Mosquitoes. Australian Encyclopedia. 7:41-42.

*Mosquitoes* is copyright by Elizabeth N. Marks 1983.

Permission has been granted by the State Library of Queensland and the executors of the estate of Dr Elizabeth Nesta Marks for display of *Mosquitoes* on the SERF website.
THE
AUSTRALIAN
ENCYCLOPAEDIA

VOLUME VI

MARSUPIALS
TO
PARLIAMENT HOUSES

THE GROLIER SOCIETY OF AUSTRALIA
SYDNEY
HUGH MOSMAN, son of Archibald, was born in Sydney and educated at The King's School, Parramatta. He went to Queensland in 1860 to explore the country and acquire properties. In these plans he apparently did not succeed, and he spent the next 10 years mining gold in various localities, including the Orange district of New South Wales. He revisited Queensland in 1870 and engaged in gold-prospecting in the north. There, early in 1872, an aboriginal youth in his employ stumped upon an outcrop of gold while seeking horses that had stampedede during a storm, and this spot developed into a rich field. The aboriginal, known as Jupiter Mosman, was later educated at Mosman's expense and became a respected figure in the town, Charters Towers (q.v.), that was built in the area. Mosman, on his part, was rewarded by the Queensland Government with a grant of £1000 and a number of claims, and subsequently he established several rich mines and did much to further the interests of the town. Later again he was for several years a member of the Queensland Legislative Council. A daughter of his married in 1879 Sir Thomas McIlwraith, then Premier of Queensland.

The Queensland town of Mossman (q.v.) and the neighbouring Mossman River were named after one or other of the Mosmans, but it is difficult to ascertain which.

MOSQUITOES, insects of the family Culicidae, order Diptera. These flies are characterized by an elongated proboscis, the length of which is approximately equal to that of the head and thorax together, and by the presence of scales along all the veins of the two wings. All mosquitoes pass from eggs through a larval (wriggler) stage and a pupal (tumbler) stage in water before becoming adult. Water is essential for the development of the immature stages and most types of still or even gently moving water may be utilized by various species as breeding grounds.

The fact that individual species may be restricted to certain types of water is important in their control. Broadly, the most important classes of breeding grounds are: (a) domestic, that is water in tanks, roof gutters, discarded water-holding rubbish, septic tanks and domestic drains; (b) brackish-water marshes; (c) freshwater swamps and particularly their margins, and (d) temporary small pools in creeks, roadside drains and other depressions.

Most larvae feed indiscriminately on any minute particulate matter (algae, bacteria) in the water, but those of a very few species are predatory on other larvae or even cannibalistic.

Only the adult female is blood-sucking and there is at times a strong predilection for the blood of certain types of vertebrate animals to the exclusion of others.

Certain species of mosquitoes are responsible for the transmission of disease; for example some species of Anopheles transmit malaria, others of the genus Aedes both yellow fever and dengue fever, and species of Anopheles, Mansonia and Culex transmit filariasis. Other mosquitoes not incriminated as vectors of disease are well known as household and bushland pests.

In Australia some 125 species of mosquitoes, included in 17 genera, have been recorded. For the whole of the Australasian region these figures are respectively almost 400 and 21. Amongst these, the disease-carrying and pest species are relatively few in number although individual species attain large populations. The most important species in Australia are the following:

Culex fatigans is the commonest household mosquito occurring throughout Australia. It breeds in domestic situations and is particularly abundant in polluted water. The adults bite at night and often shelter in dark corners and cupboards in the house during the day. It is a proven vector of periodic filariasis.

Aedes aegypti is another domestic species occurring throughout those parts of Australia north of the Hawkesbury River and Culcairn in New South Wales and Perth in Western Australia. It has not been recorded from Victoria, South Australia or Tasmania. In Australia A. aegypti is the proven vector of dengue fever; in South America and Africa it transmits yellow fever. Unlike C. fatigans, A. aegypti breeds in clean water or in water polluted by leaves, but not in foul water. In New Guinea a closely related species, Aedes scutellaris, is the dengue-fever vector. This species also breeds in clean water, especially that held in half coconut shells.

Aedes vigilax, Culex sitiens (both found in New South Wales, Queensland, the Northern Territory, and Western Australia) and Aedes camptorhynchus (in Tasmania, Victoria, and South Australia) are all species that commonly breed in brackish marshes. They all have a greater range of flight than most other species and may cause annoyance up to 5 miles from their breeding grounds.

Anopheles annulipes is the most widespread anopheline mosquito in Australia, occurring in all States including Tasmania. It is responsible for the occasional sporadic indigenous cases of malaria in southern States, where other more important malaria vectors do not occur. It breeds in ground pools, rock-pools in mountain streams, dams, and swamps, and occasionally in brackish water.

Anopheles punctulatus farauti is the most dangerous malaria vector known to occur in Australia, but is confined to the area ranging from just north of Townsville across to the northern part of the Northern Territory. This and the closely related Anopheles punctulatus punctulatus are the dominant and most widespread vectors of malaria.
throughout New Guinea and adjacent islands, and are in part responsible for the transmission of filariasis in this area.

An outbreak in humans of a virus encephalitis (now called Murray Valley encephalitis) in the Goulburn and Murray river valleys of southern Australia in 1951 drew attention to mosquitoes in areas where they had not previously been considered of any importance as vectors of disease. This virus, which has as its reservoir certain wild birds, particularly water-birds, is also transmissible to dogs, horses and fowls. The disease is thought to be mosquito-borne, although the actual vector species have not yet been proven. Probably a number of species are responsible for the transmission of the disease from bird to bird, from birds to domestic animals, and from domestic animals or poultry to man. One of the domestic mosquito species is most likely to be the vector to man.

Since 1950 mosquitoes have assumed a role of great importance in all the rabbit-infested areas of Australia as the primary vectors of myxomatosis among rabbits. These animals are consistently attacked by such species as *Anopheles annulipes*, *Culex pipsiens australicus* and *C. annulirostris*, all of which are important myxomatosis vectors. In environments where these species are not abundant, *Aedes queenslandis* and *Aedes alboannulatus* may assume the role of major vectors. (See also Rabbit.)

Mosquito Control. The control of mosquitoes may be embarked on either to control or eradicate a disease for which they serve as vectors or simply to alleviate the nuisance caused by their biting. Much attention has been given in the past to the reduction of malaria vector populations as a means of controlling the disease. Recently some emphasis has been placed on complete eradication with the object of eliminating the disease from particular areas, such as Cyprus and Sardinia. Classical mosquito control embraced both drainage for breeding-ground elimination and periodic treatments of breeding grounds with oil or paris green. Other measures, termed "naturalistic", effected various alterations in the breeding areas in order to make them less satisfactory for the development of the species that it was desired to control.

All these methods are still employed but have to some extent been replaced by the use of newer insecticides, particularly DDT, but also BHC (benzene hexachloride). Individual protective measures such as the screening of houses and the use of bed nets and repellent lotions are also common. In some areas the use of DDT or BHC as residual insecticides periodically applied in the form of sprays to dwellings is showing promise as a means of reducing the incidence of malaria. The success of such a measure depends largely on the particular habits of the vector concerned.

The recent development of better machinery for the application of sprays and dusts, combined with the efficiency of insecticides such as DDT, has made possible the general control of mosquitoes in heavily infested areas where their importance is not primarily connected with the incidence of disease.

Biological methods of control, such as the use of larvivorous fish, although still useful, have not proved a solution to the mosquito problem, particularly because they cannot take account of temporary breeding grounds. With one exception those mosquitoes that are predatory on others, for example *Aedes alternans*, commonly known as the "Scotch" or "Hexham grey", are themselves pests in the adult stage. The exception is the genus *Toxorhynchites*, in which the larvae devour those of other species and the adult is not blood-sucking. Unfortunately, the level of population maintained by these mosquitoes is too low to affect appreciably general mosquito abundance.

(See also Tropical Medicine.)

D.L.

MOSS, Alice Frances Mabel (1868-1948), social-welfare worker, daughter of John A. Wilson, was born in Ballarat, Vic., on 24th April 1868 and educated at the Presbyterian Ladies' College, Melbourne. She married I. H. Moss in 1887. In her life of 80 years she was associated with numerous organizations engaged in social service work, and in many of them she was an office bearer. Her first association with public affairs was political. In 1906 she was appointed a member of the executive of the Australian Women's National League (Victoria), holding the office of vice-president until her retirement in 1914. During World War I she was the only woman member of the State Recruiting Committee. She became a member of the board of management of the City Newsboys' Society (see Youth Movements) in 1906, and worked for that society until her death.

Mrs Moss was appointed Australian alternate delegate to the League of Nations Assembly in Geneva in 1927, and in the same year she attended several other assemblies abroad as an Australian delegate, including a conference of the International Council of Women and the first World Population conference (both at Geneva), and the first Women's Peace Study conference (Amsterdam). In 1927 she was also a member of the executive of the League of Nations Union in Paris. She was an accredited delegate to a conference on the Nationality of Married Women at The Hague in 1930, and Victorian delegate to a congress of the International Council of Women in Vienna during the same year.

In 1928 she became first Australian vice-president of the International Council of Women, and she was also president of the National Council of Women of Victoria (1928-38), first president of