# THE HISTORY OF THE VASCULUM

By D. E. Allen

## Introduction

A short while ago, in an earlier issue of this journal (Allen, 1957), I drew attention to the surprisingly late date cited for the word 'vasculum' in the standard English dictionaries and raised some queries about its history. A few months after my note appeared, I was very pleased to receive from Professor H. G. Baker an advance copy of his paper on the subject, since published in *Proceedings* (Baker, 1958), in which he was able to report the discovery of several earlier references and bring to light some suggestive evidence concerning its origin. I had in the meantime come across one or two further references myself, and Dr. Baker's findings now stirred me to delve much more extensively into the literature, foreign as well as British, in the hope of settling the matter with at least some greater degree of finality.

This is a peculiarly difficult field to investigate. The potential literature that bears examining is extremely vast, much of it is repetitive, there are few cross-references, and until the appearance of Lawrence's *Taxonomy of Vascular Plants* in 1951 there had been no bibliography worthy of the name since Kreutzer's in 1864. For these reasons, and because my interest was particularly in the origin of the vasculum, I have concentrated on tracking down all uses of the word and descriptions previous to 1850. After that date the mentions became copious, and for this more recent period I have only sampled the literature at random.

## Origin of the Metal Collecting Case

The formation of a herbarium normally entails three consecutive operations: collecting in the field, then drying, then mounting and arranging. It is only with the first of these that we are here concerned—an old procedure, but not, it would appear, an ancient one, for the early herbalists are believed to have dried their plants merely by exposing them to the air, without applying pressure of any kind. It can only have been with the formation of the first true herbaria—beginning, as far as we know, with those of Gherardo Cibi of Bologna, about 1532 and of the Englishman, John Falconer, in the 1540's (Saint-Lager, 1885)—that field collecting became a skilled occupation and called for some means to be found of countering the habit of so many species of withering almost immediately

upon removal. Basically, only two solutions to this have ever been practicable: pressing the specimens, with more or less efficiency, in the field itself, which means carrying around a bundle of papers; or keeping them fresh until they can be taken home and pressed at leisure, in which case one must make use of some reasonably air-tight container.

The former alternative, the portfolio, field-book or press, though it ensures better herbarium material and is certainly preferable when collecting plants that shrivel quickly such as ferns, has the disadvantage of being awkward to use in wet weather or in more than a slight breeze, and in its more elaborate modern versions the constant opening and arranging and re-strapping tends to be unduly time-consuming, at any rate on anything more than a short and specialised excursion. As Lecoq (1829) has noted, it is also impracticable on any occasion when large numbers of examples of each species need to be collected. Nevertheless, the portfolio has always had fervent advocates, particularly among professional botanists, many of whom have become accustomed to its use under the more exacting conditions of the tropics; and in tracing the history of the collecting container it is as well to remember that it has constantly thrived and multiplied only at the expense of this almost equally serviceable competitor.

The first botanist known to have mentioned any kind of collecting container is Edward Lhwyd (Gunther, 1945). In a letter in 1682 he describes how the plant collectors in the Welsh mountains used hand-baskets which they filled with roots. It is interesting to note in this connection that Bingley (1798), over a hundred years later, describes how, when climbing in Snowdonia, his companion, the Rector of Llanberis, had "a small basket to contain our provisions, and hold the roots of such plants as we wished to transfer to his garden; this he carried behind him by means of a leathern belt fastened round his waist". Possibly the Rector was continuing a local tradition, although an ordinary collecting tin is undoubtedly cumbrous when climbing and Thompson (1912, 1917) has even recommended that it be dispensed with under these conditions in favour of a sponge-bag.

James Petiver, a contemporary of Lhwyd, either did not know of, or did not believe in any collecting container. In his *Directions for the Gathering of Plants* (c. 1700) he writes: "Wherever you go ashoar, or into the Fields or Woods, carry with you the Collecting-book (to gather the samples or specimens in, which you must shift into this book the same day, or within two or three at farthest after you have gathered them)". Again, in his *Brief Directions for the Easie Making, and Preserving Collections of All Natural Curiosities* (c. 1700), he recommends that plant specimens be treated in the same way as butterflies or moths and "put into a book, or quire of brown paper stitch'd (which you must take with you) as soon as gathered".

Linnaeus, too, on his Lapland journey in 1732, only had "a parcel of paper stitched together for drying plants". Nineteen years later, however, in his *Philosophia Botanica* (p. 293), among the items he recommends his students to take with them on their botanical excursions around Uppsala, he includes a *'Vasculum Dillenianum'*. In a footnote he describes this as "a semi-cylindrical container made of copper, 9 inches long, furnished with a suitable lid, with an opening wide enough for the hand, the side moderately concave for convenience when walking; for the purpose of keeping specimens moist and fresh till the evening".

The title employed by Linnaeus clearly suggests that he had derived his knowledge of the vasculum from the English botanist, Dillenius. The two had met at Oxford during Linnaeus' famous visit to England in 1736 and had formed a friendship which was kept up in correspondence till Dillenius' death eleven years later. One can only assume that the latter either showed Linnaeus his vasculum or else described it in one of his letters; but there is no mention of it in the small portion of the correspondence between the two published by Smith (1821), which according to Druce & Vines (1907) was all that survived after the death of the younger Sibthorp.

Dillenius was a German by origin and was brought over to this country by Sherard in 1721. Five years later he made a 'herborising' trip through Wales and the West of England, accompanied by Samuel Brewer. In the account he left of this (Smith, 1821), however, there is no mention of how his plants were collected. Brewer's diary (Hyde, 1931) is likewise of no assistance in this connection. Mrs. H. N. Clokie, who has made a special study of Dillenius' writings, informs me that she, too, has never come across any reference to collecting containers.

Nevertheless, we cannot assume from this that it was Dillenius who invented the vasculum. The early records are so scanty and the collecting case such a likely tool for any of the early field botanists to have dreamed up independently that there can never be any certainty about its origin. There is, moreover, an awkward reference by the Salzburg botanist von Braune (1802), who includes among the equipment necessary for botanising in the Alps "*eine bleche sogenannte burserische Büchse*" (a so-called Burser Box of tin). This appears to refer to Joachim Burser (1583-1639), a pupil of Caspar Bauhin who is known to have travelled widely in Europe and to have botanised a great deal in the Alps. In 1625 he became a professor in the academy at Sorö, in Denmark, and died leaving a large herbarium which proved of great value to Linnaeus and which is still preserved at Uppsala. He published only a single work, and in the few references to him in the literature I can find no mention of his botanical equipment.

## Size and Shape

The most surprising feature of the Dillenian vasculum, as described by Linnaeus, is its size—only 9 inches long. Withering (1776), who was the next to provide a description, recommends one equally small: 9 in. × 4½ in. × 1½ in., or about as long as a page of these *Proceedings* and not even quite as wide. The earliest illustration, in the vignette on the title page of Curtis' *Flora Londinensis,* which Curtis (1941) has shown to have been first published in May, 1775, depicts a botanist putting a specimen into what appears to me to be a small circular tin, which is suspended from his shoulders by a strap. Another early model, however, figured by Graves (1818), is very flat and rectangular; the size is unstated, but Graves calls it "a common tin vasculum or pocket herborizing box" and from his description implies that larger specimens were not ordinarily admissible unless doubled.

From this evidence, scanty though it is, it would appear that most of the early vascula were decidedly small and were probably designed to be carried in the hand or the pocket. Clearly, however, they were too small for any substantial collecting and for longer excursions many botanists began to use a second auxiliary case of much larger dimensions. Cirillo (1787) mentions that at Naples they employed very large ones (*"vasculis amplissimis modo utimur"*) when it was necessary to collect plants on a large scale in distant parts and bring them back complete with their roots for the Botanic Garden. Similarly, in a letter to J. E. Smith in 1796 (Smith, 1832), Edmund Davall, an Englishman resident in Switzerland, describes how three years earlier he had climbed Mont Suchet and taken with him "a boy who carried my larger *Vasculum*". Roth (1803) also prescribes two sizes of vascula, one 12-14 inches long for carrying under the arm or in the hand, and another somewhat broader and deeper to be used for distant excursions and worn with a strap. This fashion for two vascula evidently persisted for at least another thirty years, for Poiret (1820) was still recommending to beginners an 8-inch size for simple walks and a 15-inch one for longer journeys; and MacGillivray (1830) describes the length of vascula as varying from 9 inches to 3 feet, "according to the taste and avidity of the collector".

But already now there were botanists who preferred to use only a single large model for all occasions. Hoppe (1791), in commending Linnaeus' idea to Austrian botanists, describes the type used by him and by some of his friends as about the size of a large sheet of paper—presumably folio, as he also describes it as 6 inches deep. Another one, made for Pohl (1806), was at least 20 inches long. In France, Gérardin (1805), after remarking that every botanist has his box made in the form most convenient to him, adds that having himself experimented with various

shapes he could find nothing better to suit his personal taste than the type he had used for several years: 18 in. × 8 in. × 5 in. Another French author, Philibert (1807), recommends "a slouch hat, light in weight, a hunting-jacket, a pair of pantaloons buttoning at the side so that they can be rolled up when going into water; a long tin box [15-18 in.] hung at one's side from the shoulder, for keeping one's plants in, or a portfolio containing drying-paper". The vasculum used by Darwin during his voyage in the *Beagle* in 1831-36, now in the possession of the Linnean Society and probably the oldest one still in existence, measures 16 in. × 7½ in. × 5 in., and for its size is quite remarkably light, tipping the scales at only 2 lb. 10 oz. In America, too, Short (1833) was of the opinion that the vasculum "should not be less than 18 inches long and 6 inches in diameter". And by the beginning of the Victorian era the large size had evidently so completely displaced its rival that Greville (1840) thought it deserved a distinctive name and proposed that it be christened the 'Magnum'. We must presume that the greater care now taken to secure good herbarium material had finally extinguished the earlier, reprehensible practice of doubling up all the larger specimens and squeezing them into tiny tins. Perhaps, too, the emergence of the 'Magnum' reflects the rise in botanists' self-confidence, their subject being now so generally accepted and popular that the vasculum had become no longer something to carry around rather furtively, but something to flourish—a badge of recognition, the honoured tool of the trade.

As the 'Magnum' grew in favour, so, cuckoo-like, it gradually edged out the smaller versions into a deeper and deeper obscurity. In some cases, in Britain especially, these evolved into very small pocket-boxes, for preserving diminutive specimens or any that were exceptionally fragile, a use first mentioned by Philibert (1807). In other cases, they were banished to lead a permanently embryonic existence inside the larger boxes (Kreutzer, 1864) or became fossilised into nothing more than one or two built-in compartments (Eloffe, 1862). These compartments, always more popular on the Continent, have in time come to serve a number of ancillary purposes. Bailey (1881), for instance, filled them with water and in this way was able to keep small aquatics in the freshest possible condition. Verlot (1879), on the other hand, preferred to regard them as more suitable receptacles for the botanist's *"provisions de bouche"* or the odd trowel or digger. Pohl (1806), owning a partitioned vasculum at an abnormally early date, used one compartment for floras and the other for any insects he managed to catch and pin. And many British botanists will recall the celebrated vasculum owned by the late A. J. Wilmott which included *inter alia* a compartment specially reserved for his spectacles.

Verlot's descriptions and advice on these matters, and indeed on anything at all remotely connected with botanical outfitting, are unusually comprehensive. He recommends two to three, five or a maximum of seven companions, suggests velvet for clothing and cautions the botanist against drinking cold milk. He even includes a special section on catastrophes that can happen to the botanist and prescribes the appropriate treatment for such complaints as blisters, bruises, sprains, stings, bites, sunstroke and even attacks from wild animals! The shapes of vascula, he says, can vary very greatly: some are completely cylindrical, others more or less depressed on one side, still others almost crescent-shaped and worn round the body like a belt. Very rarely, even, they can resemble a large missal in size and shape, in which case they are worn like a knapsack and open at the top; but such an immense version requires two people to use it, one to do the carrying, the other to do the collecting and inserting. For distant trips he regards a vasculum as long as 70-75 cm. (about 2½ feet) as a necessity.

Another massive type, first devised by Hoppe (Fürnrohr, 1849), takes the form of a large, rectangular tin chest, in Hoppe's example 15-17 inches long and about a third as wide and rather more than half as deep. The lid is lifted off to admit the specimens and these are at once placed into drying papers inside. It is worn, with the aid of two straps, across the back. Dr. C. G. G. J. van Steenis has described (*in litt.*) a rather similar container that he invented some years ago for collecting in Java, where the very rainy weather and the woody nature of so many of the species combined to make it an exceedingly useful piece of equipment. It was about 3 feet long, 1 foot wide and 8 inches deep. Besides having a detachable lid across the top it could also be opened on the side parallel to the bearer's back, so that specimens were inserted without any need to stop walking. This large container "was taken only on extended tours in unexplored or very promising country, where we were in the forest for chains of 7-14 days with different camps, each day covering 5-10 miles. It was naturally not used in small day-trips in explored country, where I used either baskets, presses or smaller vascula".

The use of these very large vascula has traditionally been limited mainly to professional botanists, who "generally prefer sizes larger than those available from the commercial supply houses and have cans made to specification by local metalsmiths" (Lawrence, 1951). This is partly because it is normally only the professional who needs to collect large amounts of, say, fresh material for teaching purposes, and partly because the amateur, whatever his nationality, tends to be embarrassed by an outsize container. Dr. van Steenis indeed suggests that the vasculum may owe its declining popularity in Holland, at least in part, to the fact that it is so much more conspicuous than a portfolio.

Bailey (1881) also has a passage that seems apposite in this connection:

> "At best, it is a terrible bugbear to the young explorer, who imagines, and justly, that the rural population regard him with suspicion. He may be taken for a tramp. He often is approached as a peddler of peanuts, and it is with profound sorrow and disappointment that the public learns that he is a mere weed-hunter. Sometimes one is thought to be carrying a fire-extinguisher, and one botanist was approached as a dealer in corn plasters. The persecution then takes a new form, and he is asked about the virtues of all the harmless herbs in the country. Sometimes (and this is the hardest to bear) he is made the object of the persistent and united gaze of a whole village."

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TABLE 1.

RECOMMENDED SIZES

| | *Date* | *Author* | *Length* | *Breadth* | *Depth* |
|---|---|---|---|---|---|
| (a) | *British* | | (in.) | (in.) | (in.) |
| | 1751 | Linnaeus | 9 | | |
| | 1776 | Withering | 9 | 4½ | 1½ |
| | 1840 | Greville | 20 | 8-9 | 5 |
| | 1856 | S. Thompson | 18 | 6-8 | 4 |
| | 1905 | Guiton | 15 | 7 | 2½-3 |
| | 1905 | White | 16 | 7 | 3 |
| | 1917 | H. S. Thompson | 16 | 7-8 | 2½-3 |
| (b) | *American* | | | | |
| | 1833 | Short | 18 | 6 | |
| | 1836 | Gray | 15-18 | 6 | 3 |
| | 1874 | Wood | 15 | — | |
| | 1891 | Knowlton | 20 | 7½ | 4½-5 |
| | 1899 | Bailey | 16-18 | 7 | 4½-5 |
| | 1955 | Core | 20 | 8 | 10 |
| (c) | *Continental* | | | | |
| | 1803 | Roth | (i) 12-14 | 8 | 3 |
| | | | (ii) 13 | 11 | 5 |
| | 1805 | Gérardin | 18 | 8 | 5 |
| | 1807 | Philibert | 15-18 | 5½-7½ | 4-5½ |
| | 1862 | Eloffe | *24-28 | | |
| | 1864 | Kreutzer | 15-17 | 6-9 | 4-6 |
| | 1868 | Boitard | *20 | 6 | |
| | 1886 | Baillon | *20 | — | |
| | 1945 | Bimont | *20 | | |

*Calculated from metric equivalents

The experience of American botanists could be matched in any country. In Ireland, for example, Praeger (1937) has described how his vasculum was taken at different times for a queer kind of engineering instrument, a receptacle for fish, and once, even, for a holy man's tin drum.

There is thus a psychological upper limit to the size of a vasculum, and this is reinforced both by convenience and by the traditional and sensible aim of matching the length with the size of the standard sheet used in herbaria. The first author to stress this last point appears to have been Short (1833). For at least the last fifty years, as reflected in the sales of Messrs. Flatters & Garnett Ltd., the scientific instrument makers, the majority of British botanists have preferred a length of 15 inches, with the 17-inch size enjoying favour among the more advanced.

## Materials

The first essential for a collecting container is, of course, that it should be as light as possible, and there are various materials that could serve if this were the only factor to be considered. But durability is also important and it is desirable, too, to have a material that cannot be crushed or punctured; and for these qualities thin metal of some kind cannot be bettered.

Linnaeus (1751) describes his vasculum as made of copper, but Withering (1776) gives the sounder and more popular advice in recommending botanists to "get the box made of the thinnest tinned iron that can be procured". Zinc and aluminium have also been employed, the latter more especially since the 1890's, when a fall in the price of the metal first made its use economical. In addition, brass has been used for making the loops and handles and a wire often utilised as a bolt.

Metal, however, is very liable to rust, and this has led to a practice that has been a source of controversy almost since the first vascula were invented. Withering (1796) insists that "the box should be painted, or lacquered, to prevent it rusting"; and Thompson (1807) and Graves (1818), repeating this advice, add that japanning (a process intermediate between painting and enamelling) should be extended to the inside as well as the outside of the tin. Gérardin (1805) and Short (1833), on the other hand, claim that the protecting influence of the tin is greater if it is not painted or japanned at all, and Bailey (1899) mentions that many American botanists like to leave their vascula unpainted for this very reason. The usual colours chosen are black (particularly in Britain), white, grey and green, and these have traditionally been chosen not primarily because of their influence in countering the heat of the sun—for which purpose black is about as bad as possible—but, as Bailey (1881) observes, so that they will render the vasculum as inconspicuous as possible.

## PLATE 1

Linnaeus at "Hartekamp", resting after a day's botanising

*From a painting by L. F. P. Roux in 184*

scene is quite imaginary, as shown by the erroneously large size of vasculum)

Reproduced by courtesy of the Director, Rijksherbarium, Leyden

PLATE 2

Use of the sandwich-box for botanical collecting
*From Murray (1881)*

To prevent the tin becoming overheated, several authors, starting with Koch (1798), advise collectors to cultivate the habit of always carrying it on the side of the body removed from the sun. Others suggest covering the tin in hot sunshine with some protective material: Constantini (1794) used cardboard or leather for this purpose, Murcott (1843) canvas, and Kreutzer (1864) a sheet of paper glued down and coated with a light-coloured varnish. Murcott also used a canvas lining inside the tin, while Constantini and Koch laid a carpet of damp leaves or moss or grass or several doubled-up sheets of wet blotting-paper. The practice of occasionally sprinkling the specimens with water is first mentioned by the younger Withering (1830), and Gérardin (1805) and Pohl (1806) were the first to recommend the now general practice of putting the specimens between sheets of paper inside the tin, so that they can receive some preliminary pressing and will also be saved from being tossed about overmuch. Gérardin also suggests using dry moss for this packing. At all times, as Bailey (1881) and Thompson (1917) emphasise, plants keep better in a full vasculum than in one only partly filled.

So long as these precautions have been observed, specimens will normally keep fresh in the tin for up to four days (Pohl, 1806) but no longer. If the collector returns at the end of the day too tired to perform the labour of transferring them to the press, Bailey (1881) remarks that the vasculum is then better left in a cool place, such as a cellar. This practice was also followed by Hoppe (1791).

## Uniqueness of the British Vasculum

It has long been known, but apparently never set on record, that the British and Continental vascula differ from one another in several ways. The most striking of these differences is in the shape. For at least a century and a half Continental vascula have been consistently more cylindrical, generally longer in relation to their breadth (see Table 1) and oval instead of narrowly elliptical in cross-section, resembling a somewhat flattened tube as opposed to the British flat box with rounded sides. There have, it is true, been variations from this basic pattern—Philibert (1807) and Bailey (1899) mention vascula that are square or rectangular in cross-section—but in general the two types have retained their distinctive, highly conventionalised shapes with astonishing persistence and in spite of the fact that so many all along must have been made up according to individual specifications. The divergence seems to date from at least as far back as 1800, for Audouit (1848) and Boitard (1868) illustrate typical examples of the Continental type and Gérardin (1805) describes what sounds like essentially the same design. And the British vasculum figured by Graves (1818) is, in contrast, almost flat,

while Darwin's, except for its unusual depth, is very similar to the kind of model used by British botanists of to-day. As we have seen, the formative period for vascula was between 1780 and 1830, and for much of this time Britain was culturally isolated from the Continent by war.

So strong have been the conventions in design that the two types have even preserved their differences after crossing the Atlantic: Bailey (1881, 1899) and Knowlton (1891) illustrate vascula unmistakably Continental in shape, and yet, as Dr. Baker has pointed out, the contemporary American vasculum resembles the vasculum of Britain. The United States, it seems, has not proved such a melting-pot of vascula as it has of customs and races.

Only two explanations of the original divergence seem at all feasible. The first that springs to mind is that they were carried differently in this country compared with on the Continent. Unfortunately, this is not an aspect that authors have generally thought worth describing and consequently we have only the most fragmentary evidence to tease and possibly delude us. Philibert (1807) describes the French version as worn crosswise from the shoulder to rest against the left hip, and he adds that it would be an improvement if the case could be fitted to the curve of the body. Desvaux (1839) suggests making it curved for the same reason. Already, however, American collectors, according to Short (1833), had vascula that were flattened on both sides, a shape that was found more convenient when the tin was worn below the arm. Greville (1840) describes British botanists as wearing the field-book slung over the shoulder "on the side unoccupied by the vasculum"; and from his remarks it is clear that his vasculum had a handle at the end and was sometimes carried along vertically by hand. This was also true of the model illustrated by Thompson (1856).

The other possibility is that the two standard shapes of vascula were inspired independently and were, perhaps, modelled from the very first on two totally different instruments. Virtually every tool used in natural history appears to have been derived from some more mundane object already in use—the butterfly-net from the net used by bat-fowlers, the geological hammer and pick from the tools of the mine and the smithy—and it is quite likely that the vasculum, especially if it was invented more than once, originated in some similar manner. But again, unfortunately, the evidence is meagre and confusing. Two promising candidates as ancestors of the vasculum have been picked out by Dr. Baker from a sentence by Gray (1873): ". . . . in shape like a candle-box, only flatter, or the smaller sizes like an English sandwich case". The latter, however, can probably be dismissed straight away. It is true that Thompson (1856) speaks of "a box similar to what are called sandwich-boxes,

only on a larger scale", that Francis (1839) recommends a tin sandwich-box for botanising, and that sandwiches became fashionable early enough (c. 1760) to have been able to give rise to a container that might have influenced the vasculum. Yet the earliest traced reference to one is in Mayer's *Sportman's Directory* of 1817; and all the Victorian sandwich-boxes now preserved in the London Museum are quite unlike the vasculum, being much smaller and in shape rather resembling a cube (see Plate 2). The candle-box, on the other hand, is a much likelier source of inspiration. Edwards (1954) has an illustration of an early eighteenth century one made of brass; it is cylindrical, opens by a long hinged lid, measures 12 in. long and 5 in. deep and could easily have sparked off the idea of a similar container for collecting plants. And indeed Short (1833) does speak of the vasculum as being "very similar to a common tin candle-box", while in Dr. Abbot's correspondence in the British Museum there is a letter written in 1799, probably to Sowerby, in which he ends, "I must beg you now to make a parcel for the Coach returning me all my Candle boxes, etc.", implying that he was using these extensively for sending fresh material through the post*. But although this does at least supply a hypothetical ancestor for the vasculum, it does nothing to explain the more specific differences between the British and Continental types.

There are other differences between the two besides their shape. One of these is purely quantitative: the colour of vascula in this country has normally been black, on the Continent normally green. The unsuitability of black has long been widely, but rather vaguely appreciated, but the idea has become so firmly fixed in Britain that this is the 'proper' colour for vascula that, till only very recently, convention, aided by inertia, has generally killed all attempts at improvement. Mass-production of vascula by commercial firms has probably been largely responsible. As early as 1818 there is a note by Graves that "Herborizing Boxes can be purchased from Messrs. G. & H. Knight, Forster-Lane, London". By the time of Thompson (1856) they were "procurable in any large town". During this period it was the general practice for all kinds of ironmongery to be japanned in black, partly as a protection and partly because the fine glossy surface thus produced was greatly prized at the time for its elegance. The fashion for japanning on tin had started in this country by 1729 and from about 1750 onwards became quite an important Birmingham industry. The early Warwickshire botanist, William Ick (1800-1844), actually worked for a firm of japanners in his youth. The technique appears to have been very largely confined to this country, and it is to this fact that we must evidently

*Since writing this I find that M. Coley (1913, *Wild Flower Preservation*, 28) actually recommends "old-fashioned candle-tins" as substitutes for vascula, adding that they can be bought from a tinsmith's for only a few pence.

attribute the long and unchallenged predominance of the black vasculum here and here alone.

One final way in which the British vasculum is unique is in its name. For some reason the Latin word used by Linnaeus has only become established in the English-speaking countries. The French call it a *boîte à herboriser* or a *boîte d'herborisation,* the Germans *Botanisiertrommel* or, less often, *Pflanzentrommel* (Unverricht, 1842) or *Botanisierbüchse* (Kreutzer, 1864), the Dutch *plantenbus* or *botaniseertrommel,* the Norwegians *botaniserkasse.*

The earliest mention of the word in English that I have been able to trace occurs in a letter from Lightfoot to Curtis in July, 1782: "Dear Sir, I am extremely obliged to you for the contents of your Botanic *Vasculum* . . . ." (Curtis, 1941). In 1796 the word appears in another letter, this time from Davall to Smith and now preserved in the library of the Linnean Society. In both these cases the word is italicised and spelt with a capital letter, indicating that it was still only regarded as a Latinism. The first sign of its assimilation into the English language is provided by Graves (1818), with his description of "a common tin vasculum or pocket herborizing box", but he is clearly not at ease with the word and elsewhere prefers to talk about "herborizing boxes" exclusively. There is no mention of the word in the early editions of Withering's *Systematic Arrangement* and Thompson (1807) speaks only of "the collector's or botanic box". As Dr. Baker has shown, 'vasculum' is cited with all the appearance of an established term in the seventh edition of Withering in 1830. It is also mentioned in an anonymous pamphlet by Professor Graham of Edinburgh published about the same date (Graham, c. 1830)*. Short, too, in 1833, speaks of "a tin-case, technically called a *vasculum*"; though Gray, who drew heavily on Short for information, carefully avoids using the word. J. D. Hooker, in the manuscript of his Antarctic Journal (Huxley, 1918), records being supplied with "two Botanising vascula" in 1839. The chief populariser of the term was evidently Professor J. H. Balfour, who introduced it to the public in several works (e.g. 1849, 1851), he in turn having derived most of his information from an earlier paper by Greville (1840), which includes an illustration of a very modern-looking "Vasculum or Botanical Box".

*Dr. Baker sees in the impediment that caused so much trouble to the Rev. C. A. Johns at Kynance Cove in 1831 "a vasculum of thoroughly familiar shape". The illustration in question appeared to me to depict a portfolio, and on referring to the original work (Johns, 1839) I find I was correct. Johns describes his total equipment as consisting of "a walking-stick, a folio book for drying specimens in, a packet of sandwiches, and a small flask of brandy". However, in another work (Johns, 1846, p. 115) he includes "a large tin box slung across my back for collecting specimens of plants" in the list of "my usual botanical apparatus".

Edward Forbes, in a letter to Balfour in 1843 (Wilson & Geikie, 1861), describes how the excursions of his botanical class into the country round London had created quite a stir, "alarming the neighbouring villages by an invasion of twenty or so *vasculiferi*". Forbes had previously been at Edinburgh, where, clearly, the vasculum was now treated as a students' necessity; and so, too, had the leading members of the Berwickshire Naturalists' Club, an obscure report of one of whose meetings in 1844 (Selby, 1849) was accepted by the historian of the word in the *New English Dictionary* (Craigie, 1928) as the earliest published mention in English.

### Competition From Bags

So far, nothing has been said of various alternative types of collecting containers: the 'soft' series, with the disadvantage, compared with the 'hard' tin, of being crushable and therefore less appropriate when gathering material for herbaria. The first mention of anything of this sort is by Mayr (1797), who recommends putting specimens into a paper bag lined with damp blotting-paper or damp grass or moss. "A sheet of sized paper dampened and folded around the plants" is a similar method employed by Bailey (1881), while British botanists have collected into paper carriers. A slight transition from this is the cardboard box suggested by Koch (1798) as a substitute for a tin, and this in turn leads on to the use of a wide variety of baskets—from the light, closed basket lined with some waterproof material and closely sealed, mentioned by Koch, Thompson (1807) and several others, to the modified angler's creel for fungus-collecting figured by Bimont (1945) and the pair of baskets carried on a pole horizontally over the shoulder in Oriental fashion by Dutch botanists in Java (van Steenis, *in litt.*).

"An oiled bag of silk", the first true bag, is mentioned by Short (1833). This, however, was apparently never very widely used, for subsequent authors describe all sorts of other makeshift cloth containers: the sack, "like a hunter's game-bag, made of strong cloth or leather and carried under one arm by a strap over the other shoulder" (Bailey, 1881), used in America; the closed umbrella, vouched for by Verlot (1879); the handkerchief, suggested by Francis (1839); and, of course, the hat, "not an unusual receptacle", according to Thompson (1856). On meetings of the Manchester Field-Naturalists' Society in the 'eighties' Professor L. H. Grindon always wore a very tall hat which he used for collecting his specimens in. When the Society assembled for tea at the end of the day, the Professor sat at the head of the table, put his hat in front of him, and took out the specimens one by one, describing them and making remarks about them, and very often quoting *verbatim* long passages from Shakespeare or the Bible (Garnett, *in litt.*).

Proper collecting bags appear to have come into favour about the turn of the century. Bailey (1899) was finding them useful, though more especially for bryophytes and algae, and Hua (1908) considered them the equal of the vasculum. H. S. Thompson's preference for a sponge-bag has already been referred to: he recommends that it be carried in the 'rück-sack'—an item of equipment of interest in itself, for about this time it was beginning to filter across from the Alps and displace the smaller knapsack, which Darwin in his Autobiography (Darwin, 1887) recalled wearing on a walking-tour through North Wales as early as 1826. Lawrence (1951) includes the rucksack as a collecting bag in its own right, though it is used for this purpose more in the tropical rain forests than in temperate regions. Zürich botanists were reported by Maillefer (1944) to be using bags of oilcloth about 1½ ft. long and 1 ft. wide, which they were able to put straight into their rucksacks. Since then plastic bags, with their splendid air-tight properties, have reached the botanical public. Tutin (1954) appears to have been the first British botanist to sing their praises in print: "Fresh material travels perfectly if placed in polythene food bags (obtainable from Boots or Woolworths) and packed to prevent crushing".

By now the virtues of polythene have become universally appreciated, so much so that the use of bags, at long last, threatens to displace the vasculum altogether. Their advantages are undeniable: they weigh next to nothing, they can be kept in the smallest of pockets until needed, and when filled—on the principle, perhaps, of one bag to a gathering—they can easily be slipped into some larger container such as a rucksack, a bicycle bag or the back seat of a car. But compared with the vasculum they are ordinary and insignificant objects; they bring anonymity to the botanist, causing the sacrifice of a picturesque tool of two centuries in the interests of mere efficiency. If in the future the vasculum does indeed become extinct, then the botanist will have lost not just an interesting link with the past, not just another useful aid to collecting, but something much more important: his totem, his badge of membership, his one and only claim to distinctiveness.

ACKNOWLEDGMENTS

I should like to thank all the many people who have so readily assisted me in this search, particularly the librarians of the Department of Botany, British Museum (Natural History), the Linnean Society of London and the Royal Botanic Gardens, Kew. I am specially indebted to the late Mr. A. H. G. Alston for his continual interest and help, Professor H. G. Baker for his most stimulating contribution, Mrs. H. N. Clokie for information about Dillenius, Dr. J. G. Dony for drawing my attention to the refer-

ence in the Abbot correspondence, Mr. W. J. Garnett, managing director of Flatters & Garnett Ltd., for much useful information particularly of a technical nature, Mr. J. Hayes of the London Museum for assistance on the subject of sandwich-boxes, Mr. J. E. Lousley for first pointing out to me the distinctiveness of the British vasculum, and Prof. Dr. C. G. G. J. van Steenis of the Rijksherbarium, Leyden, for details of the portrait of Linnaeus and the use of collecting containers by Dutch botanists.

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