

Produced by 'The Conchological Society of Great Britain and Ireland'

#### JUNIOR MEMBERSHIP

The following junior was elected to the Junior Membership of the Society on the date given:-

15th. May 1965

GRANT Jesse, [REDACTED] Oxford.

#### LYMNAEA TRUNCATULA L. AND ITS COMPANIONS

*Lymnaea truncatula* is a small and harmless looking member of the British fauna, but it may carry a formidable enemy to sheep and cattle in the shape of Fasciola hepatica L., the common liver fluke. The flukes are parasitic animals of the phylum Platyhelminthes, class Trematoda and the group which includes Fasciola are small leaf-like hermaphrodite creatures about 30 mm. by 13 mm. in size armed with an oral and a ventral sucker. The common liver fluke has a world-wide distribution and costs farmers many thousands of pounds in dead and unthrifty animals and condemned livers. In common with the vast majority of flukes it needs a second host in the shape of a snail and many species serve this purpose, but in Britain and probably in Europe, F. hepatica can only complete its life cycle through L. truncatula.

The adult liver fluke lives in the bile ducts of ruminants and other animals and its operculate eggs pass out with the animal's dung. The most favourable habitat for the eggs lies between permanent water and well drained land, conditions which also suit L. truncatula. If the dung falls on moist ground the eggs that become free of dung develop into the first larval stage, the ciliated miracidium. When development is complete exposure to light activates an enzyme which dissolves the substance binding the operculum to the eggshell from within. Also a small viscous cushion inside the shell suddenly expands to twice its size and within a second or two the operculum flies open as if hinged releasing the miracidium which swims rapidly away in search of a snail. (Rowan 1956, 1957).

If no snail is found within twenty-four hours the larval fluke will die but if one is handy the miracidium makes quick dives at it in a very excited manner and eventually attaches itself, burrowing in with the help of enzymes secreted from its anterior end. If burrowing occurs in the tough tissues of the snail's foot, the miracidium will probably die, but if the attack is made on the softer parts of the snail's body, the larva penetrates successfully leaving its ciliated coat behind.

However, the invader does not always get everything its own way. Within the mantle cavity of many snails there lives a small oligochaete worm Chaetogasta limnaei which is very partial to miracidia and catches them as they swim into the mantle cavity to settle on the snail. Up to fifteen miracidia have been found in the gut of one worm. (Khalil 1961).

The larvae which have penetrated successfully are now in the second or sporocyst stage, which breeds parthenogenetically, each producing about eight rediae. If conditions are not very favourable the redia will also reproduce, the next stage being daughter rediae, each of which will produce a number of cercariae which have long tails for swimming. The cercariae emerge from the snail about three weeks after the miracidia entered it and swim for a piece of herbage on which to settle down, lose their tails and encyst into metacercariae. This stage is then infective to the final host in which they reach the liver by penetrating the intestinal wall and creeping over the internal organs. At this

stage the flukes may enter the blood stream by mistake and end up in the unborn young of a pregnant animal. (Enigk and Düwel, 1959, Hay 1960).

The young flukes wander in the liver tissue making tracts about six liver cells wide and finally enter the bile ducts to mature, passing eggs about three months after infection of the host. Mice can be experimentally infected with liver fluke and it has been observed that, when the flukes are damaged by prior irradiation with X-rays and moving slowly, the white blood cells which normally move in to clear up the liver cell debris in the wake of the migrating fluke, can catch up with the fluke itself and destroy it. (Dawes, 1963).

Three factors are critical for the development of fluke larvae on the pastures. The eggs must become separated from dung, they must be surrounded by water and they must have a temperature of between  $9.5^{\circ}\text{C}$  and  $30^{\circ}\text{C}$ . (Rowcliffe and Ollerenshaw, 1960). Also a large fluctuation of temperature will kill them. The climatic factors make forecasting of outbreaks of fascioliasis possible by a study of the weather. This has been done in Anglesey, one of the foci of the disease in Britain. Development is restricted in winter by temperature and in summer by moisture and, in Britain, occurs in the period between May and October. Rainfall must exceed evaporation for three months and the best conditions are when rain falls as showers rather than as occasional storms. The optimum temperature is  $15^{\circ}\text{C}$  to  $20^{\circ}\text{C}$ . An outbreak may follow about three months after these conditions, i.e. October to Spring after a Summer infection and July to October or November from infections which over-wintered in the snails. If May and June are dry the over-wintered snails will die without infecting the pasture, but if May and June are wet a Summer infection of stock may follow. (Ollerenshaw, 1958 a, and b. Ollerenshaw and Rolands, 1959, Ollerenshaw and Edwards, 1963).

There are three climatic areas in England; in the south-east and south, three wet months between May and October are rare: the hilly districts of the Midlands and North have a wetter climate but the snails are limited by mineral-poor and acid soils. The third pattern is found in the lowlands of the west country and Wales, where the soil is suitable for the snail and more rain falls; most fluke epidemics are located in these districts. (Ollerenshaw, 1958 a.).

In many cases the infection in the snails dies out during the winter and exposed eggs are killed by temperatures of  $-5^{\circ}\text{C}$  to  $-7^{\circ}\text{C}$ , but eggs protected by snow can survive even the Russian winter on the pastures. (Vasileva, 1960).

Another unpleasant aspect of liver fluke infection is the activation by the young migrating flukes of the spores of the bacterium Clostridium oedematiens type B. which cause black disease. This disease is particularly prevalent in Australia, where it causes considerable loss of stock, but it is also found in Scotland. (Jamieson, 1949).

Liver fluke can infect man on rare occasions, particularly in France, as well as several other hosts besides the normal ruminant hosts. Infection of man is usually by eating wild watercress gathered in infected streams. Commercially grown watercress is quite safe as the growers are well aware of the danger and carefully exclude all snails from their cress beds. Another method of entry for the fluke occurs when savage tribes eat raw livers from sacrificed animals. The adult flukes contained in infected livers are capable of attaching to the pharynx during swallowing and cause a condition known as halzoun, or pharyngeal fascioliasis. (Watson and Kerim, 1956).

Finally, the fluke is gifted by nature with one more advantage. Its normal life span is about nine months but it can live for eleven years! (Durbin, 1952).

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J. Crowley

MYTILUS EDULIS L. LIVING ON EDIBLE CRAB (CANCER PAGURUS L.)

During the recent Crab fishing season at Aldeburgh, Suffolk, on 23rd. April 1965 one of the fishermen brought up a very old crab from rough ground about  $1\frac{1}{2}$  miles east of the town which carried a large example of Mytilus edulis L. It was attached by a very strong byssus at the base of the left chela and against the carapace. The shell appears to be about three years old.

The crab was rejected by the fisherman as too old and damaged for sale. Unfortunately I did not accept it and preserve it.

Sir J. Arthur Thomson in "Biology for Everyman", Vol. 1, p. 209 (1934) writes "Very large crabs are sometimes captured carrying growth of epizoic animals, such as acorn-shells, which look as if they have lived there for over three years". The present writer would be glad of any records our members may have of mollusca living on the Edible Crab.

H. E. J. Biggs

FOSSIL MOLLUSCS ASSOCIATED WITH CORALS

During recent collecting from the Sharp's Hill Beds, Great Oolite (Jurassic) in the Cotswolds I have been interested to observe many instances of bivalved molluscs in close association with the various corals which occur in these Beds. Firstly, many of the corals such as Isastraea limitata (Lamouroux) have used a valve of a species of Ostrea (oyster) as a base on which the colony could grow and spread. I have obtained specimens showing the beginning of the coral colony on the edge of the shell and then those where the shell has finally been completely enveloped by the coral. Sometimes the branching compound coral, Thamnasteria lyelli (Edwards & Haime) used an inverted valve of Ostrea (that is the concave/convex valve) as a 'mount' on which to anchor.

Then there are numerous instances of the molluscs using the corals as their hosts. Often they attached themselves to the surface of colonies of Isastraea limitata, sometimes single individuals, occasionally in groups and usually in hollows and shallow parts of the coral surface. In the case of the branching Thamnasteria lyelli, the oysters sometimes chose to settle in the forks of the branches, creating an attractive effect with the crinkly,

translucent shell perched between two branches of the coral.

Of course the molluscs were not alone in this association, for one frequently finds serpulids (marine worm tubes) and rhynchonellid brachiopods crowding in with the oysters, mussels and other bivalves. However, it is interesting to note that, of the molluscs, ammonites are not usually found in association with the corals.

P. E. Negus

#### GENERAL NOTES

FOR SALE: 50 Spondylus, 100 Cypraea, 100 Conus, 100 Volutas, all different.

F. Mayer (Eaton), 16 Manette Street, London, W.1.

A copy of 'The Scallop' issued by Shell (Petroleum) - apply,

Mrs. H. Jones, [REDACTED] Ramsgate, Kent.

SHELLS REQUIRED: Madame R. Lievens, [REDACTED] Belgium, has six children who are very interested in natural history and are greatly encouraged by their mother to collect specimens and generally develop their interests as a means of education. She would much appreciate some help in obtaining shells to start her family on shell collecting. If any member has a few 'spares' or unwanted items, please be kind enough to send them to Madame Lievens - you never know, you may be starting a budding conchologist on the right road. Although this lady offers to pay for some shells, it is obvious from her letter that she has not got much money and with six children this is hardly surprising.

Mr. Ted Phillips, of the Sea Gull Shell Shop, [REDACTED] Santa Barbara, California 93103, U.S.A., is interested in purchasing European sea shells on a wholesale basis. Specimens sent would need to be in first rate condition, named and with localities; all species are required although there is a special request for Isocardia cor. Any interested member should correspond direct: fair prices will be offered.

ANNOUNCEMENTS: THE QUEKETT MICROSCOPICAL CLUB LONDON

From the Secretary: Mrs. E. M. Barron

[REDACTED] Rickmansworth, Herts.

#### Centenary Celebrations

This year The Quekett Microscopical Club celebrates the centenary of its foundation on 7th. July 1865. The title of the Club commemorates the name of John Thomas Quekett, Professor of Histology and Conservator of the Hunterian Museum at the Royal College of Surgeons of England. A prominent microscopist in his day, a founder member of the Microscopical Society of London (now the Royal Microscopical Society), Fellow of The Royal Society and of The Linnean Society of London, and author of the 'Practical Treatise on the Microscope', Quekett died in 1861 at the tragically early age of forty-six, greatly respected by all who knew him. There were at the time several suggestions current for commemorating his name in some permanent way. As events have proved, no more appropriate memorial to him could have come of this desire than the association of his name with this Club, which has met twice-monthly for the last hundred years, and today enjoys a world-wide membership. Appropriately, the Club's President in this centenary year is Professor George J. Cunningham, M.B.E., who occupies the Chair of Pathology at the Royal College of Surgeons.

The principal event to mark this occasion will be a two-day celebration meeting and exhibition of microscopy, which will be open to visitors. This will be held at the Central Halls, Westminster, S.W.1. on 8th. and 9th. October. The theme of the meeting will be two-fold. First to illustrate the founding and history of the Club, and secondly to present a survey of present-day microscopy and microscopical equipment in science and industry, in addition to its recreational aspects. Demonstrations of films, slides, and micro-projection will also be staged throughout the two days.

## PUBLICATIONS

FOSSILS: A Little Guide in Colour - published by Paul Hamlyn, London, price 5/-  
An attractive and well-produced paperback, very good value, includes illustrations and descriptions of many fossil molluscs.

KINGFISHER: A journal containing news and comment about wildlife conservation from home and abroad, will appear 9 times a year, at intervals of about 5 or 6 weeks, price 15/- for 9 issues, Kingfisher, 1 Bedford Court, Bedford Street, London, W.C.2.

CHARLES DARWIN & HIS WORLD; published by Thames & Hudson Ltd., 30 Bloomsbury Street, London, W.C.1., in their Pictorial Biographies Series.  
Price 25/-, by Julian Huxley and H. B. D. Kettlewell.

CONE SHELLS OF THE WORLD; by J. A. Marsh & O. H. Rippingale, price £ 5. 3. 0.  
Nearly 500 species represented in the 22 colour plates. Claimed to be the first work on the 'Cones' for over 80 years.

QUEENSLAND AND GREAT BARRIER REEF SHELLS; by D. F. McMichael & O. H. Rippingale price £6. Dr. McMichael is Curator of Shells at the Australian Museum in Sydney. 29 colour plates.

This and the previous volume are published by The Jacaranda Press Pty. Ltd., 73 Elizabeth Street, Brisbane, Australia.

INFORMATION WANTED: Mr. A. A. Hicks, [REDACTED] Glamorgan, is interested in collecting 'dead' shells on beaches and would like to know of any well-known shell beaches and what can be expected there. Also what type of beach is most suitable for shell collecting. Any correspondents please?

### REPORT OF FIELD MEETING HELD MAY 1st. AT GUIDE BRIDGE, LANCASHIRE

A field meeting was held on May 1st. to study the molluscan fauna of some canals in north-west England, especially the complex of canals around Manchester. Seven members of the Conchological Society and three visitors met at Guide Bridge Railway Station, to the east of Manchester, and the refinding of Bythinella scholtzi (A. Schmidt) (= Amnicola taylori) was the special objective. It is pleasant to record that it was found by Mrs. Fogan to whose enthusiasm the meeting was due.

First the Ashton Canal eastward from Guide Bridge Railway Station to Tudor Bridge (about  $\frac{2}{3}$  of a mile) was examined, and the following spp. were taken; Bithynia tentaculata (L.), apparently scarce; Lymnaea peregra (Müller), not very common; L. stagnalis (L.), frequent, of all sizes; Physa fontinalis (L.), fairly frequent, with extraordinarily thin shells; Planorbarius corneus (L.), fairly frequent; Planorbis planorbis (L.), very common; P. vortex (L.), a few; P. albus Müller, 2 or 3; Segmentina complanata (L.), one (coll. Mr. Edwards); Acroloxus lacustris (L.), a few; Succinea pfeifferi Rossmässler (one, coll. Dr. Millott); Sphaerium corneum (L.), fairly frequent, both adults and infants; Pisidium sp.

Curiously, none of the characteristic 'canal' species (Physa heterostropha Say, Menetus dilatatus (Gould), and Sphaerium transversum Say), obtained by Dr. Jackson in this part of the Ashton Canal in 1917 was refound despite careful search.

A strip of very grimy waste ground beside the canal yielded Discus rotundatus (Müller), a few; Oxychilus alliarius (Miller), one; Retinella nitidula (Drap.), a shell (coll. Mr. Ogle-Skan), Zonitoides nitidus (Müller), four, and Milax budapestensis (Hazay), two (confirmed by Mr. Ellis).

Next, part of the Peak Forest Canal was searched, from Tudor Bridge (where it joined the Ashton Canal) to John Hall's Brickyard in Dukinfield. This canal appeared extremely foul, with an iridescent scum on the water and an attenuated flora, yet the following Mollusca were taken; Bythinella scholtzi (A. Schmidt), about a dozen were obtained in a moss Fontinalis sp. on the canal-side and one or two also on the grass, Glyceria maxima; Bithynia tentaculata (L.), Lymnaea peregra (Müller), Planorbium corneum (L.) and Sphaerium corneum (L.).

Of the above localities, the Ashton Canal is in Lancashire, the Peak Forest Canal in Cheshire.

It is planned to investigate more of the canals in N.W. England and anyone who would like to join us would be welcome.

N. F. McMillan

#### FIELD MEETING AT PEGWELL BAY, KENT

Director: June Chatfield

The field meeting to Pegwell Bay on 16th. May 1965 was attended by thirteen members and friends and film cameras, the object of which was to collect marine mollusca from the strand line, the sandy flats and the Spartina (Cord Grass) salt-marsh. The damp and cold weather with a strong onshore wind kept the tide in for much of the time and a good survey of the sandy flats was not possible, nevertheless an interesting list of marine molluscs was obtained.

The following dead shells were represented on the strand line:-

Emarginula reticulata Forbes and Hanley, Diodora apertura (Montagu),  
Patella vulgata Linné, Calliostoma zizyphinum (Lamarck),  
Gibbula cineraria (Linné), Cantharidus montagui (W. Wood),  
Littorina littorea (Linné), L. saxatilis (Olivi), L. littoralis (Linné),  
Rissoa parva (da Costa), Rissoa sp., Crepidula fornicata (Linné),  
Natica catena (da Costa), Trivia monacha monacha (da Costa),  
T. monacha arctica (Montagu), Nucella lapillus (Linné),  
Ocenebra erinacea (Linné), Neptunea antiqua (Linné),  
Buccinum undatum Linné, Nassarius reticulatus (Linné),  
N. incrassatus (Ström), Nucula nucleus (Linné), Mytilus edulis Linné,  
Chlamys varia (Linné), Cardium edule Linné, C. echinatum Linné,  
Venerupis pullastra (Montagu), Tellina tenuis da Costa,  
Macoma balthica (Linné), Scrobicularia plana (da Costa).

The shells on the strand line represent several different populations which have been brought to the shore with the incoming tide. The species in the above list includes species typical of sandy or muddy shores, e.g. Cardium edule, Macoma balthica and Natica catena and also molluscs typical of rocky shores or rocky bottoms in the sublittoral zone below the low tide, e.g. Patella vulgata, Gibbula cineraria, Littorina spp., and Mytilus edulis. Some of the species are very well represented on the strand line and this would suggest the presence of populations of these species in the vicinity. However, on account of local currents and east-west drift of shingle one must be

cautious in interpreting strand line data.

Due to the weather and tide the sandy flats could not be fully investigated, but it was noted that Cardium edule and Macoma balthica occurred.

The Spartina salt-marsh at the top of the shore west of Pegwell Bay was also investigated and the salient feature was the abundance of the small prosobranch Hydrobia ulvae (Pennant) (Length of 4-5 mm.). This species of mollusc is the primary host of several different larval flukes. Shells of the mud-dwelling bivalve Scrobicularia plana were present, but unfortunately no live specimens were taken.

Summarising the results of the day, the shore at Pegwell Bay is essentially a muddy sand with a molluscan fauna consisting largely of bivalves. At the top of the shore the muddy Spartina salt-marsh harbours few species of molluscs, but Hydrobia ulvae is to be found in vast numbers. The Spartina is colonising new areas of sand and mud deposition follows colonisation, thus the habitat is not static and a survey of the mollusca of this area at various times in the future may well show a change from a sandy fauna to a muddy fauna. Some dredging would be very useful to study the fauna offshore.

Towards the end of the day a short visit was made to some habitats near Deal. An essentially fresh water ditch yielded only Potamopyrgus jenkinsi Smith, and the thick mud of some brackish creeks proved completely barren. An area of established hind dunes proved of interest botanically, an outstanding feature being the local Green-winged orchid, Orchis morio. A few land snails were also collected on the dunes.

I must thank some of the members for sending their lists of species and also Dr. Llewellyn Jones who kindly transported the larger part of the party from Pegwell Bay to Deal and Dover by car.

J. E. Chatfield

NOTE: The names of the molluscs essentially follow Winckworth, but with a few modifications.

WINCKWORTH, R. (1932) The British Marine Mollusca. J. Conch. 19, (7), 211-252.

STOP PRESS

ADDITIONS TO LIST OF SPECIES TAKEN AT THE GUIDE BRIDGE

FIELD MEETING ON 1st. MAY 1965

The following species of Pisidia have been determined by Mr. A. W. Stelfox:

Pisidium milium Held

P. subtruncatum Malm

P. hibernicum Westerlund

P. nitidum Jenyns

P. pulchellum Jenyns