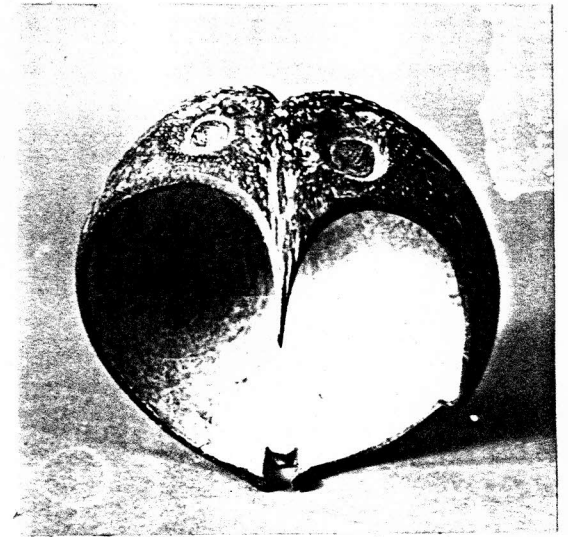
AN OWL - 1

The planar form of a bird in flight was captured in coconut shell by removing lot of material. The sweeping curves of wings, the sharp beak were cut along the ribs. Two of the eyes of the coconut were retained for appropriate facial expressions of the bird. The edges around the head were rounded and the rest chamfered to create appropriate feeling of depth. The rough texture was retained as it matched that of the feathers.



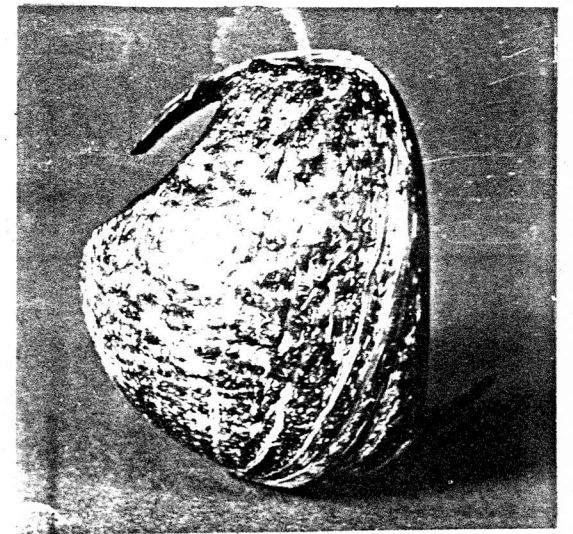
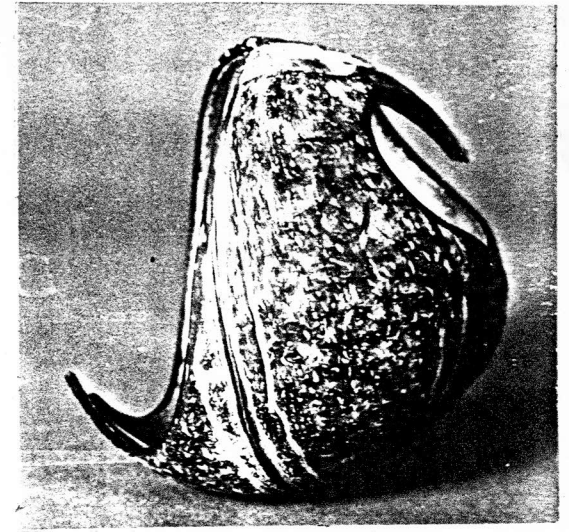
AN OWL - 2

A variation of the same bird form is tried out, which though planar suggests the round bulk of a sitting bird. The eyes and the beak are retained as in the previous example but the form is more enclosing than opening up. The protrusion on one side is suggestive of the front body form and the detail of legs is intended for a visually interesting merger of the two sweeping wings.



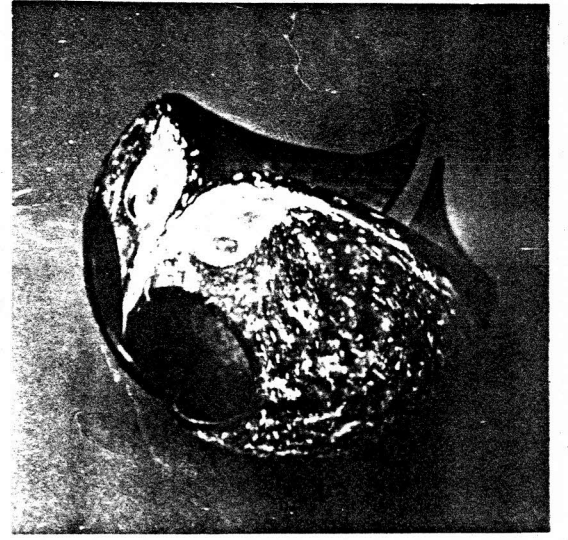
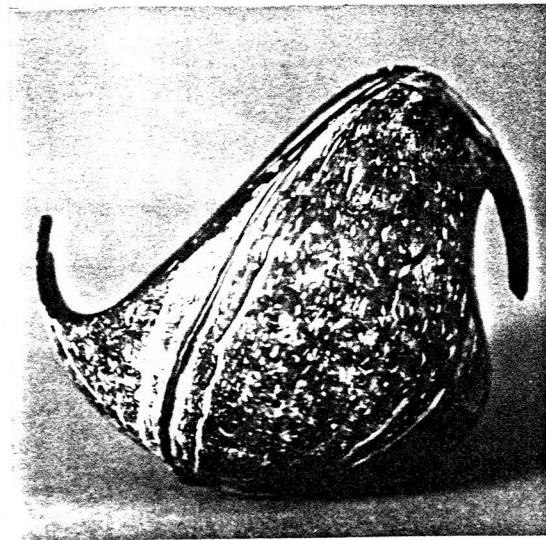
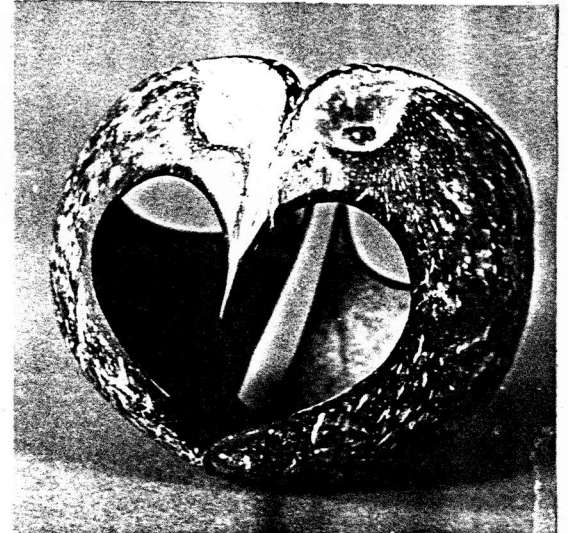
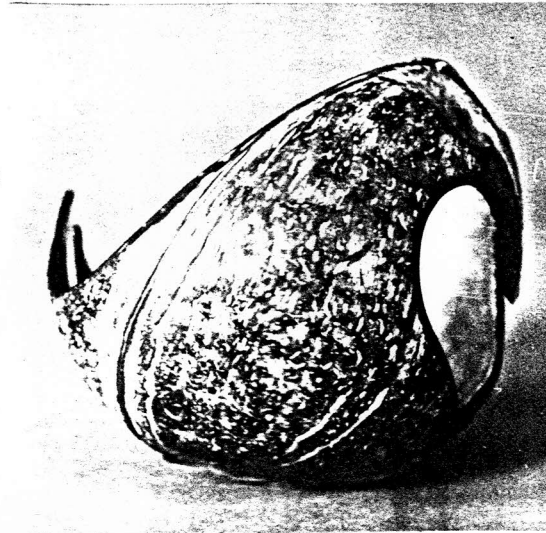
AN OWL - 3

In comparison with the previous two bird-forms a variation with further simplification is tried out. The eyes and the beak remain the same as before, taken as a clue from the original coconut form. The sweeping curves of the front and back body of the bird give it an essential bird like streamlined form which encloses volume. The bird can sit in two natural postures - on the feet as shown in the accompanying photographs and on the lower body as on the next page. The rough texture of the coconut is retained in this variation also.



AN OWL - 3

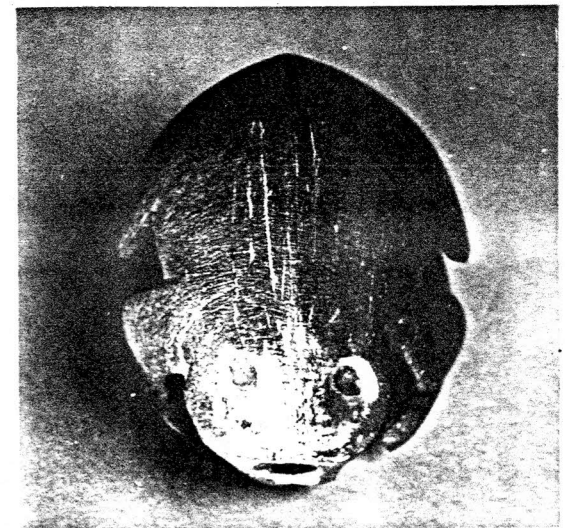
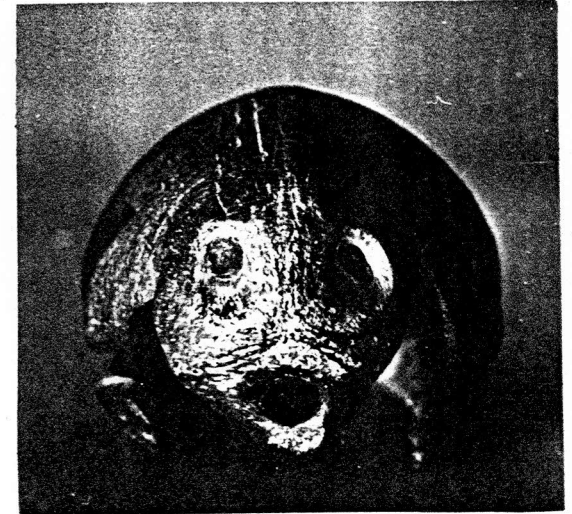
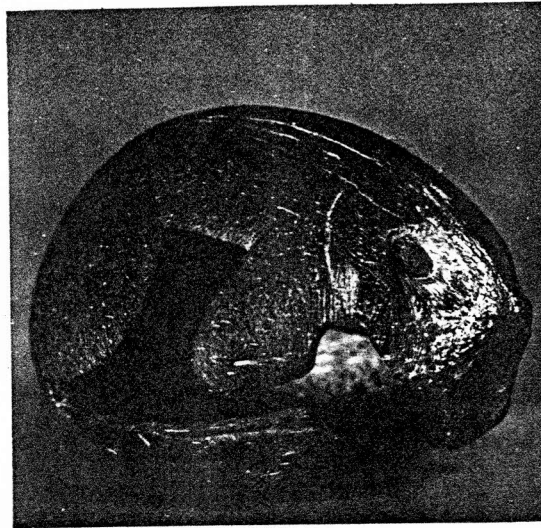
In this posture the bird looks more squat. The different aspects of the form become evident in different views. The inner surface also contributes to the nature of the form, as it generates interesting patterns of light and shade providing background to the external surface.



PUP

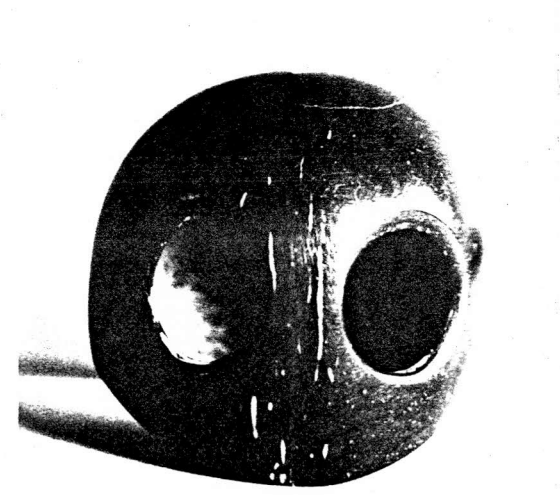
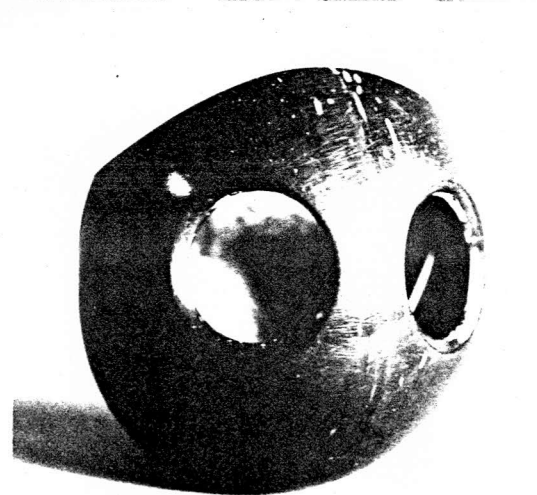
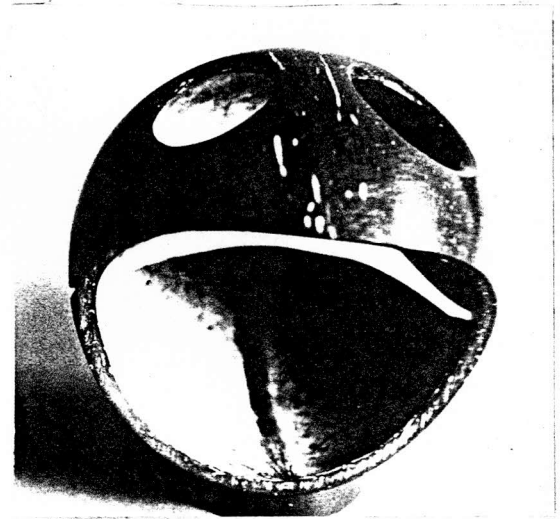
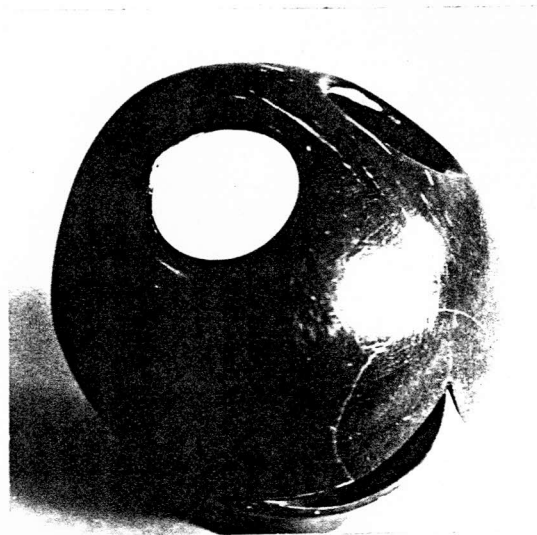
The facial features of the coconut were exploited as they matched the expressions of a pup. The drooping ears and legs folded below belly were brought out by carving out extra material. A rough furry texture was a result of scratching with hacksaw blade.

The belly is not so successful as it wrongly highlights the folded hind legs, not so much of a correct feature of a pup.



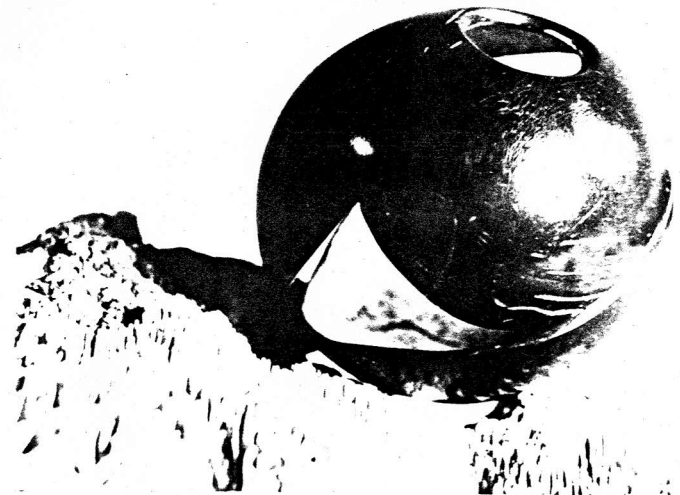
OMNI -FACE

A form that looks like a different face in different positions, is achieved with two holes for eyes and two mouth openings. This yields an open form with soft openings, that allow free movement of space in and around it.



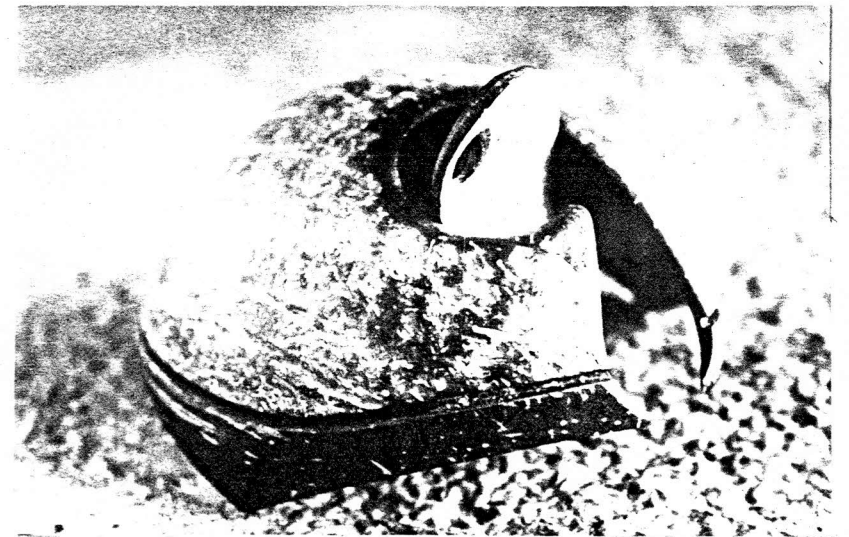
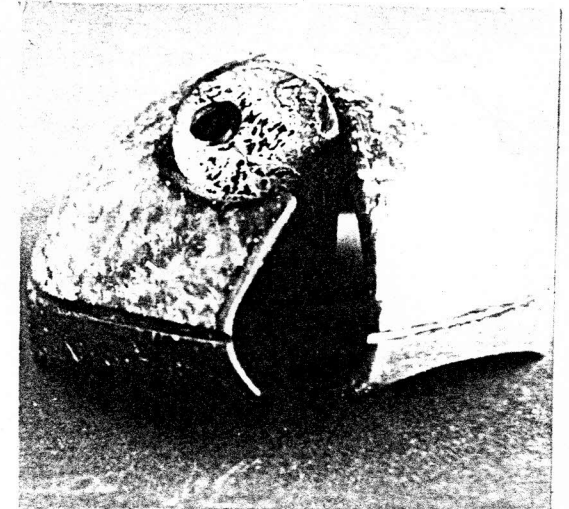
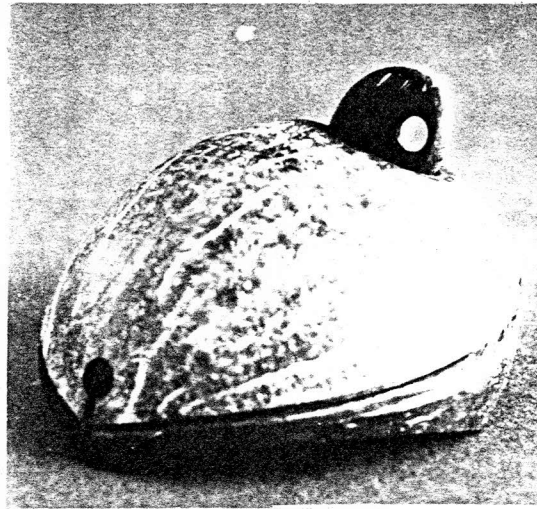
THE OMNI FACE IN AN ENVIRONMENT

The face seen in the context of an environment becomes more meaningful and can be interpreted as a fish on the sea bed. While the same face-sense-context gives a free rein to the observer's imagination and interpretation.



TURTLE

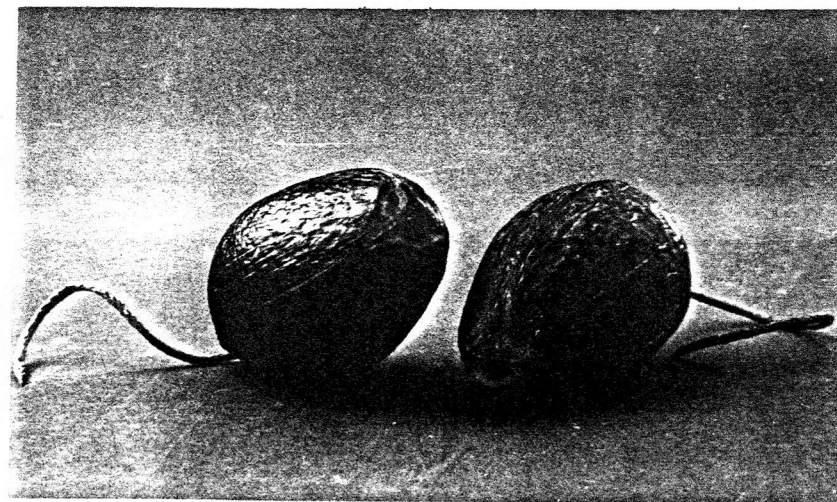
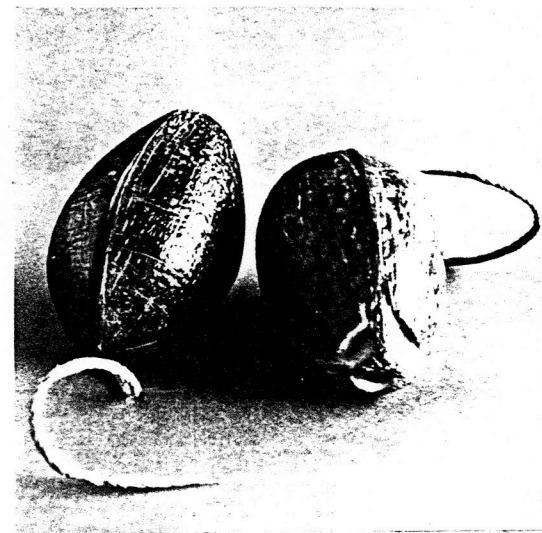
The convex form of a turtle shell and its rough texture were easily derived from similar attributes of a coconut shell. The smooth rim of a shell - defined with a groove, a little hole behind and a shy head, almost half withdrawn, gave the essence of a turtle form. The head, added as a separate piece is a departure from the self imposed constraint of non-additive sculpture but is not too far away from the spirit of the project.



RODENTS

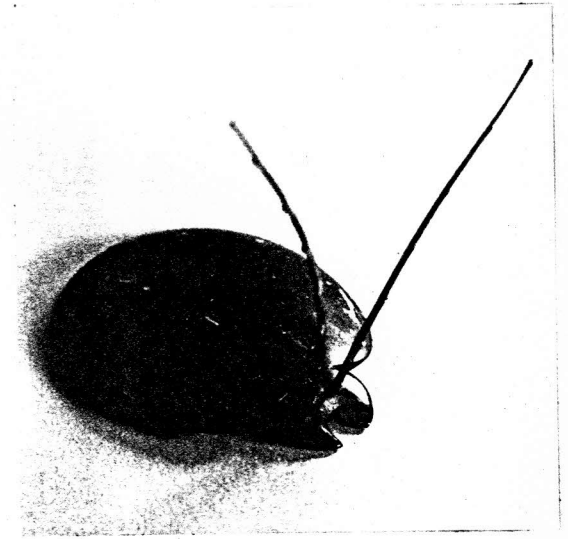
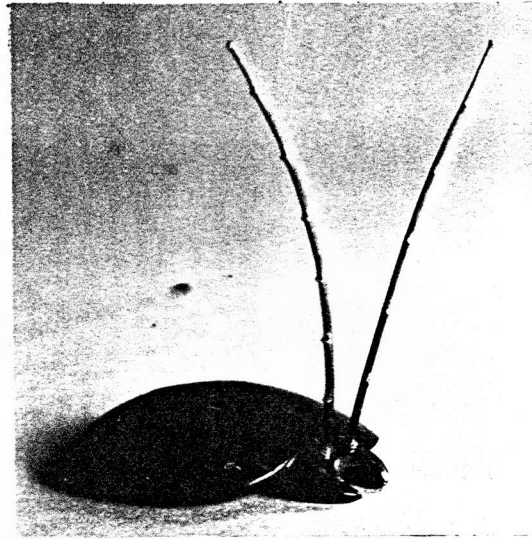
The streamlined forms and small facial expressions of these two coconut shells conveyed a strong image of rodents. Taking these clues, all that was left to be done was to stabilize them in typical rodent postures - sometimes sitting on the hind legs while looking around, sometimes face grazing the ground busy eating.

The addition of stiffened thread tails was not really essential but has certainly heightened their rodent identity.



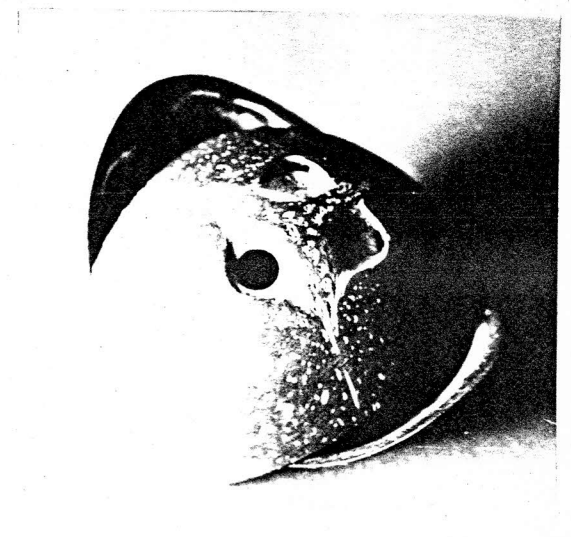
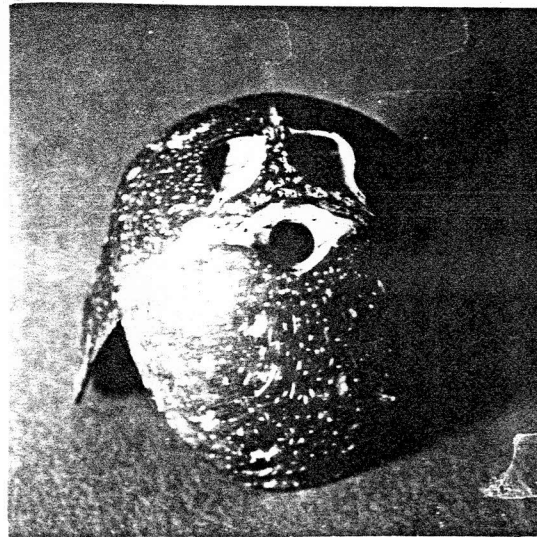
THE BUG

The bug was made from a leftover piece of another form - the belly of a pup. The slightly convex form was given the bug identify through separation of head and wings, high glossy finish and addition of antennae.



FACE AND SUPPORT

A combination of two pieces which could be arranged in several ways to give different forms and expressions.



POSITION, LIGHT SOURCE AND VIEW POINT

The perception of the form varies greatly with the position of the form itself, the position and nature of light falling on it and the position of the viewer. Different aspects of the form become clear or obscure depending on what is seen, from where and in what light. A photographic study was conducted with one of the forms and its changing perception with the three variables of

- . Object position
- . Light Source and
- . View point

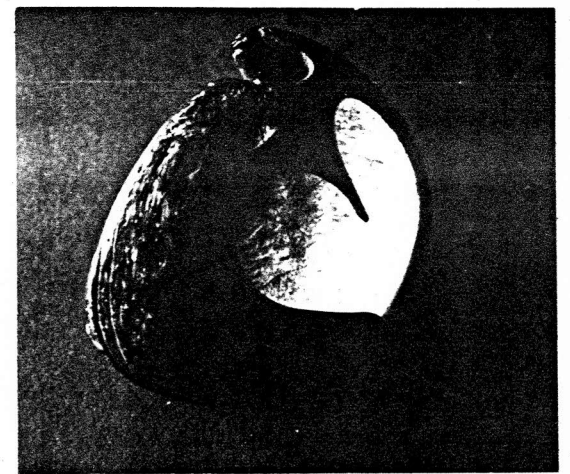
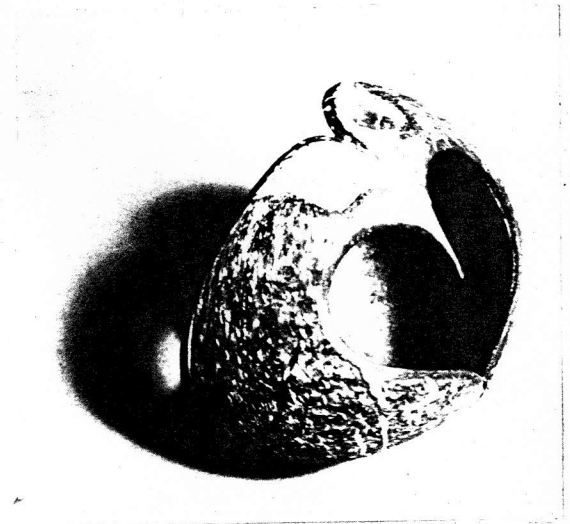
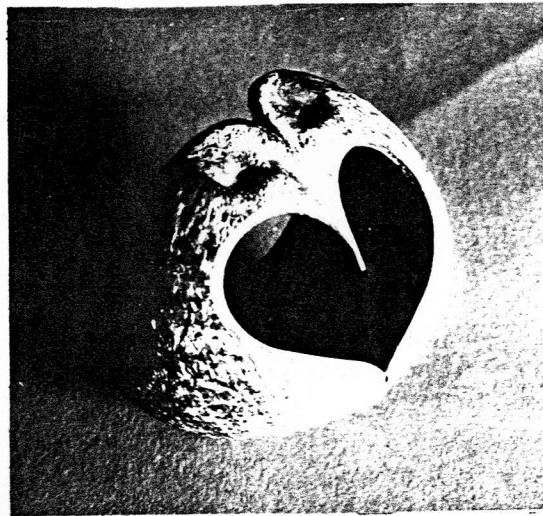
In each study, keeping two variables constant, third one was varied, to see its effect on form, details, expressions and patterns.

With the position of the object and the view point fixed but the light source shifting, different images of the form are recorded here.

With a low right front lighting the facial expressions are picked up by shadows while the beak stands out against a dark internal surface.

With a high right front lighting the face details become obscure, almost blinding the bird. The light reaches part of the inner surface and the shadow of the form generates an interesting pattern with the form itself.

With a low left back lighting the dark external surface stands out against a well lit internal surface with the lit ridge below eyes hinting at facial expression.

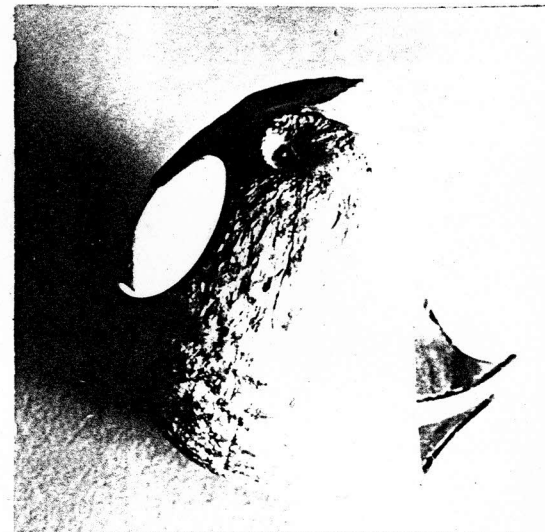
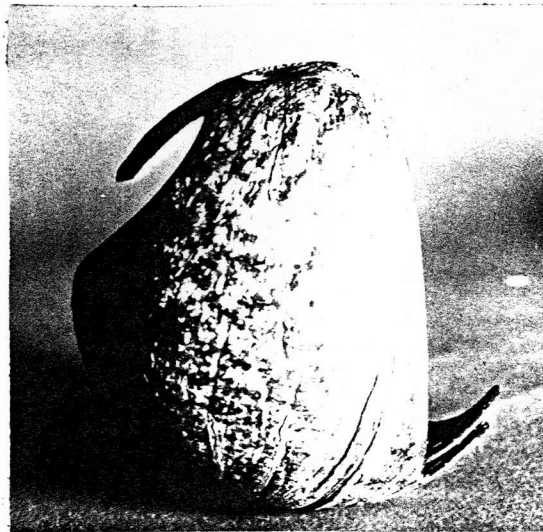


In this study the object position and the light source are kept constant, and the pictures are taken with the view point shifting upward, slowly towards left.

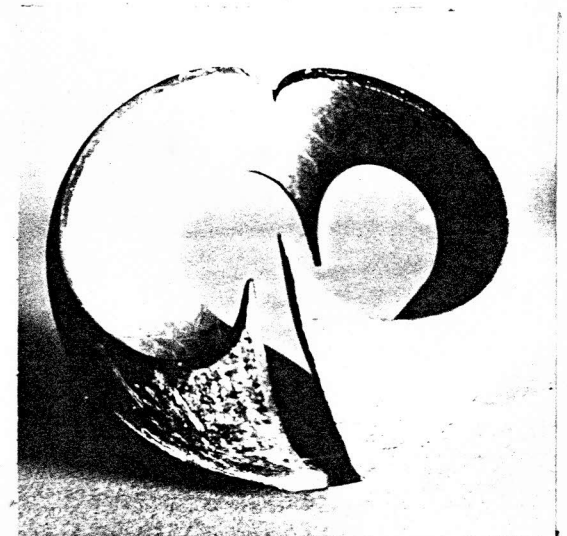
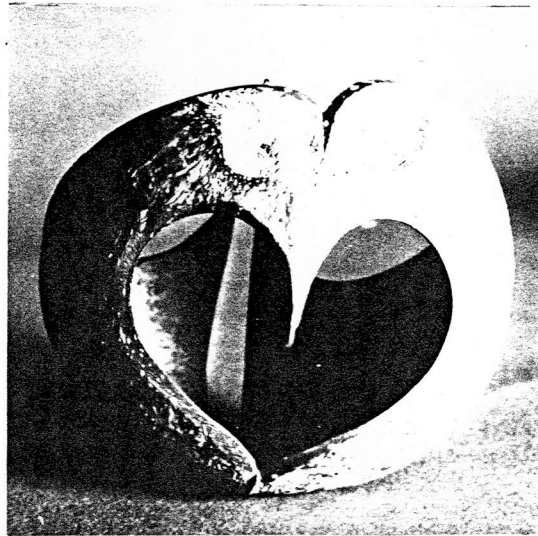
With a low view point the bulk of the form is evident with the beak and the tail as almost two dimensional profiles. The depression at top vaguely suggests an eye.

With the view point shifted up, the detail of the eye is clarified and more of the inside surface shown.

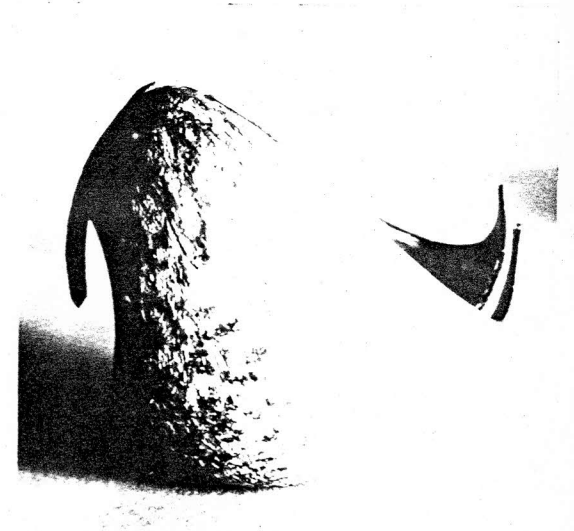
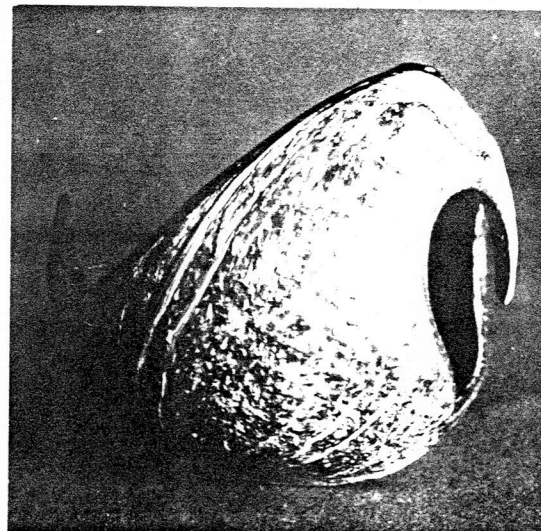
With the view point shifted towards left the tail totally vanishes from view, instead the beak and the head stand out against a highly lit internal surface.

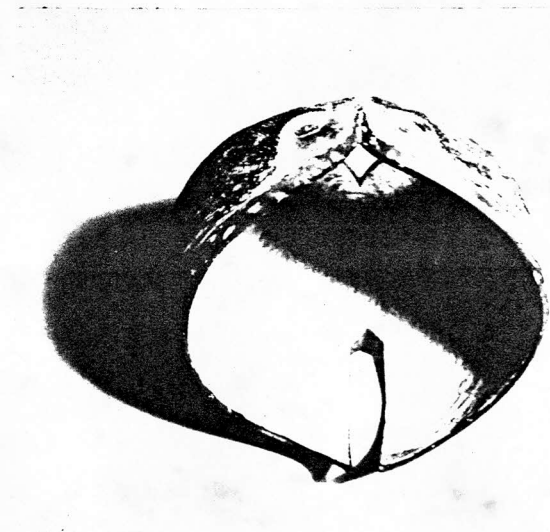
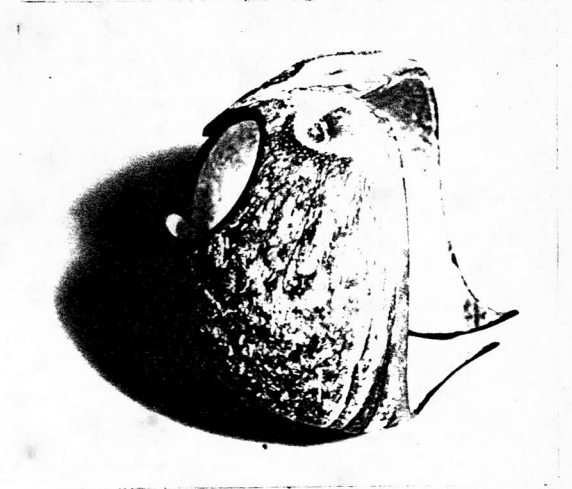
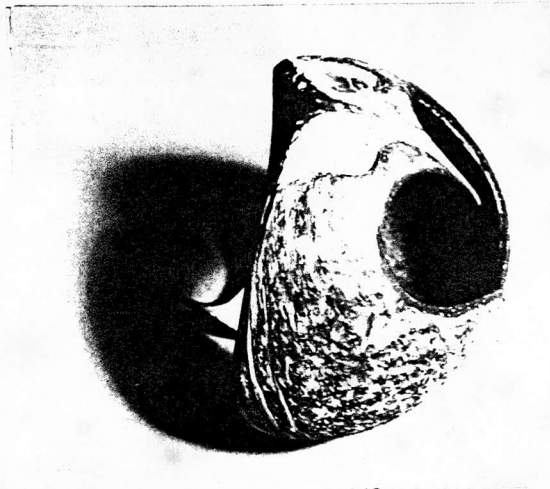


With the light source and view point fixed and the object moving, different aspects of the form are brought into light and view. Constantly changing relationship of different parts of the form with each other and the whole form can be experienced this way.



Low front right lighting
and low view point.





-High front right lighting
and high view point.

