THE KENFIG EPIPACTIS

By Charles Thomas.

In December 1941 I published a paper in the *Journal of Botany* in which I described the newly-detected *Epipactis pendula* C. Thomas. To my drawing illustrating this article I added a sketch of an *Epipactis* found on the Burrows at Kenfig, Glamorganshire. I then expressed the opinion that this plant was closely related to *E. pendula*, and deserving of further study.

Further visits to Kenfig in recent years, and the kind help of the late Miss E. Vachell, enable me to give a much more correct and complete account of the Kenfig *Epipactis* and its past history, which is not nearly so simple as I had at first imagined.

The Kenfig Burrows, famous to botanists as a locality for *Liparis Loeselii* var. *ovata*, and other rare and interesting plants, are very rich in Orchid species. *Epipactis palustris* is particularly abundant, and its variety *ochroleuca* occurs in quantity in good years. It was while examining this variety, in July 1941, that I chanced upon two strange plants growing well up the steep side of a sand heap, in a thick tangle of *Salix repens*. A casual observer might have passed them by as two more victims of the local rabbits, who are fond of nibbling at the flowering spikes of *E. palustris;* but the unusual situation prompted me to examine them closely. Not only were they a form of *Epipactis* differing from any I had previously encountered, but my interest was further aroused by the ease with which I located several other specimens in similar situations. I have since established the fact that the plant is widespread on the Kenfig Burrows. It occurs, in much smaller quantity, on the adjacent Margam Burrows. I have not, as yet, found it elsewhere.

The past history of the Kenfig *Epipactis*, for which my name *Epipactis cambrensis* seems to meet with general approval, is complicated by recent discoveries. It is now apparent that other species of *Epipactis* grow on the Burrows, beside those already mentioned. The full list is, at present:

1. *Epipactis palustris* Crantz, and its variety *ochroleuca* Barla.
2. *Epipactis Helleborine* (L.) Crantz.
3. *Epipactis pendula* C. Thomas.
4. A small *Epipactis* closely resembling *E. dunensis* (T. & T. A. Steph.) Godfery in appearance.
5. *Epipactis cambrensis* C. Thomas.

Of these, No. 1, *Epipactis palustris* with its variety is abundant on the damper slacks amongst the dunes. No. 2, *Epipactis Helleborine* occurs in rather dry sand almost destitute of *Salix repens*, in full sun-

light. In spite of this exposed situation, the plants are of a characteristic deep green colour, and the flowers are a dark, dull purple. From past experience, I should have expected these plants to be well "bleached out" by the strong sunlight. The only concession to the unusual habitat is, that the flowers all turn their backs to the midday sun. No. 3, *Epipactis pendula* occurs in a thick growth of *Salix repens* and *Rubus caesius*. The plants are small compared with the Lancashire examples, but the inflorescence is absolutely typical.

A single specimen of No. 4 was taken to the Kew Herbarium this year (1949) to be suitably preserved. It is a small plant which, when found, was in bud. It was left to flower and visited again a week later. The day was very stormy, but two flowers were then open. They bore a remarkable resemblance to those of *E. dunensis* in both form and colour, but differed in having a well-developed rostellum, large for the size of the flower. On the following day, which was hot and sunny, both flowers had been visited by insects and the pollinia removed. It is hoped to devote more time to this *Epipactis* next season.

The main object of this paper, *Epipactis cambrensis*, is now to be dealt with, the formal description being followed by a more detailed account, with comments.

Epipactis cambrensis C. Thomas, sp. nov.; *E. dunensi* (T. & T. A. Steph.) Godfery similis, sed statura minore et habitu debili, radicibus robustis et numerosis, foliis fortiter plicatis, marginibus ciliatis, floribus parvis pallidis pendentioribus, ovario longo compresso, praesertim labelli hypochilio intus haud colorato facile distinguitur.

Herba parva, debilis, glabra, c. 10-25 cm. (rarius 35 cm.) alta, luteo-viridis. *Caudex* in arenosis, inter *Salicem repentem*, sabulo movente profunde obrutus; rhizoma circiter 15-20 cm. longum, radices numerosas carnosas 9-10 cm. longas bilateraliter emittens. *Caulis* proprius solitarius, saepius dimidio inferiore vel ultra subterraneus; parte subterranea basali radices, alias brevissimas, alias c. 14-15 cm. longas per paria emittens; superne c. 6-8-foliatus, in inflorescentiam terminans. *Folia* oblongo-lanceolata, fortiter plicata, sectione ± V-formia, inferiora latiora et breviora (usque ad 3.5 cm. lata), superiora angustiora et longiora (usque ad 7 cm. longa), suprema in bracteas abeuntia, crassiuscula, tactui sicca, marginibus ciliatis. *Racemus* laxus, usque ad 10-florus; bracteae lineari-lanceolatae, inferiores floribus longiores, superiores breviores. Flores parvi (c. 10-15 mm. lati), aliquid pendentes; ovarium immaturum longum, c. 21 mm. longum (cum pedicello), angustum, dorsiventaliter compressum, maturum valde inflatum. *Sepala* et *petala* saepe acuminata, sepala 10.5 mm., petala 9 mm. longa, 5 mm. lata, luteo-alba. *Labellum* 7.5 mm. longum, bene formatum, album; epichilium cordatum, 4.5 mm. longum, reflexum; calli bini prominentes, albi; hypochilium orbiculare, 3 mm., intus haud coloratum. *Columna* 4 mm. longa; anthera sessilis, aliquid impendens; rostellum rudimentarium; pollinia in alabastro friantur et pollen in stigma extruditur.

WALES; v.-c. 41, Glamorgan; Kenfig Burrows, *C. Thomas*, July 19th, 1941; July 18th, 1942 (type), etc. Type in British Museum (Natural History).

Epipactis cambrensis is a small, apparently delicate, plant, a sickly yellow-green in colour, from 10 to 24 cm. in height (up to 35 cm. exceptionally). It grows on the sides and summits of well-drained sand heaps, in a thick growth of *Salix repens*. It is often irregularly blotched with patches of dark brown, due perhaps to the scorching action of the sea air.

The roots descend very deeply into the sand. There is, in fact, more of the stem below ground than above. It is quite useless, in most cases, to attempt to extricate the plants from the tangle of roots and underground stems of *Salix repens* through which they grow. By a lucky selection one, possibly of more recent origin, was extracted almost undamaged. Further investigation of the underground portion of the plant was abandoned when it was found that the almost certain result would be the pointless destruction of a rarity. Nothing was observed, however, to suggest that the deepest rooted specimens differed in any essential particular from the plant here described. (This plant is illustrated in the accompanying fig. A., and has been designated as the type).

The rootstock consists of a short rhizome 15-20 mm. in length, which throws off a dense cluster of long fleshy roots, having a decidedly bilateral arrangement. As a result of the accumulation of sand, due to drift, the rhizome becomes very deeply buried in the course of years. The plant illustrated had a stem 53 cm. in length: 30 cm. below ground and 23 cm. above. In most cases, the length of the underground portion of the stem greatly exceeds the figure shown. On the other hand, the aerial stem varies within much narrower limits. The internodes of the rising stem are first short, alternate ones giving off, first two sets of very short rootlets; then two unusually long roots from opposite sides of the stem, descending steeply to a length of about 15 cm.; half as long again as the longest roots issuing from the rhizome itself.

As the plant nears the surface of the sand, the internodes increase greatly in length; at about ground level, they are clasped by purple-tinted sheaths characteristic of *Epipactis*. The internodes shorten again as the leaves are produced. The leaves alternate on opposite sides of the stem, clasping it at their bases. They are simple, ciliate edged, rather oblong-lanceolate; but appearing very slender because they are sharply folded upwards on the midrib, to avoid excessive evaporation. A cut across the centre of the leaf gives a pronounced V-section.

The following measurements are the actual size of the leaves of one plant, taken from below upwards: 3 × 3½ cm., 3½ × 5½, 3 × 6, 2½ × 7, 1½ × 7 and 13 mm. × 6½ cm. Beyond this the leaves pass into the linear-lanceolate bracts accompanying the flowers. The bi-lateral arrangement of the parts, mentioned in connection with the root, is a consistently characteristic feature of the whole plant.

The flowering spike is few flowered and lax. Robust plants bear about 10 flowers. The lowest bracts are longer than the flowers, diminishing to shorter than the flowers at the apex. The pedicel is curved down, but less so than in *E. pendula* or *E. vectensis* (T. & T. A. Steph.) Brooke & Rose, so that the flowers do not appear to hang loosely but tend rather to give the whole plant a somewhat sinuous aspect. The ovary is remarkably long and narrow, smooth, and flattened above and below: a feature which should distinguish it at once from any other British *Epipactis* when in flower. The flowers are small and yellowish-white in colour. The interior of the hypochile of the lip, which is small but well-formed, is uncoloured. A narrow slit, running between the two basal bosses of the epichile, has sometimes a faint purple tint. The epichile itself is almost pure white.

The flowers are self-pollinated, and as pollination appears to take place in the bud, insect pollination is extremely unlikely. The rudimentary rostellum does not respond to an artificial stimulus: it performs its original function as part of the stigma.

Although *Epipactis cambrensis* superficially resembles *E. dunensis* it is not nearly related to that species, being distinguished, with *E. pendula* and *E. vectensis*, by the complete absence of colour (deep purple to crimson) in the hypochile of the lip. The resemblance of the habitat of the two species is of no significance, since even that is superficial also.

Griffith (1895) gives the following record: "*Epipactis latifolia*. Native, in damp woody places, and in damp sandy places." The *Epipactis* of the "damp sandy places" must at least include *E. dunensis* (first described under the name *Helleborine viridiflora* by Wheldon and Travis, 1913). I have not seen the Anglesey plants, or the locality, but in Lancashire I have found the slacks inhabited by *E. dunensis* waterlogged in a wet season. On the other hand, the Kenfig Burrows are remarkably well-drained. In very wet weather, I have found them quite dry even near to Kenfig Pool. The rain is absorbed into the sand as it falls. Moreover, *Epipactis cambrensis* grows on more or less raised, and consequently dry, sand heaps fixed by *Salix repens*. This difference of habitat is evidently of great importance in the life-histories of the two plants. Whereas *E. dunensis* has an extremely feeble root-system, and is often attacked by disease some distance below ground, so that the above-ground plant has no living connection with its underground root, *Epipactis cambrensis* in its drier habitat, has an extremely vigorous root-system, even sending down roots from the underground stem to assist in obtaining the requisite moisture from the well-drained sand.

The late Miss E. Vachell informed me that "when a child" she was shown the Kenfig *Epipactis* by her father, Dr C. T. Vachell, but was never able to find it again herself.

Riddelsdell (1907) gives the following record: " *Epipactis Helleborine* Crantz. . . . Aberafan and Kenfig Burrows, Whitehouse." This record is copied by Trow (1910) and credited to Ridd. [Riddelsdell] under *Epipactis latifolia* All. In view of the fact that *Epipactis Helleborine* is now known to grow on the Kenfig Burrows, it is impossible to say if this record can be held to indicate *Epipactis cambrensis*. It is clear that neither Riddelsdell nor Trow saw the plants themselves.

Vachell (1933) makes no mention of the Kenfig *Epipactis*. Nor is there any mention of Kenfig as a locality for *Epipactis* (other than *E. palustris*) in Hyde and Wade (1934).

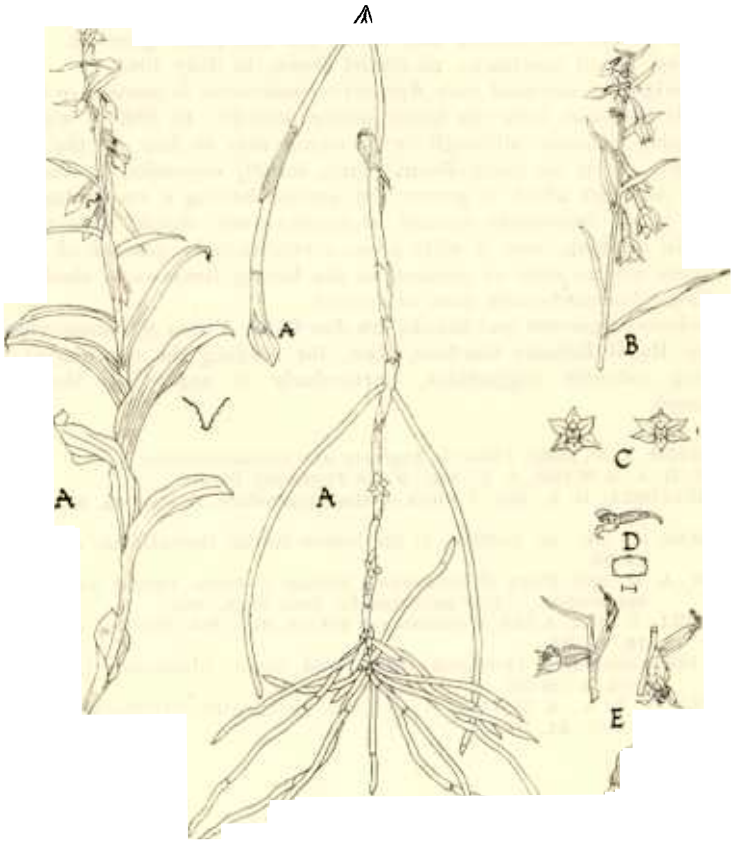

Fig. 1. Drawn by the author from fresh specimens, 18th July 1942. AA—Complete plant, in bud (×⅔). B—Flowering raceme. C—Two types of flowers. D—Ovary, column and lip in profile, with section of ovary. E—Ripening ovaries.

Vachell (1936) gives: " *Epipactis latifolia* All. Sylvestral. Locally common. Cwrt yr-Ala, Kenfig! . . . Leaves varying considerably in specimens from dunes and from woods, some being much narrower than others." This slight reference to the Kenfig *Epipactis* is the first recognizable printed record.

Miss Vachell informed me that Miss Rawling had sent her " an accurate description " of the plant, but omitted to collect specimens. She also stated that she then had a specimen of the plant in her collection, picked by Miss Thomas. This probably accounts for the appearance of the record in the 1936 list, as opposed to the one of 1933.

In 1940, Mr J. Williams, of Cardiff, rediscovered the *Epipactis* and took specimens to the Herbarium of the National Museum of Wales—the first to reach the collection. With the help of Mr Williams, Miss Vachell visited the locality and again saw the plant growing.

I first found specimens, as stated above, in July 1941.

It might be assumed that *Epipactis cambrensis* is more rare than is actually the case, from the above scanty records. In 1949 it was quite reasonably common, although by no means easy to find, on the Kenfig Burrows. It is an insignificant plant, largely concealed by the *Salix repens* amongst which it grows; but anyone having a knowledge of its habit, and a reasonable amount of perseverance, should have no difficulty in locating, over a wide area, a considerable number of plants. As there are no trees at present on the Kenfig Burrows, a shade form of *Epipactis cambrensis* does not occur.

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