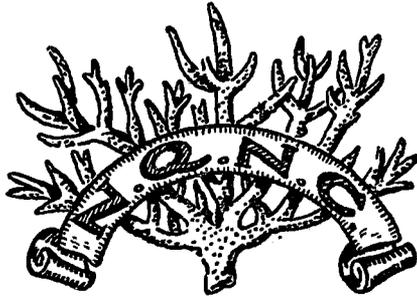

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"Each author is responsible for the opinions and facts expressed in
his or her article".

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SOME OBSERVATIONS ON STONEFISH

BY R. G. GILLIS.

(Contribution from Department of Supply, Australian Defence Scientific Service, Defence Standards Laboratories, Maribyrnong, Victoria).

Our early work on stonefish venom was done largely on fish from the Solomon Islands obtained through the courtesy of Captain Wilding of the "Bulolo" and Captain Lawson of the "Malaita". These were *Synanceja verrucosa*, and are sufficiently different in appearance from the local *S. horrida* (*S. trachynis*) to deserve special mention. *S. verrucosa* has no deep transverse trough behind the head, but instead has a shallow vertical trough between

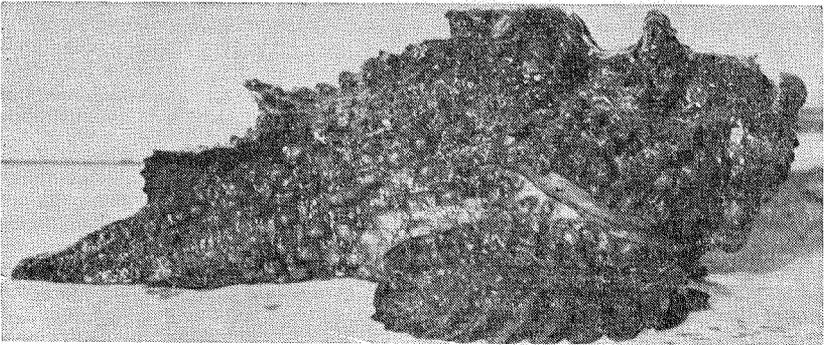


Fig. 1. — *Synanceja horrida* (*S. trachynis*).



Fig. 2. — *Synanceja verrucosa*.

the eyes. The suborbital pits are much smaller than in *S. horrida*. These differences in head structure are quite readily seen from Figs. 1 and 2. Another difference which does not seem to have been mentioned in the literature is that the bones and dorsal spines of *S. verrucosa* are all colorless, whereas in *S. horrida* they are a rather beautiful translucent blue. The Solomon Island fish also has irregular colored spots on its skin, mainly red and orange. In captivity these change slowly to give better harmony with the surroundings.

A variety of other fish often with little resemblance to *Synanceja* have

been forwarded to us in mistake for stonefish. The most interesting of these were two fish taken at Darwin by professional fishermen. Said to be common in the area, they are known locally as "stonefish". They had only three spines in the dorsal fin and were identified as *Batrachonemus trispinus* by Mr. R. Slack-Smith of the Victorian Fisheries and Wildlife Department. They are a type of frogfish and do not appear to have been reported previously in Australian waters.

In our first investigations, the fish were milked at Taroona through the

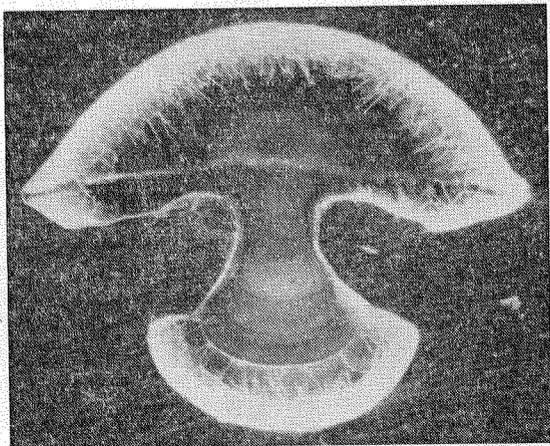


Fig. 3. — Sectioned spine showing deterioration.

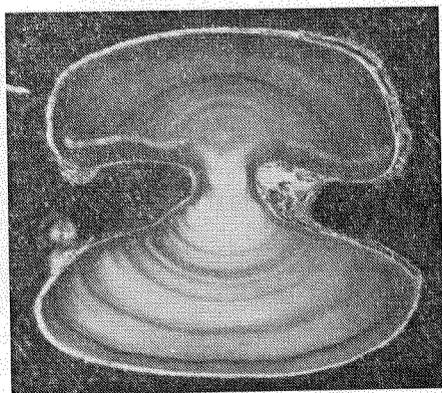


Fig. 4. — Sectioned spine (normal).

courtesy of Sir Edward Hallstrom and later transferred to Melbourne. Two methods of milking were used. In one a small glass test tube with rubber or polyvinyl chloride sheet stretched over the open end was forced down suddenly over an erect spine. This was similar to the method of milking snakes by making them bite through sheet rubber stretched over a small beaker. The

other way was to run a hypodermic needle down the side of the spine, pierce the venom sac and suck the venom out into a syringe. The fish were later sacrificed and dissected. There was no sign of regeneration of venom, though much scar tissue had developed.

One fish showed severe deterioration of the spines after the first method of milking. About half an inch of the spines remained exposed; this became cloudy and opaque from the tip downwards and the spine material decayed at the skin level so that the tips could be pulled out just like a child's deciduous teeth. Normal and decayed spines were mounted in polyester, sectioned and polished in the same way as a metallographic specimen and photographed in reflected light. In Fig. 3 the progress of the decay is clear. The growth rings in the normal spines (which are similar to growth rings in trees) could be used as a method of checking a fish's age (Fig. 4).

This type of decay has not been seen in fish which have only recently been taken, and was almost certainly due to an infection in the aquarium. Fish just caught often have a number of spines protruding through the skin of the dorsal fin and the venom sacs on these spines are almost always empty and show no sign of regeneration of venom.

We no longer endeavour to keep our fish alive for long periods, but we maintain aquarium accommodation because live fish frequently arrive late in the afternoon and it is convenient to keep them alive until we are ready to operate. Our present technique, which has been developed after collecting venom from several dozen fish, was worked out in conjunction with Dr. N. Erdstein when he was at Commonwealth Serum Laboratories. The fish is killed by severing its spinal cord at the post-occipital trough. The skin of the dorsal fin is cut transversely behind the third spine and along each side of the fin. It is held in forceps and pulled upwards and backwards towards the tail leaving the spines erect with the venom sacs exposed. The skin of the first three spines is similarly removed towards the head. The venom is sucked out of each sac through a curved hypodermic needle into a special glass container using the vacuum of a laboratory water pump. The venom collected in the flask is freeze-dried and stored.

Freeze-dried venom is a colorless, non-hygroscopic solid which redissolves in physiological saline and then has the same effects as fresh liquid venom. It has been shown to be essentially protein with some similarities to snake venom. It is antigenic, and an antivenene has been developed by Commonwealth Serum Laboratories which is available to registered medical practitioners.

The intense pain of stonefish sting is an obvious difference from snake-bite which is rarely painful in itself; many people have not realised they have been bitten by a snake until quite a long time afterwards, whereas stonefish sting is almost instantaneously painful. During our milking experiments at Taronga, one of our medical scientists was stung in the left third finger. There were two separate punctures about half an inch apart and the pain was quite noticeable in fifteen seconds. He gave himself a single injection of emetine hydrochloride between the two punctures and obtained rapid and complete relief. There were no after effects.

Emetine was first recommended by Dr. W. Armstrong of Lenakel in the New Hebrides. According to Dr. Wiener (formerly of Commonwealth Serum Laboratories) it has also been used effectively against the pain from the sting of the bullrout (*Notesthes robusta*) and of scorpions. Dr. A. Reid of Penang Hospital has used emetine against the pain of stings by other fish, but it has not always been successful. Nevertheless, emetine seems to be a useful first aid measure despite its intrinsic toxicity, and it may be effective against such painful stings as that of the butterfly cod (*Pterois volitans*).

Search for an Insect Parasite on the Northern Bangalow Palm

In Fiji there is a small caterpillar (*Agonoxena argaula*; Meyr.) which in certain places causes extensive defoliation of coconut palms. I searched for parasites for this pest during 1960 in Indonesia, New Guinea and the Solomon Islands and sent some species to Fiji. Early in 1961 I spent a few weeks in North Queensland and collected caterpillars of a related moth from leaves of the Northern King or Bangalow Palm (*Archontophoenix alexandrae*, Mueller). This is one of the King Palms of Australia, which are known to forest workers as "walking sticks".

The family Agonoxenidae (Microlepidoptera) has only 2 genera with 3 described species and does not appear to have been recorded in Australia.

In the Northern Bangalow Palm the upper surface of the leaves is green but the underside is an attractive silvery grey due to a waxy excretion. It is on this surface of the leaf that the *Agonoxena* larvae feed. They eat away the leaf tissue between the veins leaving scars of often varying width, each beneath a slender web which is difficult to see unless it happens to catch the light. When disturbed a caterpillar will often crawl from its web very rapidly and jump off the leaf at the end of a thread of silk. Up this it can climb back to its food. They are only about half an inch long when full grown and as their colour matches that of the leaf they are rather difficult to find.

The species which feed on coconut in Fiji and other Pacific Island Groups frequent both surfaces of the leaf. But in Queensland I could find no trace of this insect on coconut palms, and on the Bangalow Palm it refrains from feeding on the upper surfaces of the leaf where it would lose the advantage of camouflage.

In some of the eastern islands of Fiji *A. argaula* strips coconut leaves to an alarming extent and it is so widespread that I never remember finding a single coconut leaf anywhere in the Group without at least some traces of its feeding. In Indonesia and other more western parts of its range it is however checked to a large extent by parasites and occurs only in certain places.

In N. Queensland the position is somewhat different from either. On *Archontophoenix* the caterpillars tend to feed near the base of the leaflets rather than the tip and near to the midrib rather than the edge. Thus, although it is unusual to find more than five or six caterpillars feeding on a leaf at any one time, the cumulative effect of their attack after 3 or 4 generations (i.e. by the time a leaf is about 6 months old) often causes the leaflets to split longitudinally and present a very ragged appearance. It was the sight of these dead, greyish leaf strips which first attracted my attention to this Palm as a likely food plant of an Agonoxenid.

There appear to be four species of parasites attacking the moth in Queensland, three on the larva and one on the pupa. Two of the larval parasites seemed important enough to be worth sending to Fiji.

In order to get a reasonable number of parasites (not less than 50) at the same stage of development for dispatch by air to Fiji in one consignment, it was necessary to collect about 150 caterpillars a week at approximately the same stage of development. This meant collecting from about two dozen palms. Whereas in New Guinea or Java I could have got a native to climb the trees and cut down the most promising looking leaves, in Australia (that land of "do it yourself") I had to cut down the palms — being unable to climb them. They were often more than 50' tall.

Regeneration of this palm is extensive and fairly rapid in the swamps where they seem most to thrive, so I did not suffer any qualms of conscience

in destroying some dozens of these elegant members of the local flora. So far as landowners were concerned no obstacle was put in my way once the object of the search was explained. For this I was very grateful.

To get sufficient caterpillars became a two-fold problem. Firstly—to find adequate numbers of palms in accessible places. Secondly—to get them to fall to the ground when cut. Undergrowth, often enriched with young *Pandanus* and that exasperating trap for the unwary, which I believe is commonly called “wait-a-while” or “lawyer vine”, made the going laborious and sometimes not even practicable. I found on some occasions the palms would just not fall down.

Eventually, within a radius of 30 miles from Tully, where I had made headquarters, I located three accessible groves of Bangalow Palms, enough to go ahead with the job. Fortunately, unlike those of some other native palms, the stems are easy to cut. An occasional fire-scarred old warrior—angled from exposure to the wind—would have a steel-like outer shell. But this was always less than an inch thick and inside there was little to resist the axe.

After felling, leaves were severed and laid in a heap—face downwards—and carefully looked over. Each leaflet containing a caterpillar was cut off and finally the parts required were trimmed and placed in a polythene bag. In such a container the food kept fresh for several days and the larvae developed naturally.

The parasites in which I was specially interested (a Braconid wasp of the species *Chelonus*) is one which attacks its host while still in the egg stage but does not kill it and finally emerge until the caterpillar is full grown and has spun its cocoon. In some collections I found up to 50% of the *Agonoxena* cocoons occupied by this parasite. However the *Chelonus* does not have it all its own way. It is itself subject to attack by an even smaller wasp parasite (not yet identified). In theory, therefore, if the *Chelonus* could become established in Fiji without the “hyperparasite” (littler leaf!) it should do better even than it does in Queensland.

Five consignments of the *Chelonus* were sent to Fiji during February and March 1961. Now we must await results. We do not know that it will be capable of searching for its new host on a different plant (coconut) from that to which it is accustomed in Queensland: but the experiment is worth trying. Entomologists may be sure of their ground when deciding whether a parasite is safe to introduce to another country; but they can seldom if ever forecast with accuracy the extent to which an introduced insect will do good. One has to hope for the best.

R. W. PAINE, Norfolk, England.



Observation on a Pair of Varied Trillers

Birdwatching is an abiding interest of my family of myself and, aided by binoculars and patience, it is far more rewarding and interesting than mere book knowledge of the subject. We have strong fellow feelings for those who share our interest in birds and for those who devote their spare time to personal observations of natures ever present every varying wonders.

About a month ago I noticed a Triller in an orange tree between my house and my neighbours. It alighted in the uppermost branches, rested for about ten or twelve seconds and then went straight on to its nest. This, I have

observed since, is its usual habit. The nest in small, 2 $\frac{1}{4}$ " diameter by 1 $\frac{3}{4}$ " deep (outside measurements).

The parent triller almost covers the nest whilst sitting on the single egg. Observations, carried out daily, were made by my family and myself and it was very interesting to notice that the cock bird took his turn on the nest during the incubating. This changeover seemed always methodically done at about the same time each morning. About 7.0 a.m. the cock would fly to the tree and utter his very soft call—a soft trilling sound (which I learned to imitate to the seeming satisfaction of the trillers). The female would immediately vacate the nest and fly away. The male would then alight in the top of the tree and move to the nest without delay. As the birds were already sitting on the eggs when we first observed the nest, I cannot give the exact length of brooding time but it was just over a fortnight from first observing the nest that we found the baby chick tiny and featherless in the small shallow nest. (From observations since Mr. Minchins, three weeks is the length of time incubating the eggs. Ed.) The adult birds hardly left the nest for three or four days, keeping close cover over their prize baby. The chick grew fast and both birds took turn in feeding. Whilst the cock bird was away getting insects the female sat over the nest and chick and likewise the cock bird sat whilst the hen was away foraging. Seven days after the hatching the chick was clearly visible from the ground and at this time both parents were hunting for food which observation with the binoculars showed, consisted almost entirely of insects caterpillars predominating.

On the eleventh day after hatching, the chick got out of the nest and on each successive day afterwards left the nest for occasional short periods.

The birds seemed so tame and quiet that I decided to try and feed them if possible and find out if they would trust me close to their nest and chick whilst they themselves were there.

I tied a very fine piece of wire to a piece of fencing wire and this latter I tied to a strong stick for stability. The very thin wire was used to support the food—grasshoppers and caterpillars—which would be easily noticed by the parent bird, whereas the wire would not be so noticeable as to alarm them unduly. A grasshopper was first affixed and I walked beneath the nest (as we had been doing throughout our observations) and raised the insect towards the cock bird who was standing by the nest. He was a little wary at first and it was obvious that some instinct warned the chick that all was not well, for it turned round in the nest and tried to hide beneath the breast of the male. I proceeded very slowly to move the food towards the nest and soon had it within reach of the male who had been watching it intently all the while. He took the grasshopper (to my great satisfaction) hesitated a while as I moved away from the nest, and then flew to a nearby tree where he ate the insect. I then gathered some earth-worms and went through the same procedure when the female took charge, with the same result, the hen fluttering away to a nearby tree to eat as the cock bird had done. Toward evening when the hen bird had settled on the nest for the night (the usual habit of this particular bird) I placed several worms in succession on the wire and offered them to her as I had done previously. All were taken and eaten without the bird leaving the nest. The birds quickly learned to accept what we offered them, and seemed to appreciate the help we were giving them. The young bird is now (at the time of writing) fourteen days old and will probably leave the nest in the next four or five days. According to life-history studies, these birds are migratory and usually nest earlier than this but probably the unusually long dry season accounts for this late breeding. From my experience it is unusual to have trillers in this locality at this time of the year.

Note.—The chick left the nest four days after this article was written and the trillers stayed on in the area for over a month later.

A. F. MINCHIN. Edmonton.—27/5/61.

EDITORIAL

The Officers of the Club would like to wish all members a Very Happy Christmas and Prosperous New Year.

Field Days were held at Davies Creek Forestry Road, Springmount Weir and the Barron Gorge. At the first named unfortunately very few were able to attend but for the "Birdos" who attended it was a most successful day, many interesting jungle birds being seen. A small black snake was found but not identified and after examination was returned to its piece of rotted fern. Quite a lot of members journeyed to Springmount Weir near Dimbulah and Town members were very happy to welcome several new and Country members. We always welcome the opportunity of meeting Country Members and hope that more will join us when the outings take us into their district. The last outing for the year was at the Barron Gorge when quite a party went up the new road where "Transfield" are tunnelling into the hill. We would like to see many more members coming to our Field Days and would remind them that only by all joining in and pooling their specialist knowledge can the rest of the members hope to learn something of the wonders around us.

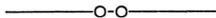
We have to thank Miss Andrews, Mr and Mrs. Ziegenfusz and Mrs. Whitton for very kindly donating new books to our library. In this way we can build up a library to be proud of.

A successful Christmas Party was held at the home of our President, Mr. and Mrs. A. Read when we were entertained with some interesting Natural History films. Refreshments were served. A competition was held for the best cooking by a junior member and this was jointly won by Peter Cassels, Judith Cassels and Gail Corbet. Thanks to Mrs. Mear and Mrs. Geddes for donating the prize. Mr. Luppi kindly donated a duck which was raffled. Our thanks to Mr. Luppi. And particularly our thanks to Mr. and Mrs. Read who once more willingly and cheerfully put up with us all.

We regret that we have lost our Librarian and our Secretary who have both had to resign owing to their work. Mr. Cassels has now been elected Librarian with Lyn Corbet as a junior assistant Mr. Carl Luppi has kindly consented to take on the job of secretary.

Will all members who have not yet paid their subscriptions, please do so as soon as possible. The Treasurer has had to be away from Cairns and so has not been able to send out reminders, so please help him by sending your cheques by return.

Will all members who have library books please return them to the library after Christmas so that the Librarian can make a complete inventory of all books owned by us so that lists can be compiled for the Country members.



POT POURRI

The "Tidy Spider" has been identified for us by "Mrs. Spider" of Brisbane as *Aranea Producta*. If anyone is willing to listen I can hold forth for some time on my observations of this spider. Regret it has disappeared—whether eaten, oldage or just gone away to rear her young I do not know.

CATTLE EGRETS

Cattle Egrets (*Ardeola ibis*) have been observed in the Innisfail area, by five observers during August, 1961. They were first noted by Mr. J. R. Wheeler of Geelong, Victoria.

One previous report of Cattle Egrets in this district was made by Captain H. L. Bell, (*Emu*, Vol. 61, Page 6), who reported seeing one bird.

There are over twenty birds in the present flock, and they closely attend a few cows, on several occasions they have been seen to alight on the backs of the animals. They also follow horses.

It is not easy to observe this flock as the cattle are on Private property, the owner of which does not like birds, nor the people who wish to observe the same.

In a general description, I would say the most distinguishing feature is, the hurried scrambling action of the birds when following the animals as they move; the flock keeping close to and under the animals all the time whilst feeding on the insects disturbed.

Only one bird showed any buff colour, so it would appear that they are not yet in breeding plumage.

The bill is short and thick, of a light yellow colour, the head and neck is also rather heavy. The overall size is larger than *Egretta garzetta*, but not quite as large as *Egretta intermedia*. Finally they have a hunched and anxious appearance even when not feeding, different altogether to the calm waiting pose of the other Egrets.

Contributed by Mrs. R. G. GILL, Innisfail.

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