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NORTH QUEENSLAND NATURALISTS' CLUB

Meets at Girls' and Infants' School, Abbott Street, Cairns, usually on second Monday in each month, at 8 p.m.

Next Meeting—Monday, 9th March.

Dr. H. I. Jensen will lecture on the "Geology of North Queensland."

Excursions.

Will those who are anxious to arrange or participate in excursions at short notice, kindly communicate with the secretary.

The February Meeting.

Due to the non-arrival of the S.S. Wandana, our lecturer (Dr. Jensen) was not present. Mr. R. L. Hunter is to be complimented on preparing a lecture and gathering such a quantity of illustrative material at such short notice. He dealt ably with the life history of the yellow butterfly *Catopsilia pomona* Fabr., which is very common in his (the Freshwater) district. An interesting point mentioned was that some of these butterflies have female markings on one set of wings and male on the other.

Exhibits.

Dr. Flecker—*Eucalyptus pruinosa* and *E. racemosa*. Leaf Insect (Phasmatidae).

Dr. Cook (Barcaldine)—Scorpion (*Urodacus*) which bit a child in his district.

Mr. J. Manski—Pupa case of the Hercules Moth—*Coscinoscera hercules* Misk. (Family Saturniidae).

Mr. Bates—Mantis Prawn (*Squilla*).

Mr. A. B. Cummings—Spider Crab, clothed with weed as camouflage, from Green Island. Preserved Angel fish (*Chaetodon auriga*) from Green Island.

Mr. Holloway—Brass shim suitable for labels on plants.

Miss J. Brake—Female of *Eupatorus australicus* Arrow, Sub-family Dynastinae, Family Scarabaeidae.

Queensland Forest Service—Collection of polished timber blocks, all named, which were presented to the Club.

Mr. R. L. Hunter—Food plant (*Cassia fistula*), eggs, larva, pupating larva, larval skin and male and female of *Catopsilia pomona* Fabr. (Family Pieridae, Order Lepidoptera).

Mr. J. G. Brooks, L.D.S.—Fruit Flies (Family Trypetidae, Order Diptera) caught on the Wild Tobacco Plant (*Solanum verbascifolium*) at Lake Barrine.

Committee Change.

Mr. M. Auricchio was elected to fill the vacancy caused by the resignation of Mr. Balfe.

Wild Nature Show.

It was decided that this Show be held on the Friday and Saturday following the resumption of school after the August vacation. The appointment of a Show Secretary was left in the hands of the committee.

Contributions for this Page.

Observations of nature will be greatly appreciated and can be forwarded to J. G. Brooks, Box 545, Cairns.

"FOSSILS AND THEIR MEANING."

Synopsis of Lecture given to the North Queensland Naturalists' Club by F. S. COLLIVER, Esq., Hon. Sec. Field Naturalists' Club of Victoria (Contd. from p. 14.)

Similarly in the Mammals, in the Pleistocene period, wombats as large as bippopotamus, and kangaroos 12 feet high were common. These animals roamed all over the eastern half of the con-

tinent, but now they have disappeared leaving in the Holocene time numerous members of the family, but none of them even approach the size of their predecessors. In this case their disappearance

was undoubtedly due to changed climatic conditions with subsequent depletion of food supplies.

Another interesting case may be mentioned in relation to the sharks.

In the Tertiary deposits of Victoria sharks' teeth are common, and teeth of the white shark type have been found nearly six inches long. The monster that possessed teeth such as these must have been nearly 100 feet long, and these teeth are fairly common; now whilst sharks are common at the present time nothing even approaching such a size can be recorded.

As before mentioned, Man appeared about Pliocene times, and many strange forms were evolved before the present types. Australia unfortunately does not possess any very good evidence for ancient man; one very interesting point may be noted, however, in connection with a *Cohuna* skull; previous to the finding of this skull the lower jaw known as the Heidelberg Jaw was recognised to be the largest jaw found, and therefore the remains of the largest skull. This jaw, however, is much too small for the *Cohuna* skull, and therefore suggests that possibly some of the giants of the early men had their home in Australia.

In the tertiary times conditions in Southern Australia and Tasmania were very different to the present time. On the evidence of the fossil shells and corals, etc., it is seen that tropical con-

ditions somewhat allied to those enjoyed by Cairns were then enjoyed by Victoria and Tasmania, and it was due to these conditions that the giant marsupials flourished. By the evidence of their remains it is believed that Lake Callabonna, S.A., was a last stronghold of these creatures.

In the present time (Holocene Age) man is supreme, and as we learn by studying the rise and fall of previous life types, it seems possible that man too may follow suit and reach a maximum development, and then give way to some higher form of life. Just what this form of life may be—who can say? It can only be suggested as an interesting speculation.

A word might be said in relation to the economic aspect of the study of fossils, whilst in the main it is a pure science, unsullied by money matters. Still, it is interesting to note that in Victoria one of the now extinct fossil groups, the Graptolites (*Grapho* I write; *lithos* a stone) are used as index fossils for the gold bearing deposits. That is wherever these fossils are found it is known that one has a reasonable chance of finding gold; and to mention one other case applying more particularly to America, it is by the study of the Foraminifera (*Ferro*, I bear; foramen, a small hole) that oil field development has reached the efficiency shown in modern times.

HOW DO BUTTERFLIES DISTINGUISH THEIR FOODPLANTS?

By M. J. MANSKI.

To delve into the mysteries of insect life is very fascinating but to understand how these insects can distinguish their respective foodplants seems to be beyond reasoning power, and the best we can do is to merely guess.

In this article I shall deal with the butterfly and its foodplants.

Many naturalists are inclined to emphasise that sight is the solution; others favour smell; others favour chemical action, whilst others quote just instinct. In my experiences and observations, sight, smell and chemical action are all feasible. I go further and point out that after the caterpillar has ceased its eating and forms into its pupal stage there is always a certain amount of water

not required and on emergence of the butterfly its body is so saturated with the sap of the foodplant that the butterfly after mating seeks this plant by sense of smell, and unless it throws back to some distant parent that fed on other plants it should lay its eggs on the plants from which it springs.

Further, there is the case of "where I lay my eggs, feed or die as I have an idea that my forefathers were reared on this plant." It certainly seems unnatural for the butterfly to leave its young to starve if it does not like the plant, but in the case of *Lindula* (*Cynthia*) *arsinoe* Ada it seems so.

We know that certain butterflies are attracted by bright colours as *Papilio Ulysses joesa* is attracted by

bright blue and will fly down and examine it each time it returns during its circular flight. Also the *Terias*, *hecabe sulphurata* is attracted by bright yellow, thus showing a keen sight and on the other hand, smell forms a big factor with them as the day-flying moth (*Alcidis zodiaca*) is attracted by the fumes of benzine, the double-tailed emperor (*Eriboea pyrrius sempronius*) is attracted by overripe fruit, whilst the smaller *Mycalesis terminus* and *Mycalesis sirius* can easily be netted whilst they are feeding on the ripe fruit of *Melastoma malabathricum*.

Many butterflies keep to one genus of plants, just as certain races of people have their staple food, Chinese, rice; Egyptians, dates; Persians, figs; natives of India, curries, etc., and the newer races have a mixed diet, and who knows but that the mystery of food applies also to the older race of butterflies? Some may be true to type and know no other foodplant than their predecessors used, but many are crosses and hence the mixed foodplants.

Those that keep to the one class of plant are as follows:—*Troides priamus euphorion* (Cairns birdwing), *Eurycus cressida* (the large greasy), *Papilio polydorus queenslandicus* (the red-bellied swallowtail) feed only on *Aristolochia*; the *Papilio Ulysses joesa* keeps strictly to *Evo-dia accedens*; the *Papiliones aegaeus*, *egipius*, *anactus*, *capaneus* and *sthenelus* keep to citrus trees.

Sight may be a factor in this regard as the spectrum may be the same for each genus of plants, but smell may also play a part, as the Citrus and *Aristolochia* have a very strong scent which may attract them.

I have noticed a female *Troides priamus euphorion* hover over a small tree around whose trunk a young *Aristolochia* vine was growing. I am almost certain that the butterfly could not see the plant and yet she knew it was there as she laid eggs on the leaves of the tree knowing that when the young caterpillars emerged they would soon find their foodplant.

These and other caterpillars have a tendency to leave their foodplants but come back at feeding time.

This makes the smell theory very feasible.

But what of *Lindula* (*Cynthia*) *arsinoe* Ada? What causes her to seek out the dry tendrils of the *Passifloraceae* and yet only the *Modecca populifolia* will satisfy the young larvae? Here is the case of "where I lay my eggs, live or die." Her actions point to protective colouration as the eggs soon turn to the colour of the dry tendril and the young larvae keep to the dry tendril also. Can this be the spectrum or sense of smell? It is hard to say. She knows the *Passifloraceae* but only one will feed the young. Take again the *Doleschallia bisaltide australis* (the leafwing butterfly) and its foodplant the *Eranthemum variabile*.

This butterfly will lay its eggs on the flower buds and under the leaves of all the varieties of this plant, but *Hypolimnas alimena* also has this foodplant and lays its eggs not on the flower buds or any variety but keeps strictly to seedling plants of the green underleaf variety, and in nearly all cases the small leaves are resting on the ground. How does she distinguish the plants and know what variety to lay on?

If the spectrum works on other plants why not on *Eranthemum variabile* and how does she single out the green underleaf? Again the *Hypolimnas bolina nerina* lays her eggs on the underside of seedling plants of *Sida rhombifolia*. The young larvae can be reared on *Sida rhombifolia*, but after the second moult they can be taken off *Sida* and placed on *Synedrella nodiflora*, whence they continue to grow without any difficulty and do not mind the change of food. This is interesting as in only a few cases can butterflies be persuaded to feed on plants other than that on which the eggs were placed.

Other butterflies that have singular foodplants are as follow (foodplants in brackets):—*Eupha prosope prosope* (*Scolopia Brownii*), *Danaida affinis* (*Vincetoxicum carnosum*), *Delias* sp. (*Loranthus* sp.), *Hasora alexis contempta* (*Pongamia glabra*), *Hasora discolor* (*Mucuna gigantea*), *Hasora hurama hurama* (*Derris trifoliata*), *Issoria propinqua* (*Xylosma ovata*), *Mynes geoffroyi* (*Laportea moroides*), *Miletus apollo apollo*

(*Myrmecodia Beccarii*), *Miletus narcissus* (*Loranthus*), *Ogyris zosine zosine* (*Loranthus*), *Notocrypta wai-gensis leucogaster* (*Alpinia coerulea*), *Phaedyma shepherdii* (*Pongamia glabra*), *Pseudodipsus eone iole* (*Faradaya splendida*), *Tellervo zoilus zoilus* (*Parsonsia velutina*), *Thysonotis hymetus taygetus* (*Alphitonia excelsa*), *Thysonotis cyanea arima* (*Entada scandens*), *Cethosia cydippe chrysepe* (*Modecca populifolia*).

Now let us look into the foodplants of some butterflies that do not confine themselves to one plant but may be found on two or more plants and in most cases the genus is widely separated and not related botanically. The *Catopsilia* may be found on *Cassia alata*, *C. fistula* and species of *Indigofera*; *Danaidae plexippus* and *petilia* on *Asclepias curassavica* and *Calotropis gigantea*. *Euploea corinna* and *Eichorni* on *Nerium odorum* and *Asclepias curassavica*. *Amblypodia anytis*, *Hypolycaena phorbas phorbas* and *Lycaenesthes godeffroyi* may be found on *Eugenia*, *Terminalia Muelleri*, *Hibiscus tiliaceus*, *Glochidion Ferdinandi*, *Faradaya splendida*, *Cordia dichotoma*, *Heritiera littoralis* and another plant very much like the lastmentioned, and *Miletus apelles* on *Avicennia offic-*

nalis and *Angophora* and possibly on *Careya australis*, *Papiliones agamemon*, *macfarlani* on *Anona muricata* and *Sassafras*, whilst *Papilio hycaon* favours *Anona muricata* and *Cinnamomum camphorae* (the *Camphor Laurel*). *Papilio sarpedon choredon* may be found on *Sideroxylon Richardsii*, *Cinnamomum camphorae*, *Cryptocarya triplinervis*, *Mallotus* sp. and a species of *Macaranga*.

Precis albicincta may be found on *Thunbergia alata*, *Angelonia floribunda*, *Apypasia scandens* and *Eranthemum variabile*. *Terias hecabe sulphurata* on *Cassia*, *Breynia* and *Indigofera*.

The plants are so varied that neither sight nor smell can hope to claim all these, and it may be possible that some chemical action peculiar to all these plants appeals to the butterflies.

Further observations are necessary and many experiments tried before a solution can be possible, and any members of the North Queensland Naturalists' Club so interested can get busy as there is quite a lot of life histories to be recorded, and the races of *Lycaenids* have yet to be compared with those of the South and the more one goes into this class of hobby the more interesting it becomes.

ADDENDA

- Vol 1. No. 9, p. 5—*Hibbertia velutina*. Add (F.M.B.) after locs. Add loc. Betw. Ingham and Cardwell (Priest) and mo. 8. Before (*H.*) *longifolia* add (*H.*) *volubilis*, Andr. 10. Campbell Cr. (Flecker). Before (*Nymphaea*) *lotus* add (*N.*) *gigantea*, Hook. Large Blue Water Lily, 9. Archer Cr. (Flecker). Before Family *Piperaceae* add (*N.*) *minima*, F.M.B., 11 Parramatta Swamp (Flecker).
- P. 6—*Drimys membranacea*. Add loc. Mt. Bartle Frere (Pearson) and mo. 9.
- P. 7—*Cryptocarya triplinervis*. Add loc. Mareeba (Flecker) and mo. 8.
- No. 10. p. 5—Before *Lepidium* add

- Senebiera*, Poir. *didyma*, Pers. Wart Cress. Europe, 9. Malanda (Flecker). Before Family *Violaceae* add *Raphanus*, L. *raphanastrum*, L. Jointed Charlock, Europe, 11. Cairns (Flecker).
- P. 6—Before *Xanthophyllum* add *B. (C.) sylvestre*, Lindl. (10. Betw. Torrens Cr. and Pentland (Priest). (*X.*) *octandrum*. Add loc. Bartle Frere (Flecker) and mo. 10. *Aglaia ferruginea*. Add loc. Mt. Bartle Frere (Flecker) and mo. 10.
- No. 11. p. 4—*Ganophyllum fallacatum*. Add loc. Green I. (Cummings).
- P. 6—Before *Waltheria* add (*M.*) *corchorifolia*, L., 4. Mt. Mulligan (Flecker).