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The Triassic insects of Denmark Hill, Ipswich, Southeast Queensland: the creation, use and dispersal of a collection

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ABSTRACT

Type and additional fossil insects from the Late Triassic Denmark Hill locality in Southeast Queensland, Australia, are held in the collections of the Queensland Museum (Brisbane), the Australian Museum (Sydney) and the Natural History Museum of the United Kingdom (London). The history of these collections shows that they were the product of a concerted effort in the first two decades of the twentieth century to extract the fossils by Benjamin Dunstan, Queensland's Chief Government Geologist, and to describe the fossils by Dunstan and Robin Tillyard, the foremost Australian entomologist of the time. They collaborated closely to document the late Triassic insects of Australia, at the same time as Dunstan carefully curated and organised both the official government collection of these insects for the Geological Survey of Queensland, and his own private collection. The death of the two men in the 1930s led to the sale by his widow of Dunstan's private fossil collection (including type and type counterpart specimens) to the British Museum, and the donation of Tillyard's by his widow to the same institution, in addition to some material that went to the Australian Museum. This paper documents the locations of all of the published specimens. The history of the Denmark Hill fossils (a site no longer accessible for collection) highlights the problems for researchers of the dispersal of holdings such as these, and in particular the separation of the part and counterpart of the same insect fossils. It also raises ethical questions arising from the ownership and disposal of private holdings of important fossil material collected in an official capacity.

❑ *Mesozoic, palaeoentomology, Ipswich Coal Measures, Goodna, Duaringa, Tertiary.*

The Triassic insects of Denmark Hill in Ipswich, Southeast Queensland, were first discovered in the 1880s and described in a series of papers, mainly in the period 1916–1923. At that time they represented one of the most important Triassic insect faunas then known and because of their significance they attracted the attention of Robin Tillyard, a leading entomologist of that time.

In order to assist researchers studying this remarkable body of early fossil insects, this paper documents how the fossils were discovered, collected and curated, and then disposed of, and where the described specimens are now held.

This is also a story of three men – John Simmonds, an amateur naturalist, Benjamin Dunstan, Queensland's Chief Government Geologist, and Tillyard, who documented these fossils -- of the remarkable ten-year collaboration between Dunstan and Tillyard to bring these insects to the attention of science and the public, and of the vagaries of fate that led to their dispersal in the 1930s to three institutions in Australia and Great Britain.

The paper also highlights ethical questions relevant to public collections. The fossils had been collected primarily by Dunstan, they were in his care in his role as Queensland's Chief Government Geologist, but most of them

left Queensland as part of Dunstan's private collection. A small, but significant, private collection of John Simmonds also ended up as part of Dunstan's personal collection and was sold to the British Museum (Natural History).

RESEARCH APPROACH

This study arose because of the regular demand by researchers to access, at the Queensland Museum (QM) in Brisbane, a collection of Late Triassic fossil insects from Ipswich near Brisbane, first collected over 120 years ago. It was recognised that not all of the specimens were present at QM, nor was it clear where the other material might be located. The insects held at QM had been part of the original collections of the Geological Survey of Queensland (GSQ), which were amalgamated with the QM in 2003.

Research led the author to make enquiries of the Australian Museum (AM) in Sydney about their holdings of Denmark Hill fossils, the National Library of Australia (NLA) where Dunstan's papers had been copied and retained, and the National History Museum in London (NHMUK), its Archives and fossil insect registers. Papers relating to Dunstan and Tillyard were obtained from the NHMUK Archives and, once it was clear that the NHMUK had relevant fossil material, the staff at that museum kindly provided copies of the registers from the 1930s which clarified their current holdings of Dunstan specimens. GSQ Archives, held at the Queensland State Archives and the Queensland Museum, further filled out the historical picture of the fossil collections.

This is therefore a study based on documentary evidence, much of it previously not accessed, and is not an analysis of the fossils or the insects themselves. The published specimens are arranged taxonomically, using Jell (2004), and incorporating more recent taxonomic changes (see Tables 1 and 2). Reference is also made in Table 2 to some Tertiary specimens from Queensland and Triassic insects from Sydney, which were described at the same time by Tillyard, and of which some became part of Dunstan's private collection.

J.H. SIMMONDS, STONEMASON AND PLANT COLLECTOR

John Simmonds was born in 1862 and moved to Brisbane from Victoria in 1880 with his parents. Apprenticed to his father in the family stonemasonry business, which was successful and widely known, he eventually took over in 1889 (Dowe 2017). The Simmonds business may well have taken the younger Simmonds to Ipswich. By 1881 the firm was advertising its services widely, including in Toowoomba and Rockhampton (*Darling Downs Gazette*, 1 August 1881; *Rockhampton Morning Bulletin*, 20 July 1881) and by 1888 an 8-gallon water filter jar was being made by the Dinmore Brick and Tile Company (in Dinmore, rich in shales and clays and also a fossil plant locality, close to Ipswich) using a dripstone filter made by the Simmonds company, and embossed with the "John Simmonds" name (Ipswich Art Gallery 2004).

Being a stonemason by trade may have attracted Simmonds to studying rocks and collecting fossils in his spare time, but not necessarily to his other interests in botany and plant collecting. It was a combination of these interests that led him, an enthusiastic amateur naturalist, to make known the fossil plants and insects of Denmark Hill. As a founding member of the Royal Society of Queensland (RSQ) in 1884, he later became the secretary of its Field Naturalists section. Dowe (2017) documents Simmonds' collections and the botanical specimens which he collected and which are now held in a number of Australian and overseas herbaria.

Fossil plants were also a collecting passion of Simmonds, it seems. He first donated a "collection of fossil plants, Denmark Hill" to the Queensland Museum in July 1882 (QM Donations Register 1882-87: 11), and he was a significant donor to the Museum thereafter for the remainder of the decade. What prompted him to visit Denmark Hill is not known, although Frederick Whitehouse records that "early in the eighties of the last century the wealth of beautiful plant impressions, preserved in the typical blue and grey shales of the area,

were attracting attention" (*Queensland Times*, 17 September 1929). Simmonds was clearly one of the early collectors there. Prior to Simmonds arriving in Brisbane there had been a number of reports which highlighted the presence of fossil plants in the Ipswich region (especially in relation to the coal measures), notably Gregory (1876, 1879), Daintree (1872) and Carruthers in the same report, and Feistmantel (1880). Tenison-Woods (1882 and 1883) and Jack (1886) published more detailed surveys on Queensland fossils and geology, and Shirley (1898) used the Simmonds collection in his work on the fossil flora of Queensland, as did Walkom and Dunstan in 1915.

Denmark Hill, now located in the centre of the city of Ipswich, was then on the outskirts overlooking the growing commercial and industrial town. The hill became a popular location for large residences, the Ipswich hospital was built on its lower slopes in 1860 and a water reservoir was constructed as part of new water supply infrastructure in 1878. Contemporary images of Ipswich show Denmark Hill as far less wooded than it is today, and geological formations would have been clearly visible (as they are today in certain parts) as GSQ photos reveal (Tillyard & Dunstan 1916, Plate 9). Coal mining operations (the City Colliery, later named Noblevale No. 6) began mining the Aberdare seam under the hill from 1912 and in later years shafts were dug higher up and began to despoil some of the fossiliferous formations (Whitmore 1991). As a result, by 1936 the GSQ regretted that "the Denmark Hill beds at Ipswich are no longer available as a collecting ground" (Queensland Museum, Geological Survey of Queensland Archives: 003/36-0032). The original fossil beds remain inaccessible today, as they are part of a public recreation reserve, buried under spoil from the coal mine which closed in 1952.

Simmonds' fossil flora collection was widely regarded as "beautiful" and "magnificent" by Etheridge (Jack & Etheridge 1892: 347, 387; Walkom and Dunstan 1915: 1), and "of the very greatest value" (Shirley 1901: 42). As we know from his donations to the Queensland Museum, Simmonds had been collecting plants from Denmark Hill and other Ipswich localities since at least 1882, although it is possible he renewed his collecting efforts after the President of the RSQ suggested (perhaps somewhat belatedly) in August 1888 that Mr Simmonds "might, with advantage to himself and the Society, turn his attention to the fossil plants to be found in the Ipswich coal beds" (*Brisbane Courier*, 18 August 1888).

In his quest for fossil plants Simmonds also discovered fossil insects within the same plant bed, and the "Simmonds Collection" of insects was formed. It is unclear exactly when Simmonds collected his first insects from Denmark Hill, but they were first described in 1890 by Etheridge and Olliff, who referred to his "zealous researches" (Etheridge & Olliff 1890). His contact with Etheridge and Olliff probably came through fellow Royal Society member, R.L. Jack, Queensland Government Geologist, with whom Etheridge was collaborating on the major publication, The Geology and Palaeontology of Queensland and New Guinea (Jack & Etheridge 1892), and which sought to document the palaeontology of these areas. Jack records that Etheridge "examined the beautiful Collection of Plants made by Mr. J.H. Simmonds, of Brisbane, in August 1890" and identified insect and crustacean (conchostracan brachiopod) remains. Because of their similarity in age to the NSW Mesozoic strata, these fossils were included in Etheridge's 1890 publication with Olliff, on the New South Wales Mesozoic and Tertiary insects.

The "Simmonds Collection" of fossil insects from Denmark Hill consisted of seven items, two of which included part and counterpart. Etheridge and Olliff illustrated all of them, and described one species (*Mesostigmodera typica*), while Handlirsch several years later (1908) re-described it and also named four other beetles: *Ademosyne minor*, *Ademosyne major*, *Pseudorynchophora olliffi* and *Etheridgea australis*. Despite its only consisting of a few specimens, the Collection was nonetheless the starting point for the later extensive work by Dunstan, Tillyard and others on the Late Triassic insects of Ipswich.

BENJAMIN DUNSTAN, GEOLOGIST

Born in 1864, Dunstan was the son of a Cornish miner from a goldmining settlement near Castlemaine in Victoria. He graduated from Sydney Technical College in geology and became a lecturer there, and also worked as a consulting geologist. He was appointed as Assistant Geologist to the Geological Survey of Queensland in 1897. His passion for collecting was perhaps a natural result of his upbringing, and while in Sydney he collected widely from the Sydney Mesozoic sandstones at St Peter's, notably fossil fish, insects and a labyrinthodont (Tillyard & Dunstan 1916; NLA 1990: 1098). Dunstan was promoted to Acting Queensland Government Geologist in July 1902, being confirmed in the position in 1908. He served as head of the Queensland Geological Survey until his retirement in January 1931 (Sanker 1981; Denmead 1956).

Dunstan's achievements as head of the GSQ were significant, particularly the publication of the comprehensive Queensland Mineral Index and Guide (Dunstan 1913), and his encouragement of mapping (including aerial photography), coal exploration and palaeontological work. The Denmark Hill story owes much to his zeal. Denmead (1956) considered 1914 as the "heyday of Dunstan's rule".

In the Annual Reports of the Geological Survey, Denmark Hill is first mentioned by Dunstan in his Assistant Geologist's report in 1900, covering activities of 1899. He made many visits to Denmark Hill accompanied by an assistant, Mr W.T. Wilcox, to study and collect from the site. The early GSQ registers record Dunstan as the primary collector of the Survey's Denmark Hill plant specimens (but these entries would appear to have been made around 1912). Simmonds provided advice on the locations, and further insect-bearing strata were identified. Insects found were passed on to the Queensland Government Entomologist, Mr Tryon, for investigation and description (Queensland Department of Mines 1900: 194; Queensland State Archives, ID269545 Letterbook March 1899 to November 1900: 663-4; Tillyard & Dunstan 1916, 1923).

As there are no publications or reports, it seems that Tryon did not complete any substantial work on this material. He was, in any case, primarily engaged in economic entomology and plant pathology, including insect control of prickly pear (Anon. 1929). The first descriptions of the Denmark Hill insects by Tillyard and Dunstan were published in 1916.

According to Denmead (1956), Dunstan was "an expert mineralogist and had a passion for gemstones". Because he had been a lifelong collector of geological and fossil material, on his death in 1933 a large personal collection was left for his widow to deal with, a process of negotiation and sale that took until the 1950s to finalise through his daughter. It was Dunstan's keeping of a carefully curated personal collection (the "Dunstan Collection" or, as he referred to it, the "B. D. Collection"), that resulted in the dispersal of the Denmark Hill insect fossils and much other material obtained through his work and that of the Survey, and through his connection as head of the Survey.

At the same time, it is important to note that Dunstan's personal collection of the Denmark Hill insects was a by-product of his collecting in an official capacity on behalf of the GSQ – he was already employed by the Survey when he first went to Denmark Hill. Despite his government role, he retained a private collection of many hundreds of Denmark Hill specimens including types, "co-types" or type counterparts, which should perhaps have deposited with the GSQ. These included the Simmonds Collection of insects, as there exist no records of their transfer to him or to the Survey. This practice continued throughout his time at the Survey, including his period as Chief Government Geologist, when he made further "campaigns" (as he called them) to collect at Denmark Hill, adding to both the official and private collections. It was obviously the habit of an expert enthusiast, who perhaps felt that he had gone above and beyond his official duties, given the considerable effort he put in (as detailed below). His private collection also contained a wealth of other Queensland and NSW fossils, minerals and gemstones.

ROBIN TILLYARD, ENTOMOLOGIST

Tillyard was a significant figure in the history of entomology in Australia, arguably the leading authority in this country in the early decades of the twentieth century (Evans 1946; Imms 1936). Born in 1881, an Englishman by birth, Tillyard came to Australia in 1904 after gaining a Bachelor of Arts at Cambridge University. He taught at Sydney Grammar School before undertaking entomological research at Sydney University, being awarded his science degree in 1914, and later gained a lecturing position there. He had a particular interest in dragonflies, but it was in September 1913 that he first contacted Benjamin Dunstan at the suggestion of Professor Edgeworth David of Sydney University (himself a professional colleague of Dunstan) to ask whether he might work on the Ipswich fossil insects. Dunstan readily agreed, sent by post a first batch of specimens, and thus began a decade-long collaboration between the two men that led to the publication of 12 papers from 1916 to 1924 dealing with the Mesozoic insects of Queensland, primarily those from Denmark Hill.

Tillyard was chief of the Biological Department at the Cawthron Institute in Nelson, New Zealand from 1920–28, followed by six years as head of the Division of Economic Entomology at the Commonwealth Council for Scientific and Industrial Research in Canberra (CCSIR, later known as Commonwealth Scientific and Industrial Research Organisation, CSIRO). He achieved recognition for his work at both institutions on the role of insects in biological control, and published his major text, *The Insects of Australia and New Zealand,* in 1926 (Tillyard 1926). Tillyard's prolific palaeo-entomological work on Australian, American and British fossils continued, later investigating the newly-discovered deposits of Triassic insects at Mt Crosby, near Ipswich (Tillyard 1936; Tillyard 1937; Queensland Museum, GSQ Archives GSQ-003 1936).

Tillyard's health problems were a source of great trial to him and his family throughout his professional life, impacting on his work. He was injured in a railway accident at Milson's Point in Sydney, 1914, which affected him severely thereafter, suffering from many ailments over the years. He succumbed to a nervous breakdown in 1933 which led to early retirement from the CCSIR the following year (Ward 2013). He continued to research and publish after his retirement, but died as the result of a car accident in Goulburn NSW, on 13 January 1937.

Upon his death, his research collection had to be dealt with, a task which fell to his widow Patricia, liaising with both the British Museum and the Australian Museum. The dispersal of the Tillyard Collection is discussed below.

COLLECTING THE DENMARK HILL FOSSILS

The Denmark Hill site is part of the late Triassic Blackstone Formation (Purdy & Cranfield 2013), from the Late Triassic (Norian) period (-227—208.5Ma). The fossils occur in bands of shale with fossil plants and lie between the Aberdare and Bluff coal seams, just below the Aberdare seam and associated conglomerates. Now part of a local public reserve (-27.622° 152.756°), the fossil-bearing shales are today covered over and inaccessible, so further collecting is currently not possible.

Although we have no records of the collection of fossils by J.H. Simmonds, other than those listed from "within a small area on Denmark Hill" (Shirley 1898: iii), Dunstan provided detailed notes on the location, collection and curation of his Denmark Hill material (Tillyard & Dunstan 1916 and 1923; Tillyard 1917a).

Dunstan records that he visited the Denmark Hill site in 1899 with his assistant Wilcox, to reacquaint himself with the plant-bearing strata referred to by Shirley (1898). Dunstan noted that he located "a bed containing abundance of fossil flora, several species of insects, and numbers of a small crustacean, *Estheria mangaliensis*", now *Magniestheria mangaliensis* (Jones 1862) (Tillyard & Dunstan 1916; Queensland Department of Mines 1900: 194). In later paper Dunstan explained how he found another 6-inch layer containing

insects, a few feet higher up than the original "Simmonds shale" (Plan 1 and Map 2, Tillyard & Dunstan 1923, and Plates 8 and 9, Tillyard & Dunstan 1916).

> This fossil bed is of "finely arenaceous shale" and "the grain of the Ipswich shales and sandstone is fairly fine, so that the fossils, though sometimes rather faintly impressed upon the rock, offer the ideal conditions for study by strong oblique light. By this means the various sets of cross-veins in the wing venation can be brought into relief." (Tillyard & Dunstan 1916).

Dunstan clearly put a great deal of time and effort (official and private) into the collection, preparation and care of the fossil insects. While Simmonds had located the first few insect fossils from Denmark Hill, Dunstan devoted his energies to successive excavations over a number of years, and to the collection of a large amount of material that was subsequently curated and numbered, in addition to much material that was not. His personal passion for collecting no doubt drove him, but his senior position with the Geological Survey, and the fact that the Survey was at that time undertaking intensive work to map the Ipswich area for its coal measures, was perhaps an added incentive (Cameron 1899, 1907).

Undoubtedly, the effort involved in collecting the Denmark Hill insect material was considerable, both physically and in terms of the time taken to survey, map, extract and pack the split and unsplit shale blocks; transporting them from Ipswich to Brisbane by vehicle and rail, and then further splitting the rocks to study the fossils. The shales are located in steeply dipping strata, as vividly illustrated in Plate 9 in Tillyard & Dunstan (1916) and noted as dipping at 45° on Dunstan's map (Tillyard & Dunstan 1923). This required the removal of considerable overburden to access the fossiliferous strata. Mrs Ada Dunstan, in negotiating with the British Museum in 1935 over the purchase price of Dunstan's collection, spoke of "the 1000 little insect fossils on which my husband placed such high value. It has taken him years of finding and labour to get this fossil shale…" (NHMUK London, Museum Archives, *Dunstan*).

Dunstan himself described in early 1918 the frustrations of collecting as follows:

> Some days passed when the material was being split without a single specimen coming to light, and then one of these patches would be exposed, generally revealed by the finding of a fragment of a cockroach wing, which I consider the indicator insect, every care then being taken to split the shale into the thinnest possible plates. When this patch is exhausted, it might be days before another one is discovered. (Queensland State Archives ID269558 Letterbook January 1918-January 1919: 74)

It took some twenty years for Dunstan to gather the material, involving regular visits over that period. Tillyard indicated in 1916 that Dunstan's first collections were made "soon after he came to Queensland", which would coincide with Dunstan's reference to Denmark Hill in the Geological Survey Report for 1899. There was a further exploration in 1909, and Tillyard himself visited the site with Dunstan in late 1915 (NHMUK London, Museum Archives, *Tillyard*). More official fieldwork was undertaken after 1919, as a result of the international interest shown in the Tillyard publications (Queensland Department of Mines 1919: 154). Dunstan refers to his efforts in more detail in a letter to Tillyard on 20 February 1922:

> …I have been on a new fossil insect campaign…The material is now sorted out and we have got some startling results in the way of wings and tegmina…I have the boxes of material taken out to my house, and put in an hour every morning before breakfast and generally an hour in the evening….. We have about 75 boxes to split up and I reckon on getting an average of at least one good wing and one good tegmina in each, so there is about three years work ahead of us. (NLA 1990: 969-971)

In his paper on the fossil beetles (Tillyard & Dunstan 1923), Dunstan explains in detail his methods of extracting and preparing the fossils once the rock had been collected. He worked on the six-inch "fine clay shale" bed slightly above the original "Simmonds bed", exposing the quarry pavement by excavation and forming a "precipitous quarry face" (see Tillyard & Dunstan 1916 plate 9). After the overburden was removed, the bed was mapped and pegged, and Dunstan also prepared a careful plan of all the areas of shale extracted, which were then packed into separate boxes for examination, to determine if certain sections were richer in fossils. He had 100 boxes, each with 1½ square feet of the 6-inch shale in each box (NLA 1990: 149, 267-8 Ipswich Insect Quarry Plan). Dunstan recommended that more areas of the hill should be investigated, but it seems unlikely that that was done. The fineness of the sediments and plants within the shale would indicate a low-energy lentic environment, but Dunstan attributed the good preservation of insect material to the effect of Late Triassic hot springs causing a build-up of wings and tegmina from dead insects which were then buried, although there is no evidence to support this conjecture.

Dunstan also described in detail the laborious work of preparing the fossils from their shale matrix, and how the shale was split, the fossils found with hand lenses, and the fossil rock then trimmed and packed, with part and counterpart. He even suggested keeping the laboratory floor clean, so that fragments that fly off when splitting the rock could easily be found.

His recommended method of packing the fossil specimens was important for the future curation and identification of the "Dunstan collections". He proposed using "cardboard trays with covers, 1½ inches square and ¼ inch deep…sufficiently large for most of the specimens, the latter being cemented to the bottom of the tray with a liquid glue, or on to square pieces of cardboard fitting the trays…If the insects in the trays are packed away in boxes they should be numbered both on the cover and on the bottom of the trays… and if packed away on their ends, which is convenient, they should also be numbered on the top edges" (Tillyard & Dunstan 1923). The distinctive numbered small blue boxes of the Dunstan collection of insects, still extant today, are the result of Dunstan's careful curation of the original specimens.

FIG. 1. Dunstan's distinctive small blue boxes for the Denmark Hill fossils, with names and numbers handwritten by Dunstan

Dunstan records that "about 50 per cent of the [rock] material collected is discarded in the splitting and sorting, while the other 50 per cent, consisting of very small pieces showing no impressions on their surfaces, is repacked in the boxes for finer splitting at some future time" (Tillyard & Dunstan 1923). This detail is important, given that some 40 packing cases of Denmark Hill rock were purchased by Tillyard from Dunstan's widow after his death (see below) and are currently unaccounted for.

THE TILLYARD-DUNSTAN COLLABORATION

The analysis and description of the Ipswich insect fossils was a result of a decade of close

collaboration between Tillyard and Dunstan from 1913 until 1923. Dunstan, and his assistant Wilcox, were the primary field workers, and Dunstan held the specimens in Brisbane as "keeper" of the fossil site, particularly as he was head of the Queensland Geological Survey and the site was (as far as can be ascertained) on Crown land. Dunstan loaned the fossils in batches to Tillyard, who undertook the descriptions of most of the insect orders from his home in Sydney and later in Nelson, New Zealand. The Coleoptera, initially touched on by Tillyard in 1916, were described in full by Dunstan in 1923 (see below).

Of the series of 12 papers on the Mesozoic insects of Queensland, ten were written by Tillyard and published by the Linnean Society of New South Wales and two were produced jointly by Tillyard and Dunstan, published by GSQ. The first of these joint publications also included two Tertiary taxa from Queensland which were described as insects but of which one is a parastacid crustacean (Rozefelds 1985), and several Triassic insects from New South Wales, in addition to the Mesozoic Denmark Hill insects (see Tillyard 1917a, 1918–1923; Tillyard & Dunstan 1916, 1923).

Tillyard was dedicated to completing the work, despite ongoing ill-health and related setbacks, pressure of many other commitments as an entomologist (he was a world specialist on dragonflies, see Tillyard 1917b) and then as a senior scientist at the Cawthron Institute in New Zealand. His correspondence with Dunstan shows a level of formality on both sides, and it was not until much later that they occasionally addressed their letters as "Dear Dunstan/Dear Tillyard" rather than "Dear Mr Dunstan", although formality tended to prevail. Over the decade they visited each other several times in either Brisbane or Sydney, and frequently commiserated over each other's health problems.

Over the course of their collaboration, Dunstan would mail consignments of fossils to Tillyard in their "little blue boxes", who would then work on them. Tillyard then mailed specimens back to Dunstan when they had been described and published, although this could take a period of years. Tillyard's relocation to Nelson in New Zealand in 1920 further held up the work.

After the first report was completed (Tillyard & Dunstan 1916) Tillyard worked out a plan for the other papers. As Tillyard had a Fellowship from the Linnean Society of New South Wales there was a requirement that the papers were to be published by the Society. Throughout the long collaboration Tillyard expressed his thanks to Dunstan for the opportunity to work on the material, and for the latter's patience and forbearance. Tillyard referred frequently to the scientific value and importance of the Denmark Hill site, and the outstanding quality of the insects which he said were "beyond price to Entomology" (NLA 1990: 1023) and which could solve the outstanding problems of insect phylogeny, as he saw them at the time. The site "could have a finer show than Florissant" (NLA 1990: 1077), referring to the Eocene fossil deposits in Colorado, USA, which have produced a wealth of fossil insects. Tillyard even offered, on a couple of occasions, to put his own funds toward a more extensive excavation of the site, although Dunstan was reluctant to accept this offer. Tillyard was concerned that, after the publication of the 1916 paper, the site would become the target for "Yankees" eager to get hold of the insects for their collections. (NLA 1990: 1046 and 1048), and urged Dunstan to ensure that the site was protected.

The collaboration was, it would seem, a positive one, although there were tensions. Tillyard obviously found Dunstan hard to deal with, telling Bather of the British Museum in 1916 that "He is a peculiar fellow, and by no means an ideal man to have to work with" and complained of Dunstan's alterations to his figures (NHMUK London, Museum Archives, *Tillyard*). By late 1918 his opinion had not changed: "He is a most difficult person to get on with, and one never knows whether one is on his right side or his wrong side…You see how it is, I have to describe these insects from pure love of the job, not because of any thanks I get for doing it." (NHMUK London, Museum Archives, *Tillyard*)

For his part, Dunstan was frustrated with Tillyard and his lack of progress, although he appeared to understand Tillyard's physical and health limitations. Yet he telegraphed Tillyard in late 1917 to send a fossil wing immediately for reproduction, adding acerbically to the telegram "Might do better" (Queensland State Archives ID269557, Letterbook November 1916-January 1918: 706). There were arguments prior to the publication of the first paper published by GSQ. Dunstan complained in May 1916 to the Linnean Society of NSW (which had ordered reprints) about the quality of Tillyard's drawings, some of which (to Tillyard's annoyance) Dunstan had corrected, allegedly to avoid errors being published:

> …notwithstanding which I seemed to be blamed for daring to interfere in his work. If there is anything in this world Tillyard should be thankful for it is my severe criticism and revisal of this his first work before it appears in print. (Queensland State Archives ID269556, Letterbook 1915-1916: 546-8)

This criticism was made soon after a dispute occurred in regard to how the authorship of the first paper would be printed: not all the correspondence is available, but it would seem that the Queensland Government Printer had set the title page to give equal billing to both Tillyard and Dunstan. Tillyard reported to Dunstan that people in Sydney (possibly Robert Etheridge and William Dun from the Australian Museum) had said "that you evidently considered yourself as important as the author". Tillyard had argued that his own name be given primacy, and "I cannot help if I am open to a charge of little-mindedness…these little misunderstandings seem to be unavoidable at a distance…Let's try not to be suspicious of one another, and to remain as good friends as we were when I was in Brisbane" (NLA 1990: 1050).

Dunstan was privately angry at this, as revealed in his handwritten note on the back of the letter from Tillyard:

> Have drawn a lot of the figures, altered others, added to others, scribed them all on to the plates, altered and revised and edited his text, recast portions of it and put in a number of descriptions of new species, giving them the generic and specific names which Tillyard has adopted, and written a geological description of the three localities. All of this T. considers is simply an Introduction and therefore I should not consider myself "as important as the author", and should place my name second up onto a paper with his because I was not out for "KUDOS" as he expressed it.

These differences seem to have blown over, as the 1916 paper was jointly authored and collaboration continued, although the issue of who would describe the beetles (Coleoptera) from Ipswich remained unresolved. Tillyard expressed his dislike of working on beetles, as the elytra were difficult, if not impossible, to classify. In 1915 Tillyard suggested that Henry Tryon might be asked to undertake this task, but Dunstan pressed Tillyard to do it. Dunstan sent a consignment of beetles to Tillyard in mid-1918 and, after trying to get a fellow entomologist (H.J. Carter) to look at them, Tillyard began work on the illustrations, involving his wife ("who is splendid at wash-drawings") to paint them in half-tones – but Tillyard reiterated that "this work will take me a long time". (NLA 1990: 998) The job got put off until after the other insect orders had been dealt with, and eventually in February 1922 Dunstan proposed that he undertake the Coleoptera himself, leaving Tillyard to complete the remaining orders and a final summary paper – "otherwise it seems to me the work will be interminable" (NLA 1990: 970).

Tillyard welcomed this, and the paper on beetles was published in 1923 by the GSQ, not by the Linnean Society. The 1916 authorship disputes appear to have been forgotten, as the title page gave joint authorship to Tillyard and Dunstan (in that order), and referred to this paper as "Mesozoic Insects of Queensland Part 1: Introduction and Coleoptera", even

though it was the last one published. This was because Dunstan had arranged to bring all twelve papers together into a two-part volume, published by the Queensland Government Printer (Tillyard & Dunstan 1924).

DISPOSING OF THE DUNSTAN COLLECTION

Benjamin Dunstan died on 2 September 1933, after a "brief illness", believed to be cancer, and was buried at Toowong Cemetery in Brisbane. Probate on his estate was not granted until September 1937, due it would seem to the time taken to realise the value of his significant personal collection of fossils and minerals. This task was taken on by his widow, who endeavoured to sell this material to the British Museum. Dunstan's careful curation and documentation of the collection added to its significance.

Mrs Dunstan was prompted to contact the British Museum because her husband had previously sold them a skull and skeleton of a temnospondyl in 1927 (later described as *Paracyclotosaurus davidi* Watson 1958) for £500 (in 2020 value, about AUD$57,000), in addition to donating many fish specimens from his personal collection. Dunstan had collected the temnospondyl and fish from the St Peter's quarry in Sydney while working at the Sydney Technical College, and they were part of his personal collection.

Mrs Dunstan wrote to Dr Bather, Keeper of Palaeontology, on 18 June 1934 to seek their interest in the collection, which comprised fossil fish, insects, plants, trilobites, other ammonites, brachiopods etc., plus 100 pieces of the Queensland Tenham meteorite. A reply was received from Dr Lang, Bather's successor, Bather having retired and passed away in the interim. Lang initially offered £100, but once the material was packed and delivered to London, he agreed to pay £250 for the fossils, while the meteorite material was purchased separately for £100. Mrs Dunstan had appealed for a better valuation of especially the insects, "on which my husband placed such high value", but ultimately she accepted the amount offered (approximately AUD$32,000 in 2020 value) "as I feel sure you have conscientiously valued them" (NHMUK London, Museum Archives, *Dunstan*)

Mrs Dunstan approached the museum again in 1939 to see if they wanted to purchase more material, notably gemstones, fossil woods and lantern slides. Discussions were interrupted by the outbreak of war, but resumed soon after the war by Mrs Dunstan and her daughter Brenda. The gemstone collection was rejected, but Brenda Dunstan sent the lantern slides in 1955, which included a number relating to the fossil flora and fauna of Denmark Hill. Importantly, from an archival point of view, she also sent over Dunstan's notebooks, fossil registers, and the Dunstan-Tillyard correspondence, all of which are now digitally accessible (NLA 1990). The Museum was not interested in Dunstan's set of annotated geological maps, used in his work on the geology of Queensland, and their current whereabouts are unknown.

As a result, the British Museum holds a substantial collection of the insects from Denmark Hill, as the Dunstan arthropod specimens purchased in 1935 numbered 1112. We shall discuss below Dunstan's specimen lists and the current location of the various parts of his fossil insect collection.

DISPOSING OF THE TILLYARD COLLECTION

Tillyard had had to retire from government service in 1934 on medical grounds, although he still remained an active researcher, including an extended trip through Queensland in May and June 1936 (Lambkin 2020d). He died in January 1937, aged 56, but had a large number of fossil specimens on loan to him at that time, in addition to much material he had collected over the years. Among these were Denmark Hill fossil insects, Triassic insects from Mt Crosby in Queensland, and some 40 boxes of fossiliferous shale, thought to be from Denmark Hill, purchased by the Tillyards from Benjamin Dunstan's widow only a couple of years previously.

Tillyard's widow, Patricia, oversaw the disposal of this material. Patricia Tillyard was a graduate of Newnham College, Cambridge, graduating with Honours and a Masters from Cambridge in natural sciences (botany). She worked as a science teacher and collaborated with her husband over many years, including working as a scientific illustrator for the book, *Insects of Australia and New Zealand* (Tillyard 1926). As well as closely assisting her husband's work and nursing him through successive illnesses, Patricia was a well-known figure in Canberra society, as a hostess and head of the Girl Guides, Y.W.C.A. and other community, sporting and academic organisations. In short, Mrs Tillyard was used to dealing with institutions and authorities as her entry in the *Australian Dictionary of Biography* states: "She retained the supreme confidence of a 'Newnhamite' in her ability to chair a meeting, take charge of an organization, or entertain the highest in the land" (Clarke 1990).

Patricia Tillyard, who in June 1937 had travelled to England and her home town in Borstal, Kent for a 9-month period, entrusted the assessment and sorting of her husband's palaeontological collections to the Australian Museum in Sydney and her daughter Patience, who then worked in Canberra at the National Library. In general terms, Mrs Tillyard wanted most, if not all, the Tillyard collection to go to the British Museum, as a donation rather than a sale. Indeed, on arrival in England on 20 June, Mrs Tillyard was met by "officials of the British Museum", who took delivery of Tillyard's personal entomological collection of "500 Mayflies and 700 Dragonflies", including the types of 113 species. (*Canberra Times* 11 August 1937; *The West Australian* 22 June 1937)

Her stated motto in this instance was "when in doubt send to the British Museum", and there was extensive correspondence from July of 1937 until late 1938, when the Museum received the five packing cases of fossil specimens sent by the Australian Museum in Sydney on Mrs Tillyard's behalf (NHMUK London, Museum Archives, *Tillyard*). There was, for example, a considerable number of Triassic specimens from Brookvale in Sydney (insects, plants and fish including the important and spectacular orthopteroid *Clathrotitan andersoni* McKeown, 1937), the Permian of Newcastle, Permian Kansas insects, Cambrian trilobites from Mt Isa, and Cambrian archaeocyathinae from South Australia. There was also a separate consignment of 350 fossil insects from Mt Crosby near Ipswich in Queensland, which Dr Tillyard had collected on a trip to Queensland in May and June 1936. These now appear to reside at the NHMUK and have generated later research (Lukashevich & Shcherbakov 1999, citing NHMUK In.44958, R. J. Tillyard Colln.).

In fact, the Royal Society (London) had a direct interest in this last group of fossils because Tillyard, elected a Fellow of the Society in 1925, had received a Society grant in July 1935 in support of his post-retirement scientific activities. All material collected after that date, such as the Mt Crosby insects, belonged to the Society. They agreed, however, that these specimens should go to the British Museum with the "approval" of the Royal Society (NHMUK London, Museum Archives, *Tillyard*).

Other material that remained in Tillyard's possession after his death included Denmark Hill insects which Tillyard had been given by Dunstan in 1923, plus material which Tillyard had borrowed on a personal basis from the GSQ on 7 July 1936 (following his trip to Queensland), which he may have wanted as comparative specimens in assessing the Mt Crosby insects which he had just collected. The Australian Museum was keen to ensure that the material went back to their rightful owners, but the donated and borrowed Denmark Hill specimens (many of which were types and had been published) were retained at the Australian Museum, even those which had been borrowed from the GSQ. Two items did somehow find their way back to GSQ and are now in the QM. The whereabouts of the 40 boxes of Dunstan shale (referred to above) is unknown, although Mrs Tillyard was urged by the Museum in Sydney to forward the lot to London (NHMUK London, Museum Archives, *Correspondence Anderson*).

Interestingly, the GSQ was not an organisation to let missing specimens go astray, and on 24 September 1974 the Chief Government Geologist, Dr J.T. Woods, wrote to the Division of Entomology at the CSIRO Canberra, where Tillyard had worked prior to borrowing the fossils, enquiring if they had the specimens "in the little blue cardboard boxes in which they are still kept individually in our collection". The Assistant Curator of the Australian National Insect Collection confirmed there was no trace of the specimens in the collection but suggested some might be with the Australian Museum in Sydney and perhaps in "other hands". A "Personal" note sent on the same day to Woods said that one of the CSIRO curators, Dr Edgar Riek, had knowledge of the fossils but "refused to enlarge at all end" (Queensland Museum GSQ Archives: 013, 74/000126). This was disingenuous on Riek's part, as he had previously published on the Denmark Hill insects (Riek 1956), had used a number of the specific fossils about which the GSQ was enquiring, and his paper had referred to specimens in the Australian Museum, GSQ, the University of Queensland and the Dunstan Collection. These fossils have not been returned to the GSQ and still remain with the AM.

THE DUNSTAN REGISTERS

As noted above, Benjamin Dunstan was a meticulous administrator, and his attention to detail was demonstrated in the organisation of his personal collection of fossils and minerals. As discussed above, his approach to preparing and curating his insect fossils was precise, as was his cataloguing of the boxes of material extracted from Denmark Hill and the consequent "productivity" mapping of the Denmark Hill fossil field, where he indicated the most productive parts of the horizon (NLA 1990: 257-268). This search for completeness carried through to the tracking of the specimens he had loaned to Tillyard, and his proposed sorting of the identified and unidentified insects into several separate "categories".

This was demonstrated in his letter to Tillyard of 20 February 1922:

> I am sending you a list of fossils missing from our collections in duplicate, one of which I would like you to return showing specimens in your possession, the other you may retain. I would like returned what you actually do not require, but of course any that you may want in future will be forwarded to you at once. I am not forgetting the collection which you are to receive, but the longer this is left the more perfect it will be, as a great many duplicates exist, and the best of these are being sorted into three divisions – one for Department, one for you, and one for myself, the department collection of course being made as perfect as possible (NLA 1990: 969-73)

Dunstan eventually donated some fossils to Tillyard in 1923, 33 specimens in total, across 20 genera, not very many considering the many hundreds of insect specimens which Dunstan held.

The Dunstan registers of the Denmark Hill insects formed the basis for the eventual dispersion of the material, although it is not clear what prompted him to separate his material into the different groups, or to retain types or "co-types" in his personal collection. Whatever the reason, the result was that the department (GSQ) collection was certainly not as perfect as it should have been.

The Denmark Hill fossils he retained personally which are now held in the NHMUK were listed in his records as his "G", "D" and "S" Collections: "G" was the original Simmonds Collection of 7 specimens and two counterparts (although how and why these came into Dunstan's personal possession is not clear); "D" was the collection (numbered 1-367) that mirrored the official GSQ holdings, made up of parts or counterparts, including many types and type counterparts, plus some additional specimens; "S" was his Supplementary Collection (numbered 1-642, but including blank numbers) of additional uncited but identified specimens, plus some unidentified items. Also included was a separate group of 145 fragments,

some of which have since proved valuable: Kelly *et al.* (2018) described new dermapterans from two such fragments held at NHMUK.

LATER COLLECTIONS: EDGAR RIEK

There are no records of systematic collecting at Denmark Hill after Dunstan had completed his work, and by the mid-1930s the site was covered over by debris from the adjacent mine shaft. The entomologist Edgar Riek, however, reported in 1956 that both he and "staff of the Geology Department, University of Queensland", had made further collections at Denmark Hill, "from a slightly different horizon separated by three or four hundred yards from the original site…possibly not contemporaneous" (Riek 1956). This new location produced "beautifully preserved" insects, but Riek seems to have been deliberately vague in identifying the location in the UQ records and in the specimen labels, and the site has not been pinpointed in the intervening years. Riek did no further work there and the attention of University researchers shifted to study of the Late Triassic insects from Mt Crosby, some 10 km away.

University collection records have not revealed any further location data for the Riek material from Denmark Hill, although the UQ fossil collection (which was transferred to the QM in 1999) does hold Simmonds plant specimens from Denmark Hill, initially loaned to the Department of Geology's Museum for display purposes, and later donated by Simmonds, probably prior to 1942.

WHERE ARE THEY NOW?

The Denmark Hill insect fossils are now retained in three institutions: the Queensland Museum (Brisbane), the Australian Museum (Sydney) and the Natural History Museum (London). Types and type-counterparts are spread across the three locations, as set out in Table 1.

Queensland Museum, Brisbane (QM). The collection of Denmark Hill insect fossils held at QM (previously the GSQ Collection, transferred to QM in 2003) separately registers 344 Dunstan Denmark Hill specimens (including types and/or type counterparts). There are also 9 Denmark Hill specimens transferred with the UQ Collection in 1999. Five of the species described from Denmark Hill are not represented in the QM Collection.

Australian Museum, Sydney (AM). The AM collection consists of the Denmark Hill fossils held by Tillyard at his death in 1937. Some 30 items were borrowed by Tillyard from GSQ in July 1936, and others (as we noted above) had been donated to him from Dunstan in 1923 or (very few) loaned to Tillyard in 1923 but not returned. The AM therefore holds 64 Denmark Hill insect specimens in total, plus 8 other "Ipswich Qld" insects collected by Dunstan, probably from Denmark Hill. 23 of the published specimen numbers are currently held at the AM, including 10 of the type specimens.

Natural History Museum, London. The Denmark Hill insect specimens held in London are those sold to the British Museum (Natural History) (as it was then known) by Mrs Dunstan in 1935, as part of the Dunstan consignment. In total, there are over 1100 items, including 149 type, paratype, "co-type" or "type counterpart" specimens, which have been catalogued in the NHMUK fossil insect registers as part of the "Dunstan Collection". As noted, they are represent the "G", "D" and "S" groupings from Dunstan's personal collection.

It is worth noting that Dunstan did not lodge the historically important Simmonds Collection officially with the GSQ; but retained it with his personal holdings after retirement, and thus it also ended up with the NHMUK.

Table 1 lists all Denmark Hill specimens cited by Dunstan & Tillyard, and by Tillyard, plus additional Denmark Hill specimens cited by later researchers, and the uncited type counterparts held at NHMUK. Table 2 includes those fossils not from Denmark Hill described in Tillyard & Dunstan 1916 – important Sydney Triassic insects and the first fossil (an insect) described from Queensland's Tertiary Redbank Plains Formation -- and a

Cretaceous dragonfly from North Queensland (Tillyard 1918a). The table also lists the specimens of what was described in Tillyard and Dunstan 1916 as a Tertiary dragonfly from Central Queensland, which is now considered a parastacid crustacean (Rozefelds 1985).

The tables, organised by insect order, follow the arrangement set out in Jell (2004), except for the addition of Dermaptera in recognition of work by Kelly *et al.* (2018). Within each order, the described species are arranged alphabetically, as an easy finding aid. Unnamed but cited specimens are also included, as are *incertae sedis*. Original names later revised or synonymised are included with referral to the current name.

Information in the tables were drawn from the QM Vernon database, an Australian Museum list of their Dunstan material, and photocopies of the handwritten NHMUK registered entries from the "Dunstan Collection" material, accessioned between 1935 and 1937. These note the type and type-counterpart specimens, as indicated in Dunstan's original listing, provided to the NHMUK (NLA 1990: 696-714).

There are several minor anomalies referred to in the table notes. In particular, Table 2, two type counterpart specimens In.33592 and In.33593 at NHMUK are curiously listed in the register by the names originally proposed for the species, before being renamed and published (in Tillyard & Dunstan 1916) as, respectively, *Mesotitan giganteus* and *Notoblattites subcostalis*. The names were changed at the suggestion of Tillyard in a letter to Dunstan on 26 July 1915 (NLA 1990: 1088). The NHMUK register also incorrectly records the Goodna Tertiary insect (In.33309) as having been collected from Denmark Hill.

CONCLUDING COMMENTS

In writing this paper my aim was to bring attention to the whereabouts of the much-studied group of Denmark Hill fossil insects, and how they ended up in three separate institutions as a result of private holdings of official collections a century ago. These collections are internationally significant as they hold the type material of species from Australia, and under Australia's current Protection of Movable Cultural Heritage Act (1986) the sale and export of collections of this significance would not now be approved.

Splitting major collections has desirable and undesirable implications. Having this body of specimens in the northern hemisphere does provide access for researchers for whom London is a more convenient destination. At the same time, access is difficult for Australian researchers studying comparative material. Contemporaneous study of both part and counterpart of specimens may provide collectively more information than working from a single part, as details of fine venation and other features may not be adequately preserved in both. For most of the Denmark Hill taxa this side-by-side comparison is currently not possible. Furthermore, the NHMUK holdings are significantly greater in number than those in Australia, and include previously unstudied specimens which could be, and have been, used for re-assessment (e.g. Nel *et al.* 2002) and descriptions of new taxa (Kelly *et al.* 2018).

Sadly, Dunstan's aim cited above of creating an official GSQ collection "as perfect as possible" was not something he achieved, even though the material to do so was available to him. Instead, he chose to enhance his private collection, and while it is hard to assess Dunstan's decisions made over one hundred years ago, there are questions to ask. As a civil servant at the time he was diligent and competent, as his record as head of the GSQ shows, but it is not clear how he decided what was to be held in the government collection and what was able to be retained by him personally. Nor did he explain why he separated part and counterpart of most of the fossils, or why he chose personally to keep over three-quarters of all the numbered and prepared specimens.

In the ideal world, museums seek to digitise their holdings and make them accessible on-line, and it is important that in this way collections that have been split across different institutions can in time be digitally shared with all researchers who are interested in working on such material. Such a development would be of great benefit to those undertaking further study of the Denmark Hill fossil insect fauna, dispersed across nations as it has been for so long.

TABLE 1. Denmark Hill Fossil Insects: described species and location of specimens.
AM = Australian Museum (Sydney) Collection; BD = Benjamin Dunstan Collection GSQ = Geological Survey of Queensland Collection (now at Queensland Museum); NHMUK = United Kingdom Natural History Museum, London; QM = Queensland Museum, Brisbane; UQ = University of Queensland Geology Collection (now at Queensland Museum); Simmonds C. = Simmonds Collection.

Order and species name (as per Jell 2004), by collection locality	**Where first described and published** ("T&D" refers to "Tillyard & Dunstan")	**Type number originally cited**	**Notes**	**Current location of cited specimen**	**Number at current location**	**Uncited type counterparts held at NHMUK**	
						Original Dunstan number	**NHMUK number**
DENMARK HILL, QUEENSLAND							
Order ODONATA							
Mesomantidion queenslandicum	T&D 1916 T&D 1916	BD1a BD1b	Considered not an insect by Riek 1956	QM NHMUK	GSQ1a In.33278		
Mesophlebia antinodalis	T&D 1916; Tillyard 1922 Tillyard 1922	GSQ3a GSQ3b GSQ127a	Confirmed in Tierney *et al.* 2020	QM NHMUK AM	GSQ3a In.33279 AMF39270	BD127b	In.33397
Perissophlebia multiseriata	Tillyard 1918b Tillyard 1918b	GSQ203a GSQ203b		QM NHMUK	GSQ203a In.33467		
Triassagrion australiense	Tillyard 1922	GSQ290a		AM	AMF39253	BD290b	In.33544
Triassolestes epiphlebioides	Tillyard 1918b	GSQ205a	Counterpart discussed in Nel *et al.* 2002	AM	AMF39266	BD205b	In.33469
Triassophlebia stigmatica	Tillyard 1922	GSQ82a	Counterpart discussed in Nel *et al.* 2002	AM	AMF39267	BD82b	In.33352
Order PERLARIA							
Stenoperlidium triassicum	Riek 1956 Riek 1956 Riek 1956	UQC2244 UQC2245 AMF39256	Originally GSQ118	QM QM AM	UQC2244 UQC2245 AMF39256		
Order PROTORTHOPTERA							
Mesorthopteron locustoides	T&D 1916 T&D 1916 Tillyard 1922 Tillyard 1922 Tillyard 1922 Tillyard 1922 Tillyard 1922 Tillyard 1922 Tillyard 1922 Tillyard 1922 Riek 1956 Riek 1956	BD5a BD5b GSQ258b GSQ72a-b GSQ75 GSQ78a-b GSQ123 GSQ224 GSQ234 GSQ241b AMF39235 AMF39242	Originally GSQ53 Originally GSQ344a	NHMUK QM QM QM QM QM QM QM QM QM AM AM	In.33282 GSQ5b GSQ258b GSQ72a-b GSQ75 GSQ78a-b GSQ123 GSQ224 GSQ234a GSQ241b AMF39235 AMF39242	BD258a BD234b BD241a BD344b	In.33514 In.33496 In.33502 In.33583
Order BLATTARIA							
Austroblattula ipsviciensis	Tillyard 1919b Tillyard 1919b	GSQ105a GSQ105b		QM NHMUK	GSQ105a In.33375		
Austromylacrites latus	T&D 1916	BD8		QM	GSQ8		
Notoblattites? incertae sedis	Tillyard 1922 Tillyard 1922	GSQ100 GSQ162a		QM QM	GSQ100 GSQ162a		
Samaroblatta blabelloides	Tillyard 1919b	GSQ131b	Also referred to by Tillyard as "*blattelloides*"	QM	GSQ131b	BD131a	In.33401
Samaroblatta intercalata	Tillyard 1919b	GSQ262		QM	GSQ262		
Samaroblatta jonesi	Tillyard 1919b Tillyard 1919b	GSQ157a GSQ157b		QM NHMUK	GSQ157a In.33425		
Samaroblatta reticulata	Tillyard 1919b	GSQ155a		QM	GSQ155a	BD155b	In.33423
Samaroblatta triassica	Tillyard 1919b	GSQ156		QM	GSQ156		
Triassoblatta insignita	Tillyard 1919b	GSQ124		QM	GSQ124		
Triassoblatta intermedia	Tillyard 1919b	GSQ216		QM	GSQ216		

TABLE 1 cont…

Order and species name (as per Jell 2004), by collection locality	Where first described and published ("T&D" refers to "Tillyard & Dunstan")	Type number originally cited	Notes	Current location of cited specimen	Number at current location	Uncited type counterparts held at NHMUK	
						Original Dunstan number	NHMUK number
Triassoblatta typica	Tillyard 1919b Tillyard 1919b	GSQ180a GSQ180b		QM NHMUK	GSQ180a In.33444		
Blattoidea *incertae sedis*	Tillyard 1919b Tillyard 1919b Tillyard 1919b	152 121a 121b		QM QM QM	GSQ152 GSQ121a GSQ121b		
Order DERMAPTERA							
Phanerogramma australis *Phanerogramma dunstani*	Kelly *et al.* 2018 Kelly *et al.* 2018	In.35044 In.35041	Both are fragments from BD Collection	NHMUK NHMUK	In.35044 In.35041		
Order ORTHOPTERA							
Proparagryllacris crassifemur	Riek 1956 Riek 1956	AMF39251 UQC2134	Originally GSQ335a	AM QM	AMF39251 UQC2134	BD335b	In.33576
Triassolocusta leptoptera	Tillyard 1922	GSQ99		QM	GSQ99		
Triassomantis pygmaeus	Tillyard 1922	GSQ86a		QM	GSQ86a	BD86b	In.33356
Order PHASMATODEA							
Aeroplana mirabilis	Tillyard 1918b	GSQ126a	Placed in order Phasmodea by Riek 1956	QM	GSQ126a	BD126b	In.33396
Order HEMIPTERA							
Apheloscyta mesocampta	Tillyard 1922	GSQ98a		QM	GSQ98a	BD98b	In.33368
Chiliocycla scolopoides	Tillyard 1919c Tillyard 1922	GSQ158a GSQ327a		QM QM	GSQ158a GSQ327a	BD158b BD327b	In.33426 In.33571
Dunstania pulchra	T&D, 1916 T&D 1916	BD2a BD2b		QM NHMUK	GSQ2a In.33280		
Dunstaniopsis triassica	Tillyard 1918c Tillyard 1922	GSQ107a GSQ119a		QM QM	GSQ107a GSQ119a	BD107b BD119b	In.33377 In.33388
Eurymelidium australe	Tillyard 1919c	GSQ248a		QM	GSQ248a	BD248b	In.33509
Ipsvicia jonesi *Ipsvicia acutipennis* *Ipsvicia maculata*	Tillyard 1919c Tillyard 1923 Tillyard 1923 Tillyard 1923 Tillyard 1919c Tillyard 1919c Tillyard 1919c Tillyard 1919c	GSQ122a GSQ285a GSQ340a GSQ226 GSQ204a GSQ204b GSQ208a GSQ208b	Synonymised in Lambkin 2020c	QM QM QM QM QM QM QM NHMUK	GSQ122a GSQ285a GSQ340a GSQ226 GSQ204a GSQ204b GSQ208a In.33472	BD122b BD285b BD340b BD226b	In.33390 In.33540 In.33580 In.33488
Ipsviciopsis elegans *Ipsviciopsis magna*	Tillyard 1922 Tillyard 1922 Tillyard 1922	GSQ178a GSQ278a GSQ93a	Synonymised in Lambkin 2020c	QM QM QM	GSQ178a GSQ278a GSQ93a	BD178b BD278b BD93b	In.33445 In.33533 In.33363
Mesocixiodes orthoclada			See *Mesonirvana orthoclada*				
Mesocixiodes termioneura *Mesocixiodes brachyclada*	Tillyard 1922 Tillyard 1922 Tillyard 1922	GSQ88a GSQ325a GSQ4	Synonymised in Lambkin 2020b	QM QM QM	GSQ88a GSQ325a GSQ4	BD88b BD325b	In.33358 In.33569
Mesocixius triassicus	Tillyard 1919c	GSQ215		QM	GSQ215		
Mesodiphthera dunstani			See *Tardilly dunstani*				
Mesodiphthera grandis	Tillyard 1919c Tillyard 1919c Lambkin 2019	GSQ213a GSQ213b GSQ192a-b		QM NHMUK QM	GSQ213a In.33478 GSQ192a-b		
Mesodiphthera prosboloides			See *Tardilly prosboloides*				
Mesogereon affine	Tillyard 1921 Tillyard 1921 Tillyard 1921 Tillyard 1921	GSQ206a GSQ206b GSQ207a GSQ207b		QM NHMUK QM NHMUK	GSQ206a In.33470 GSQ207a In.33471		

TABLE 1. cont…

Order and species name (as per Jell 2004), by collection locality	Where first described and published ("T&D" refers to "Tillyard & Dunstan")	Type number originally cited	Notes	Current location of cited specimen	Number at current location	Uncited type counterparts held at NHMUK	
						Original Dunstan number	NHMUK number
Mesogereon compressum	Tillyard 1921 Tillyard 1921	GSQ144a GSQ144b		QM NHMUK	GSQ144a In.33413		
Mesogereon neuropunctatum	T&D 1916; Tillyard 1921	GSQ19a GSQ19b		QM NHMUK	GSQ19a In.33296		
Mesogereon shepherdi	Tillyard 1921	GSQ97		QM	GSQ97a	BD97b	In.33367
Mesogereon superbum	Tillyard 1921	GSQ169		QM	GSQ169a	BD169b	In.33435
Mesojassus ipsviciensis	T&D 1916; Tillyard 1919c Lambkin 2020a Lambkin 2020a Lambkin 2020a Lambkin 2020a Lambkin 2020a Lambkin 2020a	 GSQ33 GSQ56a-b GSQ90a-b GSQ111 GSQ220a-b GSQ240 GSQ265	Synonymised in Lambkin 2020a	 QM QM QM QM QM QM QM	 GSQ33 GSQ56a-b GSQ90a-b GSQ111 GSQ220a-b GSQ240 GSQ265	 BD111b 	 In.33381
Triassojassus proavitus	Tillyard 1919c Lambkin 2020a	GSQ191a GSQ282a		QM QM	GSQ191a GSQ282a	BD191b BD282b	In.33456 In.33537
Mesonirvana orthoclada	Tillyard 1922 Lambkin 2016a Lambkin 2016a Lambkin 2016a	GSQ318a GSQ91a-b GSQ193a GSQ324a-b	Revised in Lambkin 2016a as *Eoscartoides orthocladus* but replaced with *Mesonirvana* in Lambkin 2017	QM QM QM QM	GSQ318a GSQ91a-b GSQ193a GSQ324a-b	BD318b	In.33566
Mesoscytina australis *Mesoscytina affinis* *Triassoscarta subcostalis*	Tillyard 1919c Tillyard 1919c Tillyard 1919c Lambkin 2016b	GSQ112a GSQ235 GSQ116a GSQ320a-b	Synonymised in Lambkin 2016b	QM QM QM QM	GSQ112a GSQ235 GSQ116a GSQ320a-b	BD112b BD116b 	In.33382 In.33385
Paradunstania affinis	Tillyard 1918c	GSQ147		QM	GSQ147		
Tardilly prosboloides	Tillyard 1922; Lambkin 2019	GSQ89a	Revised in Lambkin 2019	QM	GSQ89b	BD89b	In.33359
Tardilly dunstani	Tillyard 1922 Lambkin 2019	no number GSQ317a	Revised in Lambkin 2019	QM	GSQ317a	BD317b	In.33565
Triassocixius australicus	Tillyard 1919c	GSQ267a		QM	GSQ267a	BD267b	In.33523
Triassojassus proavitus			See *Mesojassus ipsviciensis*				
Triassoscarta subcostalis			See *Mesoscytina australis*				
Unamed Homoptera	Tillyard 1919c	GSQ109a GSQ163 GSQ172a GSQ176a GSQ192a-b GSQ247a-b GSQ257a GSQ257b	In Dunstan's list, BD172 is listed as *Mesojassus ipsviciensis*	QM QM QM QM QM QM AM NHMUK	GSQ109a-b GSQ163 GSQ172a GSQ176a GSQ192a-b GSQ247a-b AMF39274 In.33515	 BD172 	 In.33438
Order HETEROPTERA							
Triassocoris myersi	Tillyard 1922 Tillyard 1923 Tillyard 1922	GSQ140a GSQ150a-b GSQ167b		QM QM QM	GSQ140a GSQ150a-b GSQ167b	BD140b BD167a	In.33409 In.33434
Triassocoris scutulum	Tillyard 1922 Tillyard 1922 Tillyard 1923	GSQ134 GSQ184b GSQ179a-b		QM QM QM	GSQ134 GSQ184b GSQ179a-b	 BD184a 	 In.33450
Triassocoris ovalis	Tillyard 1923	GSQ129a		QM	GSQ129a	BD129b	In.33399

TABLE 1. cont…

Order and species name (as per Jell 2004), by collection locality	Where first described and published ("T&D" refers to "Tillyard & Dunstan")	Type number originally cited	Notes	Current location of cited specimen	Number at current location	Uncited type counterparts held at NHMUK	
						Original Dunstan number	NHMUK number
Triassocoris grandis	Tillyard 1923	GSQ196a		QM	GSQ196a	BD196b	In.33463
Order COLEOPTERA							
Ademosyne adunca	T&D 1923 T&D 1923	GSQ194b BD194a		QM NHMUK	GSQ194b In.33459		
Ademosyne australiensis	T&D 1916, 1923 T&D 1916, 1923 T&D 1916 T&D 1916 T&D 1916 T&D 1923	BD12a GSQ12b BD13 BD13b BD43 GSQ44		NHMUK QM QM NHMUK QM QM	In.33289 GSQ12b GSQ13 In.33290 GSQ43 GSQ44	BD43b	In.33317
Ademosyne brevis	T&D 1923 T&D 1923	GSQ339a BD339b		QM NHMUK	GSQ339a In.33579		
Ademosyne cameroni	T&D 1916, 1923 T&D 1916, 1923	GSQ46b BD46a		QM NHMUK	GSQ46b In.33319		
Ademosyne congener	T&D 1916, 1923 T&D 1916, 1923 T&D 1916, 1923 T&D 1916, 1923	GSQ40 BD41a GSQ41b GSQ42		QM NHMUK QM QM	GSQ40 In.33315 GSQ41b GSQ42		
Ademosyne curvata	T&D 1923 T&D 1923	GSQ274a BD274b		QM NHMUK	GSQ274a In.33529		
Ademosyne intermedia	T&D 1923 T&D 1923	GSQ233b BD233a		QM NHMUK	GSQ233b In.33495		
Ademosyne lata	T&D 1923 T&D 1923	GSQ132a BD132b		QM QM	GSQ132a GSQ132b		
Ademosyne major Handlirsch 1908	T&D 1916,1923 T&D 1916, 1923 T&D 1916, 1923 T&D 1916, 1923	S2 GSQ36a BD36b BD10	Simmonds Collection	NHMUK QM NHMUK NHMUK	In.33272 GSQ36a In.33311 In.33287		
Ademosyne minor Handlirsch 1908			See *Ademosynoides minor*				
Ademosyne olliffi	T&D 1916, 1923 T&D 1916, 1923 T&D 1923	S1 GSQ35 BD115	Simmonds Collection	NHMUK QM QM	In.33271 GSQ35 GSQ115a	BD115b	In.33384
Ademosyne parva	T&D 1923 T&D 1923	GSQ312a BD312b		QM NHMUK	GSQ312a In.33560		
Ademosyne punctata	T&D 1916, 1923 T&D 1916, 1923	GSQ47b BD47a		QM NHMUK	GSQ47b In.33320		
Ademosyne ramocostata	T&D 1923	GSQ225		QM	GSQ225		
Ademosyne rugulosa	T&D 1923 T&D 1923	GSQ260a BD260b		QM NHMUK	GSQ260a In.33516		
Ademosyne vittamargina	T&D 1923 T&D 1923 T&D 1923 T&D 1923	GSQ341a BD341b GSQ293a BD293b		QM NHMUK QM NHMUK	GSQ341a In.33581 GSQ293a In.33547		
Ademosynoides abnormis	T&D 1923 T&D 1923	GSQ243a BD243b		QM NHMUK	GSQ243a In.33505		
Ademosynoides alternata	T&D 1923 T&D 1923	GSQ149a BD149b		QM NHMUK	GSQ149a In.33418		
Ademosynoides angusta	T&D 1923 T&D 1923	BD15a GSQ15b		NHMUK QM	In.33292 GSQ15b		
Ademosynoides magnifica	T&D 1923 T&D 1923	GSQ199a GSQ199b		QM QM	GSQ199a GSQ199b		

TABLE 1. cont…

Order and species name (as per Jell 2004), by collection locality	Where first described and published ("T&D" refers to "Tillyard & Dunstan")	Type number originally cited	Notes	Current location of cited specimen	Number at current location	Uncited type counterparts held at NHMUK	
						Original Dunstan number	NHMUK number
Ademosynoides minor	T&D 1916, 1923 T&D 1916, 1923 T&D 1916, 1923 T&D 1916	S3 GSQ38b BD38a BD39	Simmonds Collection GSQ39 in QM Collection is *Samaroblatta reticulata*	NHMUK QM NHMUK NHMUK	In.33273 GSQ38b In.33313 In.33314		
Ademosynoides obtusa	T&D 1923 T&D 1923	BD9a GSQ9b		NHMUK QM	In.33286 GSQ9b		
Ademosynoides striatella	T&D 1923 T&D 1923	GSQ16a BD16b		QM NHMUK	GSQ16a In.33293		
Apheloodes obliquum	T&D 1923 T&D 1923	GSQ143a BD143b		QM NHMUK	GSQ143a In.33412		
Apheloodes rugosum	T&D 1923 T&D 1923	GSQ236a BD236b		QM NHMUK	GSQ236a In.33498		
Elaterites subulatus	T&D 1923 T&D 1923	GSQ263b BD263a		QM NHMUK	GSQ263b In.33520		
Elaterites transversus	T&D 1923 T&D 1923	GSQ159b BD159a		QM NHMUK	GSQ159b In.33427		
Elaterium bipunctatum	T&D 1923 T&D 1923	GSQ292a BD292b		QM NHMUK	GSQ292a In.33546		
Elaterium punctomarginum	T&D 1923 T&D 1923	GSQ200b BD200a		QM NHMUK	GSQ200b In.33464		
Etheridgea australis Handlirsch 1908	T&D 1916, 1923	S4	Simmonds Collection	NHMUK	In.33274		
Grammositum bilineatus	T&D 1923 T&D 1923	GSQ136a BD136b		QM NHMUK	GSQ136a In.33405		
Leioodes planum	T&D 1923 T&D 1923	GSQ348a BD348b		QM NHMUK	GSQ348a In.33585		
Leioodes pygmaeum	T&D 1923 T&D 1923	GSQ287a BD287b		QM NHMUK	GSQ287a In.33542		
Lobites granulatus	T&D 1923 T&D 1923	GSQ183b BD183a		QM NHMUK	GSQ183b In.33449		
Lobites trivittatus	T&D 1923 T&D 1923	GSQ164a BD164b		QM NHMUK	GSQ164a In.33431		
Lobites tuberculatus	T&D 1923 T&D 1923	GSQ342a GSQ342b		QM QM	GSQ342a GSQ342b		
Mesostigmodera typica Etheridge & Olliff 1890	T&D 1916, 1923 T&D 1916, 1923 T&D 1923 T&D 1923	S5a S5b GSQ61a GSQ61b	Simmonds Collection Simmonds Collection	NHMUK NHMUK QM QM	In.33275 In.33275 GSQ61a GSQ61b		
Mesothoris clathrata	T&D 1916, 1923 T&D 1916, 1923 T&D 1916	BD48a GSQ48b BD49		NHMUK QM NHMUK	In.33321 GSQ48b In.33322		
Mesothoris grandis	T&D 1923 T&D 1923	GSQ54a BD54b		QM NHMUK	GSQ54a In.33327		
Mesothoris quadripartita	T&D 1923 T&D 1923 T&D 1923	GSQ349a BD349b GSQ51a GSQ51b		QM NHMUK NHMUK QM	GSQ349a In.33586 In.33324 GSQ51b		
Mesothoris tenuiclathrata	T&D 1923 T&D 1923	GSQ313a BD313b		QM NHMUK	GSQ313a In.33561		
Platycrossos ligulatus	T&D 1923 T&D 1923 T&D 1923	GSQ268a GSQ268b BD118a-b	Listed as 118 at AM	QM QM AM	GSQ268a GSQ268b AMF39256	BD118a-b	In.33387

TABLE 1. cont…

Order and species name (as per Jell 2004), by collection locality	Where first described and published ("T&D" refers to "Tillyard & Dunstan")	Type number originally cited	Notes	Current location of cited specimen	Number at current location	Uncited type counterparts held at NHMUK	
						Original Dunstan number	NHMUK number
Platycrossos tumidus	T&D 1923 T&D 1923	BD45a GSQ45b		NHMUK QM	In.33318 GSQ45b		
Platycrossos subtumidus	T&D 1923	GSQ171		QM	GSQ171		
Polysitum minutus	T&D 1923 T&D 1923	GSQ336a GSQ336b		QM NHMUK	GSQ336a In.33577		
Polysitum punctatus	T&D 1923 T&D 1923	GSQ153b GSQ153a		QM QM	GSQ153b GSQ153a		
Pseudorynchophora olliffi Handlirsch 1908			See *Ademosyne olliffi*				
Reeveana intermedia	T&D 1923 T&D 1923	GSQ201b BD201a		QM NHMUK	GSQ201b In.33465		
Reeveana major	T&D 1923 T&D 1923	GSQ251a BD251b		QM NHMUK	GSQ251a In.33510		
Reeveana minor	T&D 1923 T&D 1923	GSQ297a BD297b		QM NHMUK	GSQ297a In.33550		
Shepherdia quadrivittata	T&D 1923 T&D 1923	GSQ130a BD130b		QM NHMUK	GSQ130a In.33400		
Simmondsia cylindrica	T&D 1923 T&D 1923	GSQ87a BD87b		QM NHMUK	GSQ87a In.33357		
Simmondsia subpyriformis	T&D 1923 T&D 1923	GSQ135 BD276	276 at QM is *Mesorthopteron*	QM NHMUK	GSQ135 In.33531	Paratype	In.32908
Tryoniopsis granulata	T&D 1923 T&D 1923	GSQ161a BD161b	Referred to as *Leptomorpha impunctata* in the BD list	QM NHMUK	GSQ161a In.33429		
Tryoniopsis punctata	T&D 1923 T&D 1923	GSQ250a BD250b	Referred to as *Leptomorpha granulata* in BD list	NHMUK QM	In.33511 GSQ250b		
Tillyardiopsis granulata	T&D 1923 T&D 1923	GSQ289a BD289b		QM NHMUK	GSQ289a In.33543		
Tillyardiopsis tuberculata	T&D 1923 T&D 1923	GSQ133a BD133b		QM NHMUK	GSQ133a In.33402		
Tillyardiopsis variotubercula	T&D 1923 T&D 1923	GSQ66a BD66b		QM NHMUK	GSQ66a In.33338		
Ulomites willcoxi	T&D 1916, 1923 T&D 1916, 1923	GSQ50b BD50a		QM NHMUK	GSQ50b In.33323		
Willcoxia magnopunctata	T&D 1923 T&D 1923	GSQ261a BD261b		QM NHMUK	GSQ261a In.33517		
Order NEUROPTERA							
Genus *Archeosmylus*	Riek 1956	AMF39249	Originally GSQ363	AM	AMF39249		
Archepsychops triassicus	Tillyard 1919a	GSQ137a	Became *triassicus* in Lambkin 2014a	QM	GSQ137a	BD137b	In.33406
Osmylopsychops spillerae	Tillyard 1923 Tillyard 1923	GSQ314a GSQ283a		QM QM	GSQ314a GSQ283a	BD314b BD283b	In.33562 In.33538
Petropsychops superbus	Riek 1956 Riek 1956	UQC2135 UQC2136	Became *superbus* in Lambkin 2014a	QM QM	UQC2135 UQC2136		
Protopsychopsis venosa	Tillyard 1917a	GSQ160a		QM	GSQ160a	BD160b	In.33428
Triassopsychops superbus	Tillyard 1922	GSQ284a	Became *superbus* in Lambkin 2014a	QM	GSQ284a	BD284b	In.33539
Order GLOSSELYTRODEA							
Polycytella triassica	Tillyard 1922 Tillyard 1922	GSQ81a GSQ154		QM QM	GSQ81a GSQ154a	BD81b	In.33351

TABLE 1. cont…

Order and species name (as per Jell 2004), by collection locality	Where first described and published ("T&D" refers to "Tillyard & Dunstan")	Type number originally cited	Notes	Current location of cited specimen	Number at current location	Uncited type counterparts held at NHMUK	
						Original Dunstan number	NHMUK number
Order MECOPTERA							
Archipanorpa magnifica	Tillyard 1917a Tillyard 1917a	GSQ106a GSQ120a	Proposed as *incertae sedis* in Riek 1956	QM QM	GSQ106a GSQ120a	BD106b BD120b	In.33376 In.33389
Aristopsyche superba			See *Mesopsyche triareolata*				
Mesochorista proavita	T&D 1916 T&D 1916 Riek 1956 Riek 1956	BD32a BD32b AMF39230 AMF39271	 Originally GSQ142a Originally GSQ142b	AM NHMUK AM AM	AMF39231 In.33308 AMF39230 AMF39271		
Mesopsyche triareolata *Triassopsyche dunstani* *Aristopsyche superba* *Neuropsyche elongata*	Tillyard 1917a Tillyard 1917a Tillyard 1919a Tillyard 1919a Riek 1956 Riek 1956	GSQ110 GSQ128a GSQ148a GSQ228a UQC2246 UQC2247	These 4 species synonymised in Riek 1956 and confirmed in Lambkin 2014b	AM AM AM AM QM QM	AMF39233 AMF39228 AMF39263 AMF39272 UQC2246 UQC2247	 BD128b BD148b BD228b	 In.33398 In.33417 In.33490
Neuropsyche elongata			See *Mesopsyche triareolata*				
Triassopsyche dunstani			See *Mesopsyche triareolata*				
Family Orthophlebiidae	Riek 1956	AMF39232	Previously GSQ52a	AM	AMF39232	BD52b	In.33325
Mecopteron *incertae sedis*	Tillyard 1919a	GSQ168a-b		QM	GSQ168a-b		
Panorpoid *incertae sedis*	Tillyard 1919a	GSQ114b	Also another 114A-B at AM as F39288 and F39286	AM	AMF39275 as 114a-b		
Order TRICHOPTERA							
Stereochorista frustrata	Tillyard 1919a	GSQ218	Reassigned from Mecoptera to Tricoptera in Riek 1956	QM	GSQ218		
Other specimens referred to							
Coleopterous larva burrow	Tillyard 1922	170	Possible leaf mine (Rozefelds & Sobbe 1987)	QM	GSQ170		
Insect fragment	T&D 1923 fig.61	350		QM	GSQ350		
Insect fragment	T&D 1923 fig.62	352		QM	GSQ352		
Insect fragment	T&D 1923 fig.63	353		AM	AMF39259	BD353	In.33587
Insect fragment	T&D 1923 fig.64	354		AM	AMF39261		
Insect fragment	T&D 1923 fig.66	355		QM	GSQ355		
Insect fragment	T&D 1923 fig.67	356		AM	AMF39258		
Insecta *incertae sedis*	T&D 1916 T&D 1916	6 7		QM QM	GSQ6 GSQ7		
Not *Mesorthopteron locustoides*	Tillyard 1922	GSQ5c		QM	GSQ5c		

TABLE 2. Other fossil insects from Tillyard & Dunstan 1916 and Tillyard 1918a: described species and location of specimens.

Order and species name (as per Jell 2004), by collection locality	**Where first described and published** ("T&D" refers to "Tillyard & Dunstan")	**Type number originally cited**	**Notes**	**Current location of cited specimen**	**Number at current location**	**Uncited type counterparts held at NHMUK**	
						Original Dunstan number	**NHMUK number**
ST PETER'S, SYDNEY							
Order BLATTARIA							
Notoblattites subcostalis	T&D 1916	BD25a	In.33593 is listed by NHMUK as the type counterpart of *Triassoblatta subcostalis*, the name originally proposed by Dunstan and Tillyard for this species	NHMUK	In.33593		
	T&D 1916	BD25b		QM	GSQ25b		
	T&D 1916	BD24a		NHMUK	In.33301		
	T&D 1916	BD24b		QM	GSQ24b		
Order TITANOPTERA							
Mesotitan giganteus	T&D 1916	22a	In.33592 is listed by NHMUK as the type counterpart of *Triassophlebia gigantea*, the name originally proposed by Dunstan and Tillyard for this species	QM	GSQ22a		
	T&D 1916	22b		NHMUK	In.33592		
	T&D 1916	21a		NHMUK	In.33299		
	T&D 1916	21b		QM	GSQ21b		
	T&D 1916	23a		NHMUK	In.33300		
	T&D 1916	23b		QM	GSQ23b		
Order COLEOPTERA							
Elaterites wianamattensis	T&D 1916	BD30		NHMUK	In.33306		
Etheridgea petrica	T&D 1916	BD31		NHMUK	In.33307		
Mesorhynchophora dunstani	T&D 1916	BD27a		NHMUK	In.33303		
		BD27b		QM	GSQ27b		
Metrorhynchites sydneiensis	T&D 1916	BD28a		QM	GSQ28a		
		BD28b		NHMUK	In.33304		
Insecta *incertae sedis*	T&D 1916	26a		QM	GSQ26a		
	T&D 1916	26b		QM	GSQ26b		
	T&D 1916	29a		QM	GSQ29a		
	T&D 1916	29b		QM	GSQ29b		
GOODNA, QUEENSLAND							
Order NEUROPTERA							
Euporismites balli	T&D 1916	GSQ34a	Incorrectly identified in NHMUK Register as "Upper Triassic, Denmark Hill". It is from the Tertiary Redbank Plains Formation in Southeast Queensland	QM	GSQ34a		
	T&D 1916	GSQ34b		NHMUK	In.33309		

TABLE 2. cont…

Order and species name (as per Jell 2004), by collection locality	Where first described and published ("T&D" refers to "Tillyard & Dunstan")	Type number originally cited	Notes	Current location of cited specimen	Number at current location	Uncited type counterparts held at NHMUK	
						Original Dunstan number	NHMUK number
DUARINGA, QUEENSLAND							
Order ODONATA (presumed)							
Austrolestidion duaringae	T&D 1916 T&D 1916	BD20a BD20b	Identified in Rozefelds 1985 as a parastacid crustacean, not a pair of zygopteran nymphs	QM NHMUK	GSQ20a In.33297		
ROLLING DOWNS, QUEENSLAND							
Order ODONATA							
Aeschnidiopsis flindersiensis Woodward	Tillyard 1918a	GSQ368		QM	GSQ368		In.64602

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