

# On the Centenary of E.C.H. Chisholm at Comboyne, New South Wales

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E.C.H. Chisholm was one of many naturalists who contributed to our knowledge of the flora and fauna of NSW during the early 20<sup>th</sup> century. His most significant contribution, commenced in 1922, was a survey of the flora of the Comboyne Plateau. During his appointment as Medical Officer at Comboyne he documented almost 400 species of vascular plants and contributed more than 100 herbarium specimens. Apart from a few uncertain taxa, it appears that none of Chisholm's listed plant species have been lost from the plateau during the course of a century. Chisholm's botanical work at Comboyne remains the most extensive botanical contribution by an individual for this region. His legacy is both valuable and enduring.

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## INTRODUCTION

Dr Edwin Claude Hamilton Chisholm was one of many important naturalists of the early 20<sup>th</sup> century. He made substantial contributions to the study of the fauna and flora of NSW with particular interests in avifauna, selected insects, eucalypts and other plant groups. From a botanical viewpoint his most significant legacy is an extensive collection and list of plant species from the Comboyne Plateau and adjacent areas, compiled during a period of 13 years. This paper celebrates the work he commenced at Comboyne in 1922.

The Comboyne Plateau is a small scarp-bound paleoplain resulting from a Miocene shield volcano. Basaltic strata overlie Triassic sediments of the Lorne Basin (Bale and Williams 1994). The general elevation of the plateau is around 600 m, ramping down to 400-500 m at the north and north-west margins. Soils of the basalts are typically fertile red Dermosols and Ferrosols. These originally supported extensive subtropical rainforests. At cooler or less fertile sites, open forests and small areas of temperate rainforest dominated. The plateau was progressively cleared during the early 1900s to support dairying, beef production, vegetable cropping and fodder production including maize and swedes; enterprises that continue more than 100 years later. During this

time the remaining forests supported several sawmills cutting both 'brushwood' and hardwood timbers (Hannah 1981).

It appears that Chisholm was impressed with the plateau, commenting on the quality of the basaltic soils, the 'virgin beauty' of the brushes and the 'splendid assortment of softwoods' they contained (Chisholm 1925). During his tenure at Comboyne he applied himself with some diligence to documenting the native flora and fauna of the area.

## BIOGRAPHY

E.C.H. Chisholm was born in 1871 in Camden, NSW, the third of seven children of Edwin and Emily Chisholm and grandson of eminent merchant, landowner and Third-fleeter James Chisholm (Maxwell and Pugh 2016). Edwin's father was a medical doctor and Edwin followed him into that profession, graduating from the University of Sydney in 1904 with Bachelor of Medicine and Master of Surgery (University of Sydney 2022), qualifications he stated in his published papers. Chisholm's first appointment was in 1904 at Sheffield, Tasmania, where he commenced a community medical practice (Anon, 1904).

In 1908 Edwin returned to NSW and married Violet Suttor, daughter of Mr. and Mrs. George R.

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Suttor of Bathurst (Anon 1908). In the ensuing years the couple moved several times as Edwin provided medical services at Riverstone (NSW Medical Board 1909), Croydon (NSW Medical Board 1914), Picton (NSW Medical Board 1916) and Marrangaroo (Anon 1920). His writings from these years indicate a deepening interest in the plants and animals of each local area.

After these postings, Edwin and Violet moved to Comboyne where they settled at the property 'Merope', a comfortable home in Comboyne not far from the village hospital (C. Amos pers comm.). Here Edwin commenced his appointment as Medical Officer (Fuller 1924). This was a Government subsidized 'Bush Doctor' appointment intended to support and develop rural settlements that might otherwise be unable to sustain a medical practice (Anon 1914). It appears that after the passing of Violet's mother, her father George spent time in the Comboyne area and later passed away in the Chisholm residence (Anon 1928).

Comboyne was the longest of Edwin's appointments, and the Chisholms were farewelled from the district in June 1935 (Anon 1935). Edwin then had short medical postings at Manly (NSW Medical Board 1936), Barellan (NSW Medical Board 1937), Cremorne (NSW Medical Board 1939) and Batemans Bay (NSW Medical Board 1941). These postings provided fresh fields for the pursuit of his interests in flora and fauna.

Edwin Claude Hamilton Chisholm died at Blaxland in 1944 (Anon 1944).

### CHISHOLM THE NATURALIST

Together with clergymen, police officers, medical doctors and other professionals including J.B. Cleland, W.W. Watts, J.W. Dwyer, C.H. Fawcett, W.D.K. Macgillivray and H. Beckler, Chisholm was a naturalist and volunteer plant collector who pioneered field botany in Australia.

Edwin's early commentary on local flora and fauna included newspaper articles on topics as diverse as woodswallows (Chisholm 1910a) and tiger snakes (Chisholm 1910b). As his interests developed he took up memberships of the Linnean Society of NSW and the Royal Australasian Ornithologists Union and developed connections with eminent botanists including J.H. Maiden, Government Botanist of NSW and Director of the Botanic Gardens, Sydney, and his successor, G.P. Darnell-Smith. Chisholm was also acquainted with W.F. Blakely of the National Herbarium of NSW, to whom he forwarded many

specimens. Chisholm and Blakely shared fieldwork in the Blue Mountains and Marrangaroo areas in 1922, as evidenced by comments from Maiden (1924) and from numerous co-collected specimens. It appears that Chisholm was also known to E. Cheel, later Chief Botanist at the National Herbarium of NSW, who collected the type for *Callistemon comboynensis* from the 'Comboyne Ranges' in 1926 (Cheel 1943). Chisholm's specimen of the same taxon collected in 1925, now a syntype, bears an annotation by Cheel. Chisholm acknowledged the assistance of many collaborators in his papers.

Between 1918 and 1924 Chisholm collected at Picton, Camden, Western Sydney, Nyngan, the Blue Mountains and Marrangaroo. He was particularly interested in eucalypts and contributed numerous specimens, many of them hybrid forms, to the National Herbarium of NSW. He began publishing his observations commencing with an article on the eucalypts of the Blue Mountains (Chisholm 1924a). In the same year he published an account of birds observed during a short visit to Tumbarumba in March 1920 (Chisholm 1924b). As with most of his papers on fauna, he first provided an account of the vegetation, which at Tumbarumba included six species of eucalypts.

During 1922-1923 Chisholm lodged a few plant specimens from Comboyne. These were presumably collected during short visits, because he was employed at Marrangaroo at the time. His move to Comboyne in 1924 signalled increased naturalist activity as he made records of plants, birds, insects and other taxa of the region together with particular studies of funnel-web spiders (Chisholm 1932) and ladybird beetles (Chisholm 1933). During this period his observations of birds resulted in a catalogue of 119 species for the Comboyne area (Chisholm 1934a).

After his sojourn at Comboyne, Chisholm's appointments and excursions enabled further naturalist pursuits. During this time he collected specimens at Barellan, Dapto, Bong Bong Springs, Blue Mountains, Bulahdelah and several Sydney suburbs, although not with the intensity of his Comboyne years. His continued interest in eucalypts is evident from his herbarium specimens and papers. He continued his observations of animals and forwarded specimens to the staff of the Australian Museum, who provided identifications and advice relating to his collections (e.g. Chisholm 1929).

Between 1922 and 1943 Chisholm published more than 25 papers and correspondences relating to the flora and fauna of NSW. These included several listings of plants and birds for particular regions in which he resided or visited, including the Pilliga

Scrub (Chisholm 1936a), Barellan (Chisholm 1938) and Peak Hill (Chisholm 1939). Whilst at Barellan he also wrote on the impact of arsenical insecticides on birds (Chisholm 1936b). By mid 1940 he was in Batemans Bay, where he was appointed an Honorary Ranger under the Wild Flowers and Native Plants Protection Act, 1927 (Manfred, 1940). His final paper, an article on the Speckled Warbler, was written at Batemans Bay (Chisholm 1943).

### Chisholm at Comboyne

Edwin Chisholm was by no means the first botanical collector in the Comboyne region. Herbarium records indicate that botanists and naturalists were active in the Bulga Plateau area from the late nineteenth century (AVH 2022). In particular, the spectacle of Ellenborough Falls had enhanced the area's reputation (Anon 1906), prompting increased interest in the area. Prior to Edwin's arrival, collectors who had visited the area included J.H. Maiden and J.L. Boorman (mainly rainforest trees, shrubs and ferns), E.F. Rudder (*Tristaniopsis*), W.W. Watts (ferns and bryophytes) and J.B. Cleland (trees and shrubs). Nevertheless, the collective number of these records represented at best a small portion of the flora of the district and, at least for Boorman and Watts, the focus of studies was the Bulga Plateau region rather than Comboyne.

Edwin's first plant specimens from Comboyne were of *Linospadix monostachyos*, dated January 1922 and *Palmeria racemosa* dated April the same year (AVH 2022). It appears he was fascinated by the 'brushes', because several more rainforest species, including *Eupomatia laurina* and *Berberidopsis beckeri*, were collected from Comboyne in the ensuing year.

### Chisholm's Comboyne papers, plant lists and specimens

Edwin's naturalist work on Comboyne intensified following his appointment as Medical Officer in 1924. In some ways, the timing was unfortunate because of the extent of land clearance that had already occurred by then. Indeed, Chisholm lamented that Comboyne was '...fast losing its former beauty, being nearly all cleared for farming' and 'the opportunity to record its original fauna will never recur' (Chisholm 1929). Despite this, his descriptions of plants, animals and communities over many years indicated that he was able to explore several areas of relatively undisturbed vegetation, including the plant communities of Mt Bulli and a rainforested area described as a 'Government Reserve' (now Boorganna Nature Reserve) on Mumfords Creek (Chisholm 1925).

Chisholm was the first naturalist to attempt a comprehensive catalogue of the flora of Comboyne and surroundings. Unfortunately, the locations given for many of his specimens were vague: 'Comboyne' may refer to the village or to the whole plateau. Notably, 'The Comboyne' generally refers to the whole plateau, an area of about 150 km<sup>2</sup>. Nevertheless, some specimens bear specific data such as 'Mt Comboyne', a peak disjunct from the main plateau; and 'Bulga', an adjacent plateau to the west of Comboyne. Chisholm's published accounts of species are sometimes more useful than his specimens because they provide additional locational data and descriptions of interactions of plants, especially in relation to elevation, microclimate, geology and soil.

Chisholm's combined published list accounts for 380 species of vascular plants at Comboyne (Chisholm 1937). More than 100 of these species are authenticated by specimens lodged by him (AVH 2022). A map of Chisholm's collections is available (CHAH 2022). Additionally, there are several Comboyne specimens attributable to him, including *Botrychium australe* and *Lastreopsis microsora*, that do not appear in his published lists, resulting in a final tally of almost 400 plant species. Since 1937 more than 200 of Chisholm's listed species have had nomenclatural changes or taxonomic revisions, including several at the level of family. Nevertheless, his listings appear to be generally reliable, no doubt largely due to the assistance rendered to him by the National Herbarium of NSW and by visiting botanists. On one occasion he was joined in the field by Lilian Fraser and Joyce Vickery (Chisholm 1934b), two young botany graduates who were themselves embarking on a pioneering study of the nearby Barrington Tops area. Fraser and Vickery (1937a) later acknowledged Chisholm's contribution to the study of rainforests.

To some extent, Chisholm's species lists can be corroborated with specimens lodged from the Comboyne and Bulga plateaux by early collectors such as W.W. Watts, J.B. Cleland and M.B. Welch and by more recent collections by I. Telford, J.B. Williams and others (AVH 2022). Collectively, these specimens account for 130 of Chisholm's non-vouchered species. Many more of Chisholm's non-vouchered listings correspond with entries on species lists compiled for the area by botanists including A.G. Floyd, who published a list of about 100 rainforest species for Boorganna Nature Reserve (Floyd 1990).

There are nevertheless a few listings by Chisholm that appear to be out of range at Comboyne. These include *Wilkiea macrophylla*, *Parsonsia largiflorens*,

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*Xanthorrhoea resinosa* and *Acacia mollissima*. The first two species are not known south of the Richmond River and the latter two are both restricted to locations south of Comboyne (Harden et al. 2006, 2007). Chisholm's inclusion of these perhaps represent misidentifications resulting from insufficient material or poorly known taxa. The identity of the *Parsonsia*, for example, may have been *P. induplicata* or *P. straminea*, species now well-known at Comboyne.

### Special interests and omissions

Chisholm's early interest in eucalypts continued at Comboyne. In his first Comboyne paper Chisholm (1925) provided useful accounts of most of the eucalypts he encountered, including aspects of abundance, habitat, growth form and timber characteristics. He listed 16 species (including *Corymbia gummifera*) for the plateau noting that they mainly occurred on the poorer parent materials (Chisholm 1934b). He further noted that eight additional species occurred nearby beyond the escarpments (Chisholm 1925). Surprisingly, he lodged specimens for only six taxa, and two of these were determined to be hybrids. Several of his observed species have since been revised, but their identity is generally clear. However, given the extent of specific variation and intermediate forms known from the area and the paucity of Chisholm's specimens, it is difficult to affirm the identity of a few taxa. This is especially so of his listed grey gums and ironbark. Nevertheless, with the exceptions of *Eucalyptus racemosa* (e.g. NSW339815) and *Eucalyptus deanei*, now known from the western margin of the Bulga plateau (e.g. CANB 600055.1), his catalogue of the eucalypts of the area appears to have been comprehensive.

Perhaps based on his knowledge of the family elsewhere, Chisholm considered the Proteaceae to be 'poorly represented' at Comboyne (Chisholm 1934b). His final listing for the family included ten species: five of them were primarily rainforest species and a further four were species of *Persoonia* which he observed to be uncommon and generally not on basaltic soils. Surprisingly, his list did not include *Banksia integrifolia* which is now known to occur sporadically on the margins of Comboyne's rainforests (C. Amos pers comm.). Chisholm particularly mentioned the desirability of selected Proteaceous species as sources of fine timber, especially *Stenocarpus salignus*, which he noted was in great demand for cabinet work (Chisholm 1925). A further species noted for its attractive timber was '*Lomatia fraseri*', although he observed that this taxon 'appears to differ from the type...' (Chisholm 1934). The identity of this taxon is almost certainly *Lomatia arborescens* which was

collected at Comboyne by L. Fraser and J. Vickery on 21<sup>st</sup> January 1934, but not named until 1937 (Fraser and Vickery 1937b). The date of collection is the same day that they shared fieldwork with Edwin Chisholm (Chisholm 1934b).

Ferns feature prominently in Chisholm's lists and collections. This focus appears to be part of his fascination with the brushes that dominated the plateau. Almost half of one of his articles focused on morphological accounts and habitats of fern species, including a Latin citation for a proposed new variety of '*Athyrium umbrosum*' (Chisholm 1934b). His final list included 53 species of ferns and in that account he acknowledged Alma Melvaine (later Lee) for identifications 'especially...of the ferns' (Chisholm 1937). It is probable that they met at Comboyne, for there is a specimen attributable to Melvaine collected at Comboyne in 1935 a few months prior to Chisholm's departure. It is not clear if Chisholm lodged all of his fern collection, for there is a specimen of *Calochlaena dubia* (NSW473456) from Grafton 'found in collection labelled Dr. Chisholm's Ferns found on Comboyne Plateau, 1934'. The extent or fate of this collection is not known. Interestingly, Chisholm (1934b) first considered *Cyathea* (= *Alsophila*) *cooperi* to be present at Comboyne, but later declared it to be absent (Chisholm 1937). This species is now known at Comboyne from a small area east of Mt Bulli (C. Amos pers comm.).

Chisholm's fascination with the brushes also extended to their species richness and utility, particularly in relation to trees and shrubs. A pervading theme through his papers was the potential usefulness of species, whether as ornamentals or sources of timber, food or medicinal compounds. He particularly mentioned his collection of '145 samples of different species of timber native to the Comboyne Plateau, more than 100 of which are brushwoods...' (Chisholm 1934b). His interest in medicinal applications of plant extracts is evident in his account of the ophthalmic use of alkaloids extracted from *Duboisia myoporoides* (Chisholm 1925).

Graminoids form a significant gap in Chisholm's collections and listings. In his introductory paper he observed 'The remaining Monocotyledons, viz. Grasses, etc. I am not including in the flora recorded' (Chisholm 1925). He later affirmed this resolve (Chisholm 1934b). His complete list contains a *Typha*, a few sedges, *Lomandra*, *Xanthorrhoea* and many other petaloid monocotyledons, but no grasses, restiads or rushes (Chisholm 1937).

### Curiosities

A curious listing by Chisholm is *Castanospermum*

*australe* which otherwise is unreported south of Macksville (NSW31029, AVH 2022). Chisholm (1937) provided an ‘authentic account’ of this species on the Thone River, although it is not known if he personally observed the tree. Curiously, an elderly resident of Comboyne recently claimed that as a child she ‘sat on the Black Bean stump’ (C. Amos pers comm.). There is also a current report of Black Bean growing at East Comboyne, although whether or not it is native at location is uncertain (C. Amos pers comm.).

Chisholm (1925) also reported that *Araucaria cunninghamii* occurred between the Comboyne Plateau and Kendall. It is not known if this record related to cultivated or native occurrences, but the natural southern limit of this species is considered to be the Macleay River (Harden et al. 2006).

#### **New and significant taxa**

On a few occasions Chisholm observed that his Comboyne specimens differed from known taxa. He noted interesting forms of *Callistemon lanceolatus*, *Lomatia fraseri* and an unknown species of *Goodenia*. All three forms were later described as new species.

Several species reported by Chisholm for Comboyne are now regarded as significant (Table 1). Two of these are considered critically endangered under the Biological Conservation Act (NSW). Of these, Floyd (1990) recorded *Rhodamnia rubescens* at Boorganna NR and a specimen from ‘Comboyne’ was collected in 2003 (WOLL8085). Less is known of *Rhodomyrtus psidioides* at Comboyne, but this species was sighted there by J.B. Williams and the author in 1987, and there are many herbarium records of this species from catchments surrounding the plateau. Pegg et al. (2017) have shown that both species are extremely susceptible to attack by Myrtle rust (*Austropuccinia psidii*). During the last few years this pathogen has become widespread at Comboyne, where it has affected a range of native and exotic myrtle species (C. Amos pers comm.). Research is needed to assess the impact of this disease at Comboyne and adjoining areas.

Chisholm (1925) noted the presence of ‘*Fagus moorei* ...which is extremely rare...’ although he observed that land clearance may have destroyed part of the population. Six small stands of *Nothofagus moorei* are currently known from Comboyne, four of which were described by Bale and Williams (1994). Given the high habitat specificity of extant populations at Comboyne, it seems likely that, prior to clearing, the species was restricted to cool sheltered creek lines and protected slopes and was not generally common.

The presence of *Nothofagus moorei* at Comboyne is of biogeographic interest because of its occurrence at relatively low altitude and its disjunction from major occurrences in the Barrington and upper Hastings regions.

A feature of Table 1 is that many species approach their southern limit in the Comboyne-Bulga region. This is probably a result of factors including Comboyne’s high rainfall, fertile soils associated with tertiary basalts, mid altitude and a latitudinal position near the southern margin of Australia’s coastal subtropical climatic region.

Recent years have seen a significant shift in approaches to managing woodlots and rainforest remnants at Comboyne. Some landowners have initiated projects such as improving buffer zones around sensitive vegetation and restoring native vegetation on previously cleared land (C. Amos pers comm.). These efforts are both increasing biodiversity and improving security for significant flora. Apart from its general biogeographic value, Chisholm’s work is useful in informing the restoration and management of these plant communities.

#### **Species named for Chisholm**

Edwin Chisholm’s interest in eucalypts was appreciated by J.H. Maiden and W.F. Blakely. In his revision of the eucalypts, Maiden applied the specific epithet ‘*chisholmii*’ to an unnamed taxon: ‘The type is No. 265, Dr. Edwin Claude Chisholm, then of Marrangaroo...’. The etymology was given as: ‘...testimony to the excellent critical work that Dr. Chisholm has accomplished in regard to the Eucalypts (and other genera) of the Marrangaroo district and the Blue Mountains’ (Maiden 1924). This taxon was later reputed to be a hybrid involving *Eucalyptus piperita* and *E. racemosa* subsp. *rossii* (Pryor and Johnson 1971).

Whilst at Comboyne, Chisholm made collections of a species of *Goodenia* which he considered ‘... apparently a new species...’ and noted that taxonomic work was being done on this material at the National Herbarium (Chisholm 1927). The first specimen (NSW76615) was collected at ‘Comboyne’ in early 1925. It bears an annotation by A. Lee ‘The Type is described as collected in January 1925’, although it is further annotated as ‘Syntype of *Goodenia chisholmii* Blakely’. A second Comboyne specimen (NSW76617), also annotated as ‘Syntype of *Goodenia chisholmii* Blakely’, is dated January 1926. According to data available within the Australian Virtual Herbarium both of these specimens are assigned to collector WGC Chisholm (AVH 2022). This disparity

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**Table 1. Plant species recorded by E.C. Chisholm in the Comboyne-Bulga region now known to be of significance. ECC = Edwin Claude Chisholm.**

<b>Taxon</b>	<b>Significance</b>	<b>Comment</b>
<i>Agiortia cicatricatus</i>	Southern limit Comboyne – Lansdowne	ECC specimen [Ex: <i>Leucopogon</i> ]
<i>Akania bidwillii</i>	Southern limit Comboyne – Camden Haven	Independently confirmed for Comboyne (Ex: <i>A. hillii</i> )
<i>Anopterus macleayanus</i>	Southern limit Comboyne - Lansdowne	Independently confirmed for Comboyne
<i>Callistemon comboyneensis</i>	Syntype specimen	ECC specimen: ‘Seems to be an interesting form of <i>C. lanceolatus</i> ’. Named by Cheel (1943)
<i>Causonis euryneuma</i>	Type specimen	ECC specimen. Scripsit L Fraser. Annotated 1952 Alma Melvaine. Transferred to <i>Causonis</i> by Jackes (2020) [Ex: <i>Cayratia</i> ]
<i>Cinnamomum virens</i>	Southern limit Comboyne	ECC specimen
<i>Cuttsia viburnea</i>	Near southern limit	Outlier at Seal Rocks. Independently confirmed for Comboyne
<i>Endiandra muelleri</i> subsp. <i>muelleri</i>	Near southern limit	Outliers near Gloucester. Specimen L Fraser 1934 Comboyne
<i>Endiandra virens</i>	Southern limit Comboyne	Harden et al. (2006). No specimen
<i>Karrabina benthamiana</i>	Southern limit Bulga Plateau – Camden Haven	ECC specimen [Ex: <i>Geissois</i> ]
<i>Leionema elatius</i> ssp <i>elatius</i>	Near southern limit	ECC specimen. Locally rare. Outlier near Gloucester
<i>Nothofagus moorei</i>	Outlier population, south-eastern limit	Noted by ECC 1925
<i>Pothos longipes</i>	Southern limit Comboyne – Camden Haven	Specimen L Fraser 1935
<i>Quintinia verdonii</i>	Near southern limit Bowman River, Gloucester	ECC specimen
<i>Rhodamnia trinervia</i>	NSWBCA Critically endangered	Specimen Moore 2003 Comboyne
<i>Rhodomyrtus psidioides</i>	NSWBCA Critically endangered	Independently confirmed for Comboyne
<i>Sarcopteryx stipata</i>	Southern limit Bulga Plateau – Camden Haven	Specimen L Fraser 1934
<i>Syzygium corynanthum</i>	Southern limit Comboyne – Camden Haven	ECC specimen
<i>Syzygium crebrinerve</i>	Southern limit Comboyne	ECC specimen

is best explained as a mis-transcription of the original cursive script, because an apparent duplicate held by Kew Gardens (K000216079) and annotated as 'Syntype' by Wilson and 'Isotype' by Carolin clearly identifies the location as 'The Comboyne' and 'Dr. E.C. Chisholm' as collector. A third specimen (MEL 0018320A), also dated January 1926, and assigned to E.C. Chisholm is asserted to have been collected at 'Mount Comboyne' (AVH 2022). However, Carolin (1968) listed both this specimen and NSW76617 amongst material he examined, noting that both were collected at 'The Comboyne' by 'E C Chisholm'.

The outcome of taxonomic work was that Blakely (1929) named the species '*Goodenia chisholmi*...in honour of Dr E. C. Chisholm, who has taken a keen interest in the flora and fauna of Comboyne.' This taxon was later assigned to a new genus *Cooperookia* by Carolin (1968) and the specific epithet was retained. *Cooperookia chisholmii* is now known from the Hunter to the Clarence River, although its core distribution appears to be at Comboyne and adjacent coastal areas.

There are also animals named for E.C. Chisholm. These include two species of millipede, *Gigantowales chisholmi* and *Ainigmabolus chisholmi* (Verhoeff, 1937). Chisholm supplied specimens of both species from Comboyne.

### Unresolved questions

There are some surprising omissions in Chisholm's lodgements of plant specimens. Despite his enthusiasm for the timbers of the Comboyne area, he submitted herbarium specimens for only one of his seven listed species of Cunoniaceae (*Karrabina benthamiana*). Similarly, his lodged specimens from Comboyne include no Sterculiaceae or Sapindaceae and only one each from Meliaceae and *Acacia*. Such patchiness is also found amongst herbs and shrubs, evidenced by the absence of Comboyne specimens of Rosaceae, Ranunculaceae, Orchidaceae and Asteraceae, and only one specimen each for Epacridaceae and Lamiaceae. In contrast, 33 of Chisholm's listed fern species are vouchered.

A few years after his Comboyne sojourn Chisholm spent five weeks doing a biological survey of the Peak Hill District (Chisholm 1939), yet there appear to be no lodged plant specimens relating to that expedition. Similarly, his report on an expedition to the Pilliga Scrub (Chisholm 1936a) described the vegetation as 'extremely interesting' and he recorded twelve eucalypts, yet there appear to be no details of plant specimens relating to that trip. Presumably, if specimens were collected at these locations, they

were either not deposited at major herbaria or, for some reason, they were not incorporated.

In contrast, from an early excursion to Nyngan in June 1922, Chisholm lodged 14 specimens including 6 wattles and 5 eucalypts. It appears that, other than during his sojourn at Barellan, he lodged few plant specimens during his advancing post-Comboyne years.

### CONCLUSION

Chisholm's collections and listing of plant species for Comboyne remain the most extensive botanical contribution of an individual for this region. At the time, he saw his efforts as the last chance to catalogue the plants and animals of a rapidly changing landscape. Apart from uncertainties relating to Hoop Pine, Black Bean and a few unresolved taxa, it appears that none of Chisholm's listed plant species have been lost from the plateau during the course of a century. This does not infer that local extinctions have not occurred, because Chisholm explicitly excluded some taxa from his work and undoubtedly missed others. Nevertheless, his work stands as testament to his resolve and passion and, as with many of his volunteering peers, his legacy is both valuable and enduring.

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