December 1949

MEM. NAT. MUS. VICT., 16, 1949

https://doi.org/10.24199/j.mmv.1949.16.07

YERINGIAN (LOWER DEVONIAN) PLANT REMAINS FROM LILYDALE, VICTORIA, WITH NOTES ON A COLLECTION FROM A NEW LOCALITY IN THE SILURO-DEVONIAN SEQUENCE

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Plates IV-VI, Fig. 1.

(Received for publication June 21, 1949.)

The main object of the present paper is to give a description of plant remains from type localities in Yeringian beds at Lilydale, Victoria. The principal locality (Hull Road, Lilydale) was referred to in a previous paper (Cookson 1935, p. 146) and subsequently a list of the main types collected there was recorded (Cookson 1945). This collection now includes remains referable to or at least comparable with *Sporogonites, Zosterophyllum, Yarravia* and *Hedeia*. It will be supplemented by reference to specimens from two additional outcrops, one near Lilydale and the other at Killara, about 7½ miles further east.

The occurrence of plants in this area is of special stratigraphical interest. For many years, the Yeringian series was believed to belong to the Silurian period, but the position assigned to it within that range of time varied according to the author (see Gill 1942, Table I). Chapman and Thomas (1935), when defining the Victorian Silurian succession, correlated the Yeringian with the Upper Ludlow of Britain. Beneath it they placed the Melbournian division (Lower Ludlow), whilst the basal series, the Keilorian or Lower Silurian, was correlated with the Llandoverian of the British succession. Later Thomas (1937), in dealing with Silurian rocks of the Heathcote area, pointed out that detailed work was necessary to determine "how much of the Devonian is included in the Yeringian."

In 1938 Shirley noted that "the Yeringian contains at least one fauna similar to that of the Baton River series" (Lower Devonian of New Zealand). During the same year, in a discussion of the stromatoporoid fauna of the Yeringian limestone at Cave Hill, Lilydale, Ripper (1938) made the suggestion that this deposit "should probably be placed in the Devonian." Hill (1939), on the evidence of the rugose corals of the same limestone, concluded that its age is either Lower or Middle Devonian. Shirley's contention regarding the Yeringian shales and sandstones has been supported by the work of Gill (1942) on fossils in the shaley beds of the type Yeringian area. In his conclusion Gill wrote: "The age of the shales and sandstones is shown to be Devonian. In part at least these beds can be correlated with the Baton River (Lower Devonian) beds of New Zealand described by Shirley. The fauna reveals definite affinities with the European and North American Lower Devonian faunas."

It seems clear, therefore, that the small Yeringian flora from the Lilydale district which will now be considered can be definitely regarded as Lower Devonian.

Most of the Yeringian plant remains were collected from a small cutting on Hull Road about 14 chains south of its junction with the main highway from Melbourne to Lilydale. The name that Gill (1940, p. 357) suggested should be used for this particular locality is "Hull Road, Lilydale." Here the plant fossils occur together with well preserved animal remains in soft pink or white shales which underlie and are conformable with the Yeringian limestone (Lower Devonian) of Cave Hill. The specimens are either casts or flattened incrustations in which the original tissues are represented by small flakes of carbon or a brownish mineral substance. Such preservation, while quite adequate for sound general comparisons, limits the possibility of specific indentification. The remains from this deposit are cf. *Sporogonites, Zosterophyllum australianum, Yarravia* cf. *oblonga* and *Hedeia* cf. *corymbosa,* and will be considered in that order.

1. cf. *Sporogonites*

Plate IV, Figs. 1 and 2.

Several specimens were found at Hull Road which compare closely with *Sporogonites* (Halle 1916). Each consists of a slender stalk and a terminal capsule-like body. The appearance of the latter suggests that it was a spore-containing structure, but no trace of spores has been preserved on the flattened incrustations.

The largest example, shown enlarged 10 diameters in Plate IV, Fig. 1, illustrates the general appearance of such specimens. The axis is unbranched, about 0·5 mm. wide, and broadens gradually into a club-shaped terminal capsule. This, including the widened part of the stalk, is 4 mm. long and 2 mm. broad, and narrows slightly towards the apex. A narrow peripheral zone represented by a solid cast of a brown mineral substance is marked off from the uniform central region of the capsule.

A second specimen and its counterpart are represented at a magnification of 10 diameters in Plate IV, Figs. 2 and 3. The stalk is about 0·75 mm. wide, and approximately 6 mm. long. The capsule measures 3·6 mm. in length and 2 mm. in breadth, and is slightly tapered towards the rounded apex. The margin is not preserved in the solid as in the previous example, but a curved ridge which follows the outline of the capsule a short distance within the margin appears to mark off a central dome-shaped area from a peripheral zone. The central portion occupies an area within the capsule of 3 mm. by 1·75 mm. It is lighter in colour than the rest of the specimen because of the partial removal from it of the reddish mineral substance that has replaced the plant tissues. The significance of these two areas is not clear.

The remaining specimens, apart from providing a range in size, do not help in the more exact determination of the fossils. The capsule of the smallest specimen is 2·5 mm. long and 1·5 mm. broad.

These specimens must be considered in relation to two simple Lower Devonian plants. They are *Sporogonites* and *Cooksonia*. In both, slender leafless axes terminate in large sporangia. In *Sporogonites* the axes, as far as is known, were unbranched. This feature has been remarked upon by Halle (1936) and Lang (1937). In *Cooksonia,* on the other hand, dichotomous branching of the axes which bear the sporangia is of usual occurrence and frequently takes place only a short distance behind the sporangia. For this reason and in spite of a rather close similarity as regards size and shape of their sporangia to those of *Cooksonia* sp. from Llanover, Wales (Croft and Lang 1942), it seems inadvisable to identify the present specimens with this genus.

Comparison with *Sporogonites* appears closer. Two species are known, *S. exuberans* from Norway, Belgium and Wales, and *S. chapmani* from Victoria. The capsules of the Lilydale specimens are distinctly smaller than typical examples of either species. A considerable variation in size, however, has been noticed in *S. exuberans forma belgica* by both Lang (1937) and Stockmans (1940), and a small form of *S. chapmani* has been described as *forma minor*. The grooving of the basal region of the sporogonium, evident in both *S. exuberans* and *S. chapmani,* is also not a constant feature and its absence from the Hull Road fossils acquires less significance when the unsatisfactory nature of the preservation in this soft shaley deposit is taken into account. To the nature of fossilization may perhaps also be attributed the apparent absence from the Lilydale specimens of the clearly defined sterile basal zone which is such an interesting morphological feature of the capsules of *Sporogonites*. In view of these considerations a modification of the earlier record of these specimens (Cookson 1945) as *S. chapmani* is desirable. For the present it seems preferable that they should be considered as remains of a simple plant of the same general type as *Sporogonites* but not necessarily identical with that form.

The Australian species *S. chapmani* is only known from two localities in the Centennial beds at Walhalla.

2. *Zosterophyllum australianum*

Plate IV, Figs. 7-8.

A few specimens have been recognized as detached sporangia of *Zosterophyllum australianum.* In size and form these agree with sporangia of this plant from the Centennial beds and from Mount Pleasant. The most clearly defined specimen is shown magnified 4 diameters in Plate I, Fig. 7. The sporangium, which has a width of approximately 5 mm., is tangentially expanded, and the stalk and marginal rim are clearly defined. In this example the sporangium is flattened considerably so that the line of dehiscence is directed towards the observer and a portion of the other side of the sporangium is visible.

Another sporangium (Plate IV, Fig. 8) viewed laterally shows the line of dehiscence near the summit of the sporangium.

3. *Yarravia* cf. *oblonga*

Plate IV, Figs. 4-6.

A few specimens demonstrate the presence in the deposit at Hull Road of *Yarravia,* a synangial fructification originally described from the Monograptus beds of the Yarra Track (Lang and Cookson 1935). The specimens are flattened incrustations or imperfectly preserved casts. In size and general form they agree essentially with one of the specimens compared with *Yarravia* from Mount Pleasant (Cookson 1935, Fig. 34). No evidence of spores has been seen.

The example shown at a magnification of 4 diameters in Plate IV, Fig. 4, is the best of a small number of specimens collected. Its counterpart is represented in Plate IV, Fig. 5. The stem is approximately 1 mm. wide and broadens towards the terminal fructification which is 3 mm. wide and about 8 mm. long. Three linear sporangia are shown on the exposed plane and two of these end in tips that are free from one another. The tip of the third sporangium on the left-hand side is partly obscured by the matrix, but, as far as can be ascertained, this sporangium is identical with the other two. For a short distance behind the tips, the brown mineral that has replaced the plant tissues is continuous between the sporangia; in other places it appears to have been broken away during the splitting of the stone. It seems probable that here, as in the specimens from the Monograptus beds, the elongated sporangia were completely coherent in the fructification, only their tips having been free.

The appearance of the specimen illustrated in Plate IV, Fig. 6, strongly supports this conclusion. The fructification in this case is broader than that of the preceding example and has convex rather than straight sides. It is 6 mm. broad and 8 mm. long. Three sporangia of equal dimensions can be seen in the exposed view of the fructification. Two of these terminate in pointed tips identical with the free apices of the previous specimen, the apex of the third being hidden by the matrix.

The specimens from Lilydale agree, both in size and form, more closely with *Yarravia oblonga* than with *Y. subsphaerica.* There are deviations from this type which may possibly be accounted for by the different mode of preservation in the two cases. In the present state of our knowledge, however, *Yarravia* cf. *oblonga* seems the best name for the Hull Road specimens.

4. *Hedeia corymbosa*

Plate IV, Figs. 9-11; Plate V, Figs. 12-17.

The name *Hedeia* was originally applied to some fertile branch-systems, believed to have been radially constructed, from Mount Pleasant, Alexandra (Cookson 1935). These were characterized by the successive equal or unequal dichotomy of several daughter axes which, themselves, arose terminally from the parent axis, and by the termination of the ultimate members of the branch-system in large elongate-oval sporangia. The tips of the sporangia all reached the same level, giving the fructification a corymbose appearance. Although some differences in the details of the branching were evident in the various examples, all were kept in the one species, *H. corymbosa.* Nothing is known of the plant to which such fructifications belonged.

Several small branch-systems from Hull Road exhibit the peculiar type of branching associated with *Hedeia,* but in none of them can the ultimate terminations be clearly recognized as sporangia. While uncertainty remains regarding such an important character, specific identification with *H. corymbosa* cannot be established.

One of the best specimens of this kind, which as regards its mode of branching can be closely compared with one of the examples of *H. corymbosa* from Mount Pleasant (*loc. cit.,* Figs. 25, 26), is shown in Plate IV, Fig. 9. In it three secondary axes which arose terminally from the parent axis are exposed. Of these the one on the left-hand side appears to have been unbranched; the other two show two successive dichotomies at identical levels and their ultimate terminations attain to the same level above.

The corymbose branch-system shown enlarged 4 diameters in Plate 5, Fig. 13, has a special interest, since it clearly demonstrates a radial construction. It is preserved as a solid cast in which minute carbonaceous fragments distinguish the branches themselves from the light grey matrix which during fossilization filled the spaces between them. By an oblique splitting of the rock this specimen was exposed in such a way that, in addition to the usual lateral view, its distal end could be observed from above. At the same time the counterpart of the distal portion (Plate 5, Fig. 14) became available for examination.

When viewed laterally (Plate V, Figs. 12, 13) the origin at one level from the main axis of four secondary branches is clearly shown. Of these branches the one on the extreme left (text fig. 1, a^1) is almost completely covered by the stone, but the three small casts (a^3) which project distally beyond the matrix are in a position which suggests that they represent the terminations of its daughter-axes. The two centrally placed secondary branches (b^1, c^1) each show two successive dichotomies at similar levels, but on account of the fracture which resulted in the exposure of the distal portion of the branch-system only short lengths of their terminations (b^3, c^3) can be traced in the specimen. These appear also in the counterpart but without providing the evidence required to establish their identity as sporangia. The ramifications of the fourth secondary branch (d^1) on the right-hand side of the specimen are obscure and need no further consideration.

When the distal region of the fossil is examined the conical tips of three flattened casts (e^3) can be seen lying on the rock behind the specimen. They have a brown colour and, since small carbonaceous fragments have been retained on their surfaces, clearly belong to the branch-system. Their position at the back of the specimen suggests that they are the ultimate terminations of a fifth secondary branch that lies behind the matrix now occupying the centre of the fossil. Their position is indicated in the counterpart by small compressed cavities (e^3).

Although the preservation of this interesting fossil precludes detailed interpretation and specific indentification, certain conclusions can be drawn from its study. By it the presence of *Hedeia* in Hull Road is confirmed and the radial symmetry of such branch-systems fully established. As far as the preservation of this specimen will allow us to judge, five daughter-axes, at least, must have been terminally arranged around a central space and further subdivisions of these axes occurred by successive dichotomies at identical levels in one plane only. The corymbose nature of this branch system is particularly obvious and, in the absence of positive evidence to the contrary, strengthens the possibility that the fossil represents a fructification closely similar to that of *H. corymbosa*.

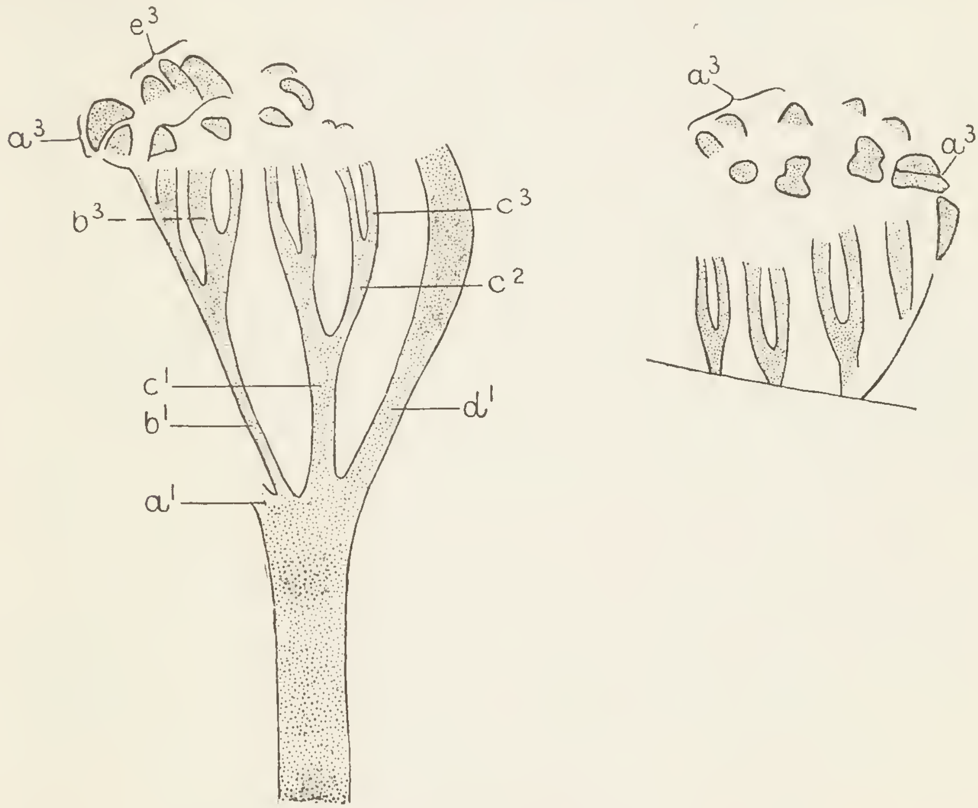

FIG. 1

Hedeia cf. *corymbosa*. Tracings made from photographs of specimen C. 102 and the counterpart of its distal region, ×5.

Recently, branch-systems of the *Hedeia* type were discovered by Mr. E. D. Gill, Palaeontologist of the National Museum, Victoria, at a Yeringian locality situated at the right-angled turn in Albert Hill Road, Lilydale. I am indebted to Mr. Gill for permission to record this occurrence.

As was the case with the Hull Road material, both the nature and form of the ultimate ramifications of the individual branch-systems from this locality is uncertain and again the only suitable designation for them is *Hedeia* cf. *corymbosa*. The corroborative evidence regarding the radial construction of such branch-systems provided by one of the specimens (Nat. Mus. Vict., Nos. 14661, 14662) is, however, of some interest. In this instance the rock split in such a way that a practically complete cross-section of the distal region of a partially carbonized branch-system was exposed. This portion of the specimen is illustrated at a magnification of three diameters in Plate IV, Fig. 11. In it can be counted some fourteen tube-like cavities, more or less completely filled with cores of matrix, the appearance and arrangement of which suggest a derivation from a radially arranged series of terminal branches. A portion of the proximal region of the same branch-system is illustrated in Plate IV, Fig. 10, where the main stem shows the origin of two short branches which in turn appear to undergo further subdivision at identical levels.

A second specimen from the same locality is shown enlarged two diameters in Plate V, Fig. 15. It is an impression of a rather large branch system in which three short secondary branches arise from the main axis (not preserved) at one level. Each of these branches shows three successive dichotomies at one level. The final ramifications can be traced for some distance in the right-hand branch without sign of sporangial enlargements.

A single specimen collected by Mr. Gill at a third Yeringian locality—Syme's Homestead, Killara—is shown in Plate V, Fig. 17.

On the whole, the branch-systems from the Lilydale outcrops are smaller and more compact and "bud"-like than those from Mount Pleasant. They indicate that this type must have been relatively abundant in Lower Devonian times and raise the question as to whether this peculiar type of branching may have been associated with vegetative as well as fertile axes.

5. Smooth branched axes. *Incertae Sedis*

Plate V, Figs. 18-20.

As is frequently the case in early Palaeozoic rocks, the most numerous plant-fossils at the Hull Road outcrop are pieces of smooth, rigid stems. These are from 1 to 8 mm. in width and some are branched by what appears to have been equal or slightly unequal dichotomy.

It is possible that specimens similar to those in Plate V, Figs. 18, 19 and 20, are portions of plants which have been identified from these beds by their fructifications, but as disconnected fragments can only be recorded as *Incertae Sedis*.

Discussion

The various types of plants known from early Palaeozoic rocks of Victoria have been described and figured in three papers. Those from a number of exposures in the *Monograptus* beds (Lower Ludlow) include *Baragwanathia* and *Yarravia* (Lang and Cookson 1935). The chief types from the Centennial beds of the Walhalla series are *Sporogonites* and *Zosterophyllum*. When these were first described (Lang and Cookson 1930) their age was believed to be Upper Silurian or possibly Lower Devonian (Skeats 1928), but now it is definitely regarded as Lower Devonian (Thomas 1937, Gill 1942). The collection of plants from Mount Pleasant, Alexandra (Cookson 1935) is not as yet definitely dated by animal remains. The interest is that it combines in one flora types known from the Lower Ludlow horizon (*Yarravia*) with others known from the Lower Devonian horizon of the Centennial beds (*Zosterophyllum* and *Pachytheca*).

The flora from Lilydale described in the present paper also combines plants from the lower horizon (*Yarravia*) with others from the upper horizon (*Sporogonites, Zosterophyllum*) but has the advantage of being stratigraphically dated. It is this rather than the descriptive details of the plant remains themselves that constitutes the importance of the Lilydale flora as at present known, for in the case of each type better preserved examples are known from other localities.

The small Lilydale flora taken along with the Mount Pleasant assemblage provides evidence of the essential similarity of the vegetation of Victoria from the Lower Ludlow to the Lower Devonian. The composition of this Siluro-Devonian flora in Australia of definite land plants with a vascular system and a considerable morphological complexity is a fully established piece of knowledge concerning early plants. The grade of organization of the plants from the *Monograptus* beds onwards is at least as high as that first met with in the Lower Devonian of the Northern Hemisphere. It is interesting that there are detailed points of agreement in the occurrence of the same generic types (*Zosterophyllum, Sporogonites, Pachytheca*) or of closely agreeing types (*Baragwanathia* in the Australian flora representing *Drepanophycus*).

In the Northern Hemisphere the representation of early vascular land plants is best and clearest in the upper beds of the Lower Devonian or Lower Old Red Sandstone where *Psilophyton, Drepanophycus,* and *Zosterophyllum* are met with, together with other vascular plants and with more anomalous types such as *Prototaxites, Nematothallus,* and *Pachytheca.* At lower horizons of the freshwater Lower Devonian a somewhat simpler assemblage of plants is met with and this is even more marked in the Downtonian where brackish water held (Lang 1937). The simplification of type by the absence of the more definite land plants is probably an ecological rather than an evolutionary feature. There are, indeed, indications that plants of the Lower Devonian and Downtonian will be traced back to the Silurian of the northern area. At present, however, there is no demonstration of a Siluro-Devonian land flora in the Northern Hemisphere, though it may have existed, as is afforded by the Lower Devonian of Lilydale and Walhalla and the Lower Ludlow of the *Monograptus* beds of Victoria.

Fossil Plants from Sandstone Beds on the Warburton-Wood's Point Road near Yankee Jim Creek

If an adequate knowledge of early vascular plants is to be obtained, a large number of outcrops, where plant-remains are preserved, must be carefully worked. The discovery by Dr. W. J. Harris and Dr. D. E. Thomas of another plant-containing locality in the Victorian Siluro-Devonian is, therefore, of interest. These plant beds are situated in a roadside quarry on the Warburton-Wood's Point Road about 22 miles from Warburton and adjacent to Yankee Jim Creek. In the absence of animal fossils, they cannot be palaeontologically dated. Dr. Thomas, however, has kindly expressed to me his personal opinion that they are stratigraphically higher than the *Monograptus* beds and are probably Lower Devonian. The plant-fragments are preserved as flattened incrustations in a dark grey sandstone, the plant tissues being represented by a brown mineral substance. The majority are small pieces of stems, but a few more connected specimens are sufficiently distinctive for classification. The identifiable types include *Pachytheca* and *Zosterophyllum*.

1. *Pachytheca* sp.

Plate VI, Fig. 22.

The alga *Pachytheca* was first recognized in Victoria from two specimens obtained at Mount Pleasant, Alexandra. Their identification enabled some more doubtful objects, from the Centennial Beds, to be associated with them as additional though more imperfectly preserved examples of the same organism.

A single carbonized specimen from the beds near Yankee Jim Creek can also be identified as *Pachytheca* sp. It is shown magnified three diameters in Plate VI, Fig. 22. The specimen is split across so that the characteristic differentiation into medullary and cortical regions is revealed. The example is a slightly compressed spherical body, 6·5 mm. in diameter, the medulla being about 4 mm. in diameter and the cortex about 2 mm. broad. The fine radial striations which were clearly visible in the better preserved specimen from Mount Pleasant cannot be distinguished in this example, but the way in which the carbonaceous material has split and broken away is quite consistent with a radial construction.

Pachytheca is a rare fossil in the Southern Hemisphere. It has been found only in small numbers in the Mount Pleasant and Centennial beds; its occurrence at a third, widely separated locality is therefore of interest.

2. *Zosterophyllum australianum*

Plate VI, Fig. 21.

Z. australianum is represented in this deposit by fertile spikes and detached sporangia.

The unusually large and almost complete spike shown of natural size in Plate VI, Fig. 21, was found by a member of Dr. Harris's party and presented to the Geological Museum, Melbourne. I am indebted to the Chief Geologist of the Mines Department, Dr. D. E. Thomas, for permission to examine and figure this very fine specimen. It consists of a smooth axis, 3 mm. broad and 2 cm. long, and a terminal spike of a uniform width of 8 mm. and a length of 4.5 cm. The tip of the spike is broken off. The sporangia are very numerous in the spike, some 35 being counted on the exposed surface. They are arranged in a close spiral and appear to be the same size throughout the spike. Those viewed abaxially show the typical reniform shape and the tangentially extended line of dehiscence.

In general characters the specimen agrees with the type material from the Centennial beds (Lang and Cookson 1930). It differs in the greater length of the spike and the more numerous sporangia in it. In spite of the fact that the distal portion is missing, the fertile region is at least 2 cm. longer than any specimen known from either Walhalla or Mount Pleasant. The sporangia themselves, though small (about 4 mm. across the widest part), are well within the limit for the species. The present specimen is distinctive for the unusually large number of sporangia that are crowded on the axis of the spike. Although the fertile spikes of *Zosterophyllum australianum* exhibit considerable variations, both in size of spike and the proportions and number of the individual sporangia comprising them, many more specimens will be necessary for comparison before specific distinctions are made.

3. *Incertae Sedis*

(*a*) Axes with H-shaped Branching

Plate VI, Fig. 23.

Several examples showing H-shaped branching have been found in the deposit near Yankee Jim Creek. The finest of these has been selected for illustration at a magnification of four diameters in Plate VI, Fig. 23. Its relatively main axis, about 1·5 mm. wide, shows two lateral branches which lie closely parallel to one another. The "upper" branch need not be considered further as only a short length of it is exposed. The "lower" appears to have divided by two successive dichotomies into two descending axes and one that was directed obliquely upwards. The descending limb (to the right in the photograph) shows further bifurcation into two more slender axes.

H-shaped branching was first observed in *Zosterophyllum myretonianum* where direct continuity with fertile axes clearly demonstrated it to be a feature of the rhizomatous regions of that plant. When similarly branched disconnected axes of between 1·5 and 2·5 mm. wide were found along with spikes and sporangia of *Z. australianum* at Mount Pleasant they were tentatively accepted and recorded as belonging to that species. The question of the future identification of disconnected branch systems of this type has been discussed by Croft and Lang (1942, p. 155). These authors remark that "evidence is, however, steadily accumulating that this type of branching was widespread among early plants." This being so, considerable caution should now be exercised before axes with H-shaped branching are accepted as evidence of the presence of *Zosterophyllum* in a deposit. Following the example set in this respect by Croft and Lang, the specimens from Yankee Jim Creek are recorded as *Incertae Sedis* rather than as vegetative branches of *Zosterophyllum australianum.*

(*b*) Pinnately-branched Axis

Plate VI, Fig. 24.

A few specimens from Mount Pleasant were grouped together under the heading "pinnately-branched axes." They are small portions of a new Siluro-Devonian plant, the nature of which has still to be discovered.

A single specimen of this rare type has been found near Yankee Jim Creek. The specimen, shown enlarged ten diameters in Fig. 24, though not as clearly defined nor as much branched as those from Mount Pleasant, is essentially of the same type of construction. It is a small curved axis about 1 cm. long and 0·75 mm.

broad. From the concave side of the axis three short branches arise, and it appears to terminate in a flattened, irregular expansion. The recurrence of this type links the beds under discussion with the sandstones of Mount Pleasant and encourages the hope that more connected specimens will ultimately be found.

(*c*) Stems with Small Spirally-arranged Elevations

Plate VI, Fig. 25.

A few short axes with small elevations on the surface or depressions (Plate VI, Fig. 25) on the corresponding counterparts have been found at this locality. These are suggestive of remains of small leaved stems, but no evidence of leaves or spines either at the margins or on the flattened surfaces has been seen. The specimens agree in every respect with similar remains described and figured from Mount Pleasant but like them can only be mentioned as a type of plant-remains and not as evidence of a small leaved plant in the Siluro-Devonian rocks of Victoria.

(*d*) Smooth Branched Axes

Plate VI, Fig. 26.

Small branched leafless axes are abundant in this deposit. All are indeterminate. The one shown in Plate VI, Fig. 26, however, has some comparative interest. It is a slender stem which just behind the point of bifurcation shows the base of an additional branch. Similar specimens were met with at the Centennial beds (Lang and Cookson 1930, Fig. 8) and at Mount Pleasant (Cookson 1935, Figs. 17, 18). They were recorded as *Hostimella* sp. and cf. *Hostimella* sp. respectively. At that time the resemblance to *Goslingia* (Heard 1927) was pointed out. Croft and Lang (1942, p. 143), in writing about similar axillary bodies in *Goslingia* from Llanover Quarry, Wales, stated that "it is useless at present to enter further into the general question of the nature of the axillary bodies which are now known to have been present in various early plants without being satisfactorily understood in any of them." The occurrence of this feature in several types of plant greatly reduces its usefulness as a diagnostic feature. It is therefore now suggested that the use of the name *Hostimella* sp. for branched leafless stems with axillary bodies be discontinued.

Acknowledgements

This paper was prepared in consultation with Professor W. H. Lang, F.R.S., at the Manchester Museum during the tenure of a Leverhulme Research Grant. I am indebted to Professor Wardlaw for allowing his assistant, Mr. E. Ashby, to help with the photographic illustrations. To Dr. D. E. Thomas and Mr. E. D. Gill I am grateful for information regarding the geology of the two areas concerned.

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EXPLANATION OF PLATES

All the figures are from untouched negatives. "C" before a specimen number refers to the Cookson collection.

Plate IV

Fig. 1. Cf. *Sporogonites.* Specimen showing general characters. Hull Road. ×10. (C. 82.)

Figs. 2, 3. Cf. *Sporogonites.* Specimen and its counterpart. Hull Road. ×10. (C. 72, 72a.)

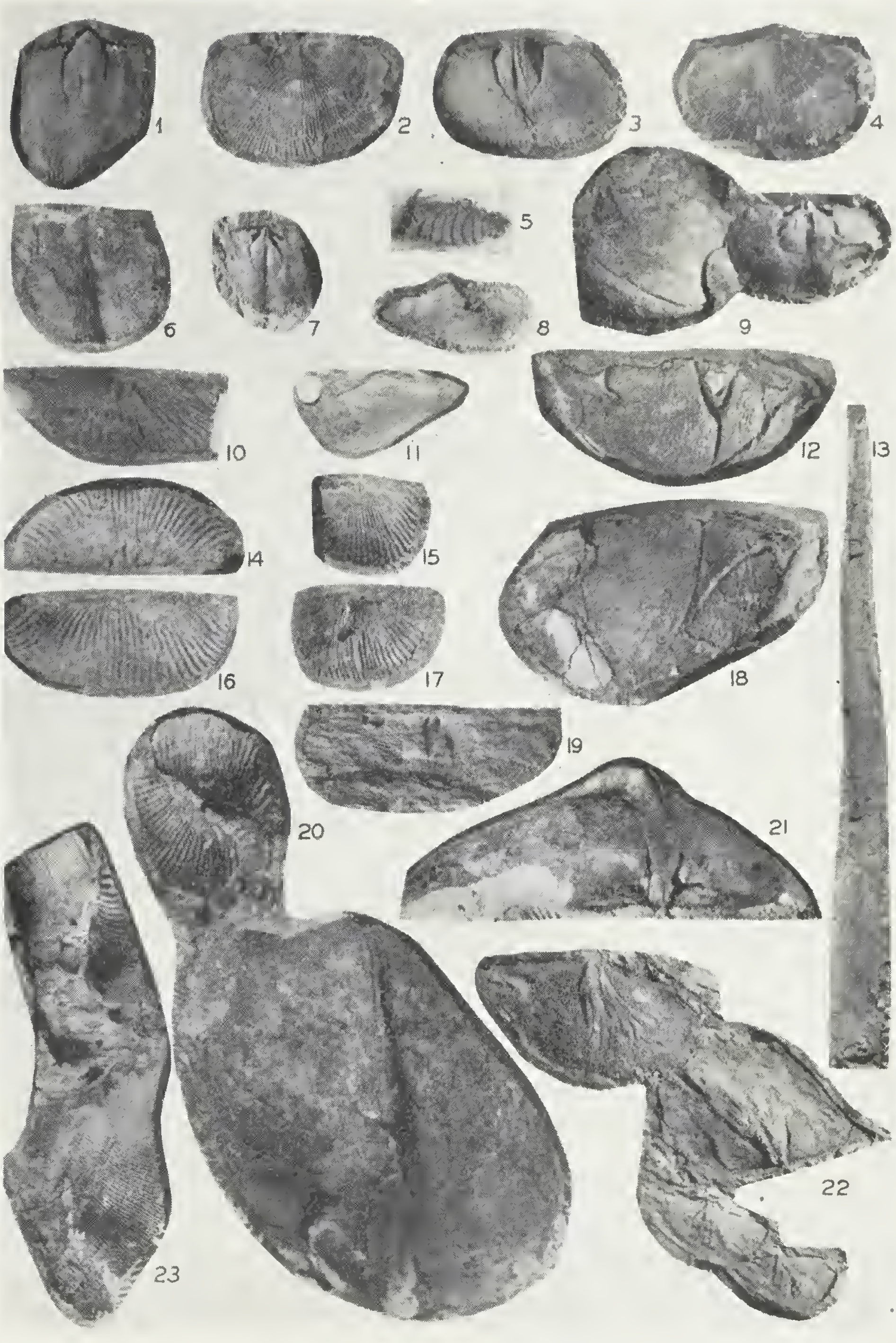
Figs. 4, 5. *Yarravia* cf. *oblonga.* Specimen and counterpart of a fructification. Hull Road. ×4. (C. 84, 84a.)

Fig. 6. *Y.* cf. *oblonga.* Another fructification. Hull Road. ×4. (C. 85.)

Fig. 7. *Zosterophyllum australianum.* A detached sporangium showing marginal rim and stalk. Hull Road. ×4. (C. 75.)

Fig. 8. *Z. australianum.* Another specimen. Hull Road. ×4. (C. 127.)

Fig. 9. *Hedeia* cf. *corymbosa.* A corymbose branch-system. Hull Road. ×4. (C. 44.)



Victorian Devonian Fossils.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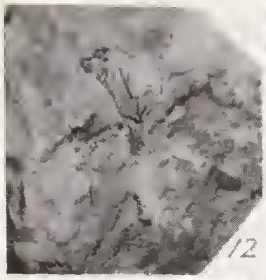
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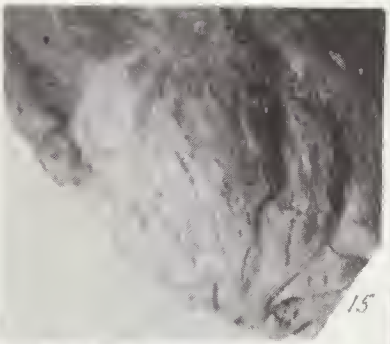
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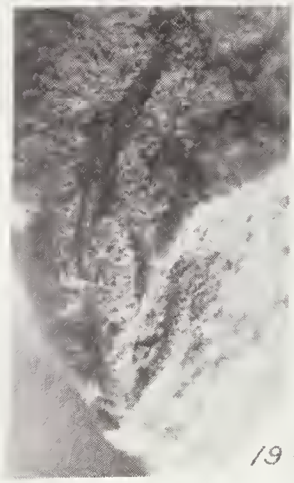
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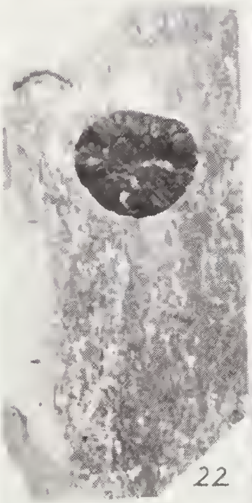
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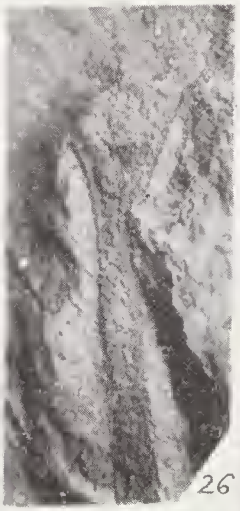
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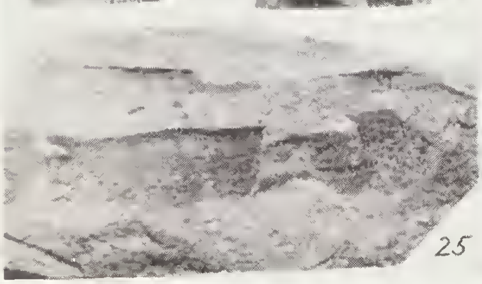
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Fig. 10. *H.* cf. *corymbosa.* Lateral view of part of a branch-system showing two successive bifurcations at identical levels. Albert Hill Road, Lilydale. ×3. (Nat. Mus. Vic., No. 14661.)

Fig. 11. *H.* cf. *corymbosa.* Cross-sectional view of distal region of the same specimen. ×3. Nat. Mus. Vic., No. 14662.)

Plate V

Fig. 12. *Hedeia* cf. *corymbosa.* Lateral view of a branch-system preserved in the solid. Hull Road. Natural size. (C. 102.) To be deposited in the Geological collection of the British Museum (Nat. Hist.).

Fig. 13. *H.* cf. *corymbosa.* The same specimen. ×4.

Fig. 14. *H.* cf. *corymbosa.* Counterpart of the distal region of the above specimen. ×4. (C. 102a.)

Fig. 15. *H.* cf. *corymbosa.* A branch-system from Albert Hill Road, Lilydale. ×2. (C. 106.)

Fig. 16. *H.* cf. *corymbosa.* A specimen showing the branching of two secondary axes. ×3. Albert Hill Road, Lilydale. (Nat. Mus. Vic., No. 14663.)

Fig. 17. *H.* cf. *corymbosa.* A corymbose branch-system. ×3. Syme's Homestead, Killara. (Nat. Mus. Vic., No. 14659.)

Fig. 18. A smooth branched axis. Hull Road. ×4. (C. 107.)

Fig. 19. A small branched specimen. Hull Road. ×5½. (C. 121.)

Fig. 20. A smooth axis with a smaller lateral branch. Hull Road. ×4. (C. 120.)

Plate VI

All specimens are from Warburton-Wood's Point Road, near Yankee Jim Creek.

Fig. 21. *Zosterophyllum australianum.* A fertile spike. Natural size. (Geol. Surv. Vic., No. 47387.)

Fig. 22. *Pachytheca* sp. Specimen showing differentiation into medulla and cortex. ×3. (C. 128.)

Fig. 23. Specimen showing H-shaped branching. ×4. (C. 129.)

Fig. 24. A pinnately branched axis. ×10. (C. 145.)

Fig. 25. Stem showing small concavities. ×2. (C. 59.)

Fig. 26. A branched axis showing the base of a third branch. ×2. (C. 148.)