

## The geographical movements of Hermann Elgner (d. 1913): a lepidopterist based in Torres Strait, Australia

Kelvyn L Dunn  
email: kelvyn\_dunn@yahoo.com

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### Abstract

A German, Hermann Elgner resided at Cape York and on several islands in Torres Strait at the turn of the Twentieth century. He collected butterflies and other insect on a regular basis, his efforts adding new species to the list of Australian fauna. His Australian collections now form an essential and historic baseline for that region, one upon which contemporary workers have only recently begun to build. This paper lists Elgner's geographical movements from 1900-1911 as a guide for researchers examining his material, now part of several Australian museums' holdings. It refines and expands upon the earlier chronology suggested by Moulds (1977). Using a thematic sample (n=1407 records labelled with Elgner's name), the analysis of his collecting detected only eleven records conflicting with proposed movements. Yet, this proportion as an estimate of Elgner's data accuracy hinges consequentially on that of the database from which the data sample came. With elimination of database process and vicarious contaminations (creative of 64% of these eleven records), an estimate of 99.7% was obtained as a measure of Elgner's labelling accuracy. Statistically, this error estimate, at merely 0.3 percent, upholds Elgner's veraciousness and labelling validity as exemplary – a model for perfection.

### Introduction

Thirty years ago in his *Bibliography of Australian Butterflies*, Moulds (1977: 77) wrote of Hermann Elgner, an early 20<sup>th</sup> century insect collector:

*Although Elgner did not publish on Australian insects, material collected by him from the Torres Strait islands and the vicinity of Cape York remains of considerable significance. He collected insects of several orders, including large numbers of butterflies which he sent to G.A. Waterhouse for study.*

The insects collected by Elgner, on an almost daily basis spanning a decade, now form the most important single collection from this remote region. Climatically, his collecting period encapsulated a series of suitable seasons that fell between two major droughts spanning much of continental Australia. Lauded as "systematic" by his peers (Dumigan 1933: 2), Elgner's collecting commenced towards the end of the severe drought of 1895-1903 and continued through to the beginning of the next significant drought of 1911-16 (Bureau of Meteorology c.1984). Collecting was most diligent from the years 1906 to 1910 with dramatic decline in 1911, perhaps due to cyclic climatic changes associated with the developing *El Nino* event, inevitably plunging butterfly abundance. However, other reasons such as declining health might also be explanatory; he died soon after in 1913.

Some one hundred years later, his specimens, especially the butterflies, serve as an essential and irreplaceable historic baseline for Torres Strait. Indeed, a male Birdwing of his still excellently preserved after 90 years, found its honour among the choice illustrations in Braby (2000), a finer example being hard to find among recent contributions to museums from this region. Moreover, a number of butterfly species have not been encountered since, perhaps due to their irregular vagrancies from PNG, or localised extinctions on islands and at Cape York itself due to habitat and land use changes. *Orsotriaena* is one such butterfly genus that

vanished from the mainland soon after Elgner's era. After leaving Australia, Elgner collected in the northern region of New Guinea (then politically, German New Guinea), and on Aru Islands and Ceram. He died prematurely on Ambon in Maluku, after prolonged suffering (Waterhouse 1913, see translation in Appendix – this paper). Knowledge of him as a person has vanished with the passing of time, and Musgrave (1932) was unaware even of his year of birth. Museum records have since provided a fragmented glance into the Australian period of this man's life (Moulds 1977), a collector whose efforts added several new lycaenids to the rapidly growing list of Australian butterflies (Waterhouse & Lyell 1909). Aside from this, he is commemorated in eponymy by the jewel butterfly, *Hypochrysops elgneri* (Waterhouse & Lyell 1909), a species he discovered on Prince of Wales Island on or about 17 Jun 1908 (earliest dated 'co-type' in the Museum of Victoria). Clearly, his extensive collections (Edwards 1993), which have advanced regional knowledge and enriched science, testify to his dedication in pioneering entomology.

Moulds (1977) chronologically detailed Elgners movements in Queensland, spanning January 1906 to March 1911, based on the butterfly and dragonfly holdings in the Australian Museum collection, Sydney NSW, but other data have since become accessible. The Dunn & Dunn database, established in 1983 and, at the time of writing tallying 127 503 butterfly records, holds 1407 records attributed to Elgner (as per label data). This resource incorporates two large collections (ANIC, Canberra and MV, Melbourne) and miscellaneous literature citations of Elgner's specimens. Its use enabled construction of a new list. Records crosschecked well against Moulds (1977) but where ambiguity or complication was exposed, I have suggested a conclusion of best fit. Neither list is superior in itself but in combination, this revised chronology serves to clarify his day to day movements. It is likely to prove convenient in interpreting label information that has or could become damaged or illegible in places. Moreover, it may aid in corroborating a label of his with that of his others, or link material inappropriately attributed to recipient collectors or those specimens since labelled anonymously.

At this point, data handling constraints need explanation and consideration. About eight decades after Elgner or one or more recipient workers permanently labelled material, the data labels were hand-copied then transcribed to computer by data examiners and database builders. This vicarious process has added two further handling steps. In effect up to four handling steps may have occurred for some specimens in the database if recipients labelled papered material, increasing chance for errors at each step. Elgner's accuracy of labelling (based on corroboration of locality, month and year as given on labels) would be higher than the reliability calculation for the database (presented later) which incorporates the subsequent twofold data processing.

As part of the data analysis I separated out eleven unusual records attributed to Elgner that did not fit suggested movements. Several of these anomalies or errors were due not to Elgner but later data transmitters. Others constitute unclear movements for which there may be another explanation. Identifying the collector of specimens is very important in data validation. Unfortunately, not all recipients faithfully retained collectors' details or original labels for varied personal reasons, later bringing specimens' origins and the veracity of the copied labels into question (Dunn & Dunn 2006). Often these anonymously labelled records omitted the day of collection, suggesting lessened exactness than those bearing Elgner's name. Many are undoubtedly his, but some raise concerns as they do not fit the suggested chronology snugly. Deemed by me as less reliable, anonymous records and those attributed to recipients have been treated cautiously, and on but few occasions were such records used to make adjustments, and then with commentary for constructional transparency.

**Other collectors in the Cape York Peninsula –Torres Strait region (1880-1940)**

Monteith (1974) provided a history of the biological collecting at Cape York from 1770 to 1973. His account included background information, giving insight into Elgner's period, but contained little information on the man himself or his travels. It was written though, that, "much of the early butterfly collecting at Cape York was by H. Elgner around the turn of the century" (p.12), Monteith specifying a collecting period from "c.1900-1910" (p.26). In order to match anonymous data, it was necessary to determine prominent collector visits to this region. I searched available database records, scanned literature that listed specimen label data and compared historical reports for the period, 1880-1940. However, it remains outside the scope of this paper to give a detailed account of the history of collecting at this time. The outline below, compiled from specimen records serves as a guideline only. Moreover, a measure of healthy caution is required as its accuracy hinges on label renderings, with some alleged or supposed movements perhaps credited to these collectors by mistaken specimen recipients or later data processors.

- G.F. Mathew collected on Thursday Island on 18 Apr 1885 and provided a detailed account (Mathew 1885); Waterhouse & Turner (1905) later commented on one of Mathew's records.
- Specimens of *Papilio fuscus*, *Tellervo zoilus* and *Pachliopta polydorus* (all MV) attest to another late 19<sup>th</sup> century visit to Thursday Island by an unrecorded collector before Elgner's period. Two of these bear the same date (27 Mar 1896) with another less precisely labelled '1896'; two also bear the initials of C. French, a Melbourne entomologist and likely recipient, the other being anonymously labelled. They may be Bertie Jardine's (see below) or perhaps those of H.G. Barnard, who visited Cape York in 1896-97 (Monteith 1974).
- Frank L. Jardine (b.1841), a former Government resident, worked variously at Somerset as a police magistrate, drover, grazier, pearler and planter from the 1860s until his death in 1919 (Monteith 1974, Edwards 2005). A number of anonymously labelled insects from Cape York, taken during the 1880s and 1890s, may be attributable to him or one or more ornithologist/naturalist visitors of his.
- B.L. Jardine collected at Somerset (Cape York) in 1902-04 and 1906, with a single record dated 1908. Records indicate that Elgner and Bertie Jardine were collecting contemporaneously at Cape York, with at least sixty butterfly specimens in the MV bearing the initials 'BLJ' with others in the AM. Bertie was born at Somerset but departed for Palestine with the Australian Light Horse Brigade during the First World War (E.D. Edwards, pers. comm. 2007).
- R.E. Turner collected on Cape York and Thursday Island in April-May 1902 (AM, ANIC, MV, see also Peters 1969).
- In 1913, an unidentified collector sampled at Cape York during Oct-Nov (ANIC, AM) and on Prince of Wales Island during May and June (MV); these records postdate Elgner's death (Waterhouse 1913, Musgrave 1932). Another or the same unidentified collector contributed specimens of at least seven species from Thursday Island between March and July 1916 (ANIC, MV). The 1913 records, at least, may be those of B.L. Jardine's.
- E.J. Dumigan collected at the old telegraph station at Cape York during Oct-Nov 1927 Monteith (1974) indicated his presence there as early as September, from data available to him. Dumigan (1933) reported on this visit, undertaken in company with his friend W.B. Barnard, mentioning four species considered worthy of note, but specified only his departure date of 25 November. He donated his collection to the University of Queensland.

- W.B. Barnard visited Cape York during Oct-Nov 1927 and again from March-June 1928. He also collected on Thursday in March and Banks Islands in May 1928. Monteith (1974) indicated Barnard visited Cape York from Sept-Nov 1927 and from March-May 1928, but database holdings indicate collecting extended into June. The bulk of Barnard's material is in the Queensland Museum.
- R.G. Wind visited Prince of Wales and Horn Islands in Feb 1939 (see also specimen citations in Peters 1969, Braby 1997).
- Elsewhere on Cape York Peninsula, H. Hacker collected in the Coen district from 1905-06, and J.A. Kershaw collected intensively farther north at the Claudie River during 1913-14, each contributing many specimens that now bear their names. Kershaw (1914, 1915a,b) detailed his explorations, but commented on few butterflies individually.
- Others' names such J.A. Brewer, J.A. Kershaw, G. Lyell, G. Masters, A.S. Meek, L.H. Mosse-Robinson, and G.A. Waterhouse appear on specimens labelled 'Cape York' taken during the 'Elgner period' of 1900-1911. These I interpret as indicating 'collection holders' or specimen recipients rather than the authentic field collectors, but Valentine & Johnson (1993) recognised a visit to the region by Meek. Other Cape York Peninsula specimens from the Elgner period bearing initials 'CF' (C. French) remain unclear as to their actual collector or precise origins (Dunn & Dunn 1991). Like the many anonymous records discussed earlier, some inappropriately attributed specimens bear rather general information, that is, the specific day of collection or even the month may be missing.

### **Chronological listing of Elgner's movements**

#### **Key:**

**Collection Sites:** Braby (2000: 17) provided a handy map of the Torres Strait Islands, segregating the island groups into southern, central, eastern and northern islands. Perusal of this map will help in following Elgner's movements. Available records indicate that Elgner collected at ten or more localities. These are as follows: Cape York, Prince of Wales (Muralug) Island, Thursday (Waiben) Island, Hammond Island, Banks (Moa) Island, Murray (Mer) Island, Darnley (Erub) Island, Stephens (Ugar) Island, and Nagia (Mt Ernest) Island. The precise site intended by 'Jewy River' at Cape York has not been determined, but it is evidently different from those labelled 'Cape York'.

**Abbreviations:** **CYP** - Cape York Peninsula; **TI** - Thursday Is.; **AM** - Australian Museum, Sydney; **MV** - Museum of Victoria, Melbourne, **SAM** - South Australian Museum, Adelaide; **UQIC** - Univ. of Queensland Insect Collection, Brisbane; **DDdb** - Dunn & Dunn database; **CWTC** - 'Passed through C. Wyatt theft collection 1946-47'\*.

[\*Colin Wyatt: refer to Moulds (1999) and Dunn & Dunn (2006) for discussion of this museum menace and his impact on label authenticity. As one damaging example, Braby (1995) dismissed an oft-cited, historic *Ogyris* specimen as unreliable after he exposed it had been subject to Wyatt's meddling. The record had been used to support a distorted species distribution and had carried through the literature since Peters (1969). The attached 'theft collection' label had escaped others' attention or consideration.]

#### **Decision-making on specimen dates:**

The label format of Elgner material is largely uniform. Many specimens in the MV contain small printed labels in typed format, specifying the locality and Elgner's name, with a separating space where a date has been inked in by hand, using numbers. A period (full stop) separates the sequence of date, month and year, eg. "23.5.1910". Other specimens bear labels that are completely hand written. In this chronology, the hyphenated dates below imply

numerous consecutive records having six or less days between them, except where circumstances required isolation of some dates. One or more omitted years signify an absence of records. Moulds (1977) did not specify the day-separation criterion he used to amalgamate sequences, so I have interpreted his chronology cautiously, albeit frequently comparing with this source, where I lack supportive data. Dates and localities provided represent a digitised version of the original and may not be the same format or spelling as the original. For instance, Roman numerals if or where present on labels have been converted to spelt abbreviations of months as part of computer standardisation for retrieval machines. Dunn & Dunn (2006) discussed this data standardisation as part of the database construction.

## **Chronology**

Records before 1906 are few. Moulds did list any movements before that year so these are included cautiously.

**1900. Thursday Island:** 15 Jan 1900. Only a single record for *Rapala varuna* (MV).

**1901. Darnley Island:** an anonymous record for 27 Dec 1901 (MV) may belong to Elgner.

**1902. Cape York:** 10-12 May 1902. Derived from two contributed records (AM) in DDdb, and there is another for the same day but four years on, namely '10 May 1906'.

**1904. Darnley Island:** 18-20 Dec 1904. Two records for *Zizina labradus* (AM) contributed to DDdb.

**1905. Prince of Wales Island:** 18 May 1905. A single specimen of *Pelopidas lyelli* (MV).

**Cape York:** 21 Oct 1905. A record of *Praetaxila segecia* (AM) contributed to DDdb.

**Thursday Island:** an anonymous record for '1905' may belong to Elgner.

**1906. Thursday Island:** a specimen of *Arhopala eupolis* labelled '15-18 Jan 1906 L.H. Mosse-Robinson' (ANIC) is probably Elgner's, but data may not have been accurately transcribed by this recipient who perhaps secondarily labelled it in this instance. Elgner's whereabouts in mid January are otherwise unreported so this information does not conflict but is viewed cautiously given the circumstances.

**Cape York:** 25 Jan 1906. Moulds is more informative providing 24-26 Jan.

**Banks Island:** 07 Feb 1906 (Moulds 1977).

**Cape York:** 10-12 & 22-26 Feb 1906 (Moulds 1977).

**Banks Island:** 05 Mar 1906 (Moulds 1977). Moulds indicated collection on Cape York and Banks Island that same day, evidently a day of transit.

**Cape York:** 05-16 Mar 1906. Moulds expanded this period to 18 March, indicating collection at both Cape York and Thursday Island on the 18<sup>th</sup>, evidently a day of transit.

**Thursday Island:** 18-19 Mar 1906.

**Cape York:** 22-26 Mar 1906, 09-22 Apr 1906, 10 & 22 May 1906. Moulds is more informative giving 19 March - 27 May 1906, and indicating collection on Thursday Island and Cape York on the 19<sup>th</sup>, evidently a day of transit. A record of *Candalides helenita* for 'Cape York, 21 May 1906, G.A. Watehouse' is most certainly Elgner's, corresponding well with established dates above and data from Moulds (1977). Elgner's collecting here coincided with that of Jardine's at Somerset. **Note:** there is a record of *Orsotriaena medus* from Darnley Island 11 Apr 1906 'G. Masters' (MV). This may be Elgner's but the locality does not match his known movements in April.

**Murray Island:** 03 Jun 1906 (Moulds 1977).

**Thursday Island:** 05 Jun 1906.

**Jewy River, Cape York:** 12 Jul 1906. Moulds' data appear sequential at this point: he gave '12 Jul 1906 - 25 Jul 1907' for 'Cape York', suggesting a full years residence (see commentary for 1907).

#### **Cape York**

Date: 31 Oct - 02 Nov 1906 & 08 Dec 1906.

**1907. Cape York:** 19-25 Jan 1907, 04 & 11-28 Feb 1907, 16 Mar 1907, 01-06 Apr 1907, 30 May 1907, 10 Jul 1907. In addition, Elgner almost certainly collected two specimens dated 01 & 08 Feb 1907, 'J.A Brewer' (MV) and an anonymously labelled specimen taken on '09 Mar 1907' (MV), providing more data for February-March. Moulds (1977) gave 31 Mar - 28 Apr, 22-27 May, and 08 & 28 Jun expanding these months and filling a gap for June. However, for Cape York, Moulds generalised a year's residence from '12 Jul 1906 - 25 Jul 1907', therein duplicating the more specific data provided for 1907 but listed out of sequence in the '1908 section' of his report. The year 1907 is clearly correct – these data do not agree with Elgners movements for 1908. Assuming no intended duplication, perhaps Moulds had meant either '12-15 Jul 1906' or '12-15 Jul 1907'. Presence on Cape York from 12-15 Jul '1907' would fit and expand upon above data providing a conservative period from at least 31 Oct 1906 to 15 Jul 1907. I suspect the data duplication was an oversight and he had records from August and September 1906 to support the extended period '12 Jul 1906 – 25 Jul 1907'. **Consensus:** All facts considered, Elgner resided at Cape York continuously between 31 Oct 1906 to 10 Jul 1907, and possibly the whole period from 12 July 1906 to 25 Jul 1907.

**Murray Island:** 30 Jul 1907 (Peters 1969).

**Mt Ernest (Nagia) Island:** 25 Aug 1907 (Moulds 1977).

**Murray Island:** 30 Aug – 13 Sep 1907, 21 & 30 Sep 1907. Peters (1969) provided the intervening date of 21<sup>st</sup> Sep, but DDdb records remain too sparse for amalgamation under established decision making. It is likely that Elgner resided at Murray Island throughout September 1907.

**Cape York:** 03 Oct 1907, 25 Nov 1907, Dec (month only) 1907. Limited data are available here (DDdb) but Moulds' list is informative. He suggested 01 Oct 1907 – 26 March 1908, but this amalgamation omits a visit to Prince of Wales Island in early February 1908, now newly reported.

Movements in December 1907 remain unclear, but it would seem Elgner was residing continually at Cape York between October 1907 and January 1908. However, an anonymously labelled specimen from 'Darnley Island', dated '29 Dec 1907' (MV) is almost certainly one of Elgner's. If accurately labelled, it would suggest an unconfirmed visit.

**1908. Cape York:** 14 & 25 Jan 1908.

**Prince of Wales Island:** 03 Feb 1908.

**Cape York:** 10-11 Feb 1908, 10-26 Mar 1908 & 6-8 Apr 1908. The commencement date of 10 Feb is from a CWTC specimen but 11 Feb is undoubted, and Waterhouse (1932) had listed February for this locality no doubt based on Elgner's data. For instance, Elgner almost certainly collected a specimen of *Chaetocneme critomedia* dated 17 Feb 1908 'G.A. Waterhouse' (MV). This expands on the dates for that month. However, an anonymously labelled specimen of *Graphium agamemnon* from 'Prince of Wales Island, March 1908' (MV) conflicts with known movements; 'May' would seem more compatible.

**Prince of Wales Island:** 12-13 Apr 1908.

**Darnley Island:** 15 Apr 1908.

**Cape York:** 17 Apr 1908.

**Prince of Wales Island:** 22 Apr 1908.

**Cape York:** 23 Apr 1908.

**Prince of Wales Island:** 28 Apr 1908 & 07 May – 8 Jul 1908. Moulds gave 04 May – 19 Jul 1908, which expands that given above. The April record is new, and suggests continuous residency from **28 Apr – 19 Jul 1908**. There is a specimen of *Hypolycaena phorbis* from Prince of Wales Island '19 June 1908, G. Lyell' (ANIC) and an anonymously labelled specimen of *Cepora perimale* from Thursday Island 'June 1908' (MV). Elgner probably collected these but the label data conflict with known movements.

**Cape York:** 27 Jul 1908 & 10-18 Sep 1908. There are no records for August 1908 (DDdb), but Moulds is informative, suggesting a continuous period from 27 Jul – 18 Sep based on his sources.

**Thursday Island:** 23 Sep 1908 (Moulds 1977).

**Cape York:** 18-22 & 30 Oct 1908, 10-17 Nov 1908 & 10 Dec 1908. Sands (1980) reported 22 Oct, serving as an end date for part of a sequence. Moulds is informative, suggesting a continuous period from 21 Oct 1908 - 18 May 1909. The new record of 18 October extends this marginally earlier. A 'Somerset' record of Jardine's dated '06 Oct 1908', suggests he and Elgner were again collecting contemporaneously at Cape York in October of that year. An anonymously labelled specimen of *Pachliopta polydorus* from 'Darnley Island, 31 Dec 1908' (MV) conflicts with known movements; the year was almost certainly 1909 in agreement with other specimens taken that day on Darnley Is. **Consensus:** see next entry.

**1909. Cape York:** 02 & 18-23 Jan 1909, 21-26 Feb 1909, 10-19 Mar 1909, 02-05, 13 & 26 Apr 1909 & 05-11 May 1909. An anonymous record dated '29 Jan 1909' (AM) is almost certainly Elgner's and would expand data for that month. However, the anonymous record of *Phaedyma shepherdii* from Prince of Wales Is. '05 May 1909' (MV) conflicts with the data above and Moulds (1977). Sands (1986) listed two of the sectional start-end dates provided above, namely 10 March and 11 May, and Moulds gave the latest date as 18 May 1909, extending one week beyond those available to me. **Consensus:** it seems Elgner spent a continuous seven-month period, namely 18 Oct 1908 – 18 May 1909, at Cape York.

**Prince of Wales Island:** 28-31 May 1909.

**Cape York:** 13-15, 23 & 28 Jun 1909. Both Moulds (1977) and Sands (1986) listed 13 June. Although, Moulds indicated a lengthier continuous period through to 26 Nov 1909, a record has surfaced from July 1909 for Prince of Wales Island, which now breaks this sequence at 28 June. This final date is again from Sands (1986), and 15 June is a CWTC specimen. An anonymous record of *Junonia orithya* from Prince of Wales Is. '18 Jun 1909' (MV) conflicts with known movements; the year intended could have been 1908.

**Prince of Wales Island:** 02 Jul 1909.

**Cape York:** 09, 16 & 27 Jul 1909, 6-13 & 22 Aug 1909, 02-26 Sep 1909, 02-29 Oct 1909, 13-16 & 23-27 Nov 1909. Moulds suggested a continuous period from June to November. The minor extension of an extra day in November at Cape York is new. In addition, an anonymous record dated '30 Nov 1909' is almost certainly Elgner's and serves to expand this period further, closing the gap between this and the next locality. However, the anonymous record of *Junonia orithya* from 'Prince of Wales Is. 27 Oct 1909' (MV) conflicts with known movements. **Consensus:** all facts considered, period of residency modifies to 09 Jul – 27 Nov 1909, given a new record from early July 1909 on Prince of Wales Island, breaking the earlier sequence.

**Thursday Island:** 03-04 Dec 1909. Two anonymous records for 02 & 05 Dec 1909 (MV) are almost certainly Elgner's and expand the period slightly.

**Cape York:** Dec (month only) 1909.

**Stephens Island:** Dec 1909 (Moulds 1977).

**Darnley Island:** 13-31 Dec 1909. **Note:** an anonymously labelled record of *Euploea core* from Thursday Is. '22 Dec 1909' (MV) conflicts with known movements; '1910' would seem more compatible.

**1910. Thursday Island:** 2 Jan 1910 (Moulds 1977).

**Darnley Island:** 09 Jan 1910.

**Banks Island:** 11 Jan 1910 (Moulds 1977). Valentine & Johnson (1993) considered the record of *Hesperilla malindeva* labelled Banks Is. Jan 1910 'A.S. Meek' (SAM) as doubtful. They argued it was a specimen of F.P. Dodd's from Herberton, and that 'Banks Island' was the locality of receipt by Meek, during a visit to Torres Strait. A labelling practise such as this, although illogical, was "not unknown at the time" (Valentine & Johnson 1993: 117). I suspect the specimen was actually taken by Elgner during mid January, and provided to Meek when he visited, this rarer species probably being of interest to him at the time. In support of locality authenticity, Dunn

& Dunn (2006) reported an Elgner specimen of *H. malindeva* collected on Banks Island in February 1910. **Consensus:** both *H. malindeva* specimens fit the chronology provided. Valentine & Johnson's decision, accepted cautiously by Braby (2000), is now over-ruled.

**Thursday Island:** 14-20 Jan 1910.

**Darnley Island:** 20-21 Jan 1910. Elgner collected on both Thursday and Darnley Islands on 20 Jan, indicating his day of transit.

**Cape York:** 22 Jan 1910.

**Banks Island:** 02 Feb – 15 Mar 1910.

**Thursday Island:** 16-21 Mar 1910. Moulds added 15 March for this island, indicating collection on both islands that day and inferring his day of transit.

**Prince of Wales Island:** 22 Mar 1910.

**Banks Island:** 22 Mar 1910. There is an anonymously labelled record of *Tellervo zoilus* from Banks Is. '22 Mar 1910', which is without doubt Elgner's. All other specimens of this species dated 1910 are from Banks Island and collected during February and March; data in Peters (1971) is also supportive. It is now suggested, and feasible, that after departing Thursday Island on either 21 or 22 March, Elgner visited Prince of Wales Island briefly on the 22<sup>nd</sup>. From here, he left for Banks Island on 22 Mar, returning to Thursday Island on the 23<sup>rd</sup> or 24<sup>th</sup>. **Consensus:** although an anonymously labelled specimen, I have chosen to include this visit based on the supportive evidence cited.

**Thursday Island:** 24 Mar 1910. Moulds is more informative providing the dates 24-29 Mar. His whereabouts on 23 March remain unclear.

**Hammond Island:** 31 Mar 1910 (Moulds 1977).

**Banks Island:** 01 Apr 1910 (Moulds 1977).

**Darnley Island:** 09 Apr – 23 Jun 1910. Moulds is more informative here suggesting residency from 03 Apr – 09 Jul 1910, evidently having records from July, unavailable in my sources. Waterhouse (1932) mentioned 17 June in passing, which is in agreement with the above sequences. **Consensus:** Concordance is with Moulds.

**Cape York:** 14 Jul – 05 Aug & 15-18 Aug 1910. Moulds gave a lengthier period from 15 Jul – 10 Nov 1910. However, there is now suggestion of short visits to Banks and Darnley Islands in late August and late September respectively, breaking his period at Cape York at 18 Aug 1910 (see below).

**Banks Island:** 24 Aug 1910. This data conflicts with Moulds (1977) but is supported by two records of the same species (*Hypolimnas alimena*) in separate repositories (MV, ANIC); both labels have been personally sighted. The anonymous record of *Anthene lycaenoides* from Darnley Is. 'Aug 1910' (MV) may represent an unknown visit by Elgner during a month where data are scanty. However, there is another of the same species from Darnley Is. dated '13 Apr 1910' and bearing Elgner's name, so perhaps the month of the former is mistaken. Alternatively, the locality may have been Cape York (rather than Darnley Is.) where Elgner also collected other examples of this species in Aug 1910. **Consensus:** Insufficient data are available on Elgner's

movements in August 1910 to confirm a short visit to Darnley Island (on an unspecified day in August) but it is possible.

**Cape York:** 25-28 Aug & 05-19 Sep 1910.

**Darnley Island:** 22 Sep 1910.

**Cape York:** 30 Sep 1910.

**Banks Island:** 02 Oct. 1910. This data conflicts with Moulds (1977), but Banks Island is close to Cape York and a day visit from Cape York where Elgner also collected that day (see sequence below) is possible. It has been based on a specimen of *Melanitis leda*, an abundant species which might be chance collected on even the very briefest visit, including during evening.

**Cape York:** 02-20 Oct & 01-03 Nov 1910. Movements on 01 Nov are sketchy in my sample, the record of that date being a CWTC specimen, but continued presence on Cape York from October seems likely.

**Banks Island:** 15 Nov 1910 (Moulds 1977).

**Thursday Island:** 06 Dec 1910.

**1911. Banks Island:** 19-22 Feb 1911. Records are few, but Moulds listed 2 Mar 1911 extending the above period by about a week.

**Prince of Wales Island:** 28 May 1911.

Note: There is a specimen of *Delias aruna* labelled 'Darnley Island Apr 1912 T. Taylor' (UQIC). I have no information on this collector, but I know of no authentic record of Elgner's that postdates 1911.

#### **The chronology as a tool: Resolving unclear information cited in earlier literature**

Sibatani & Grund (1978: 24) listed two records of *Theclinesthes miskini arnoldi* from 'Banks Island', citing their data as "16., 22. 1910 (H. Elgner)". There are three possibilities. Omission of the month may be (1.) an undetected typographical error in the text, (2.) indicative of information absence on specimen labels, or (3.) indicative of illegibility or damage at the time of examination. Causation aside, the omitted information pertaining to these Australian Museum specimen records can be deduced from the chronology. For the year 1910, I have no evidence of any records for '16 March' making this possibility very remote (and many for 16 February). Only one species is known from '22 March' with all others dated 22 February (DDdb). In both cases then, the month of capture was undoubtedly February.

#### **Contentious records**

In general, the historic labelling of Elgner material appears internally consistent, with localities and dates agreeing across specimens and years. Any errors have to be significant to enable detection, and the same degree of error distorts species' distributions and temporality or possibly conclusions of projects reliant on it. This cross-comparison of 1407 entries in the Dunn & Dunn database (each bearing Elgner's name) exposed only eleven (11) records conflicting with proposed movements and that might correspond to gross errors. These comprised one undoubted and three possible errors of specimen labelling (primary transmission errors, presumably attributable to Elgner himself or recipient labellers), and transcriptive mistakes made during database compilation (secondary transmission errors). The latter can result during extraction of information from specimen labels, be existent in citations of label data in primary publications, or be entered during extractions thereof.

**(a). Seven data processing errors**

A total of seven handling (secondary transmission) errors, being 64% of the questionable data (n=11), was exposed. Of these seven, five records proved incorrectly entered in the database after their labels were re-examined (since corrected in the database), and a sixth (currently lost in the MV collection) is almost certainly similarly attributable. Their data errors involved two instances of entry of an incorrect locality, two instances of an incorrect year, and single instances of an incorrect month and collector. In most cases, such mistakes were ‘carried over’ by inaccurate data modification of a previously similar record in a species series, rather than from misreading or mistakenly typing the label data. In one case, damage to the label created legibility ambiguity necessitating microscopic examination to clarify the intended month. A seventh process error exposed, but added vicariously through publication, was included in the database on prima facie evidence of its validity (see Dunn & Dunn 2006 for discussion of data-entry processes). Two of these seven transmission errors, namely the lost record and the contributed error, I discuss below.

- **Prince of Wales:** 16 May 1910 (MV) [lost specimen]. Elgner collected on Darnley Island that day in May 1910; there are no other records for Prince of Wales Is. for this date. However, two years prior, he took many common species on Prince of Wales Is. on 16 May 1908. A collection year of **1908** for this specimen of *Eurema hecabe* is more agreeable but no matching record exists in the MV database (Museum of Victoria 2002), which if there were such, would confirm a processing error. This record was appended to the Dunn & Dunn database (March 1990) in sequence with others of that species and locality, in accordance with a species by species extractive process and the intra-species locality groupings of the MV historic collection. In absence of the label for re-comparison, a data-entry error of year is accepted.
- Braby (1997) mistakenly listed a record of Elgner’s as ‘1919’, therein creating a posthumous record. Elgner collected several common butterflies on Banks Island that day on 18 Feb 1910 - the intended year as per the specimen label - the erroneous final digit ‘9’ being typographical.

**(b). Four Elgner labels that fit uncomfortably with the chronology**

The remaining four records appear to be, or are, anomalous, but re-examination of their specimen label data has confirmed accurate database processing in each case. Further data may show that Elgner made brief day trips to adjacent islands enabling three of these unique pieces to fit in better, but for the present they are separated out. MV specimen numbers, added to the butterfly collection during the late 1990s, now uniquely identify each specimen referred to. The final record (dated 1916) is erroneously labelled beyond any doubt.

- **Banks Island:** 18 Jan 1910 (MV) [LEP 8169]. This record concerns *Psychonotis caelius*. Elgner collected on Thursday Island on both 17 and 18 Jan and took this same species on TI on 17 Jan 1910. Moulds’ chronology concords with Elgner’s presence on TI on 18 Jan 1910. Rather than Banks Island, Elgner’s movements suggest **Thursday Island** as its likely origin.
- **Banks Island:** 31 May 1910 (MV) [LEP 4418]. The true locality of this female was probably **Darnley Island**, where Elgner collected various butterfly species that same day. He collected *Papilio aegeus*, the species this record concerns, on Darnley Island during May 1910 (and also on Banks Island but in Feb 1910).

- Darnley Island: 23 **Feb** 1910 (MV) [LEP 11508]. Elgner collected numerous common species on Banks Is. that day. In Australia, *Hypolimnas misippus* is a rare and spasmodic species that becomes locally abundant for months or seasons before vanishing, often for decades (Braby 2000). On Darnley Is. Elgner collected several adults from 19 Apr 1910 to 14 May 1910. A date of 23 **April** (rather than 23 Feb) is more compatible, becoming agreeable then with others in the series and with his attested movements.
- **1916**. A record in the Dunn & Dunn database from Banks Island (AM) gave the year of collection as '1916', with Elgner's name. Clearly anomalous being posthumous, the database details proved correctly entered as per the specimen's label (D. Britton pers. comm. 2007). Although Elgner collected intensively on 'Banks Island' during February 1910, all his other specimens of *Deudorix epirus* came from 'Prince of Wales Island' or 'Cape York'. **Possible solutions**: a date of 7 Feb 1907 or year of 1909 for this female corroborates with others of this rare species from 'Cape York' taken on other days in February. Alternatively, an unidentified collector captured the specimen in 1916, but the recipient labeller mistakenly attributed it to Elgner.

### **Measurement of Elgner's label veraciousness requires consideration of source factors**

Any measure of the accuracy of Elgner's data in an electronically stored format, hinges on the overall reliability of the database from which this information derives. The term *reliability* defines the database's ability to transmit accurate knowledge of species data for inferential constructions. This sample (n=1407), exposing several gross errors, enables an estimation of the database's reliability in absence of a more rigorous analysis. However, the use of a purposive sample such as this one, being theme and convenience-based rather than randomised, remains an important statistical limitation on generalising the reliability findings beyond the sample subset to the whole Dunn & Dunn database. Nonetheless, it is one estimate in the absence of others, and serves as a useful yardstick or quasi-control for comparison of Elgner's records.

#### **(a) Dunn & Dunn database reliability – does it measure what it supposed to measure?**

In terms of the database reliability, eleven records containing gross errors from varied sources equates to an accuracy of 99.218 percent (n=1407). This provides an inaccuracy rate of only 0.782 percent for the thematic sample. Sampling limitations aside, this figure extrapolates to 782 potentially serious errors per one hundred thousand (100 000) records. At face value of course, it begs the question that all inaccuracies are transcription or processing errors exclusive to the database compilers, which is not the case. As discussed earlier of the eleven gross errors in the convenience-based sample, four were by Elgner (or his specimen recipients), one created by Braby, and six by Dunn & Dunn accumulating during database entry processes. Sampling limitations and ability to generalise aside, it implies reliability.

#### **(b) Dunn & Dunn record validity – what is its measure of record correctness?**

*Validity* is definable as the accuracy of transcription of each copied record, irrespective of its correctness or veraciousness. Undetected errors, whether through labelling by collectors and/or specimen recipients or via data transmitters in primary literature sources were compiled verbatim on an assumption of observer truthfulness and supplied record validity (Dunn & Dunn 2006). (In select cases, though, documented experts' opinion enabled some record adjustment if inaccuracy was exposed and could be resolved.) Obviously then, in terms of individual record *validity* the database will score higher in data-entry accuracy than the overall tool *reliability* measure of 99.2% (determined above) which included five gross errors contributed vicariously. The thematic sample (n=1407) revealed six (6) entries with gross errors resultant from database processing, equating to an entry accuracy of 99.574 percent. This gives an entry inaccuracy rate of only 0.426 percent. Sampling limitations aside, this figure extrapolates to 426 records containing potentially serious typographical errors per one hundred thousand (100 000) records believed entered as valid.

In summation, at the processor level these low error findings quantitatively support the high entry validity and reliability of the database, as asserted in Dunn & Dunn (2006).

### **Elgners records are of high validity and testify to his veraciousness**

Dunn & Dunn (1991) had earlier commented on Waterhouse's historic examination of Elgner's records asserting their trustworthiness. It was written that "Waterhouse & Lyell (1914) did not suggest any doubt concerning the reliability of the label data and upon examination of numerous Elgner specimens, I have found his data to be very reliable" (Dunn & Dunn 1991: 525). Waterhouse did not hesitate to condemn others' work where it was substandard, or where he believed that the reasonable collector or taxonomist should be capable of greater exactness (for two examples, see commentary in Waterhouse 1933, 1937). Hence, an absence of comment is positive rather than neutral evidence in this case. Despite lack of dispute by any turn-of-the-century workers and support by Dunn & Dunn (1991), there has been recent disputation. Meyer *et al.* (2004: 180) asserted doubt after reporting that a specimen attributed to collection by Elgner on 'Thursday Island' (*but apparently without his name or date*), was in fact the Asian *E. crameri crameri*. These authors remarked, it was "apparently collected by H. Elgner in the early 1900s" (p.178). They considered the new evidence that the specimen was extra-Australian and then extrapolated that this "must therefore place in doubt the reliability of the label data for other H. Elgner butterfly records from the period ..." Taken at face value that Elgner had made an error of labelling in this one instance, Dunn & Dunn (2006: 818) objectively judged that, even so, such "a generalisation of unreliability based on a solitary erroneous record is a major inferential leap." Moreover, the link to Elgner is presupposed, further emphasising the need for "avoidance of a frame of absolutism ... in healthy scepticism" (Dunn & Dunn 2006). Of course, everybody makes mistakes despite their personal measure of pragmatism in their research or fact contributions, yet my findings show that Elgner's care in labelling was excellent. Four records believed spurious or suspicious in one or more label components (n=1407 records bearing his name) equates to an exemplary accuracy of 99.716 percent (or inaccuracy of 0.284 percent).

### **Conclusion**

This diary of Elgner's geographical movements in Torres Strait and on Cape York Peninsula is corner-stoned on the earlier chronology suggested by Moulds (1977). Only a small number of records did not fit well into the proposed chronology, and errors of transmission by data processors accounted for more than half of these. An estimate for the Dunn & Dunn database indicated its generalised reliability at 99.2% and validity of record entry at 99.6%, using Elgner records as a convenience and thematic sample. The difference in these components arises because the database accepts labels at 'face value' (adjusting with commentary only where evidence to the contrary has been exposed), thereby accumulating other's errors as an inevitable process of trust. Elgner's records corroborated well with each other, using time and locality as measures of internal consistency. An estimate of 99.7% was determined as the minimum measure of Elgner's label accuracy (n=1407 records labelled with his name). Statistically, this estimate of merely 0.3 percent error hinges on the reliability of the source database (quantified herein) and upholds Elgner's labelling and his veraciousness as a collector. I believe his pragmatism as a specimen labeller should be regarded as established and not in doubt.

**Dedication:**

To Hermann Elgner, who died after prolonged suffering on 5 April 1913, in primitive and torrid conditions on Ambon, I write this tribute to your tireless collecting in what was then a poorly explored, lonely and hazardous region:

*Of those who wrote nothing of themselves and yet whose efforts, however small, remain on the lips of those who knew them not, then surely such persons must stand among those deserving of remembrance – KLD.*

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**Appendix: Translation of the German obituary from *Deutsche Entomologische Zeitschrift*, traditionally attributed to Waterhouse (1913).** Translation by Ilonka Guse (with technical guidance from KLD) - 2007.

“H. Elgner

*We received word from Sydney [Australia] that our member, Mr H. Elgner had died on 5 April 1913, in Ambonia [Ambon, Maluku], after lengthy affliction/suffering. Elgner collected Lepidoptera for a number of years in northern Queensland, mainly at Cape York. The Entomological Society owes him a lot. He found a few new and rare species. After leaving Australia, he collected on Aru Islands, Ceram and German New Guinea [northern area of PNG]. He had only recently become a member of our society. We mourn the early death of this successful collector, whom we will remember.”*