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Thomas Penny, the sixteenth century English botanist : some of his European plant records

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ABSTRACT

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Based on several sources, but mainly on annotations which he made to the plant illustrations contained in the collection of Conrad Gesner, the plant records of the sixteenth century English botanist, Thomas Penny, and his experience of the flora around Geneva and elsewhere in Europe, are revealed. Penny's relevant records quoted in the literature of the day, his drawings, and some of his surviving letters, are also discussed briefly.

Recherche |

KEYWORDS

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Introduction

Although one of the most important English naturalists of the sixteenth century, the botanical achievements of Thomas Penny (c.1530–1588) have largely gone unrecorded. By contrast, his later entomological work is known from the posthumous joint publication with three other persons: the eminent Swiss botanist, zoologist and linguist, Conrad Gesner (1516–1565); Thomas Mouffet, Penny's pupil (1553–1604); and Edward Wotton. This was the *Insectorum Theatrum* (subsequently edited by Mouffet) which was eventually published in 1634 by Sir Theodore de Mayerne. The main reason that so little is known of Penny is that invariably he adopted a low profile, apparently never publishing records or botanical observations of his own. Instead he entrusted them to his fellows and especially to Clusius (Charles L'Ecluse) and (Lobelius) Matthew de l'Obel in whose works they infrequently appear. Although usually credited to Penny, these and others are merely scattered references within the contemporary botanical literature of the sixteenth century.

However, important evidence of Penny's botanical skill and knowledge is available from annotations which he made to the large collection of illustrations originally in the possession of Gesner which the latter had amassed for his projected publication, the *Historia Plantarum*. It is largely from these annotations, and to a lesser extent from the published works of his contemporaries, that most information on Penny's European botanical contributions is obtained, with the richest source lying in the former.

In fairly recent times, some biographical details and plant records of Penny have been summarised, the most detailed of which is that of Raven (1947) which also covers aspects of his entomological work. Gardner (1930) also gives biographical detail but largely restricts himself to Penny's entomology whilst other information, mainly referring to his British exploits, can be found in Boulger (1895), Green (1914), Gunther (1922) and Salmon (2000).

A significant departure from the above is the publication by Zoller et al. (1972–1987) which reproduces the plant illustrations originally in the collection of Gesner and now held in the archives of the Universitätsbibliothek Erlangen-Nürnberg. On many of these are written interesting and revealing comments by Penny.

A brief Biography

Penny's activity and study of plants occurred during the period of great Renaissance botany of the sixteenth century. Up to that time, apart from the early Greeks and Romans, such as Pliny, Theophrastus and Dioscorides, who were active around 2000 years ago and whose interest in plants was restricted to illustrating and describing them for their potential medical use, little serious work had been done on such aspects as nomenclature and classification. The descriptions and illustrations provided by these early workers were often crude and frequently failed to equate adequately with the plant in question; this then led to confusion and misidentification. In addition, only a relatively small number of the total plants in existence were covered in this way. The work of the Renaissance botanists, some of the most important being Bock, Clusius, Valerius Cordus, Dodoens, Gesner, de Lobel and Mattioli, went in some way to correct this by more accurately recording and identifying a large number of new species. Also, in their use of multiple descriptive adjectives (i.e. the polynomial system) in naming plants, these workers developed a style of nomenclature which became the forerunner of today's currently-accepted Linnaean binomial system. Penny was in contact with several of these botanists and it was within these times of rapidly developing botanical knowledge that he worked and in which he exhibited his own wide knowledge of European plants then known to science. It is this aspect of his work, carried out mainly in the Geneva area and in nearby areas of southern Europe, that is exemplified below.

Thomas Penny (Fig. 1) was born in the village of Gressingham, Lancashire, which lies to the north-east of Lancaster in the Lune valley. Although in his later years he travelled far, he must have retained an affection for his birthplace since, although at the time living in London, he stated in his will dated June 4, 1588 that, amongst other bequests to his friends, "I give to the poor of Gressingham and Eskrigg [an adjacent hamlet] where I was borne ten pounds to be distributed at the discretion of Mr Fawcett minister.....". In St John's Church, Gressingham, there is, to this day, a plaque listing previous ministers of the church and which includes Penny's contemporary, the said John Fawcett, minister there from 1562 to

1590. For such a small village, it is surprising that some years earlier it had also produced another eminent person, Edmund Scambler, who was later to become Bishop of Peterborough and then of Norwich.

Following his schooling, Penny went up to Cambridge University, entering Queen's College in 1546 where he read Divinity. He later transferred to Trinity College and was made a Fellow in 1553 after gaining his Bachelor of Arts degree (B.A.) two years earlier. He obtained his Masters degree (M.A.) in 1559 and was appointed Fellow of the Royal College of Physicians (F.R.C.P.) as late as 1582. Whilst at Cambridge he took Holy Orders and was ordained in the Church of England. He was a strong puritan and during the reign of the Catholic Queen Mary he kept his views to himself but on the accession of Elizabeth he rapidly rose to prominence, becoming Prebend of St Paul's in 1560 and preacher at Cambridge University in the following year. In 1565 he was appointed by the Lord Mayor of London to preach the annual Spittal Sermon at St Paul's Cross, a major occasion in the ecclesiastical calendar as well as a great honour for whoever was chosen. One of his puritan contemporaries, George Withers, in a letter to Henry Bullinger¹, commented that the Bishop of London considered him to be "so learned as worthy to preach at St Paul's Cross before the most critical congregation in England". Unfortunately, during his sermon his words were found to be politically too extreme for the current religious climate and he was dismissed from his post, Mathew Parker (1504-1575) the then current Archbishop of Canterbury, criticising him for being "ill-affected towards the Establishment". With his prospects within the Church now adversely affected, Penny decided to travel to the continent and study medicine.

His itinerary whilst abroad is unclear. He appears to have been known to the Northumbrian-born William Turner (c.1508-1568), the author of the first English herbal, who is generally considered to be the "father" of botany in his own country; he was also a friend of Turner's son, Peter. In the early 1540s, William Turner, had also been temporarily exiled abroad for falling foul of the religious authorities and, whilst in Zurich, visited Conrad



Figure 1. Thomas Penny (c.1530-1588).

Gesner. As will be shown, subsequently there were strong connections between Penny and the work of Gesner and since the latter died of bubonic plague in December of the very year (1565) Penny went abroad, must have visited Gesner just before that date probably following an introduction from William Turner.

Penny was on the continent for about four years and more precise information on his whereabouts can be gained from a study of his initialled annotations appended to the plant drawings in Gesner's large collection (see section: "Localities where Penny had seen the various plants"). Much of this time was in the Geneva area and Zurich but he also travelled elsewhere in France and Switzerland and also visited Majorca. There is also a reference to him having seen *Rhodiola rosea* in the Alps near Grenoble as well as in the Dauphiné. Penny is mentioned by Pena & de Lobel (1576) as collecting a species of *Scirpus sylvaticus* near Heidelberg, and

¹ Henry Bullinger (1504-1575) born at Bremgarten near Zurich was a Swiss Puritan preacher and minister of the Church of Zurich. In 1523 he joined forces supporting Ulrich Zwingli's reformation of Zurich after whose death in 1531 at the Battle of Kappel he succeeded him as chief pastor of Zurich, remaining in that post for the next 40 years. He enjoyed great prestige in England and was also a close associate of Cranmer, Calvin and Beza.

it was at that university that he spent some time with his two friends, Peter Turner and William Brewer, on his return journey to England; there are also extant letters from him from Frankfurt in 1569 when he passed through that area also on his return. It has also been suggested (Raven 1947) that before finally arriving in England he visited the Baltic area, but evidence for this is not too reliable. Whilst at the university in Montpellier, a famous early botanical centre, he appears to have met Matthew de l'Obel, the Flemish botanist in whose published works many of Penny's records are mentioned.

Penny returned to London in 1569 eventually taking up residence in the parish of St Andrew's Undershaft (see Penny's Will) and appears to have commenced practicing medicine soon afterwards. Although entomology appears to have occupied much of his later years, he continued to take at least some interest in plants since in his Will he mentions a bequest for the staff "of my garden in Morefields" [Moorfield, just to the north of the old wall fortification in London]. Finally his health began to deteriorate. According to Mouffet (*Insectorum Theatrum*) he developed a series of ailments comprising headaches, digestion problems, loss of memory and asthma. For the latter he treated himself with a mixture of woodlice macerated in wine (see Mouffet 1634, p. 204) and then, on Mouffet's advice, inhaled sulphur fumes, this appearing to give him at least temporary respite: "*Pennium asthmate laborantem diu Asellis vino maceratis.....meo tandem consilio fumum sulphuria per infundibulum*". However, following the death of his wife in 1587, he also succumbed in January of the following year. In his Will he left his scientific notes, which formed a substantial part of the *Insectorum Theatrum*, to Mouffet "I give to Doctor Mouffett my written works.....and all my other books.....written or printed" but unfortunately the botanical portion seems to have been lost. This is perhaps understandable since, according to Mouffet, his papers were in great disarray when he received them. The botanical notes may have gone to his friend Peter Turner but Penny's Will only appears to mention Turner being bequeathed "a glass" whilst to his other naturalist friend William Brewer he left, amongst other things, a copy of the works of Rondelet.

Thomas Penny's European plant records and observations

It is therefore from just a few principal sources that information regarding Thomas Penny's botanical work in Europe is obtained. These are:

- (i) An analysis of the notes and comments (in Latin) which he added to the large number of illustrations in Conrad Gesner's collection. As already mentioned, these are now preserved in the archives of Erlangen University, a large number of which were published by Zoller et al. (1972-1987) in a set of ten folio volumes. This is the most important source.
- (ii) Information relating to Penny with respect to engravings of some of Gesner's illustrations published in the mid-eighteenth century (Schmiedel 1753-1760).
- (iii) Published works of his contemporaries, especially Clusius, de Lobel, Camerarius, and indirectly Gerard, as well as a few others.
- (iv) A series of six letters written by Penny whilst on his European travels or later when back in London. These are now held in the archives of the Universitätsbibliothek Erlangen-Nürnberg and the Universitätsbibliothek Basel and offer a little additional background.

In addition, some general, non-botanical information can be obtained by consulting the *Insectorum Theatrum* (Mouffet 1634) and Penny's Will, copies of both of which are extant.

(i) Annotations to the illustrations in Conrad Gesner's collection. Plants seen by Penny in continental Europe during the years 1565-1569

Many of Penny's English botanical records are difficult to date. Some, such as those relating to finds on Ingleborough [hill] very near to his birthplace in the Lune valley in England, may have been made early in his lifetime, otherwise on subsequent visits to the area when he lived away. By contrast, his continental European records all appear to fall within the period of his self-imposed exile during 1565-1569.

By the year 1565 Gesner had amassed a large number of drawings and paintings, the majority of which were of plants of European origin; these were intended to form the basis of his major work,

the *Historia Plantarum*. The greater proportion are illustrated to a high standard and usually coloured at least in part, and were obtained either from botanical contacts and plant artists or were, in many cases, illustrations by Gesner himself.

Penny's connection with Gesner's work stemmed from his visit to Zurich where he met him in 1565 shortly after leaving England and just prior to Gesner's death. Then, or subsequently, he must also have met Caspar Wolf², the person entrusted by Gesner, (in the event of the latter's death) to arrange for the publication of his *Historia Plantarum*. However, Wolf was a linguist and a medical man, not a botanist, so he enlisted knowledgeable help in order to comment on the accuracy of the illustrations and to provide other relevant details. This involved Penny and to some extent Jean Bauhin, the elder brother of Caspar Bauhin, author of the famous *Pinax* and another important botanist at that time. However, it is Penny who appears to have made by far the greater contribution judging by the number of illustrations which he annotated. Penny's considerable effort is confirmed by a statement made almost 200 years later by the editor (Casimir Schmiedel³) in the introduction to "*Conradi Gesneri Philosophi et Medici Celeberrimi Opera botanici*" (Schmiedel 1753-1760) which contained engravings of a selection of Gesner's illustrations. Schmiedel stated that there were only a few sheets of pictures to which Penny failed to add some observation: *Thomas Penneius vero, Doctor Medicus Londinensis pauca solum earundem iconem folia praetermisit quibus non aliquas observations vel animadversions, loca natalia praesertim concernentes adleuerit.* (Thomas Penny, medical doctor of London, rarely failed to add some comment, especially regarding localities).

In most cases Penny's notes (always in Latin) are written directly onto the illustrations and are clearly legible. They are easily recognisable by his characteristic handwriting (Fig. 2) but, in any case, most are also initialled "T.P. Angl." or variations of this. In addition to Penny's notes, there are also annotations made by Gesner and occasionally by others such as Jean Bauhin. Sometimes these were intended to act as a guide for future reproduc-

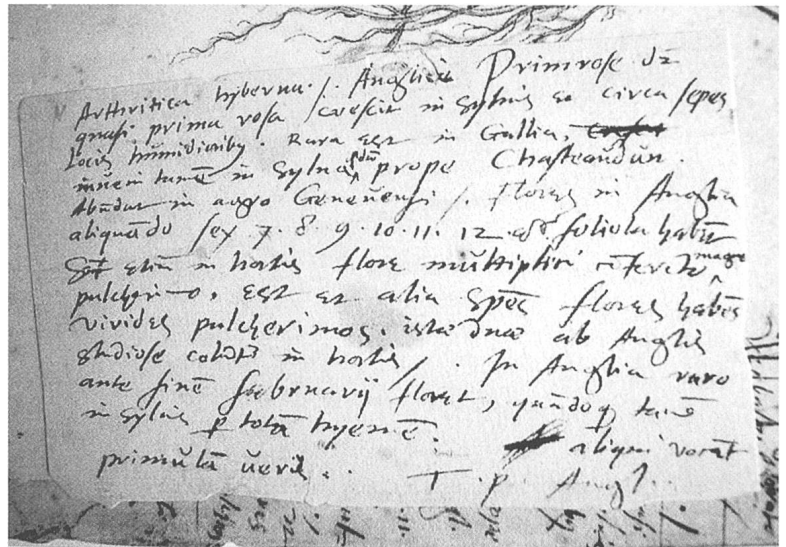


Figure 2. Example of Penny's handwriting from an annotation to an illustration of *Primula vulgaris* in Gesner's collection at Universitätsbibliothek Erlangen-Nürnberg.

tion by the engravers, but were mainly to provide additional information on the plants' taxonomy, distribution or nomenclature.

These illustrations have been reproduced by Zoller et al (1972-1987) and, together with a limited number of additional photographic copies taken from the originals at Erlangen, are the source of much of the information given below. Most of the plants depicted are recognisable from their drawings but where there is doubt more than one species may be indicated below; otherwise the identifications are those given by Zoller et al. Nomenclature follows that of *Flora Europaea* (Tutin et al. 1964-1980).

When Penny's notes are examined they give a very clear indication to the depth and scope of his botanical knowledge.

Localities where Penny had seen the various plants

Although a great many of Gesner's illustrations were produced by others, Penny had seen most of the plants in the field and usually indicated these localities in his annotations. By this means his

² Caspar Wolf (1532-1601) of Zurich, doctor, philologist and professor of physics and Greek.

³ Gesner's illustrations had been sold by Wolf to Joachim Camerarius but by the mid-eighteenth century they were in the collection of a new owner, Christopher Jacob Trew, who arranged for them to be edited by Schmiedel (Schmiedel 1753 - 1760).

activities on the continent during the period 1565-1569 can be traced, although not in any definite sequence. Many of the localities are around Geneva⁴ and nearby areas close to the Swiss-French border (Mont Salève, Mont Mole and the Jura); this shows that he knew the plants of this geographical area very well. His largest concentration of records is from here and it seems probable that he spent a considerable period botanising in this area for him to gain such a wide experience of the local flora. Other than those of Dalechamps and Pena (Burdet 1974) these records appear to be amongst the earliest made by anyone in the Geneva area.

His annotations show him to be familiar with the following species at localities indicated.

Switzerland

Geneva

Alyssum minus, *Anthyllis vulneraria*, *Buglossoides purpureocaerulea* (in hedgerows), *Cucubalus baccifer*, *Daphne striata*, *Epilobium angustifolium*, *Eryngium alpinum* (cultivated), *Erythronium dens-canis* (by the Arve), *Euphorbia dulcis*, *Galium sylvaticum*, *Globularia punctata*, *Herminium monorchis*, *Lathyrus sylvestris* (by the Rhone), *Lonicera xylosteum* (by the Arve), *Peucedanum cervaria* (by the Arve and the Rhone), *Polycarpon tetraphyllum*, *Primula vulgaris*, *Saxifraga oppositifolia*, *Scrophularia canina*, *Serratula tinctoria*, *Tamus communis*, *Tetragonolobus maritimus*, *Thymelaea passerina* and *Trifolium montanum*, as well as three others which he had seen at the confluence of the rivers Arve and Rhone by Geneva: *Gypsophila repens*, *Linaria alpina* (presumably washed down from alpine regions) and *Typha minima*.

Moudon and Payerne

Impatiens noli-tangere (between Moudon and Payerne), *Ramaria* sp. (between Moudon and Lausanne),

Zurich

Centaurea montana (mountains near Zurich), and *Polygala chamaebuxus*.

France

Mont Salève, just south of Geneva

Acer platanoides, *Actaea spicata*, *Adenostyles alpina*, *Alchemilla* sp., *Antennaria dioica*, *Arctostaphylos uva-ursi*, *Aruncus dioicus*, *Asphodelus* sp., *Aster alpinus*, *A. bellidiastrum*, *Astrantia major*, *Athamanta cretensis*, *Barbarea intermedia*, *Cardamine pentaphyllos*, *Carduus defloratus*, *Cephalanthera damasonium*, *Cotoneaster integerrimus*, *C. nebrodensis*, *Cypripedium calceolus*, *Daphne laureola*, *Dianthus caryophyllus*, *D. sylvestris*, *Doronicum* sp.?, *Draba aizoides*, *Epilobium angustifolium*, *Epipactis palustris*, *Genista germanica*, *Gentiana bavarica*, *Globularia punctata*, *Hepatica nobilis*, *Hieracium villosum*, *Juncus* sp., *Kernera saxatilis*, *Laburnum anagyroides*, *Laserpitium siler*, *Lathraea squamaria*, *Lathyrus vernus*, *Leucojum vernum*, *Lilium martagon*, *Lonicera alpigena*, *Lunaria rediviva*, *Mycelis muralis*, *Nigritella nigra*, *Ononis rotundifolia*, *Petasites albus*, *Potentilla caulescens*, *Prenanthes purpurea*, *Rosa pimpinellifolia*, *Saxifraga paniculata*, *Silene acaulis*, *Sorbus aria* and *Valeriana montana*

Mont Mole

Astrantia major, *Athamanta cretensis*, *Campanula thyrsoides*, *Chrysosplenium alternifolium*, *Dryas octopetala*, *Eryngium alpinum*, *Gentiana acaulis*, *G. purpurea*, *Lysimachia nemorum*, *Pedicularis verticillata*, *Polygala chamaebuxus*, *Pulsatilla alpina*, *Ranunculus thora*, *Saxifraga rotundifolia*, *Trollius europaeus* and *Viola biflora*.

Jura

Aconitum anthora, *Anemone narcissiflora*, *Astrantia major*, *Athamanta cretensis*, *Bupleurum longifolium*, *Campanula thyrsoides*, *Centaurea montana*, *Chrysosplenium alternifolium*, *Crocus vernus*, *Dryas octopetala*, *Erigeron alpinus*, *Erinus alpinus*, *Eryngium alpinum*, *Gagea lutea*, *Gentiana acaulis*, *Geum montanum*, *G. rivale*, *Iberis umbellata*, *Laserpitium siler*, *Lilium martagon*, *Linaria alpina*, *Paradisea liliastrum*, *Pinguicula alpina*, *Plantago atrata*, *Polygonum viviparum*, *Pulsatilla alpina*, *Ranunculus platanifolius*, *R. thora*, *Rhododendron*

⁴ About one hundred years later, this area was visited by another eminent English botanist, John Ray (1627-1705), presumably around the time of his journey to Montpellier. Ray, always ready to acknowledge the work of others, appears to have been unaware of Penny's earlier activity here, as he fails to make any mention of him (cf. Ray 1673; Burdet 1974). It is interesting to compare Penny's Geneva plant list with that recorded by Ray.

ferrugineum, *Saxifraga rotundifolia*, *Senecio doronicum*, *Seseli libanotis*, *Silene saxifraga* agg., *Soldanella alpina*, *Sorbus aria*, *Thalictrum aquilegifolium*, *Trollius europaeus* and *Viola biflora*.

Montpellier

Aristolochia rotunda, *Artemisia alba*, *Asphodelus ramosus* or *A. aestivus*, *Biscutella laevigata*, *Bituminaria bituminosa*, *Cakile maritima* agg., *Catananche coerulea*, *Cercis siliquastrum*, *Chrozophora tinctoria*, *Cneorum tricoccon*, *Coris monspeliensis*, *Daphne gnidium*, *Echinops sphaerocephalus*, *Euphorbia serrata*, *Fabaceae* sp., *Globularia alypum*, *Lagurus ovatus*, *Leuzea conifera*, *Limonium* sp., *Otanthus maritimus*, *Phagnalon sordidum*, *Ruta angustifolia*, *Scrophularia canina*, *Silene vulgaris*, *Stachelina dubia*, *Thymus capitatus*, *Triglochin bulbosa* or *Leuzea conifera* and *Trinia glauca*.

Nîmes

Bituminaria bituminosa, *Chrozophora tinctoria*, *Delphinium* sp. (at the Pont du Gard), *Echinops sphaerocephalus* and *Rhamnus saxatilis* agg.

Frontignan/Narbonne

Aetheorhiza bulbosa, *A. bulbosa* agg., *Chrozophora tinctoria* and *Lavatera arborea*.

Arles

Asphodelus ramosus or *A. aestivus*.

Marseille

Phalaris canariensis.

Orleans

Adonis aestivalis/flammea, *A. annua*, *Alyssum minus* (by the Loire), *Arnica montana*, *Bunium bulbocastanum*, *Cucubalus baccifer*, *Echinophora spinosa* (cult), *Falcaria vulgaris*, *Gratiola officinalis*, *Ferulago campestris*, *Fritillaria meleagris* (by the Loire), *Leucojum vernum*, *Melittis melissophyllum* (with whiter flowers), *Oenanthe pimpinelloides*, *Onobrychis viciifolia*, *Orlaya grandiflora*, *Peucedanum oreoselinum*, *Polycarpon tetraphyllum*, *Ranunculus nemorosus*, *Reichardia picroides* (cult.), *Scrophularia canina*, *Statice* sp. (on the Loire), *Thuja occidentalis*, *Trifolium montanum*, *Vaccaria* sp., *Veronica scutellata* and *Xeranthemum* sp.

Paris

Bupleurum fruticosum (cult.), *Centranthus ruber*,

Cerinthe minor/major (cult.) *Ferulago campestris* and *Scorzonera hispanica*.

Chateaudun

Primula vulgaris.

Included in these annotations Penny sometimes refers to English localities where he had seen the same plants and it is perhaps appropriate to include this information here. (Where no localities are given these were simply seen in “Anglia” [England]). As it seems that Penny never returned to Europe after 1569 and unlikely that he had the illustrations sent on to him for annotation after his return, it is probable that all the following were known to him in England prior to 1565.

Caltha palustris, *Chrysanthemum segetum*, *Cochlearia officinalis* (on the Thames in London), *Corallina* sp. (Isle of Wight), *Crambe maritima* (on the beach), *Crithmum maritimum* (seen on coastal rocks), *Crocus sativus* (Cambridge and Saffron Walden), *Drosera obovata*, *D. rotundifolia*, *Geranium sylvaticum*, *Hypochoeris maculata* (Shelford near Cambridge), *Ilex aquifolium*, *Legousia speculum-veneris*, *Linum catharticum*, *Myrica gale* (damp places), *Onobrychis viciifolia* (Cambridge), *Orlaya grandiflora* (Cambridge), *Papaver somniferum* (in gardens), *Phalaris canariensis*, *Primula farinosa* (presumably in Lancashire or Yorkshire near to his home), *P. vulgaris*, *Pulsatilla vulgaris* (at Shelford near Cambridge), *Quercus ilex*, *Ranunculus arvensis*, *Salicornia europaea* (by the sea) and *Serratula tinctoria*.

Penny's notes on taxonomy, nomenclature, ecology and distribution

Penny's wide knowledge of the flora of the area around Geneva and elsewhere in southern France was based on field experience and is exemplified by many of his annotations. These show his attention to detail and to taxonomy as well as his knowledge of plant distribution, ecology, medicinal uses, colloquial and early names, and the scientific nomenclature in use at the time as well as of his predecessors. Good examples of his descriptive powers and his knowledge of taxonomy are exemplified by his notes on *Blackstonia perfoliata* and *Erigeron alpinus*, his knowledge of ecology by those on *Crocus albiflorus* and *Inula conyza*. Translated from the

Latin, along with many others, the more detailed and informative of these are given below. For some plants his annotations are repetitive but these comments have been maintained in the (rather literal) translations given below.

Aconitum anthora: “The other root must also be drawn from my collection if it has not been depicted here. Grows abundantly in the Jura”.

Allium nigrum or *A. sphaerocephalon*: “Inside there is no subsidiary bulb but they grow outside on it. Observe whether subsidiary bulbs attain the size of chestnuts”.

Anemone narcissiflora: “Abundant in the Jura”. [This is still very frequent in the Jura in damp pastures, often in large stands and associated with *Trollius europaeus*].

Blackstonia perfoliata: “I would describe it without doubt as a perfoliate centaury. Although it doesn't have the same bitterness as the small centaury, it is nevertheless undoubtedly still bitter. Perfoliate or yellow centaury, a yard high or less, the stem round, at the roots are basal leaves which are very similar to those of the small centaury. On the stem itself are three or four leaves through which the stem grows, as in the wild teasel, they are unequal on both sides of the stem and (taper?) to a point. The stem produces in its upper part, from the middle of the leaves, in splendid and wonderful order, two side shoots and between them there appears a delicate stem, fairly long, which on the end carries a yellow flower. This is made up of eight petals and has inside it just as many yellow points and opens before the others. (It blooms consecutively; from the side shoots grow new shoots from the middle of the leaves in the same way). The fruit receptacles are longish and round, the seed minute, round, and numerous, the roots small and useless [medicinally?]. It grows almost everywhere”.

Campanula rapunculoides or *C. trachelium*: “The leaves of the larger species sting and burn like the nettle”.

Campanula rotundifolia: “Occurs in hedgerows and scrub margins”.

Campanula thyrsoides: “Many call this the Alopecurus of Pliny⁵, it grows in the mountains of the Jura and Mont Mole. A cubit or longer, the flowers occupy the upper half of the stem”. [This plant is still frequent in the Jura to the present time].

Cardamine pentaphyllos: “Mattholi⁶ calls this the first Dentaria. He pictured it without flowers. Some consider it to be the first Aconite but without reason. Some call it the Alabaster plant because the roots shine like alabaster. When the roots are taken out of the ground at first they shine like alabaster but when dry become dark and take on a blackish, smutty colour. On Mt Salève near Geneva it grows abundantly and there you often find it with white flowers. Sometimes also found with purple flowers, otherwise near purple or white. On monte Salève the leaves are larger”.

Crocus vernus subsp. *albiflorus*: “The saffron is not so tall as the common crocus and also not of such a vivid colour. The peasants in the mountains use it in place of saffron although in this respect it is much weaker than common saffron. The roots are larger, spherical, as in the common crocus, but not very large. It grows abundantly in the Jura where it flowers immediately after the snows melt and where the flowers develop from below the snow. The flowers appear not long after the snow melts but droop after two or three days”.

Cucurbita maxima: “Seen in the garden of Domini Colladon⁷, a Geneva advocate, they [gourds] were so heavy that I could scarcely lift them with both hands”.

⁵ Gaius Secundus Pliny the elder (23-79 AD) of Verona, naturalist.

⁶ Pier Andrea Mattioli (1500-1577), an Italian doctor whose commentaries on Dioscoridis remained for a long time the basic work of medical botany: *Commentarii in libros sex Pedacii Dioscoridis Anazarbei, de medica material* (1554).

⁷ A friend of Penny.

Cypripedium calceolus : “The Damasonium nothum of Dodoens⁸. I would rather place it amongst the helleborines. Or as Satyrion polyrizon. It grows in the woods at the foot of monte Salève. The Allobroges call it ‘Braguette d’Alemangne’ - their own special name”.

Daphne striata : “Flowers before the leaves at the beginning of Spring. The flowers are a splendid purple. It grows practically everywhere in the woods near Geneva. Some call it German Chamelaeam and use it in place of laurel although in my opinion it is much more poisonous than that. The Savoyards call it ‘du bois gentil’ [sweet wood]”.

Dictamnus albus : “This is called fraxinella because of the similarity of the leaves. It is named Fraxinella [Ash] by some people on account of the similarity of the leaves”.

Doronicum pardalianches : “Mattioli considered it to be a species of Aconite. Grows in Monte Saleva [Salève], with a root of many parts as Mattioli depicted it. Certain people consider it to be the first Aconite but they are wrong for neither its occurrence nor its description nor its poisonous qualities correspond. Certain people say that the plant is poisonous to dogs. Mattioli states that it is a kind of Aconite and wont accept it as Doronico Ro[mano]”.

Dryas octopetala : “Some people think this is Leucas. It is certainly the Leucas of Dioscorides⁹. The seeds are of course sharp, even more they are in some way burning or corrosive”.

Epilobium angustifolium : “It grows on mount Salève in this form, but near Geneva it occurs with branched stems having six or seven double flowers. I refer it to a species of Lysimachia”.

Epilobium roseum : “[William] Turner¹⁰ says this plant is a kind of Lysimachia and not without reason. It grows in moist places and near water. It is called ‘flos molitoris’ [Milner or Miller Flower] in England”.

Epipactis palustris : “I’ve found this species in Monte Salève as well as another similar smaller plant with white flowers”.

Erigeron alpinus : “This is a small plant 1½ spans high or less. It has fairly numerous basal leaves, which are long, slightly hairy, delicate, and somewhat yellowish. It has three, four, five, or six upright stems, mostly divided and moderately hairy, with alternate leaves. At the apex of the stem are the flowers, separate, as it were emerging from a compact pappus, dark blue above; they disintegrate very quickly into pappuses. The seeds are minute and longish, the roots threadlike and black. Flowers in August and grows in the Jura”.

Eryngium alpinum : “I believe that this is Pliny’s Eryngium. The leaves are of course not prickly except [bracts?] on the flower head. It grows in the Jura and in Geneva in certain gardens. If a third bigger leaf were added [to the drawing] it would be better. I have of course seen much bigger leaves on Mont Mole”.

Gentiana purpurea : “From a single root divided above, two, three or four stems may sometimes grow. In monte Mole plants occur with thick roots about two feet long”.

Gratiola officinalis : “Grows frequently on or near to rough damp places at Orleans. It seems to come very close to the description of Sesamoides so it seems to me that those people who take this plant for such should not be judged harshly”.

Herminium monorchis : “I’ve found this in the neighbourhood of Geneva where it sometimes has another small dry tuber attached, although rarely”.

Inula conyza : “Some people call this the black mullein because it has similar leaves; in Montpellier they take it for the Baccharis but there they are mistaken. It grows on the edges of ditches and in woods on dry ground as well as by hedges and fences. In dry places, for example on walls and

⁸ Rembert Dodoens (Rembertus Dodonaeus, 1518-1585) doctor of medicine, professor at the university of Leyden.

⁹ Pedanius (or Pedacius) Dioscorides (c.40-90 AD), a Greek physician, born in Anazarbus (Turkey).

¹⁰ William Turner (c.1508-1568) physician, clergyman and first English botanist who travelled widely in Europe (see above).

rocks, its leaves are of the form shown but in other places the leaves are much broader”.

Lamiastrum galeobdolon: “Also often seen with white flowers. There is also a purple flowered variety growing in crops”.

Lathyrus montanus or *L. niger*: (Interestingly, this drawing is not annotated by Penny but by Gesner who states “The Englishman brought it from Aarau on one occasion as licquorice”. This could refer to Penny or perhaps more likely to William Turner).

Lavatera arborea: “At Frontignan in Provence there is a very tall tree (the mallow tree) which has leaves, flowers, and fruits like the mallow. It is reported on good authority that the plant was originally bred from a mallow”.

Linaria alpina: “Grows at the confluence of the [rivers] Rhone and Aar in stony sand [shingle] near Geneva”.

Melittis melissophyllum: “In wooded areas near Orleans and elsewhere this plant can be found with white flowers”.

Oenanthe pimpinelloides: “This plant grows in damp fields around Orleans, I refer it to *Oenanthe*”.

Onobrychis viciifolia: “Grows in Cambridge, England around field margins. It is abundant in pastures in the Orleans area where the people grow the plant as fodder so that in certain fields I saw no other plant at all”.

Paeonia officininalis and *P. mascula*: “I’ve seen three species of Paeony in the garden of Domini Colladon, a Geneva advocate, a very cultured friendly gentleman”.

Phyteuma spicata: “Called *Rapunculus sylvestris* by Tragus¹¹. The root is sometimes long and the flowers are sometimes blue; there is also another

species in mountain areas with shorter beautiful blue flowers”

Pinguicula vulgaris: “It is called butterwort in England on account of its fleshy leaves. Within a single night the pounded leaves can heal cracks and splits in the lips and hands. Women in England use it to heal the splits and cracks in the udders of cows. In the Jura mountains it occurs with abundant white flowers”. [The white-flowered plant of the Jura will be *P. alpina*; Penny’s reference to the English plant will be to *P. vulgaris*].

Primula vulgaris: “Given by Dodoens as the sweet-scented *Verbascum*. Winter arthritica [English name]. In English, the Primrose, as in the first rose. It grows in woods and by hedges in rather damp places. It is rare in France but I’ve found it in a wood at Chateaudun [France]. Very frequent in the Geneva area. In England the flowers have between 6 and 12 petals. There are also garden examples with multiple, double and very big beautiful flowers and there is another kind which has splendid yellow-green flowers. English people eagerly cultivate both kinds in their gardens. In England the plants rarely flower before the end of February. However, sometimes in woods they can flower throughout the whole winter. Some people call them *Primula veris*” (see Figs. 2 & 3).

Pulmonaria officinialis: “The spotted *Pulmonaria* is portrayed by Kentman¹² not in the book but together with *Arisarum* on a sheet. The leaves are spotted, hairy, and somewhat rough, the flowers are sometimes purple-red, sometimes blue. In England they are called colloquially Sage of Jerusalem or Ladies Milk”.

Pulsatilla vulgaris: “Grows in England in Cambridgeshire near a town called Shelford and elsewhere on dry slopes. Matthioli called this plant *pulsatillam*”.

¹¹ Tragus = Hieronymus Bock (1498-1554) German botanist, Lutheran priest and doctor. He wrote *Kreutterbuch* (1539), an important herbal in which he attempted to classify plants in a systematic way and which also described their medicinal effects.

¹² Johannes Kentmann (1518-1574) originally from Dresden, studied medicine in Leipzig, Wittenberg, and Nurnberg, went to Padua in 1547 where, for a while, he oversaw the medical garden of the university and then took a degree in Bologna in 1549; he later became a correspondent of Gesner.

Ranunculus arvensis: “occurs in damp places among arable crops in England”.

Ranunculus flammulus: “The Flammula palustris of Dodoens who has illustrated it if I’m not mistaken. Some people call this plant flammulam palustrem [little flame of the bogs] because of its burning effect - and not without reason. Perhaps this is Pliny’s Lingua or related to it”.

Saxifraga oppositifolia: “I have found this plant in monte Jura and on Mont Mole. It always grows in damp places clinging to the rocks as if it were dew between its leaves”.

Scorzonera humilis: “The true Scorzonera grows frequently in wooded hills of Orleans and also in certain meadows in the district of Orleans near the source of the river Loiret, also in meadows near Paris. The roots are fibrous and at times split up into two, three or four branches. One seldom finds seeds which are undamaged and not eaten by worms, especially if the year has been damp”.

Serratula tinctoria: “Sometimes occurs with more stems from one root. Grows in damp places in England almost everywhere. I have found it in the woods with very large leaves and in the area of Geneva. It is clearly it. Not referable to iacea”.

Tamus communis: “Ruellius [Jean Ruel 1474-1537. French doctor] described the plant as the second Cyclamen with which description everything fits quite well except the roots which, perhaps in Dioscoridis’ time, were not used for medicinal purposes and therefore described as useless and superfluous by him. It grows everywhere in the woods near Geneva”.

Thymelaea tartonraira: “It is a shrub, known as a purgative in Provence”.

Trollius europaeus: “Grows in the meadows of the Jura and on monte Mole. I am satisfied that this is well drawn”. (Penny was here assessing the accuracy of the drawing. It is still very frequent in the Jura).

Many other plant illustrations in Gesner’s collection also bear brief notes by Penny although these are mostly of lesser interest or lack the detail

of those given above. They include: *Alcea rosea*, *Allium senescens*, *Asphodeline lutea*, *Pallens spinosa*, *Centaurea montana*, *Centranthus ruber*, *Cercis siliquastrum*, *Cerithe minor* (or *Cerithe major?*), *Cicerbita alpina*, *Dianthus superbus*, *Epilobium angustifolium*, *Erigeron acer*, *Euphorbia peplis*, *Gagea lutea*, *Cruciata laevipes*, *Gentiana asclepiadea*, *Geranium sylvaticum*, *Herniaria* sp., *Lathyrus* sp., *Kickzia elatine*, *Lychnis flos-cuculi*, *Silene album*, *Myosotis scorpioides*, *Nasturtium officinale*, *Phallus impudicus*, *Prenanthes purpurea*, *Rhamnus saxatilis*, *Rosa arvensis*, *Salvia glutinosa*, *Scolymus hispanicus*, *Spiranthes aestivalis* and *Valerianella locusta*.

(ii) Penny’s own plant collections and drawings

From comments made by Schmiedel (1753-1760) it is apparent that Penny not only annotated Gesner’s illustrations but also provided dried specimens and drawings of his own. *Lotus corniculatus*, *Homogyne alpina*, *Hieracium villosum*, *Veronica spicata*, *Trinia glauca*, *Botrychium lunaria* and various species of *Erigeron*, *Inula* and *Viola* are stated to have been supplied by him as dried plants “e sicca... ex siccis”, etc. Very likely, these were all of European origin. Two plants drawn by Penny and illustrated in Schmiedel (1753-1760) are *Tuberaria guttata*: “*Helianthes hirsutus* T. P. Angli, ex picta” and *Sagittaria sagittifolia*: “*Sagitta Plinii maior ex picta* D. T. P. cum nistis radicibus” whilst an entire (live?) specimen of *Acinos arvensis*: “*Zygia*....herb integra a T.P.” was also apparently provided for an illustrator.

The original drawing of *Tuberaria guttata* by Penny (Fig. 4), which is preserved in Gesner’s collection, now at Erlangen, (perhaps understandably) lacks any annotation by himself. The resulting engraving published by Schmiedel (1753-1760: Tabula 3. no. 27) bears a very close likeness (Fig. 5). Penny also provided an illustration of *Swertia perennis* which is illustrated in colour by Schmiedel and is further referred to by Clusius (1583) “..... iconem & descriptione.... ..Thomas Pennaeus....”. However, other plants mentioned in Schmiedel with a connection to Penny are difficult to identify from the engravings.

Several drawings executed by Penny are mentioned by Clusius (1583). Again, many are of European origin and include: *Anemone narcissiflora*, *Arnoseris minima*, *Cirsium helenioides*, *Cornus suecica*,

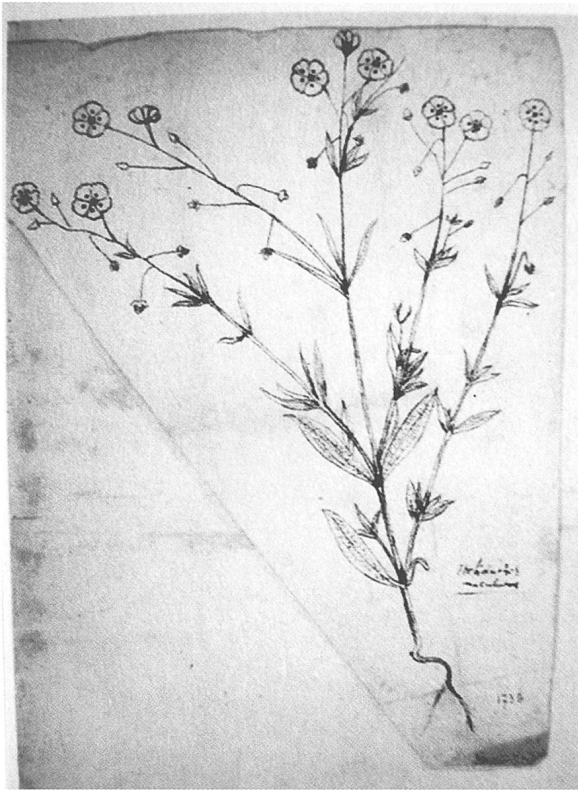


Figure 4. Original drawing by Penny of *Tuberaria guttata*.

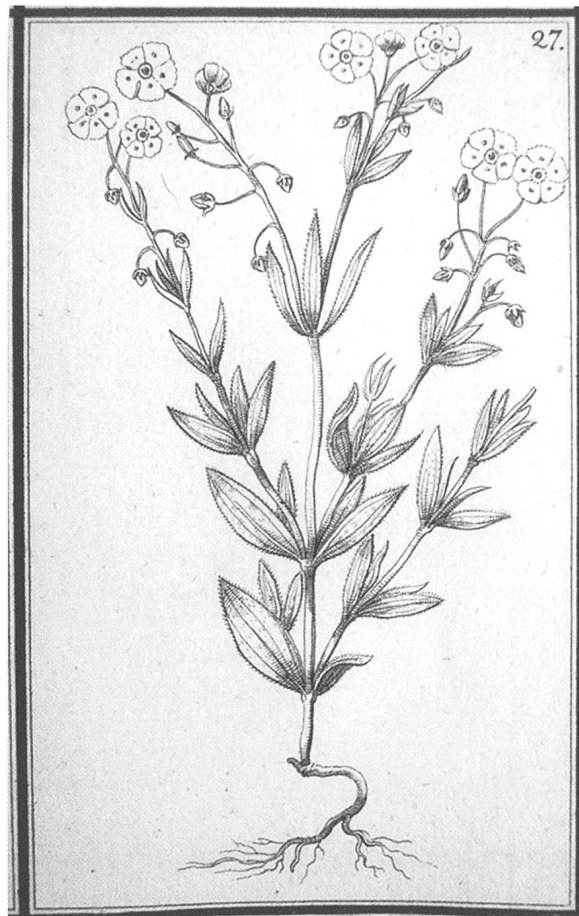


Figure 5. Engraving of Penny's drawing of *Tuberaria guttata* later published by Schmiedel (1753-1760).

Coronilla varia, *Geranium bohemicum*, *Hypericum balearicum* together with a species of *Geum* and another of a *Hieracium*. However, an excellent illustration of *Rubus chamaemorus* is almost certainly based on plants seen near the mountain summit of Ingleborough in England, close to his birth-place.

(iii) Records of Penny's European plants in the published works of his contemporaries

Penny is referred to on several occasions by John Gerard in his famous Herbal (1597) and also in the later expanded version by Thomas Johnson (Gerard 1633). Penny was held in high esteem by Gerard who referred to him as "master Thomas Pennie of London Doctor in Physicke of famous memorie, and a second Dioscorides for his singular knowledge in Plants" (Gerard 1597: 352). Elsewhere he remarked ".....Doctor Pennie, lately of London deceased, a man of much experience and knowledge in Simples, whose death my selfe and many others do greatly bewaile" (Gerard 1597: 621). Gerard (1597: 564) also states that Penny "brou-

ght [*Sideritis syriaca*] first into England out of the cliffs of the mountaines Iura and Salana [Saleve]". In regard to *Swertia perennis* (mentioned above) Gerard relates that Clusius received a plant from Penny in which "the floures grow upon small tender stalkes, compact of five slender blewish leaves, spotted very curiously with many blacke spots and little lines; having in the middle five yellow chives" and referring to it as the "Spotted Gentian of Dr. Pennie" (Gerard 1633). Earlier, Clusius (1583) himself stated about it ".....sed cuius iconem & descriptione cum Londoni essem anno 1581 C.V. Thomas Pennaeus Londinensis medicus, pro nostra amicitia liberaliter communicavit,.... Provenit copiose in monte Bockemuto Suitensium, & floret Augusto".

Another plant found by Penny was *Hypericum balearicum* which, perhaps during his time at Montpellier, was obtained on an unrecorded excursion to the island of Majorca. Gerard (1633) states that Penny gathered it "upon the Islands of Majorica or Majorca and called it by the name μυρτοκιζου, in Latin, Myrtocistus Balearica". Clusius (1583) gives

this as “De Myrto-Cisto Pennaei. Elegans porrò ea est planta, cuius iconem Cl. V. Thomas Pennaeus Londinensis medicus annus 1580 ad me misit, & subsequente anno Londoni in Anglia siccam ostendit; quam ille ex Balearium insularum maiore, vulgo Majorica nuncupata erutam μυρτοκιζου appellavit”.

Joachim Camerarius, the younger, in his *Hortus Medicus* (1588) records that his friend Penny found *Geum montanum* with white flowers in monte Lupo in France: “Thomas Pennaeus Medicus Londinensis praecipuus, rerum naturalium peritissimus, amicus meus singularis, in monte Lupo Galliae reperit floribus albis.” Also, that he received from Penny *Lactuca virosa*, a *Euphorbia*, and a *Matricaria* (Camerarius 1588).

Clusius with whom Penny was in regular contact, frequently refers to him in his *Rariorum Aliquot Stirpium Historia* (1583). Other than those already referred to above by Gerard, Clusius quotes Penny as finding *Anemone narcissiflora*: “...cuius iconem et descriptionem D. Thomae Pennaei liberalitate consequentus sum... Crescit copiose in monte Iura, è regione urbis Genevensis.” and also *Coronilla varia*: “Sed aptius forsitan Hedysari descriptioni conveniet ea planta cuius iconem & descriptionem cum aliis iam memoratis a C.V. Tho. Penneaeo accepi, quámque Securidacam Dioscoridis esse censet....Crescit in agro Genevensi no procul a Ponte tremolo, inter dumeta, nusquam alibi mihi conspecta”.

Three of Penny’s records from Germany are given by Pena & de Lobel (1576). These are *Scirpus sylvaticus* by the River Nekkar at Heidelberg “...lectam industria summae sedulitatis Medici Thomae Penii habuimus, ad Neccarum flumen agro Heidelbergensi”, *Bellis sylvestris* “Hanc a se lectam in Sylvosis montibus Germaniae nobis communicavit D. Pennius Anglus” and a species of *Thymelaea* “in locis Germaniae videas, unde habuit industries & magne spei medicus Anglus D. Pennius”.

From the Geneva area they (Pena & de Lobel 1576) give *Cephalaria alpina* “Non paru speciosiore & maiore hanc è iugis oriundá Iure & Salane [Jura and Saleve] nobis impertiuit singularis amicus D. Pennius...”, *Chaerophyllum hirsutum* “...e Genevae & Salevae viciniis montibus: pertius juxta ac amicus medicus Pennius Anglus Londini serendam curavit...” and *Typha minima* at the confluence of the Rhone and the Aare: “In agro Genevensi, qua confluent Rhodanus & Arua Typha pusilla.....accurate plantarum expensore Thoma Penio Anglo”.

(iv) Extant letters by Penny

There are at least six surviving letters (five autographed, one a copy) written by Penny, three of them dated 1569 from Frankfurt, the others from London between 1575 and 1578. The originals of these are held in archives at either the Universitätsbibliothek Erlangen-Nürnberg or the Universitätsbibliothek Basel. Most are of a rather general nature and have little botanical content. Perhaps the most interesting are those of 1569 written in Frankfurt before Penny returned to England. One of these dated 4th April was to Theodor Zwinger (1533-1588) the highly respected academic and doctor of the University of Basel. In this Penny urges Zwinger to help Caspar Wolf [i.e. in his preparations for the publication of Gesner’s *Historia Plantarum*] by supplying him with various plants from his garden: *Prunus mahaleb*, *Apium “crispum”* and a species of *Euphorbia*. Also, that he (Zwinger) should encourage Wolf to hasten to complete the publication since there were rumours that a similar publication by others was imminent. In a second letter to Zwinger, again from Frankfurt in September of that year, Penny repeated his request that the same plants should be sent, this time to himself. Another letter (April 7, 1569) was to Ludwig Camerarius at Leipzig, who was the brother of Joachim (the younger) the author of *Hortus medicus et philosophicus* (1588) and who, in 1580, had acquired Gesner’s illustrations and manuscript from Wolf. Penny had met Ludwig when he was at Montpellier. Of the remaining three letters, all from London, two were to Zwinger and the other to Joachim Camerarius.

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