Biography of Peter Frederick Mattingly

Dr. Peter F. Mattingly was born at Walton-on-Thames, Surrey, on November 21, 1914. He was educated at a preparatory school in Sussex and at public school (Repton) in Derbyshire, where he was on the classical side. He left shortly before his sixteenth birthday, matriculated, was articled to his father, a solicitor, and studied at law school. In 1934, he realized his true vocation and applied to study zoology at London University. He was accepted with some hesitation, his only science at that time being self-taught, but obtained a first class honors degree and a college research scholarship in 1937. His Ph.D. thesis was on amphibian endocrinology. He was awarded a university travelling scholarship to finish it in New York in 1939, but the war intervened. He was given a D.Sc. degree for published work in 1963.

For the first year of the war he was on the scientific reserve and supported himself and his wife by grammar school teaching and university extension lectures. Both enlisted in 1940. After spells in the infantry and the Intelligence Corps, he was commissioned as a lieutenant in the Royal Army Medical Corps and posted to No. 7 Malaria Field Laboratory. This was responsible for large scale drainage around the R. A. F. staging posts at Apapa in Nigeria and Takoradi in Ghana and for various outstations in both territories. He was concerned mainly with the latter apart from a spell at Takoradi. His first paper, incorporating new material and new records of *Anopheles* was written on leave in 1944.

After the defeat of Germany, the Rockefeller Foundation applied for his transfer to the newly established Yellow Fever Research Institute at Yaba, Nigeria. Administrative difficulties were overcome by transferring him to the Colonial Medical Service and seconding him to the Foundation. He was discharged with the rank of major and transferred on January 1, 1945. While with the Institute he carried out transmission experiments with Yellow Fever virus, publishing a short note on this and on responses of *Aedes* and *Culex* to different blood fractions. Most of his work was done, however, at a field station at the head of Lagos Lagoon where he organized continuous 24-hour mosquito catches at different heights in the forest.

Failure of the biting cycles to match changes in light and other physical conditions led him to suggest that an internal clock might be involved. To check this he asked that the Foundation should supply a suitable sound recording apparatus. This was provided but arrived only after he had left the Institute. It was left to others to perform the necessary experiments which gave clear evidence of an innate circadian rhythm in *Aedes africanus*, the first to be demonstrated in mosquitoes. The technique has remained in use right up to the present.

On his return to England on leave in 1946, he was invited to apply for a post at the British Museum (Natural History). He did so and was provisionally accepted. His appointment, as Senior Scientific Officer, was finally confirmed in 1949. His new tasks were varied in the extreme, some a challenge, others an education. An example of the latter was the checking of the key to pupae in

De Meillon's Anophelini of the Ethiopian Region prior to its publication in 1947. This was his introduction to pupal taxonomy. Equally welcome were contacts with others who, like himself, were at the start of their careers. Activities such as checking their material or searching the literature on their behalf were often of as much benefit to himself as to them.

Among other activities the one which most influenced his later career was the reference service which he provided for local health authorities. It was this which first interested him in the status of *Culex pipiens* form *molestus*, leading him, when the opportunity arose, to tackle it at the international level by organizing a Royal Entomological Society symposium on the *pipiens* complex in 1950. This marked the beginning of his involvement with mosquito genetics.

His involvement in *Stegomyia* genetics also came about initially in connection with control. He had already made a plea for more mosquito genetics in the first of two papers on African *Stegomyia* published in 1952 when he became involved shortly afterwards with certain problems affecting the control of *Aedes aegypti* on the Kenya coast. He suggested that these might be due to the presence of both domestic and non-domestic or partly domestic populations distinguishable by certain color characters. On investigation both suggestions were confirmed. The need for taxonomic treatment was evident but he felt justified in undertaking this only in 1957, when he was asked to assist with the genetics chapter of Sir Rickard Christophers' book on *Aedes aegypti*. With this in mind he published two papers summarizing existing knowledge of the subject for Christophers to draw on. While preparing these he found that the species which Linnaeus named *Culex aegypti* was not in fact a *Stegomyia* but a common palearctic *Ochlerotatus*. Redescription and type designation then made a formal microtaxonomy inevitable.

In 1954, following a paper on mosquito genetics which he read at the annual meeting of the British Association for the Advancement of Science, he was made a member of the Genetical Society and of the committee of the zoology section of the Association. He later became recorder of the section with responsibility for its annual program. This gave him a welcome opportunity to press the claims of genetics and medical biology. Later he became a member of the Council and the General Committee of the Association.

Although alive from the first to the danger of resistance to chlorinated hydrocarbon insecticides he became involved with resistance genetics only in 1957 when he was an invited speaker in the opening discussion following a paper by Busvine at the Royal Society of Tropical Medicine. This led to his appointment a few months later as rapporteur to W. H. O. on mosquito genetics at the International Congress of Tropical Medicine in Lisbon. In his paper for the congress he covered not only resistance genetics but also genetical aspects of mosquito taxonomy and of insecticide avoidance. The latter subsequently came to interest him particularly and he explored it further in a contribution to the Annual Review of Entomology in 1962, and a chapter on behavior genetics in the W. H. O. monograph on vector genetics published in 1967.

Despite receiving every encouragement from the Museum to undertake such outside activities he was at pains to allow them to interfere as little as possible with conventional museum work. In the period leading up to the Lisbon congress he published some 30 papers on macrotaxonomy (several jointly) besides a complete updating of the first volume of Mosquitoes of the Ethiopian Region. He also established a worldwide range of contacts many of whom contributed valuable material to the Museum.

He joined the W. H. O. Expert Advisory Panel on Parasitic Diseases (General Parasitology) in 1955 and made his first contribution in the form of a paper on filariasis vectors in 1957. This was followed by a consultancy in Geneva to evaluate rumors of pullulations of *Culex quinquefasciatus* in urban centers. Baseline data were few but he was able to supplement them with an unpublished survey of his own in Kaduna, Nigeria, during the war when he failed to find *quinquefasciatus* at all though by 1960 it was present in densities of hundreds per room per night. This and a similar instance, in Freetown, Sierra Leone, reported in the literature, led him to submit an affirmative report. Shortly afterwards he joined the newly established W. H. O. Filariasis Research Unit in Rangoon, for six months, as consultant ecologist.

These activities, as well as several working papers and contributions to seminars in Geneva, were commissioned by the Vector Biology and Control Division of W. H. O. For the Malaria Division he visited 9 different African territories, as well as Madagascar and Mauritius, to report on evidences for behavior changes and infraspecific variation in *Anopheles*. He also contributed the chapter on taxonomy to the manual for malaria entomologists in Africa published by the W. H. O. Regional Office in Brazzaville.

Although his W. H. O. consultancies had related only to malaria and filariasis, he never lost touch with the arboviruses. From the time when he joined the Museum he maintained a card index of these on which he was able to draw when, in 1960, he organized a symposium on their evolution for the Royal Society of Tropical Medicine. It later proved indispensable when he had to provide a table of mosquito-borne viruses, their vectors, hosts and distribution for the Museum's Insects and Other Arthropods of Medical Importance published in 1973. By that time the number of known mosquito-borne viruses affecting man had risen from about twelve when the index was started to ninety. In the same year he covered Diptera in general in Gibbs' Viruses and Invertebrates.

Following on his two papers in the Museum Bulletin on African *Stegomyia* he published a joint paper with Ken Knight, in the same journal, on the mosquitoes of Arabia and from then on devoted his taxonomic work almost exclusively to the Oriental Culicinae. His six papers on the Indomalayan culicines were a B. M. special publication prompted initially by the admirable team of mosquito workers at the Medical Research Institute in Kuala Lumpur who provided much first class material for the Museum. The series had been intended to run to some thirty parts but a change of plans ensued with the break up of the team in Kuala Lumpur and the formation of the Southeast Asia Mosquito Project in Washington.

This project originated from the deliberations of a small committee, of which he was a member, at the International Congress of Entomology in London in 1964. He joined it as a consultant in 1968, and worked for it and its successor, the Medical Entomology Project, both in London and in Washington until he retired, publishing three papers in Contributions of the American Entomological Institute. The second of these was republished in French, at the request of the Office de la Recherche Scientifique et Technique Outre-Mer, and in the B. M.'s Insects and Other Arthropods of Medical Importance. While in Washington, he never missed an opportunity to visit colleagues in other parts of the U. S. A., and the hospitality he received on such occasions is among his happiest memories.

During his consultancy in Rangoon he studied the circadian oviposition rhythm in *Cx. quinquefasciatus* and was impressed by the selective concentration of infected mosquitoes to be expected at the oviposition site and their vulnerability during oviposition and the pre-oviposition resting period there. He contributed a paper on the subject to the First International Congress of Parasitology in Rome in 1964, where he was President of the Arthropod and Mollusc Division. This was published in abstract in Cahiers O.R.S.T.O.M. in 1965, and followed by a contribution to the second congress in Washington in 1970, and an unpublished report to the Medical Research Council in 1972.

His series of twenty-nine papers on egg morphology and bionomics, published in Mosquito Systematics, was similarly prompted by the extent to which he felt this stage in ontogeny to have been neglected. It led him, among other things, to the discovery of only the second eukaryotic mosquito egg parasite so far known, a *Lagenidium*. He similarly combined taxonomy with bionomics in two papers in early numbers of the journal on the little understood phenomena of setal hypertrophy and mouthbrush dimorphism in mosquito larvae. His last paper for the journal, on Australasian *Tripteroides*, was an adjunct to his third paper for S.E.A.M.P. and M.E.P. It enabled him to revise the whole genus at subgeneric level.

Much of the relevant material was collected by himself during an expedition to New Guinea organized by the Bishop Museum in 1965. On previous occasions he had always taken advantage of such opportunities to visit colleagues en route, notably in Israel, Iran and India, on flights to and from Burma. This time he collected in Queensland with Pat Marks, who also accompanied the expedition. On the way home he visited Canberra, Sydney and Melbourne, collected with Francisco Baisas in the Philippines, visited colleagues in Bangkok, stayed with Harry Hoogstraal in Cairo and the Coluzzi family in Monticelli and ended at a siminar in Geneva. In all, he visited more than forty countries in the course of his career.

He has a great love for Italy, and when invited as a guest speaker to the Italian National Congress of Parasitology, in Perugia in 1970, took pleasure in reading his paper in Italian as a tribute to his hosts, translating it into English for publication in Parassitologia. In his book The Biology of Mosquito-borne Disease, published in the previous year, he had taken as his basic theme the concept of mosquito-borne diseases as ecological systems.

Whishing to explore further the evolutionary aspects of this concept he concentrated at Perugia on the evolution of the vector. Then, finding this unrewarding, he concentrated instead on some basic principles affecting the evolution of the parasite-vector system. He discussed these in two further papers in Parassitologia. Then in the last paper he published, a contribution to an international Darwin Centenary Symposium held at the B. M., he reviewed the whole range of Haemosporidia and their vectors and introduced for the first time the palaeontology of the vertebrate hosts. This enabled him to arrive at a plausible reconstruction of the primitive malarial ecosystem and to adduce some cogent evidence as to relationships between the mammalian hosts. This paper was in greater demand than any other that he wrote with requests for reprints from workers in at least a dozen different disciplines.

He particularly values his friendly relations with the medical profession. (He claims to be the only entomologist ever to be invited to dinner at the Cosmos Club by the alleged arch-entomologistophobe Fred Soper.) It was a very special pleasure to him to express these feelings when he was asked to propose the health of the Royal Society of Tropical Medicine and Hygiene at its seventy-fifth anniversary dinner in 1982.

In the same year, three years after his retirement, he joined the newly formed Social Democratic Party, campaigning for it in the elections in various parts of the country which led to its successful establishment. He also formed a small group in his own village. He has had a lifelong interest in Art History. Other interests include book collecting, classical music, gardening, village activities and his micro-computer. He undertakes occasional scientific work but no longer more than one job at a time.

He and his wife, Christine, were married in 1939. They have three children and six grandchildren. Their elder daughter, Elizabeth, married a farmer. Their son, Stephen, a physicist, gained a scholarship at Cambridge and works at the Meteorological Office. Their younger daughter, Margaret, has a biology degree and teaches.

LIST OF PUBLICATIONS

On Mosquitoes

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