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CAPE MAY-FLIES

By A. Cecil Harrison

Introduction

IN the first place, let us clear the air of any confusion of terms.

The classical Mayfly or May Fly of British anglers (*Ephemera vulgata* of Linnaeus) had given its scientific name to a whole Order of Insects which are distributed all over the world, the Ephemeroptera. Therefore, in common parlance, it seems only reasonable to refer to the whole group by the name of its best-known representative. Opposition to this practice has come mainly from British anglers of, dare we say?, the purist type, to whom there is only one May Fly. The term "Day-flies" has even been suggested to embrace the Order, but this has not been adopted. In any case, these insects are not so short-lived as the ancients took them to be. No doubt it was the adult flies which were thought to be literally ephemeral (the aquatic nymphs may live for anything from several months to two or three years), but by keeping them in captivity it has been proved that the perfect insect may survive for much more than one day.

As a concession to the purists, and following the lead of the Rev. A. E. Eaton ("Revisional Monograph of Recent Ephemeridae or May-flies," 1883-88, Trans. Linnaean Society, London) and Dr. K. H. Barnard (1932), the hyphen is inserted in "May-flies" to imply the whole Order, which includes the tiniest dun and its spinner, as well as the May Fly itself, and its even larger relations.

There are no true May Flies in the restricted sense in our Cape waters, but there are a good many members of the Order in the wider sense.

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From the point of view of the fly-fisher who is imbued with angling tradition and lore, the May-flies are the basis of the art. They are also one of the most interesting items on the trout's bill of fare. May-flies are entirely aquatic, except for the last short phase of their existance, and the larval stages are always present in the trout streams. In this Order, all the feeding is done in the larval or nymphal stages in the water. The fully-fed nymph comes to the surface, or crawls out, and transforms into the first adult stage, or subimago. (In some cases it will be shown that the emergence of the subimago from the nymphal shuck may even take place underwater.) The subimago stage lasts for only a short period, and then a final moult takes place, and the perfect insect or imago is revealed in all its fragile beauty. The adult May-flies do not feed at all. To quote Eaton: . . . "the mouth-organs are atrophied . . . the alimentary canal is capacious, straight, and filled with gas, and apparently destitute of salivary glands." The adults have a purely reproductory function, a gay dance over the water, culminating in the large species with the mere dropping of the eggs into the water by the female—although she has been known to be deceived by a wet tarmac road! In some smaller species the female crawls down a protruding rock, reed or bank, and deposits her eggs in patches under water—which has led to the use of "fly-boards" in the endeavour to produce better "hatches of duns" in the chalk streams of southern England. May-flies have a high nutritive value for the trout—and for generations anglers of the "exact imitation" school have been striving to delude him with their versions of the nymph, dun and spinner.

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The writer began to take interest in Cape May-flies about twenty years ago, as a by-product of angling and the study of the food of trout, and primarily in the Groot Drakenstein district. Although the Order was quite obviously well represented, it was notable that the common kinds had received so little attention from anglers that not a single local name had come into use. It was even more remarkable to find that they had had but slight attention from science.

In fact, one got quite used to hearing suggestions from anglers that our angling and our trout food supplies might be improved by the importation and planting of the eggs of the May Fly and various "duns"—when all the time the stones under their waders were swarming with the nymphs of our indigenous species! To some extent, excuses can be found for such lack of observation, as many of our Cape May-flies "hatch" (i.e., transform from the nymph) by night, and mass emergences and flights of the larger species are not at all common.

The lack of recorded knowledge of May-flies in 1929 was not confined to the Cape, but applied to the whole of South Africa. The doyen of the specialists on the Ephemeroptera, the Rev. A. E. Eaton, had visited Cape Town in 1874 as a port of call. He described a single specimen which he found "floating on a streamlet at the Platteklip, on Table Mountain. The nymph was vainly sought for in the haunts of *Telphusa*, the disuse of the net may have caused the failure." (*Telphusa* was the freshwater crab, now known as *Potamonautes*.) Had he picked out stones from the deepest pool he could find he might have surprised the coveted nymph; for his discovery was *Atalophlebia tabularis* (now known as *Aprionyx tabularis* (Eaton)), the "April Dun", one of the largest species occurring at the Cape. He also found a single drowned specimen of the little Cape Cain-fly (*Austrocaenis capensis*, Barnard), but did not describe it. He recorded only four described species of South African May-flies in his great Monograph. Two Continental specialists, working only on dried specimens from the South African Museum (some collected by Dr. Barnard on mountain expeditions), had added ten more species which are still recognised. In this total were included some large and showy May-flies collected in Zululand—the fringe of sub-tropical forms. But they were all adults, and not a single May-fly nymph had been described from south of the Zambesi. Only eight of the species recorded as adults had come from the Cape.

Dr. K. H. Barnard, of the S.A. Museum, Cape Town, a specialist on the classification of fish, crustacea and aquatic invertebrates, was, fortunately, also an active mountaineer and an ardent collector in the field. In addition to his extensive publications in the Annals of the S.A. Museum, Dr. Barnard was engaged in the collection and classifying of material for his series of reports on the Fauna of the Mountain Ranges of the Cape Province, contributed to the Transactions of the Royal Society of South Africa. (1, "A Study of the Freshwater Crustacea," vol. xiv, 1927; 2, "A Study of the genus *Colophon*" (beetles), vol. xviii, 1929; 3, "The Cape Alder-flies," vol. xix, 1931.)

The writer was so enthralled with the subject of the Cape May-flies—an almost unopened vein of wealth of interest—that his satisfaction can be understood when Dr. Barnard agreed to make their study his fourth task in the Royal Society series, and suggested collaboration in collecting and in the aquarium work of "breeding" adult May-flies from nymphs, so that the aquatic and aerial stages could be definitely correlated.

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The position in 1929 was that only 16 species of South African May-flies were known to science—and that even these were but partly described, as none had been linked with their larval forms. It was evident that extensive research in inland waters and aquarium experiments were a prime necessity. As it turned out, some of the latter took about six months to complete, as most of the larger Cape May-flies go through an annual life-cycle, and the adults appear at different seasons of the year.

The writer's angling diary began to sound a new note in October, 1929. Entries of preliminary descriptive names and cryptic numbers referred to new forms of May-fly nymphs as they were brought to light—a sort of a code adopted by Dr. Barnard and himself in the early stages of the job. The collection of material went on for two years, and the significance of the numerous forms and their true affinities were gradually disclosed. Dr. Barnard gathered in a

great deal of material from the mountain streams all over the south-western Cape. The writer worked mainly on the trout streams: the Eerste, Lourens, Berg, Dwars (Groot Drakenstein), Wemmer, Witte, Smalblaar, Holsloot, Hex and Upper Breede (Ceres); but as time went on the trout waters had to be abandoned on occasions for collecting excursions to the lower levels of the rivers and to ponds and lakes. Living nymphs were brought back from all the collecting grounds for "breeding out" when they were nearly ready to transform, and in some cases quite young nymphs were fed and reared to maturity in tanks. By this process 18 species of May-flies were correlated with their aquatic forms in the writer's tanks.

Fresh specimens were obtained of nearly all the Cape species which had been partly described by the previous workers, and the diagnoses of several were completed; and Dr. Barnard named a number of new species of May-flies and some new genera. Dr. Barnard's paper, "South African May-flies (Ephemeroptera)," was presented at a meeting of the Royal Society of South Africa in Cape Town on June 17th, 1931, and published as part iii of volume xx of the Transactions in 1932. This paper brought the total number of South African May-flies up to 38 species (more than double the number previously known—including those recorded from Natal and Zululand), and contained the descriptions of the nymphs of 22 species. (At that time the British Museum list for the British Isles covered 42 species of May-flies—K. G. Blair, "Entomologist," April, 1930.) Some 40 plates of figures of the insects were given, and, besides the systematic parts, there were a good many text references to the life history of Cape May-flies, and the ecology of the waters in which they are found.

It was a fascinating study, as the May-flies are creatures of unique interest to the reflective angler, as well as to the naturalist—and the "time taken off" from catching trout was never regretted. The writer fears, however, that his motives for so much "bug-hunting" in apparent connection with his trout fishing (the rod was usually there with the rest of the paraphernalia) were often misunderstood by stranger anglers—in a community where nothing but the artificial fly is legal, and where to look twice at a trustful grasshopper or to fail to avert the gaze from an adventurous earthworm is halfway to committing an offence!

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It was obvious, of course, that the results of two years of intensive collecting and study in the limited area of the south-western Cape Province could not produce the final word on the subject, and that the paper could be no more than a sounder basis for future work. Dr. Barnard published a second paper in Part 6 of Vol. XXXII of the Annals of the South African Museum in 1940. This gave a number of additional records and notes concerning the species listed in his previous work, and also the descriptions of three further new species and assigned another nymph from Natal.

Since then the study of May-flies in Natal and the Eastern Cape has been taken up with great thoroughness and skill by Mr. R. S. Crass, B.Sc. .He took full advantage of his residence in an area where "real May Flies", the subtropical burrowing Ephemeroids, were found, and has fully described these large insects in all their stages. His work on the smaller forms with stone-clinging and swimming nymphs was equally impressive. His aquarium work and study of the life history of these insects was far in advance of anything which the writer was able to undertake at the Cape. Mr. Crass's paper, "The May-flies (Ephemeroptera) of Natal and the Eastern Cape", in the Annals of the Natal Museum, Vol. XI, Part 1, January, 1947, was the first systematic investigation of the May-fly fauna of that region. Previously only 14 species were recorded from Natal and Zululand, and he brought the total up to 44, including the descriptions of 20 new species, together with 22 new nymphs.

The works of the earlier authors and of Barnard and Crass had resulted in 62 species of May-flies being described in South Africa.

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The writer's association with Dr. Barnard in the collection of the freshwater fauna of the Cape has been a long and happy one, and from May-flies it extended to caddis-flies, alder-flies, stone-flies and a host of other forms, and to the indigenous freshwater fishes. May-flies were the "first love", however, and as the writer accumulated many field notes and aquarium observations on these insects—which could only be briefly summarised in Dr. Barnard's papers—it is hoped to publish a series of short articles in subsequent issues of PISCATOR which may be of interest to anglers.

THE PAARL RESERVOIRS

By S. A. M. ATKINSON

THE news that the Paarl Municipality had declared the reservoirs on the Paarl Mountain open to fishing, and simultaneously had placed the control of this fishing in the hands of the Cape Piscatorial Society, was made public during the last week of February, 1949.

This news will be welcomed by all members, as these reservoirs will provide a new field for angling during the summer months when river fishing is at its lowest ebb.

Before dealing with the reservoirs in detail, a survey of the events leading up to the step taken by the Paarl Municipality will form a background to the present state of affairs, particularly in regard to the regulations now being administered.

Up to 1947 the water supply to the Paarl municipal area depended on two reservoirs situated on the Paarl Mountain, the larger being the Bethel reservoir, and the smaller the Victoria reservoir. Towards the end of 1947 the new Nantes reservoir was completed and brought into service. All three reservoirs are formed in natural valleys, and are mainly dependent on water pumped up from the Berg River, though in each case a fraction of their volume in dry weather is contributed by small perennial streams.

Details of the first introductions of fish are set out under the heading of Bethel reservoir, and at this point it will suffice to say that the initial stockings in the years 1930 and 1933 were with trout and largemouth bass respectively.

Early records of the society show that the trout survived, and that the largemouth bass grew well in the first few years. Later investigations showed, however, that there had been a considerable decline in the condition of the bass, and both the Inland Fisheries Department and the society were consulted with a view to improving the stock.

Reporting to the Paarl Municipality at that time on the state of the stock of bass in the Bethel reservoir, it was emphasised that overstocking was apparent, and that the only remedy was the reduction of the population of bass. This was not carried out, and nothing further was done until December, 1946, when a new approach was made. New samples of bass were obtained for examination, and a further deterioration was evident. At that stage the Paarl Municipal Council placed all their reservoirs at the disposal of the Inland Fisheries Department and the society for control and stocking.

During the ensuing period of investigation it was thought necessary to obtain regular specimens for examination, and in agreement with the Paarl Municipality five members of the committee of the society were deputed to fish the reservoirs under the supervision of the honorary secretary, Mr. A. Cecil Harrison.