

Digital Darwin: Editing The Loves of the Plants as a Case Study of the Theory and Practice of Digital Editions

by
Alana Helen Rigby

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Digital scholarly editing is an evolving field that allows for the rendering of complex print works that are rife with paratextual material. Erasmus Darwin's The Loves of the Plants represents this kind of paratextually complex work: it is an eighteenth-century scientific poem of approximately 2000 lines, added to which are illustrations and extensive footnotes. Existing editions of the poem are 1) incomplete, presenting only a portion of the text, 2) lacking annotations, or 3) strip it of some of its paratextual elements, such as the footnotes or illustrations. This paper explores the use of digital editing methods to render Darwin's most popular poem into the first-ever complete critical edition of part of Loves; using copy-text editing theory in the tradition of Greg and Bowers, an eclectic edition was created. A full transcription and annotations are included. Using the Text Encoding Initiative P5 Guidelines, a digital edition of the Front Materials, Canto I, and Interlude I was also created.

The digital edition component of this project can be viewed at [the Digital Darwin website](#). The password is "Snow Grimalkin".

The paper then explores the theory and practice of digital editing, charting its history from inception to present day applications. Ongoing debates in the field are discussed. Three other digital editions – Peter Robinson's *The Canterbury Tales Project*; Morris Eaves, Joseph Viscomi, and Robert Essick's *The William Blake Archive*; and Martin Priestman's *The Temple of Nature* – are surveyed in detail with a focus on the various techniques for representing complex paratextual content. The essay concludes with the realization that digital editions have the capacity to overcome some of the pragmatic limitations encountered when creating scholarly print editions, especially in terms of representing paratextual content. However, this capacity comes with its own challenges and digital editors must, like editors of print, be rigorous in defining editorial goals and limiting scope. Also like print editors, digital editors must also maintain transparency in the application of their principles.

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Table of Contents

Author's Declaration.....	ii
Abstract.....	iii
Acknowledgements.....	iv
List of Tables.....	vi
1.0 Introduction: Why Edit The Loves of the Plants?.....	1
1.1 Choosing a Medium: The challenges of representing text and paratext	5
1.2 Edition-building: Process and choices in the journey to a digital edition.....	11
1.2.1 The Process	12
1.2.2 The Translation to Digital	19
2.0 Survey of Digital Editing	26
2.1 Debates in Digital Editing.....	31
2.2 Diverse Digital Practices.....	35
2.2.1: Looking Backward: Peter Robinson's "The Miller's Tale".....	39
2.2.2: Looking Outward: William Blake's "The Tyger"	42
2.2.3: Looking Inward: Martin Priestman's <i>The Temple of Nature</i>	45
2.3 Conclusion	48
Works Cited:	51
Appendix A: TEI-XML Edition Code	60
Validation Schema Code:	60
Front Materials Code:	61
Canto I Code:	75
Interlude I Code:	134
Appendix B – Transcriptions and Annotations.....	145
Poetic Transcription	146
Annotations from Digital Edition	254

List of Tables

Table 1 Publication history of The Botanic Garden; BG: The Botanic Garden	12
Table 2 Editorial principles decisions	13
Table 3 An overview of digital humanities tools and institutional support	28

1.0 Introduction: Why Edit The Loves of the Plants?

In his 1982 book *Kinds of Literature*, literary critic Alistair Fowler defines three types of canon. The “potential canon... comprises the entire written corpus, together with all surviving oral literature” (214). The “accessible canon” represents all works of the potential canon that are readily available: documents that can be accessed via libraries, bookstores, and now the web, at a relatively low cost (215). And the “selective canon” consists of those books from the accessible canon that have been elevated by the “systematic preferences” of experts and intuitions (215). What belongs in each canon shifts as scholarly opinions vacillate and new discoveries are made, but the fluctuation has historically been a slow one (213).

Recent decades, however, have witnessed an unprecedented and rapid change in the works that comprise Fowler’s three categories. As digital humanists Kenneth Price and Ray Siemens note, “mass digitization is adding to the accessible canon and reducing the difference in potential and accessible canons” (para 6). They cite the efforts of *Project Gutenberg*, a volunteer run archive of public domain works, and *Google Books*, the 2005-launched digitization project from technical magnate Google, as instigators in this drastic increase in accessible works of writing (para 7). Optical character recognition tools and other technological transcription advancements have enabled this trend to continue in scholarly spheres as well, and projects like Carnegie Mellon University’s *Million Book Project* and digital-copy collections such as *Early English Books Online (EEBO)* and *Eighteenth Century Collections Online (ECCO)* demonstrate the massive output that such technologies enable. Even the scholarly database JSTOR makes use of OCR technologies to digitize archived print editions of journals (Fenton and Duggan 246).

The massive shift from potential to accessible canon begs the question: will we see a consequent shift of texts traversing from the accessible canon into the selective canon? Historically, movement between these canons could be observed in the editorial forms a text was allowed to take: French literary theorist Gerard Genette discusses the evolution of the “pocket-edition” as a sign of a text’s canonicity (20). The making of a pocket-edition – a small version of *A Tale of Two Cities*, for example, you could tuck in your coat and pull out for quick reference – meant that the work had survived “the test of a trade edition” (20), connoting “its admission into the pantheon of classics” (18). Thus, the text was made low cost and accessible for “a ‘university’ public – that is, undergraduates” (21). Genette drops the Penguin classics and Pelican classics series as examples (21); books of these series witness both light critical editing of the texts themselves and the larger editorial compliment of being admitted into the series in the

first place. Genette's example demonstrates how editorial intervention can serve to control a text's social perception – we know they are 'classics' because they have been admitted into the series – and can stabilize that text – we know this is an authoritative version of the text because the publishers' voices are authoritative ones. The result is a reliable and convenient edition for study and reference. In print history, the shift of a trade paperback novel into a pocket edition form meant that readers gained access to an edited text that had been deemed salient.

Unlike the vetting and critical editing that informs pocket editions in "classics" series, however, the shift of texts into a digital medium does not represent a similar application of editorial judgement. Many of the works digitized by projects like *Google Books* or represented in databases like *EEBO* have never experience critical editorial mediation to create a single stable form of the text. They have never been annotated and often their inclusion in a digital realm is due more to pragmatic criteria like date ranges or access permissions – *EEBO*, for example, digitizes all books from the three catalogues the publishing group can access – than to selection based on the contents of the work. Though these texts are more accessible than ever before, our reading of them is unlikely to increase without an equal increase in editorial efforts. Editorial intervention saves readers work: editors compare variants of the work to determine what single version of a text they should present to readers. They transcribe the text, rendering the sometimes challenging letterforms, printing conventions, and font types for modern readers. They annotate the text to elucidate words that have been obscured by time and to expand on social and historical contexts that can inform the reader's understanding of the piece. In most cases, these interpretative steps have not yet been applied to texts that have entered the accessible canon through digitization. Without mediation, the subsequent shift into the selective canon does not occur, and these digitized texts are not often used as authoritative versions for study. As Fowler indicates, "the selective canons with the most institutional force are formal curricula" (215); for texts to enter formal curricula, editorial mediation and presentation in anthologies, with commentary, or even with variant comparison, is often required. Mass digitization thus calls for mass editing in response. Greg Crane, editor and chief archivist of the *Perseus Digital Library*, an online archive for artefacts from the Greco-Roman world, summarizes this sentiment in his discussion of text digitization: "we have vast amounts of work before us... we need to edit the entire record of humanity" (para 5).

My thesis focuses on one of the many texts that has been made accessible through these recent digitization efforts, but lacks editorial mediation. In the fourth year of my undergraduate degree, my supervisor Professor Tristanne Connolly assigned selections from Erasmus Darwin's The Loves of the Plants as required reading for a class in Romantic Literature. Loves is a dense work of nearly 2000 lines

plus extensive footnotes; it combines rhyming verse, scientific prose, images, and other paratexts all with the aim of teaching its readers about the then-new mode of botanic classification pioneered by Swedish botanist Carl Linnaeus.

Though excerpts of Darwin's work are reproduced in several Romantic anthologies, there is no print edition that represents his poem in its entirety. For example, Paul Keen's Broadview anthology *Revolutions in Romantic Literature* presents only the first eighty lines. To access and read all of The Loves of the Plants, students in my class had to login to *ECCO* and locate the poem (a complex feat given the numerous editions Loves has been published in). Once located, undergraduates were faced with the daunting task of acclimating to 18th century typefaces – the long S (ſ) and ligatures, the non-standard spellings and unique vocabulary that sprung from Darwin's choice of topic, botany.

Reading The Loves of the Plants was possible, but not ideal, under those circumstances. Our discussion of the poem was in fact informed by the fact that no full critically edited version exists; we used that point to understand the text's reception history, and its obfuscation over time by changing aesthetic tastes and political climates. This added analysis, however, could be enabled via informed editorial commentary as well and does not seem a sufficient reason to leave the text unedited.

Reading it in *ECCO* was preferable to reading it in any other format: the poem is reproduced on *Project Gutenberg* without the illustrations and diagrams that serve to elucidate Darwin's content, and on *Literature Online* it exists without the exhaustive footnotes in which Darwin details Linnaeus' system and many other topics. Neither these editions nor the *ECCO* version supply instructive annotation. The poem, written in a Popean style of heroic couplets that seems antiquated to modern day readers, is rife with intertextual allusion and reference to mythology and to contemporary political events and scientific discoveries. Thus, without scholarly annotation, non-specialist readers are likely to be mystified, bored, or outright confused by the work.

Scientific poetry is a format alien to readers today, and thus my romantic literature class was surprised to learn that Darwin's poem was a best-seller when first published in 1789. Printed by radical printer Joseph Johnson, the poem had Darwin lauded as "a new Pope or Milton" (Fara 77). Loves was praised by the likes of Mary Wollstonecraft, Horace Walpole, William Cowper, Samuel Taylor Coleridge, William Wordsworth, and more. Conversely, it was also condemned by some of the same as aesthetic tastes and political anxiety over the French Revolution evolved over the course of the 1790s (Haut, King-Hele 1999 235). In Loves and the poem it was later published with, The Economy of Vegetation, Darwin makes reference to his extensive network of scientists, industrialists, and artists, forging links to the likes of Anna Seward (Loves 138), poet and writer from Lichfield, Josiah Wedgwood of the Wedgwood

pottery company (Economy Note XXII), painter Henry Fuseli (Loves 97), dissenter and scientist Joseph Priestley (Loves 41), president of the Royal Society Joseph Banks (Loves 150), American politician Benjamin Franklin (Economy Canto II 335), steam-engine innovator James Watt (Economy Note XI), and many more. Thus, Darwin's poetry represents an intertextual web that maps out many aspects of late eighteenth century discovery, all while also serving its function as an instructional text on Linnaean botany. Botanical writing was increasingly in vogue in the late eighteenth century, but after the publication of Loves, the genre's popularity surged, spawning texts like Sarah Hoare's "The Pleasures of Botanical Pursuits" (1801) and Charlotte Smith's "Flora" (1804) (George 678).

In addition to being a massively successful poem that prompted Johnson to print numerous editions, Loves is a cultural nexus of sorts, an influential text that betrays its own many influences through its copious footnotes and poetic allusions. It is a text of historical significance and its own history of popularity and subsequent repression in the early nineteenth century demonstrates how it can be used to understand the changing socio-political contexts of a tumultuous period in English history. Thus, I felt the need to fill the gap in scholarship and create a digital edition that did what *ECCO*, *Project Gutenberg* and *Literature Online* did not. I wanted an edition of Loves that represented the text in its entirety, showcasing its detailed images and diagrams, representing the voluminous notes and retaining what Genette terms the "sometimes very significant typographical choices that go into making a book" (7). In short, I wanted an edition that represented the poetic portion of The Loves of the Plants and its paratexts. I wanted an edition that would be accessible to students in the same position I had occupied – an easily-reachable and easily-readable undergraduate teaching edition that supplied context and stabilized a single version of the text for discussion.

To achieve this, I opted for an online format. The first section of my essay will discuss the unique elements of Loves that prompted this decision. I will then detail my editorial choices and their theoretical reasonings and will showcase what I was able to achieve in editing The Loves of the Plants.

I turned to the digital format as a solution to the potential complexities of editing paratextual elements in a codex (printed book) form. Thus, the second section of my essay will situate my edition in the context of digital editing work: first I will present a brief history of digital editing. Then I will explore the various ways other editors have attempted to resolve paratextual representation online.

And finally, I will share the unexpected conclusion I reached through both my research and my own editing practice. In the final section of my essay I will explain how in a quest to better represent text and paratext of The Loves of the Plants, I encountered 1) paratextual elements which I, unexpectedly, could not translate into a digital space due to constraints of my medium and 2) a new set of paratextual

elements created for consideration. So, while I partially succeeded in filling the gap in scholarship that initially prompted my project, I discovered, through my own work and by examining the digital editions of others, that digital editing presents its own unique sets of affordances and constraints. We, as editors, have only the same standard apparatuses - introductions, notes on the texts, and annotations - to explicate editorial motivations and to help reader understand that there are both gains and losses in a digital medium.

1.1 Choosing a Medium: The challenges of representing text and paratext

I began my editorial process with the decision of medium: was I going to create a print edition or a digital one? Which mode would be best suited to the representation of paratextual elements and, perhaps more importantly, why bother with representing the paratexts at all? I had already conducted my survey of existing editions of The Loves of the Plants and noted that there was is no existing critical print edition of The Loves of the Plants. Indeed, the only critical edition of any of Darwin's poetry is Martin Priestman's digital *Romantic Circles* edition of Darwin's *The Temple of Nature*, a "defiant" and "densely packed scientific poem" on evolutionary theory, that was a major influence on later Romantic writers (Priestman Introduction para 1). But the dearth in scholarly editions of Darwin's is easy to understand, given the "densely-packed" nature of its text and paratexts.

The most succinct definition of Genette's term paratexts comes from Richard Macksey, Director of the Digital Humanities Center at John Hopkins University, in the foreword to Genette's book *Paratexts*: paratexts are "those liminal devices and conventions, both within the book... and outside it, that mediate the book it the reader: titles and subtitles, pseudonyms, forewords, dedications, epigraphs, prefaces, notes, epilogues and afterwords – all those framing elements" (xviii). Scientific poetry, by nature, is rife with this type of adornment: copious notes attend each section of Darwin's poetry, as do illustrative diagrams and various types of front material that explicate his purpose to his readers (the work has an advertisement, a preface, *and* a proem).

Historically, editorial practice often relegates paratext to the sidelines: the focal point of many editions is unambiguously the text itself. Renowned Joyce editor Hans Gabler remarks on this hierarchy, noting how editorial work is often envisioned to supply an author-function: throughout the twentieth century, scholarly editing has been seen as "the presentation of a text... or of a work (mainly, a work of literature) in its often enough several texts through the agency of an editor *in lieu* of the author of the text" (44). Editors are "[guardians] of a lifeline between the work (or text) and author", and their work would not be necessary if the author was present to mediate the text to readers themselves (Gabler 44). The main textual elements - those that are clearly products of the author's hand with little influence from publishers,

booksellers, typesetters, illustrators – are retained while other elements may be excised for reasons of edition length, production cost, reader interest, and so on. As Gabler puts it: “the edition text is seen as the core edifice, as properly ‘the edition’, where an edition volume’s other sections serve but as thresholds to it” (44). Retaining the text is the highest priority for editors: paratextual elements are nice-to-have, but not need-to-have if other constraints of the production process bear down on editorial decision-making.

Given that Genette’s book on paratexts is subtitled “Thresholds of Interpretation”, is it really a problem that paratexts are often regarded by editors as mere thresholds, non-central to the reproduction of a work in a scholarly edition? Bibliographer D.F. McKenzie would argue yes: in his *Sociology and Bibliography of Texts* McKenzie postulates that “a book is never simply a remarkable *object*. Like every other technology, it is invariably the product of human agency in complex and highly volatile contexts which responsible scholarship must seek to recover if we are to understand better the creation and communication of meaning” (4). To McKenzie, the study of texts is incomplete without the examination of the “processes of their transmission, including their production and reception” (12), and paratextual elements can be the most informative tools for conducting that sort of analysis. McKenzie proposed a new mode of editing called social editing, a form that addressed those ancillary elements of texts that he felt were unacknowledged in the editions of his day, and he sought to complete a social edition of the works of William Congreve. However, he died before that work was completed.

McKenzie’s theory of bibliographic and editorial practice emphasizes what editor and literary theorist Jerome McGann calls a text’s “bibliographic codes”. “Bibliographic codes.... immediately call our attention to other styles and scales of symbolic exchange” (McGann 1991 57): they represent the material elements of a text, the typeset, white space, texture of the paper, the font size, book-binding, and paratextual elements. “Linguistic codes,” by contrast, often inform analysis of the “language-based arts like novels and poetry” and make up the content of the text itself – the words of a poem or the prose in a novel (McGann 1991 56). Bibliographic codes are especially important in texts that require specific design and presentation: as Romantic poetry editors Neil Fraistat and Steven Jones note, “so much of the history of poetic expression is a matter of what is sometimes dismissively treated as ‘mere’ appearance of the words on the page” (106). The prototypical example of this is William Blake’s works, which combine image inextricably and immediately with text. Indeed, as Blake editor Morris Eaves demonstrates, the representations of Blake’s work over time – as pure text, as text with some plate representations of image, as pure facsimile – represent different editorial stances and perspectives on Blake (Eaves 2006).

For McGann, who is lauded as the editor who took up McKenzie’s mantle and the mandate of social editing (O’Donnell 111), it became increasingly clear that the codex form was a limitation to the

scope of editing proposed by McKenzie and to an accurate representation of linguistic *as well as* bibliographic codes: “the exigencies of the book form forced editorial scholars to develop fixed points of relation - the definitive text, copy text, ideal text, UR text, standard text, and so forth - in order to conduct book-bound navigation... through large bodies of documentary material” (1995 para 4). A text like Loves demonstrates this cumbersome navigation perfectly – it is rife with instances of internal reference. For example:

- 1) Loves contains an instructive preface for applying Linnaeus’ theory: “LINNEUS has divided the vegetable world into 24 Classes; these Classes into about 120 Orders; these Orders contain about 2000 Families...” and so on (Preface i). Darwin expounds on the system he seeks to teach in the preface and then makes references, throughout his text, back to the terms introduced in those front materials. Audiences may want to flip back to the preface to understand the various categories of the system.
- 2) References are made to the instructive illustrations on separate pages: “These are the Calyx, or Flower-cup, as seen in No. iv. Fig. I. No. x. Fi. I. and 3. No v. xiv. Fig. 1. 2. 3. 4.” (Preface v)
- 3) The poetry makes reference to footnotes, and the footnotes sometimes extend across pages.

For example, “COLLIN” is cited in line 51 above, but the footnote for “*Collinsonia*” spans page four and five of Canto 1. Though the footnotes always begin on the page of their referent, they often carry onto the next page.
- 4) The footnotes make reference to other sections of poetry and other footnotes. For example, the footnote on *Genista* above closes with: “See note on *Collinsonia*, *Gloriosa*, *Draba*” – *Collinsonia* is represented on page four, *Gloriosa* on page thirteen and *Draba* on page twenty-seven.
- 5) The footnotes also make reference to another set of notes which follow the conclusion of the poem: “See additional notes at the end of the poem”, reads the footnote on *Silene* (15).

The examples continue and there are just as many instances of references to works outside of Loves. Like McGann, in my consideration of how to represent dense paratextual content – in this case Darwin’s footnotes and his many intra- and intertextual references – I was beginning to suspect that a digital space was necessary to make an easily readable and affordable edition. As McGann notes, “when we use books to study books, or a hard copy text to analyze other hard copy texts, the scale of the tools seriously limits the possible results” (1995 para 3). Part of what makes Darwin’s work so rich is the context he writes in and the people and ideas he alludes to: I wanted to emphasize those people and ideas via my own

annotation, but how could I do that on a printed page that is already so cluttered with the author's own complex annotation?

I also want to include the bibliographic codes that tie into the "sociology" of my book. For example, the frontispiece, *Flora at Play with Cupid*, was engraved by Emma Crewe, an artist employed by Josiah Wedgwood, and it reveals both thematic information about the piece and biographical connections of Darwin. In terms of theme, Asia Haut describes the importance of the image's subject matter: "botany operated as a key cultural trope" in the eighteenth century, "acquiring a significance that far surpassed vegetative concerns" (240). Botany was the science most allowable to women, popularized by actions like Princess Augusta's royal endorsement with her expansions of Kew Gardens and by works like Darwin's poetry and the offsprings it inspired. But as Flora's languid and sensual pose in the engraving suggests, even a science as tame as botanic classification bears the risk of compromising a woman's reputation. Haut elaborates on these dangers by tracing the mythic roots of Flora and flower gathering. Flora is depicted in Ovid (whom Darwin cites in his Proem) initially as Chloris, a virginal nymph, who is spotted flower-gathering by Zephyrus, god of the west wind (also cited in Darwin, Canto 1 35). Zephyr rapes and then marries Chloris, after which she metamorphizes into the botany goddess Flora of the engraving (Haut 246). These overtones were not lost on Darwin's readers, as demonstrated by contemporary publications like Richard Polwhele's 1798 book *The Unsex'd Females* which decries women's practice of botany through verse: "With bliss botanic as their bosoms heave/Still pick forbidden fruit, with mother Eve/For puberty in sighing florets pant/Or point the prostitution of a plant;/Dissect its organ of unhallow'd lust,/ And fondly gaze the titillating dust" (10-11). In a note he appends to this passage, Polwhele more explicitly shares his warning: "Botany has lately become a fashionable amusement with the ladies. But how the study of the sexual system of plants can accord with female modesty, I am not able to comprehend" (10). He cites Darwin's poem specifically and goes on to report, with concern, that "I have, several times, seen boys and girls botanizing together" (10). Botany, then, held social valences and could reflect on one's character. In light of these historical and mythological contexts, the indulgent posture of the goddess takes on new tones, perhaps becoming a warning: do not be as lax as Flora in your botanical practice, ladies, lest you face a similar fate.

Biographically too, the presence of an engraving from an associate of the Wedgwood company elucidates Darwin's own personal networks. His son Robert married Wedgwood's daughter Susannah, leading to the birth of the most famous of Darwins, Charles Darwin. The frontispiece then demonstrates the potential importance of image-paratexts; the frontispiece provides thematic and historical context, and the other illustrations of plants and plant class diagrams are inserted into the text to accompany the poetic

and prose descriptions Darwin provides. By neglecting to include these paratexts, the *Project Gutenberg* edition deprives the work of some of its richness. Similarly, existing excerpts in print editions like Paul Keen's Broadview anthology also avoid the images (139-140). Print editions often will include illustration plates which can be printed in colour and situated on high quality paper in the middle of the book. However, the complexity of the bibliographic codes of Loves – its dense and copious footnoting as well as the placement of illustrations near the poetic sections they are referencing – make these paratextual elements more challenging to render in a print form.

Considering the representation of image-paratexts and bibliographic codes, the digital form seemed to trump a print one. Digital humanist Susan Schreibman succinctly summarizes the boons of pursuing an electronic edition: “the digital environment leveled the playing field for multimedia and text, creating a holistic environment within which to seamlessly navigate between primary objects and the contextual, between visual and aural” (2013 para 16). The “seamless” navigation Schreibman discusses is through the use of hyperlinks, hard-coded connections in digital spaces that enable a one-click transition from one section of the text to another. Hyperlinks in Loves would make those many connections both within the work and to external works more efficient, and would allow me to insert my own annotation discreetly, not cluttering up the page but removed at a distance and accessed via a hyperlink.

What's more, the use of a hyperlinked structure for my edition has the theoretical potential to integrate paratextual elements more centrally into my edition. George Landow, *Victorian Web* editor and author a book on hypertext that is now in its third edition, emphasizes the way that such hypertextual connections can overcome the text-paratext hierarchy Gabler observed: “since hypertext, which links a passage of verbal discourse to images, maps, diagrams, and sound as easily to another verbal passage, it expands the notion of text beyond the solely verbal” (2006 3). By including hypertextual links to the original facsimile images of my copy-text, for instance, I could enable quick access to an image of the original typeset, fonts, and other bibliographic codes encapsulated in that image. While it would be possible to achieve this type of immediate bibliographic comparison in a print edition, such an edition would need to reproduce a facsimile image with a facing page transcription for each page of Loves. Loves consists of 184 pages. Such reproduction would result in a large and expensive edition, likely limiting access to specialists instead of creating an affordable version for students.

By connecting, via code, the central text – in my case, the poetry prioritized by the *Literature Online* edition - to its paratextual elements and to other linguistic codes within the text, Landow suggests that readers will see the text as one continuous network of interrelated works: “as readers move through a web or network of texts, they continually shift the center – and hence the focus or the organizing

principle” (11). The use of hyperlinks to bridge the intra- and intertextual references in Loves would enable quick and fluid transitioning through the network of works and ideas Darwin cites. While I did not want the extreme decentralization Landow idealizes, I wanted to create a text that encouraged reader exploration so that the context of Loves could be fully appreciated. Hypertext provided means by which to facilitate that exploration.

This concept of a shifting center of a text that could put paratexts in equal position to the central text is especially important for a text like Loves, where a paratextual element – the footnote – is perhaps more central to the author’s stated purpose than the poetic text. In a letter to his intellectual sponsor and colleague, Joseph Banks, president of the Royal Society, Darwin indicated that his purpose in Loves was “to induce ladies and other unemploy’d scholars to study Botany, by putting many of the agreeable facts into the notes” (qtd. in King-Hele 2012 195). The bulk of botanical classification information comes in the footnotes: each footnote begins with a statement of the then-used Latin name of the plant, the plant’s common name, and a description of its physical arrangement. The number of stamens and pistils are required for readers to apply Linnaeus’ system. Thus, a description like *Callitriche* in page four, above, reads: “*Callitriche... Fine-hair, Stargrass*. One male and two females inhabit each flower”. By referring back to the Preface, readers can identify both the flower’s Linnaean Class, distinguished by the number of stamens – “Class I. One Male. *Monandria*; includes the plants which possess but One Stamen in each flower” (Preface ii) – and its Order, distinguished by the number of pistils – “TWO FEMALES, *Digynia*” (Preface iv). Using Darwin’s explanation of Linnaeus’ system from the Preface, readers can categorize *Callitriche* as being of the Class *Monandria* and the Order *Digynia*. All of the information required to perform this operation, to “study Botany” in the way that Darwin has presented it, is communicated via paratextual elements – notes and front materials.

What this closer examination of Darwin’s educational purposes reveals is that the paratexts are central to the work’s purpose, just as much as the poetry is. The poetry should not be undervalued because it is less strongly tied to Darwin’s stated didactic ends. Indeed, the poetry is what Darwin’s contemporary reviewers seized on: “Dr. Darwin has destroyed my admiration for any poetry but his own”, stated eminent Gothic writer and literary critic Horace Walpole (qtd. in King-Hele 1999 265). Conversely, after his period of admiration for Darwin, Coleridge’s opinions swayed: “I absolutely nauseate Darwin’s poem”, he said of Loves (qtd. in Jackson 171). Thus, both poetry and paratext are important in appreciating the text’s purpose, impact, and context.

Loves fits into the category of what Jerome McGann calls “n-dimensional texts” – “documents are n-dimensional because they are socially determined” (2013). Socially determined texts can be

appreciated from a variety of angles: from pursuing, in the case of Loves, the footnotes in greater detail, by focusing on the poetry in isolation, by reading both in combination, or by ignoring both and instead focusing on the images. The reader, through their choice of which dimensions to explore, is not obliged to read the text in any particular way; though Darwin lays out the foundation for conducting botanical analysis, the text itself is so multi-faceted that the reader has multiple options and is ultimately the only one who determines what content will be processed, in what order that content will be accessed, and how carefully it will be read. Digital representation which employs hypertexts became a logical choice for my edition because of this reader-driven n-dimensional quality of Loves; as Landow indicates, “hypertext blurs the boundaries between reader and writer” (2006 4), enabling self-directed navigation throughout the text. Images could be rendered easily into that navigational web because “one can include material that could not be afforded or would not be possible in print” (Price and Siemens para 8). The “afforded” point is especially salient in Darwin’s case. Though the representation of Darwin’s work was obviously possible in print, when originally published, his text was expensive. Creating a low-cost version for readers today, a version that replicates important paratextual elements while also providing editorial commentary, would be challenging in a print format. A digital format, however, could include this information more readily due to the lower costs of incorporating paratextual information online: the addition of hyperlinks would also improve upon a print edition by making Darwin’s intellectual links easy to follow.

My consideration of various elements of the text and paratexts of The Loves of the Plants and of the existing theory surrounding the editing of paratexts thus led me to select a digital format for my edition. Having made that choice, I was ready for the most labour-intensive part of my project: the research and creation of the edition itself.

1.2 Edition-building: Process and choices in the journey to a digital edition

Much of the brute force of editorial work is the same, regardless of medium. Gathering of witnesses, selection of the copy-text, creation of transcriptions and collations, research and writing of annotations and commentary – all the processes so well-described in *Textual Scholarship*, David Greetham’s 1994 summary of critical editing practice, are the same whether creating a print edition or a digital one. It is only after that this initial work is complete that the process differs and additional steps are required for moving an edition online. Thus, my discussion of my editorial practice will be split into two components. In the first, I will discuss the basic elements of generating an edition. In the second, I will elaborate on the steps involved in moving that editorial work into a digital space.

1.2.1 The Process

The Loves of the Plants has a complex publication history. No manuscript copy of the poem survives. Table 1 indicates the publication record of all versions of Loves published in England in the eighteenth century. This information was gathered from the title pages of editions housed in *ECCO*. Though subsequent editions were published throughout the nineteenth century, Darwin died in 1803 and was thus only directly involved in these initial publications of his work.

Loves was first published in 1789. Darwin’s name was not ascribed to any printings of his poem; he had written publisher Joseph Johnson, indicating that “I would not have my name affix’d to this work on any account as I think it would be injurious to me in my medical practice, as it has been to all other physicians who have published poetry” (King-Hele 2012 235). This fear was not without reason: as Darwin’s biographer Desmond King-Hele reveals, both Darwin and his Lichfield neighbor Anna Seward knew of other physicians who had published poetry and felt their medical practice suffer (1999 201).

Table 1 Publication history of The Botanic Garden; BG: The Botanic Garden which contains both “LOP” and “EOV”; LOP: The Loves of the Plants; EOv: The Economy of Vegetation

Version	Year	Edition
LoP	1789	1
LoP	1790	2
LoP	1791	3
BG – Both parts	EoV reads 1791 (King-Hele has determined it was in fact printed in 1792) and includes LoP dated 1791 (same edition as stand-alone 1791 edition)	2 (actually the first printing of EoV)
LoP	1794	2
BG – Both parts	1795	3
BG – Both parts	1799	4

To begin my editorial work, I had to decide what type of edition I was going to create. My decisions and priorities were largely informed by W.W. Greg’s *The Rationale of the Copy-Text* and by the subsequent work of Fredson Bowers and G. Tanselle, who expanded on Greg’s system of editing. Greg’s seminal essay in editing theory articulates the difference between substantive and accidental variants between versions. Substantive variants are “those namely that affect the author’s meaning or the essence of his expression” and accidental variants are “such in general as spelling, punctuation, word-division and the like” (21). Using Greg’s terminology, table 2 summarizes my editorial objectives and the consequent decisions those objectives motivated.

Since my editorial goals were not concerned with representing each minute accidental variant, but rather with presenting a version of the text that presented *all* the substantial variants in one, I knew I could not create a diplomatic or facsimile edition (those editions which focus on a highly accurate representation of a single version of the text). Instead, I created an eclectic edition, a version that had no

Table 2 Editorial principles decisions

I wanted an edition that:	Thus I decided that:
created a stable and easily-readable version of the text for use in undergraduate teaching.	I would focus on substantive variants between witnesses instead of employing a highly detailed method of transcribing <i>all</i> variants, substantive or accidental.
retained paratextual elements lost in other editions.	Where logical, I would both (1) include as many text-based paratextual features (prefaces, notes, running headers) as possible and (2) aim to include facsimile reproductions of image-based paratexts (the frontispiece and diagrams, as well as small marks like Thomas Holloway’s cameo at the end of the Proem).
provided a sense of the impressive social and intellectual network that Darwin’s poem invokes while also reinforcing the scientific purpose of the poem.	I would craft annotations that (1) defined challenging words, especially those related to botany, (2) explained intertextual references and allusions, and (3) identified the people and works Darwin cited.

exact model in the witnesses but rather combined elements of all documents to present the most complete version of the text. To do this, I employed Greg’s copy-text method: using this method, the version I selected as my copy-text would serve as my model for accidental variants, and I would only consult other witnesses with an aim to including substantive variants and resolving textual cruxes, those elements of the work that could not be resolved consulting only a single witness. Copy-text theory has been “the dominant mode of Anglo-American textual criticism” (Greetham 334) in the twentieth century. Its use has been the subject of much discussion, especially because editors can use it to “[construct] authorial intention in *despite of* the testimony of individual documents” (Greetham 334, my emphasis). However, given that there is no critical edition of Loves yet in existence, copy-text theory met my stated goals of representing the text in its entirety, in a readable fashion.

Greetham describes the various factors that can inform the selection of a copy-text – an initial manuscript version or the last version published are popular choices for representing the author’s first or final intentions (333-336). In Darwin’s case, no manuscript exists. Apart from the correction of errors or the addition of extra content, there is little variation between editions –details like punctuation placement and number of words on a page are somewhat similar across versions, suggesting that the printer, John Jackson of Lichfield, copied previous editions when re-setting frames for subsequent printings. Thus, I decided to again turn to my editorial goals to determine which witness I would use as a copy-text. Though later editions do contain additional content, I opted to use the 1791 third edition as my copy-text because of the richness of that particular historical moment. The 1791 edition is, as table 1 indicates, also the same version that was included in the initial publication of the *The Botanic Garden* – the complete version of Darwin’s poetic plan. The *Botanic Garden* was first released in 1792 (despite the cover reading 1791), and it contains the first edition ever published of The Economy of Vegetation and the third edition of The Loves of the Plants. Thus, my copy text was the first text to participate in the completed version of *Botanic Garden*, and would be a good starting point if I ever wanted to expand my editorial efforts to include The Economy of Vegetation.

Secondly, as I am interested in the historicity of Loves, I wanted to pick a moment in its publication history that captured the popularity of the work. For modern day readers, the concept of a best-selling scientific poem about botany and plant sex is a strange concept, and by choosing a period earlier in Loves’ history, before the poem began to fall out of fashion, I am presenting readers with a version of the poem that captures the fleeting years of Darwin’s success. Both extensive praise and strong censure followed the 1791 publication. For example, William Cowper, leading poet of the 1780s, discussed Loves in the 1793 issue of the *Analytic Review*: “the splendor of his [Darwin’s] poem, which could not have been more highly finished, sweeter in flow of its numbers, more exquisite in the expression, more diversified in the matter, or richer in every species of embellishment” (qtd. in King-Hele 1999 264). Similarly, William Hayley mailed Darwin poems of praise in June of 1792:

As Nature lovely Science led
Through all her flowery maze
The volume she before her spread
Of Darwin's radiant lays. (qtd. in King-Hele 264)

Darwin’s context in the history of radical writing in post French Revolution England is also especially rich in the early 1790s. In addition to the publishing the complete *Botanic Garden* in 1792, Darwin’s publisher Joseph Johnson also put out Mary Wollstonecraft’s *The Vindication of the Rights of Woman* and Thomas Paine’s *The Rights of Man Part II* (King-Hele 1792). The revolutionary ideas in Darwin’s

poetry, though they are perhaps more oblique, are nonetheless comparable to Paine and Wollstonecraft's works. He hints at evolutionary theory: "other animals have marks of having in a long process of time undergone changes in some parts of their bodies," he writes in a footnote, "which may have been effected to accommodate them to new ways of procuring food" (Loves 7). He treats sexual subject matter with marked liberality – his description of "the society, called the Areoi, in the island of Otaheite, consists of about 100 males and females who form one promiscuous marriage" (from a footnote on page 178) is often quoted as an example of this frank attitude:

*A hundred virgins join a hundred swains,
And fond ADONIS leads he sprightly trains;
Pair after pair, along his scared groves
To Hymen's fane the bright procession moves;
Each smiling youth a myrtle garland shades,
And wreaths of roses veil the blushing maids;
Light Joys on twinkling feet attend the throng,
Weave the gay dance, or raise the frolic song (lines 471-478).*

But perhaps the most radical passage of Loves is in Canto III where Darwin takes a firm stance against the British slave trade, urging Britain's policy-makers to heed their consciences and abolish slavery:

*E'en now, e'en in Afric's groves with hideous yell
Fierce SLAVERY stalks, and slips the dogs of hell;
From vale to vale the gathering cries rebound,
And sable nations tremble at the sound! –
– YE BANDS OF SENATORS! whose suffrage sways
Brittania's realms, whom either Ind obeys;
Who right the injured, and reward the brave,
Stretch your strong arm, for ye have power to save!
Throned in the vaulted heart, his dread resort,
Inexorable CONSCIENCE holds his court;
With still small voice the plots of Guilt alarms....
*Hear him, ye Senates! Hear this truth sublime,
"HE, WHO ALLOWS OPPRESSION, SHARES THE CRIME"* (441-450)*

Thus, both the subtle but recurrent sexuality of his poem and the more overtly radical themes had Darwin lumped in with the revolutionary figures he was published alongside, all of whom were lampooned in conservative and Anti-Jacobin writings and caricature. For example, in 1794, "The Golden Age", a poem of 202 lines written in Darwin's style of rhyming couplets, was published by Rivingtons, the leading Tory publisher (King-Hele 299). The poem is falsely labelled "a poetical epistle from Erasmus D---n, M.D. to Thomas Beddoes, MD" (1). Beddoes was an outspoken political critic and an acquaintance of Darwin. The poem simultaneously dismantles Beddoes' ideas because they are rendered by the author as ridiculous, and Darwin's own credibility, as he is allegedly praising Beddoes' preposterous ideas

(King-Hele 299). Indeed, even to this day “The Golden Age” is mistakenly taken as a true product of Darwin’s hand, and *ECCO* attributes it to him.

The 1791 edition is significant in that it was the first version of Loves represented as part of the larger, complete *Botanic Garden* and because of its publication context. The early 1790s were a period in which the popularity of Loves was at war with the fiercely anti-radical response to the French Revolution. Later in the decade, aesthetic tastes would change, causing Darwin’s already-old-fashioned, Popean style of heroic couplets to fall further out of popular taste. This change is most succinctly vocalized by Wordsworth and Coleridge’s 1798 *Lyrical Ballads*. The preface articulates Wordsworth’s artistic aim “to imitate, and, as far as is possible, to adopt the very language of men” (para 10). By the late 1790s, Darwin’s verse seemed too ornate, an antiquated form against the modern “language of men”. Given that reception of the text is an area of interest in my editorial work, I opted for an earlier version that could better represent both its popularity and the controversies it ignited. The 1791 third edition thus became my copy-text. My perspective on the project is well-put by Hans Gabler: in the world of digital editing “the editor, and the edition of the editor's responsibility, will no longer decree a text. Edition and editor will instead, to the best of their rationale and ability, propose a solution to editorial problems inherent in a text, or a work and its texts” (47). Though Gabler is known for his genetic edition of *Ulysses*, his statement applies well to my own ends of creating a complete edition of Loves that solves the editorial problems of deleted paratext and presentation without context, instead of creating an edition that fixates on representing each potential variant to readers.

My transcription process was conducted in Microsoft Word. As I encountered textual cruxes like incorrect page numbers or potentially incorrect words, I consulted other editions (see Appendix B: Transcription & Annotation for the poem transcription). The three substantive inclusions I made were to:

- 1) Include the advertisement from the 1790 second edition. The advertisement is an oft-quoted part of Loves that appeared in slightly different forms before the Preface in the 1789 first edition and 1790 second edition. It was removed for the third and fourth stand-alone editions of Loves but it is appended to the front of the *Botanic Garden* in each of those productions. I deemed it a substantive variant because in it, Darwin articulates the ultimate purpose of his poem: “THE general design of the following sheets is to Inlist imagination under the banner of science” (advertisement, 1790 edition).
- 2) Include lines 345 -362 and the footnote on page 169 Canto IV of the 1794 fourth edition of Loves. These lines include a description of one additional plant, “Nelumbo”, that was added for the fourth edition of the poem.

- 3) Include lines 391-400 and the footnote from page 51 Canto I of the 1799 fourth edition of Loves. These lines include a description of another additional plant, “Epidendrum” that was added in this later printing of the fourth addition.

In his essay “Levels of Transcription” editor M.J. Driscoll succinctly categorizes the kinds of decisions I had to make during the transcription process. I have used his categories (from pages 255-257) below and explained my choices in each:

- **Forms of letters:** As a product of the eighteenth century, Darwin employs a long S (ſ). As my goal was to make a readable version of the text for a non-expert audience, I opted to normalize these letter forms to “s”, the short s. I did, however, retain characters like æ as they are readable to modern audiences, as their letter forms bear similar enough structures to what modern readers are used to.
- **Punctuation and capitalization:** I retained Darwin’s punctuation and capitalization because it does not distinctly disrupt the reading process or make words unrecognizable for a modern reader.
- **Structure and layout:** Given my aim of creating a reader-friendly version of the text, there were instances where I altered the layout to facilitate reading ease. Though this works against my aim of retaining bibliographic information, I felt that the goal of providing a logically laid-out and readable edition trumped my dedication to the code of text placement on the page. Thus, I decided that if footnotes continued onto a second page and were further removed from the text they were defining, I would move the displaced text onto the page where the original term appears. The idea for this alternation came from the *Victorian Women Writers Project*, a group of editions that use Text Encoding Initiative’s extended markup language, the standard digital humanities coding language, in their creation of digital editions. They recommended: “when you encounter a note that spans pages, for readability, collapse the note into one page, the first page it occurs. To signify the page break, which is important for citing and other reasons, we will impose the following editorial markup: <add type=“editorial” resp=“EDITORNAME” rend=“i”> [cont’d on p.202]</add>” (VWWP TEI P5 Encoding Guidelines). I have employed a similar code in my own extended markup language (<add rend=“i”>[Continued p.6]</add>) which can be seen in Appendix A: TEI:XML and is discussed in more detail in the following section. Apart from footnote placement, I attempted to retain my copy-text’s indentation and spacing, though I faced some challenges (discussed below).

- **Corrections and Emendations:** Corrections were indicated in my transcription (Appendix B: Transcription and Annotation) and noted in my code using the <cor> tag. Printer's directions (small letters at the bottom of the page) were removed; though they are a clear indication of my text's bibliographic history, I felt that in an online format, they might confuse readers without annotation. The thought of annotating a single small letter on *each* page of the poem, however, seemed to me more likely to act as a distraction at best and an annoyance at worst. It was an unfortunate concession that detracted from the "sociology" aspect of my text, but I felt that in service to the higher goal of creating that easily-readable and instructive version, removing the printer's directions was the best choice.
- **Standardization & Modernization:** This is a point Driscoll neglects to mention, but it is an important one in Darwin's case. Inconsistent uses of abbreviations pepper Loves. In the case of abbreviations, I did not standardize but instead annotated in each instance. Unlike the printer's marks, these sections of the text would all receive annotation so that I could explain what works Darwin was citing. It seemed unnecessary to alter his spelling choices if I was already providing an annotation. In the case of names like Linnaeus, I opted to modernize the spelling so that it would be recognizable and reusable for a modern day audience. I applied the same principle to other archaic spelling patterns ("antient" instead of "ancient", for example). Given the educational hopes of my edition, modernizing seemed an appropriate choice to render the text more intelligible to readers today.

Using these principles, I completed my transcription and began my annotation. Commentary was crafted with two purposes in mind. Most overtly, I aimed to deliver definitions for subject-specific or now-obscure terms; naturally, Darwin's poem abounds with botanical terminology. Because Darwin was also responsible for an early and thorough translation of several of Linnaeus' works, he is acknowledged as having coined several botanical words in English (like calyx). King-Hele provides an effective summary of Erasmus Darwin antedatings of the Oxford English Dictionary (1989). Secondly, my notes also intend to elucidate the historical, social, and scientific context in which Darwin was writing. Loves calls upon many sources across many genres; the annotations identify those sources and provide biographical and historical context where relevant. My edition thus employs annotations that fit into some of the categories of annotations defined by Bauer and Zirkier in their theory of literary annotations. My annotations serve "intratextual and "intertextual" ends in that they elucidate references to other parts of Darwin's own work or to outside works (para 18). They also provide "linguistic" commentary via their definitions and "contextual" commentary through links to pertinent contemporary information (para 18). What they do not do is demonstrate the "interpretative" type of annotations discussed by Bauer and

Zirkier (para 18): my annotations do not seek to analyze Darwin's themes, but rather hope to give readers the tools to conduct such analysis themselves.

With a complete and annotated transcription prepared of The Loves of the Plants, I was ready for the biggest hurdle in the project: moving my editorial work into an online space.

1.2.2 The Translation to Digital

Digitization is lauded by many contemporary editors because it “overcomes the codex-enforced spatial limitations on the amount of material that can be uniformly gathered and re-presented” (Buzetti and McGann 58). That limitless potential sounds ideal, and Buzetti and McGann are quick to emphasize the more pragmatic elements of digitization: “a digital text is coded information, and a code as a syntax that governs the ordering of the physical signs it is made up of” (60).

Coded information implies that the original text in my Word document transcription needed to be rendered in a completely different way. It required the addition of coding. Coding is not a new language in and of itself. Rather, as editor Allan Renear indicates, coding is “a metalanguage” or “metagrammar”; a grammar for defining other grammars (1). Applying such a metalanguage to my work was necessary because, as Renear clarifies, “before they can be studied with the aid of machines, texts must be encoded in a machine-readable form” (1). Machines do not read typed letters on a page as words: instead digital humanist Christian Wittern explains that, to a computer, each letter is understood as a set of numbers that corresponds to a Unicode metalanguage (293). “To represent characters in a digital form”, says Wittern, “we must enumerate them and map them to numbers” (292). Thus, the letters we can create with the press of a key on our keyboard are in fact all mapped to specific Unicode designations, determined by the International Organization for Standardization (ISO), one of the several companies that attempted to standardize this enumeration process (293). The complete Unicode character set provides codes for 65,000 characters (Hockey 32). So machines do not read a capital “A” as the letter A, but rather as U+0041. Unicode correlations are the first level of transcription at work in a digital work. The second level is the metalanguage discussed by Renear.

Metalanguages entail the use of a specific set of tags – tags will take collections of characters and tell a machine what those characters represent. For example, the tag <word> around </word> a group of letters, the way I've placed it around “around”, will tell a machine that what's in between the tags is a word. In short, tag sets are necessary because a “string of characters does not carry information in markup: words don't have meaning [to a computer], tags do” (Buzetti 2009).

There are multitudinous tag-sets available to those interested in migrating content to a digital environment. The next step in crafting my edition was choosing which set I would use. Research quickly led me to the doorstep of the Text Encoding Initiative Consortium (TEI-C), “an international organization

whose mission is to develop and maintain guidelines for the digital encoding of literary and linguistic texts.” (About the TEI). Founded in 1987, the TEI-C is “still the leading international organization for systematizing and standardizing the markup of humanities texts” (Price and Siemens para 3). They produce a TEI Guidelines document, now in its fifth iteration, which shares a standard tag-set to use for presenting digital editions online. I call this tag-set the TEI:XML, as it uses extensible mark-up language (XML) to set a baseline for editors while also allowing editors the flexibility to add additional tags as needed (a unique feature of XML languages). The nuances and motivations of the TEI:XML are discussed in more detail in section 2.0.

I chose to use the TEI:XML instead of another coding language because it is adopted widely by digital humanists who produce scholarly editions (many editions on *Romantic Circles*, the Romantic-era digital edition collection maintained by Neil Fraistat and Steven Jones, are in TEI:XML, for example). In addition to its use as a standard, the Modern Language Associate (MLA) Committee on Scholarly Editions recommends TEI because it “opens up important opportunities for deployment of data” (para 2). TEI:XML is fundamentally interoperable, which means that my code can be translated across multiple platforms, devices, and browsers and still appear as I intended it. The MLA also indicates that “transcriptions [in TEI] can be compared using collation tools, as data that can be contributed to a digital repository or aggregated into a text corpus that might support quite different types of analysis” (para 2). The use of a standardized coding language by humanities scholars opens up the possibility for larger aggregate projects that can more easily be achieved if everyone is using the same metalanguage.

Having decided to encode my edition using the TEI:XML, I began the process of teaching myself the metalanguage. To do this, I made heavy use of the TEI-C website, which runs through examples of each entry in their tag-set of hundreds of tags, and the robust TEI:P5 Guidelines Document. The TEI-C website also led me to Oxgarage, translation software created by digital humanists for the purpose of converting their work into different coding languages/formats. Using Oxgarage, I converted my Word documents of the Front Materials, Canto I, and Interlude I into a very rough version of TEI:XML. I limited myself to just these sections of the poem so that the scope of my project was realistically contained for the timeframe I had. On the advice of Susan Schriebman (2010) and Fraistat and Jones (2006), who both examine a variety of digital tools, I identified the Oxygen XML Editor as a useful tool for my purposes. Oxygen is preloaded with knowledge of the TEI:XML, and its academic mode allows for code writing and transformation into hypertext markup language (HTML). Transformation into HTML is important for any project bound for the web because web browsers present information in HTML. Thus, Oxygen’s ability to quickly see what my code looked like in an HTML format allowed me to know if my code was producing the desired results.

I translated TEI:XML of my editorial work from the document Oxgarage produced and pasted it into Oxygen. I then began the long and meticulous process of correcting my code. This process is called “text-encoding”, putting those tags around elements of a document, and the term can be applied to the application of any tag-set to a document. To guide my own encoding work, I used various examples from *Romantic Circles* editions as models (as they make the TEI-XML code viewable directly from their editions – see the Mary Tighe *Verses Transcribed for H.T.* edition as an example). Despite the availability of examples, each edition has unique needs, and a large part of this process was trial and error, using Oxygen’s transform function to see what my TEI:XML looked like when translated to HTML.

In this phase of editorial work, the advice of other digital edition editors helped. “The most important lesson from the last 20 years of digital scholarly editions,” Schreibman indicates, “is that it is necessary to separate content from display and to present the objects of our contemplation - the full-text files, the images, the audio, and moving images - according to well-established standards” (2013 para 40). The TEI:XML exists to provide those standards, and I was able to conform to them, but as experienced TEI coder Sebastian Rahtz indicates, “the TEI offers more than one way to encode information” (311), and there is naturally some variance across editions. For example, I was originally encoding both my own footnotes and Darwin’s footnotes using the <note> tag. However, the <note> tag automates formatting that overrides the original formatting I wanted for Darwin’s notes. Darwin’s notes appear in a smaller font than the poetry, with a slight indent. The use of the <note> tag, however, made notes on the page (as opposed to endnotes like my own annotations) appear in square brackets. I was unable to override the TEI’s code for representing Darwin’s notes – thus I had to abandon use of the note tag and instead use original tags to accommodate these bibliographic codes. I made use of the <rendition> tag to create two new attributes – a “smallest” attribute and an “indent1” attribute. By adding the following lines of code to my TEI Header:

```
<rendition scheme="css" xml:id="indent1">text-indent: 1em;</rendition>
```

```
<rendition scheme="css" xml:id="smallest">font-size: 10pt;</rendition>
```

I was able to create attributes for a tag I could then use to format Darwin’s footnotes. Thus, I was able to better match the notes to their typographic presentation in my copy text, preserving those bibliographic codes.

The option to declare my own tags using a <rendition> tag in the in a <tagsDecl> section of the TEI Header is part of what makes the TEI-C’s use of an XML language so effective. As Rahtz notes, “rendering a TEI text often means rearranging or transforming in some way” depending on the needs of the copy-text (311). By using an *extensible* markup language, editors can extend the code set to accommodate their needs. I did this in several ways, as indicated in the example of Darwin’s footnotes.

Another digital editor who inspired my editorial choices was Kevin Kiernan, who speaks highly of incorporating images in digital editions: “the most compelling scholarly editions of the future will make use of full markup schemes such as XML (or its TEI manifestation), but not without the extensive integration of images” (264). Kiernan’s electronic edition of *Beowulf* is a beautiful example of this process. Though I initially aspired to the type of page-for-page equal representation Kiernan models, the limits of my own programming knowledge and my choice of TEI:XML rendered me unable to do so (Kiernan’s edition uses Java, a different programming language). Instead, I opted for the embedded images, using the TEI <figure> and <graphic> tags where images fit directly into the work. I also made use of the TEI:XML <facs> tag, a tag designed to embed hyperlinks to images of each page so that, if my reader desired, they could view the original pages from my copy-text while they read my edition.

The use of that <facs> tag might seem innocuous when enmeshed with the rest of my code, but the information represented between those tags was the most difficult to acquire. Despite the fact that Erasmus Darwin is dead and any copyright for his work has long expired, I faced challenges in locating facsimile images that I could safely reproduce. Inspired by the detail of Kiernan’s reproductions, I initially sought highly quality digital photographs of my copy-text. McMaster University seemed like a promising candidate with their “Digitize on Demand” program that offered a digital reproduction of a book for only 40\$. However, their 1791 edition of the *Botanic Garden* had a 1790 second edition of Loves appended after The Economy of Vegetation labelled 1791. They did not have my copy-text, the 1791 third edition, in their collection. I explored potential libraries in England (the British Museum, the Wellcome Library), but none of them offered the same kind of digitization service that McMaster did. The University of Toronto has two copies the 1791 third edition of The Loves of the Plants, one in the Thomas Fisher Rare Book room, which charged 25\$ a page for reproduction. Given that I required at least 68 pages of text, I deemed this option cost-prohibitive. My last hope was Victoria University, which offered one-dollar a page scanning. However, despite ongoing conversation and some possible hope, the librarian eventually deemed their copy of the 1791 third edition too fragile for further copying. Given the importance of paratextual representation to my editorial goals, this was a very disappointing outcome for me. However, I hold out hope that in future projects and with further funding, I might be able to one day incorporate high-resolution facsimile images.

In the meantime, I was left to use the low-resolution version provided by Gale Cengage via *Eighteenth Century Collections Online*. However, Gale had express copyright notices indicating that “the subscribing institutes (“Customer”) and their authorized users, may make a single print, non-electronic copy of a permitted portion of the content for personal, non-commercial, educational purposes only” (Privacy Statement). The “non-electronic” caveat of this statement worried me, so I followed up with the

University of Waterloo's dedicated copyright librarian, Lauren Byl. I was grateful when Byl informed me that, because I was reproducing only a portion of the text (the Front Materials, Canto I and Interlude I), I could safely display facsimiles under the following more specific terms of University's agreement with Gale Cengage:

Each such item shall carry appropriate acknowledgement of the source, listing title and author of the extract, title and author of the work, and the publisher. Copies of such items shall be deleted by the Member when they are no longer used for such purpose. (Byl Feb 3 2016)

For the limited scope of my project, then, I could work within the terms of the agreement to include a facsimile representation. The low-quality images, while not ideal in their representation of material aspects of the text, such as the texture of the paper or colour of the ink, could at least give my readers the option of examining original typographic and illustrative information in some greater detail.

There were three bibliographic codes that I have been unable to represent in my edition, thus far. The first is the line numbering – I have encoded line numbers every five lines in my text, as my copy-text dictates. However, these are not represented when I translate to XML. I have also applied several extensible stylesheet language (XSLT) transformations to try to render page numbers, as suggested by Sebastian Rahtz, a XSLT developer whose work is hosted on the TEI-C website (322). These stylesheets are another commendable function of the TEI:XML – with stylesheets, editors are able to quickly transform their original code into another format. There are stylesheets to simply add page numbers. The transformation Oxygen performs to take my TEI:XML and turn it into HTML for preview is using a stylesheet. While I could successfully generate line numbers in Oxygen, applying a stylesheet, I was unable to have those numbers carry over when I applied a subsequent XSLT to transform my work into HTML. The same frustration applied to my attempts to apply 1.5 line spacing to the poetic stanzas of the poem and to change the font type of my HTML output. My copy-text has 1.5 line-spacing and a serif font-type, but I was unable to replicate those with my own modest knowledge of XML and XSLT. I am continuing to attempt these transformations, as retention of the bibliographic codes is important to my editorial goals.

However, these obstacles have helped me appreciate the particular ways in which digital scholarly editing involves a “community of practitioners who share interest and competencies” and are “collaboratively engaged in producing an edition” (Pierazzo 19). Though she primarily discusses contemporary social editing, digital humanities professor Elena Pierazzo's comment highlights the fundamentally collaborative nature of digital humanities practice. Nearly all of the organizations and editions I have consulted and mentioned throughout this paper are the result of extensive teams of people co-operating to produce digital works and resources. I have only been able to achieve so much with my

own edition because of the tools and expertise made available by digital humanists in this field. In the future, I hope to attend a TEI:XML workshop where I can leverage the expertise of the “communities of practitioners”, improve on my initial attempts at XML coding, and encode the remaining portions of The Loves of the Plants.

Once my TEI:XML was complete, I needed a way to produce a permanent transformation, an HTML file that I could save and work with. Pierazzo provides a useful analogy for this process using a culinary metaphor: “the source [code] contains the ingredients, the [XSLT] scripts contain the recipe, and the output represents the cooked dish [the HTML that ultimately goes on the internet]” (28). I was able to generate this cooked dish by again using programs created by digital humanists and recommended by the TEI-C. I ran a virtual computer on my Windows system so that I could launch an Ubuntu Linux operating system. In that Linux operating system, I was able to use TEItoHTML, a conversion program written by Rahtz to produce an HTML savable document of my edition. This document I then uploaded to a free-website content management system, Wix, where my edition is now hosted.

It was only once this entire process was complete that I authored the accompanying documentation for my edition. My introduction and my note on the text exist to document my editorial principles and decisions. Peter Robinson, one of the pioneers of digital editing with his *Canterbury Tales Project*, clearly states that “a digital edition should be full-text transcription of original text into electronic form with explicit principles” (2006 78). The need for transparency is especially important in a digital venue, where scholarship faces increased criticism due to the ease of publishing content online – as Daniel O’Donnell notes, “many digital editions contain excellent and comprehensive scholarship [that] is not being cited nearly as often as its quality would seem to deserve” (113). Thus, Robinson’s prioritization of explicit principles and transparent methods is vital online. Including facsimile images helps with that end: as Robinson says, with facsimiles “it possible for readers to check what we say against what the reader can see” (2006 83).

There are obstacles I have yet to overcome in my experience of digital editing. But ultimately, I was able to create an edition that, at least in part, met my stated objectives of creating an easily readable and paratextually comprehensive version of The Loves of the Plants. The most impressive lesson I had from this process was that I could achieve all of this from my desk in my living room. Information about process, required tools, exemplars – all of these are readily available to would-be scholars, freely accessible through the goodwill of the people responsible for them. I did not have to pay for a single service or resource I made use of in my editorial process. “The vast majority of tool developers (84%) happily supply tools to others”, found Schreibman in her study of digital humanists who have built

research tools (2010 4), and in my exploration of various tools such as TAPAS, an online site for displaying TEI, I had only positive experiences interacting with other scholars.

Editor Greg Crane of the *Perseus Digital Library* summarizes my learned lesson best: “digital editing lowers barriers to entry and requires a more democratized and participatory culture” (13). His statement encapsulates my own experience with putting a scholarly edition online. However, as I investigated further into both the history and current practice of digital editing, I discovered that for all the liberation and co-operation the field engenders, it is not without its own unique challenges, setbacks, and detractors. My own struggle obtaining copyright permission just to reproduce low-quality images hints at some of the issues that surround paratextually dense work in particular. The next section of my paper discusses this context, with a particular focus on works with paratextual elements of a similar complexity to those in The Loves of the Plants.

2.0 Survey of Digital Editing

“Electronic scholarly editing,” writes editor Martha Smith, “consciously incorporates phenomena associated with the movement and manipulation of electrons, those indivisible charges of negative electricity, through wires and radio waves onto screens and through speakers” (7). Her technical definition emphasizes what so many digital scholars believed, especially in the early days of the digital humanities: that computers would revolutionize the way scholarship is completed – even though the editorial groundwork remains much the same, “pages and screens are now being read as quantum fields in which the meaning of words are interdependent with the graphic elements in which they are embodied, surrounded, and displayed” (Fraistat and Flanders 2).

The computer, then, has been pitched as a liberator of the contents of the book, with its screen as the liminal entrance point into a space of networked thinking and increased reader agency, as apparent in Landow (2006) and McGann’s (1995) discussion of hypertext as a reader-controlled equalizer of content. But long before the computer began to play these many parts, humanities scholars were considering the ways in which it could accelerate analytical processes.

The efforts of Jesuit priest Roberto Busa are often cited as the earliest intersection of literary analysis and computing technology. In the 1940s, Busa undertook a project to create a concordance of all of the writings of Thomas Aquinas. The project, entitled *Index Thomisticus*, aimed to lemmatize the approximately eleven million words employed by Aquinas – an impressive feat to collate by hand (Hockey 5). Thus, in 1949 Busa sought the help of IBM computers, creating a system of thirteen million punched cards and using only capital letters to represent the Latin words (Busa 2). The first volume was completed in 1973, twenty-four years after the project began (Hockey 5). Today, in the world of Web 2.0, his *Index Thomisticus* lives online and is fully searchable by any user.

Textual analysis projects like Busa’s represent the earliest instances of computing in literary analysis. But as Busa himself observes, there has been a process of “technological miniaturization” that spanned from the end of the Second World War to present day – he traces his own project’s transition from electro-countable machines with punched cards to magnetic tapes to CD-ROM. (Busa para 5-7). With that miniaturization of technologies came an increase in awareness of what technology could feasibly do for literary studies and in the institutions that were willing to fund that work. As the timeline in table 3 depicts, from 1963 onward scholarly organizations and associations began to form, dedicating effort to the exploration of computers in literary analysis.

Looking at digital editions and collections like the *Blake Archive* and *Romantic Circles*, it's difficult to conceptualize a work of electronic editing that existed before the web. However, the earliest electronic editions were exactly that – projects like Peter Robinson's *Canterbury Tales Project*, begun in 1989, applied “computer-assisted analytic methods” to conduct stemmatic analysis of the eighty-four manuscripts and four incunabula editions of the *Tales* that date from before 1500 (Robinson 2006 76). The use of computers to process those massive amounts of data also inspired Robinson to think creatively; to trace the revision history of his witnesses, his project team also experimented with “a program used by biologists to hypothesize a tree of descent among species” and came up with novel conclusions about the descent of the various manuscripts (2006 85). Robinson's editions were initially released on CDs, and though samples are available online today, his team still uses CDs as the primary mode of distribution of his edition.

Impressive as pioneering editions like Robinson's *Tales* might be, the end of the twentieth century and the beginning of the twenty-first has proven the age of the internet. In his survey of the history of computing in literary analysis, digital humanist Alan Liu traces the development of the internet through its various stages. In the Web 1.0 world of the early 1990s, the internet was an impressive content host but was largely inaccessible to mainstream audiences. It followed a simple model: an author created content, an HTML version of that content was imported to a server, and a user could view that content exactly as inputted somewhere in the world on a webpage (Liu para 5-6). Webpages were largely static, with the reader simply choosing what to read and watching content load in the same format that the author entered it. What came next is what Liu terms Web 1.5: in the mid-to-late 1990s, companies and institutions sought to make authoring content easier, and they created databases that “ran on the server alongside the Web-server program” (Liu para 8). When a reader wanted to see the content, an “output template” or “theme page” dictated by the Web-server would pull information out of the database and fit it into that format (para 9). Liu analogizes Web 1.5 to a special edition of a print book, where the publishing staff has taken the author's work and fit it into a different, perhaps fancier, layout (para 8).

The significant revolution in the author/reader dichotomy came with Web 2.0 in the 2000s. With a plethora of companies and institutions putting databases online, the size of the web, the number of networks that comprised it, rapidly increased, and thus so too did the number of authors (Liu para 11). Employing the same dynamic web page structure as Web 1.5, Web 2.0 presented one innovative enhancement: it gave readers access to the same type of data-entry forms that content authors had been using since Web 1.5 (Liu para 11). These data-entry nodes took the forms of comment boxes on blogs, Facebook walls and streams on social media sites, Wiki templates for authoring articles. The users and readers of dynamic web-pages were given the tools to become authors themselves.

Table 3 An overview of digital humanities tools and institutional support. Compiled with information from Price and Siemens; Liu; Apollon, Belisle and Regnier; Renear; Wittern; and Hockey

Year(s)	Event
1949	Roberto Busa begins work with IBM using computers to generate concordance for Thomas Aquinas
1960s	Graphics Communication Association: GenCode project progresses with the goal of creating standard descriptive markup language for publishing.
1960s-70s	Various organizations create markup languages for basic computing. These include ASCII (today's standard), ISO (international Organization for Standardization) and JIS (Japanese Industrial Standard).
1963	Roy Wisbey forms Center for Literary and Linguistic Computer at Cambridge University
1966-78	Various professional organizations are founded (Association for Literary and Linguistic Computing in 1973, Association for Computers and the Humanities in 1978), and they develop publications to explore computer use in humanities.
1973	The first version of <i>Index Thomisticus</i> appears 24 years after Busa started. Electronic text on punched cards are organized by dictionary headword.
1980	First draft of SGML released – this is a ‘standardized general markup language’ that is used in the creation of online documents.
1985	The Perseus Project at Harvard, one of the earliest digital scholarly libraries, is founded in 1985.
1987	The Text Encoding Initiative is formed. They were then an interdisciplinary and international group of 32 scholars dedicated to creating standards for representing texts online. TEI membership has since expanded extensively.
Late 1980s	ASCII emerges as the most common mode of character set standardization. The TEI determines that works coded using their standards will contain a line to indicate which ASCII version they are using: <code><?xml version = "1.0" encoding = "utf-8" ?></code> UTF-8 indicates the ASCII version.
1989	Canterbury Tales Project begun. This is one of the earliest extensive digital editing projects: the edition compiles 84 manuscripts and 4 incunabula editions dating from before 1500
1990	P1, the first draft of TEI guidelines, is released.
1996	The first CD-ROM of the Canterbury Tales Project is published. It uses SGML.
2000-today	The term ‘humanities computing’ gives way to the ‘digital humanities’. Further institutions, journals, and organizations are created to focus on studies in these areas. The TEI updates their standards: today they are on version P5. More digital editions are born.

This shifting technology is relevant for the history of editing the book online because it drastically changed the way that editors conceptualized a digital edition. As Fraistat and Jones summarize, the “largest challenge” in digital editing is to “produce an electronic edition that doesn't simply translate MLA themselves have modelled this type of interactive experimentation in their own scholarly the features of a print edition onto the screen but instead takes advantage of the truly exciting possibilities offered by the digital medium for the scholarly editing of poetry” (105), or, indeed, of any work. The collections: their 2013 “evolving anthology”, *Literary Studies in a Digital Age*, provides live comment boxes where readers can input their thoughts and discuss particular paragraphs of the anthology's twelve articles. Other editions like University College London's *Transcribe Bentham* project by Tim Causer invites the public to examine Bentham's manuscripts online and to assist in the transcription process, thereby integrating potential readers into their editorial process (Introduction para 1-2). Fraistat and Reiman's early electronic editions provided options for audience input through the use of frames on the screen: they presented a poem like Percy Shelley's “The Devil's Walk” in one scrollable box, the variants in another box, and the editorial annotations in yet a third, “making each part of the textual apparatus visible to the user at a glance, to be read easily and referenced in relation to every other part” (109). Though the *Romantic Circles* editions have since moved away from this format, the use of frames is replicated in other editions (see Bauer and Zirkier's student-run Mark Twain projects) and it, alongside commenting and transcription options, provide examples of the many strategies that digital editors have employed to increase reader engagement with their new medium.

Soliciting audience participation in either the editing or reading process demonstrates the ways that editorial practice tends to follow the more general trends of literary analysis. We are in an era of criticism that expands the typical generic restrictions for inclusion in the selective canon, as seen in the increased scholarship in fan studies and adaption theory or in post-colonial cultural and race studies. These modes of analysis emphasize what Apollon, Belisle and Regnier term a model of “looking inward” and appreciating a text “as an individual expression that is valid and representative for its time and setting” (44). In their survey of the development of editorial theory, Apollon, Belisle and Regnier trace editorial history through three stages. First, some editors practice “looking backward” through the use of stemmatics and developing an “Ur text” – a practice common for early editors who worked on texts like the Bible or Greco-Roman classics or to editors of modern vernacular literature who have adopted these traditional methods. Later, Apollon, Belisle and Regnier argue that “looking outward” become the editorial focus, and readers saw the creation of genetic and historically-contextualized editions (36-40). Finally, this was followed by a more “inward” focused model that results in editions that focus their interpretative weight on the text itself, including both the linguistic codes and bibliographic evidence both

in the text and of its material format (44). Kathryn Sutherland's edition of Jane Austen's *Persuasion* manuscripts represent this kind of interest, as Sutherland produces transcriptions while also including facing page images that indicate the creases, crossed out lines, and stains that signify the "private circulation between family and friends" that her story enjoyed (*Intro* para 1).

Though they are speaking primarily of the history of print editing, Apollon, Belisle and Regnier's model of looking back, looking out, and looking in maps well to the evolution of computing in editorial analysis as well. As discussed, the earliest methods of computing were used for textual analysis, to measure word use and frequencies and apply the kind of stemmatic analysis conducted in Robinson's 1989 *Tales* edition. But evolving alongside Robinson's older model of analysis – an appropriate one given the time period *Tales* originates from – were more exploratory and genetic models of collating materials online. George Landow's *The Victorian Web* began in 1988 and continues to this day. His website represents a networked series of linked materials that trace the political, social, economic history and so much more of the Victorian period (*What is the Victorian Web*). *The Victorian Web* was born in "hypermedia environments... that existed long before the World Wide Web" and now lives online with the aim of "[presenting] its images and documents, including entire books, as nodes in a network of complex connections" (*Why* para 1). "It emphasizes the *link* rather than the *search tool*... and presents information linked to other information rather than atomized and isolated" (*Why* para 1). *The Victorian Web* is thus a tool that looks outward, making connections between a text and the works and pieces that surround it.

Given both the internet's capacity for facilitating easy linking between information and the multitudinous volumes of information available online, it might seem surprising that looking "inward" would follow "outward" in a digital context. The impulse to look outward and harness the wealth of information available online characterized much early digital editing; however, such methods could easily fall victim to "undisciplined scholarship, editions and commentaries", enabled by the "ease of access to unscholarly versions" and non-copyrighted materials (Buzzetti and McGann 58). Stuart Curran's *Frankenstein* edition, hosted on Fraistat and Jones' *Romantic Circles* site, is a good example of a project that began with ambitious goals and later scaled back to maintain both the centrality of the text under discussion and the scholarly quality of materials cited. "What we attempted to design was a work of totalized intertextuality," said Curran of initial iterations of his edition (83). "Rudimentary offerings on *Romantic Circles*" presented "illustrative visual materials... and contextual works" as well as links to full bodies of other texts like *Paradise Lost*, a central intertext of *Frankenstein*. However, as Curran layered annotations on and supplied increasing amounts of intertextual material, he ran up against the questions of what to include and what to dismiss (85). He recognized that "no library of this sort can ever be both

comprehensive and sufficiently limited to offer true parameters” for inclusion; eventually, he had to scale back on the scope of his project, so that he could “acknowledge that the text of the novel has returned to its position as the principal center of edition” (86). By focusing on the text itself under discussion, and limiting the extent of the linked network that he built around it, Curran maintained an inward focus in his editorial practice. My own edition demonstrates this type of focus as well. It was tempting to make links to some of the many intertexts Darwin cites – especially where scholarly editions are readily available, as in the case of Ovid’s *Metamorphoses* in his Proem – but I opted against hyperlinks that extended beyond my own site. My primary goal is to create a reading edition that allows students to peruse the text from start to finish, clearly maintaining Loves as the central focus of the edition, and thus, like Curran, I limited the scale of my annotations to those references contained within the text itself.

Developing alongside these shifting models of digital editing was the technology by which such editing was achieved. As table 3 demonstrates, the technology of markup languages evolved in several stages, moving from the emergence of a single, popular coding system for all character-sets – Unicode – to the Text Encoding Initiative’s generation a specific encoding language for scholarly editing. The TEI has increasingly become the starting point for many digital editing projects, and their guidelines exist to constrain the development of unscholarly materials by forcing editors who use it to adhere to a highly detailed set of tags and rules. Early online archives of scholarly materials tend not to use the TEI standards – Landow’s *Victorian Web* is an example of this – but newer editions will often employ the standards. For example, many recent and all future editions hosted on *Romantic Circles* will use TEI. Thus, my own edition adheres to a standard that is, while not universally used, certainly a norm.

2.1 Debates in Digital Editing

Because they are often shared online and made accessible to the public, many of the early discussions about the ideology of digital editing praised its democratic potential. In their introduction to *Electronic Textual Editing* – a collection of essays on digital editing practice which also includes the MLA’s latest Guidelines for Editors of Scholarly Editions – experienced digital scholars Burnard, O’Brien O’Keefe, and Unsworth indicate that “concomitant with the spread of computing facilities, and with their adoption as the basic means of communication among academics at all levels, has been an extraordinary democratization in the production of textual editions”(12). Though the editors acknowledge the potential quality concerns with these editions (12), the sense of liberation concordant with digital editing is expressed by many scholars. Space is not a barrier in a digital realm in the same way it limits a print publication: a book can only be so large before necessitating multiple volumes, and colour reproduction can be costly. Typesetting or highly quality printing can add to those costs, or such decisions may simply be out of the editor’s control. In a digital space, new types of barriers exist, but

those pragmatic concerns that limit print editions become less of an issue. With this ability to include more information, more documentary evidence and more commentary easily, McGann is able to follow in the footsteps of McKenzie's social editing model of looking outward from a text. He notes that, "scholarly 'editing' no longer confines itself to a focus on textual documents alone, but now pursues investigations into the entire social context that comprises the cultural work" (2010 37). But not only does a digital space alter the *nature* of the work it houses; it alters the *process* by which that work is created as well. "Digital environments upset the editorial chain", write Apollon and Belisle; "the scholarly editor has the possibility to become online publisher, make his editorial work public" (88). Robinson too highlights this change: "without our noticing it, over the last decade a different model of editing has emerged" – we have moved away from a "top-down editor-driven model" to a collaborative model where many contribute to a widely shared and affordable product (2010b 59).

Part of this newfound democratic ethos is the result of the mass transition of works between canons discussed earlier: with an increased number of works moving into the accessible canon, there is a consequent decrease in what editor Martha Smith calls "BE-O" objects, "artifacts that have customarily been viewed by experts only"(8). Even the tools with which to conduct digital editing and textual analysis are often freely available. From the TEI Guidelines to the collation comparison resources catalogued (and, in the case of the Versioning Machine, developed) by Susan Schreibman (2010) to the concordance programs surveyed by David Hoover (para 19), both the coding and compilation of analytical data can be generated at home, for free. With an increase in material to work with, and a decrease in the barriers to enter scholarship, the optimism that initially surrounded digital editing seemed justified.

However, like any novel technology or change in medium, digital editing has faced scrutiny and skepticism of its usefulness: the most pronounced of these comes from Kathryn Sutherland, bibliographer and editor of an evolving digital edition of Jane Austen's manuscripts. Sutherland cautions that digital editors have been too quick in their adoption and adaptation, saying that many existing digital editions ignore questions of potential reader and of good interface design, bringing "delight and funding to those who compile them" (20) but with "limited" worth to a larger reading audience (22). "We are paying insufficient attention to electronic difference at almost every stage of our engagement with the architecture and functioning of the electronic edition" she elaborates, "because we are too enamored of electronic simulation" (18). In a direct attack on McGann and his followers, she points out the irony of editors who use "the computer to fetishize the book as object", highlighting some of the fundamental technological differences that no amount of high-fidelity facsimile reproductions will overcome, such as the heft of a Victorian novel in the hands of a daunted reader (20). The book online, Sutherland reminds us, can never *both* "simulate and release the text from its bookishness", and thus the claims of McGann

and others that online editions can reproduce a book's materiality while also overcoming limitations of the print form become paradoxical.

In her observation of that paradox, Sutherland highlights an obvious but important distinction for online editors. The book online is *mediated* experience, to an even greater extent than a print edition. In addition to the paratexts an editor herself adds to a print book – the layers of interpretation, the additional introductions – digital works are surrounded by further paratextual thresholds. The initial Unicode is one paratext, as is whatever text-encoding metalanguage the editor chooses to use. But in addition to these invisible layers are the more blatant ones – the Web browser that loads the edition, the screen that the user views it through, the combinations of pixels that make up a text. These elements represent a new materiality of the digital book, and they are often overlooked in the rush to cite the many benefits of digital representation. Reflecting on my own editing experience, I realized that Sutherland's objections to the "bookishness" of online books revealed a seemingly obvious consequence of my editorial actions: in my quest to present the original paratexts of Love's more thoroughly, I also added many new paratextual layers.

Despite her negative stance, Sutherland seeks to model rigorous and meaningful digital editing through her own project that pays close attention to the bibliographic codes in Jane Austen's manuscripts. With its access to numerous manuscripts from many museums and private collections, her edition overcomes a significant limitation of digital editing that scholars have recently begun to note. In his 2010 essay, "Editing Without Walls", Chaucer editor Peter Robinson's own optimism about digital editions is tempered by one of the same obstacles that barred my own work: in a digital world,

the costs have sky-rocketed. You can't just present samples: a few images, a few transcripts. You have to present all the versions of the text, in image and transcript form, and that costs money... for photography, for permissions, text capture, encoding and correction, then lots more money to create interfaces, and to support the digital humanities centers which house the staff who can help the editor do all these things (2010b 59).

In tandem with the increased accessible canon and the increased ability to access that canon, then, are the many costs that come with such access. My own edition is housed on a free and limiting content management site, Wix, because I did not have the funds for my own server nor the access to one of the digital humanities institutions that provides such a service. My own quest for high-quality facsimile reproductions of Love's was quashed by the high costs involved, and even my use of low-quality reproductions was complicated by concerns over copyright permissions. "The demon of copyright," as Robinson calls it in a 2010 book chapter, adds "to the sheer expense and difficulty of making digital editions" (2010a 148). Curran too discloses the naivety that first accompanied digital editing projects: in

earlier versions of his *Frankenstein* edition, he describes a complex series of interlinked materials that showcased how authors made reference to each other's works in various ways. Those interlinked documents were "the most innovative aspect of the edition" and the editors, perhaps foolishly, "presumed that the copyright issues involved would eventually be universally solved rather than becoming, as it turned out, even more legally complicated and intractable" (83). If I faced challenges with my edition, which has only one witness reproduced, it comes as no surprise that massive projects like Robinson's, which indexes some 84 copies of *The Canterbury Tales*, and editions that attempted to more overtly showcase their intertexts, like Curran's earlier *Frankenstein* drafts, find real barriers in the location and reproduction of facsimiles. The inclusion of image-based paratexts is thus one of the enduring obstacles in digital editing, and while scholars with extensive funding and robust support overcome these issues, as Sutherland has, they remain a realistic barrier for many.

Sutherland's edition could also overcome this barrier more easily because she is working from single witnesses of Austen's works. Indeed, Sutherland finds the inclusion of multiple witnesses in digital editions problematic: presenting each and every variant in every surviving witness threatens to "freeze our selection capacities as readers, redirecting them towards a wilderness of locally variable and meaningfully inert features" (23). Essentially, Sutherland fears that readers will be lost in the limitlessness of digital editions: "at an extreme, each user will choose, expertly or ineptly, her own variant text to prove her own critical point (everyone her own editor), a direct route to silencing critical dialogue and the shared life of our discipline" (23). With multiple variants presented, no single stable version of text will emerge to inform discussions. This dramatic conclusion that *more* documentary evidence of a text's various forms will result in *less* effective discussion seems ironic, especially given that Sutherland's own editorial work catalogues exactly these types of intermediary documents – "working drafts, fair copies, and crafted 'publications' for private circulation among family and friends" as well as cancelled chapters from Austen's *Persuasion* (Intro para 1). Though she is working from a single manuscript of *Persuasion*, her insistence on providing facsimile reproductions of intermediate stages in a text's production seems to provide *more* information to inform reader commentary. I acknowledge that having access a surplus of documentary evidence can confuse a reader; for that reason, I opted to limit the size of my hypertextual network and to notate only substantive variants between witnesses in my own edition, hoping thereby to present a single and stable version for discussion. However, Sutherland's stern reprimand of her contemporaries' editions – "the electronic depository is currently best seen as a recyclable wastebank, one that can be scavenged by scholars for particular purposes" with little use to the everyday reader (25) – seems stronger than necessary, especially given that many editors are, in various small ways, in agreement with her.

What digital editors have come to realize is not that they should eschew the representations of documentary evidence critical to the history of the works they are editing, but rather that self-discipline is necessary. This is a lesson familiar to editors of print editions, but more salient because digital space can overcome some of the space and cost restrictions of the print form. Experienced editor G. Tanselle puts it best:

It is understandable, editors would revel in their newfound freedom to offer images and transcriptions of all relevant primary documents. But their goal of giving readers the freedom, in turn, of conveniently studying different textual manifestations of a work cannot be fully realized without their offering a variety of editorial helps and emended texts (5).

Thus a strong editorial voice is perhaps even more important in digital environments where paratextual representation alongside the central text is increasingly easy. As Siemens et al. indicate, editorial decisions have always “[configured] the relationship between reader, editor and text” and they will continue to do so online (165). In a digital space, elements like “interface and design”, like “user studies and usability assessments” (Siemens 167), must become considerations of the editor so that they are able to provide a clear reading path that leaves space for reader agency, leverages the advantages of the medium, and provides an instructive editorial voice. Understandably, this balance is a difficult one to reach, and although digital editing is entering its fourth decade, debate continues over the best method for achieving such an outcome. The following section will examine several editions, the first of which is my own, with the aim of cataloguing the various ways the digital editors attempt to reach this balance.

2.2 Diverse Digital Practices

Whether consciously or not, discussions about digital editing practices are peppered with words like “affords” (Price and Siemens), “allows” (Curran, Greg, McGann 1995), and “enables” (Hockey, Deegan and Sutherland) when discussing what can be achieved in a digital edition, and words like “constrains” (Renear, Schreibman 2013), “unable” (Hockey), and “limits” (Buzetti, Fraistat and Jones) when highlighting the drawbacks of some aspects of the technology, be it the text-encoding language, the server, or the ability to obtain copyright permissions. These editors are conducting, in their own eloquent fashions, a pros and cons analysis of their new tools and medium, and the ideas they hint at through their assessments of the creation and usability of their editions are succinctly categorized in psychology and design expert Donald Norman’s *The Design of Everyday Things*. Norman terms these contrasting ideas - what *can be done* with a technology/tool/medium versus what a technology /tool/medium *prevents* us from doing – affordances and constraints, respectively. Affordances chart “the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could

possibly be used” (9) and constraints “limit the realm of possibility as to what things can be” (60). Understanding the possibilities and limits created by a medium is essential to effectively using that medium to represent content, like a poem and its paratexts.

In my own edition, the affordances of the medium attracted me to a digital space. I knew that on the internet, hyperlinking could increase ease of navigation and enable relatively seamless integration of images into digital space. I could also include my own annotations at a distance, and thereby avoid further clutter on Darwin’s already densely packed pages. I believe my edition successfully leverages these affordances. The inclusion of a “Back” button at the end of my annotations also facilitates reading ease, as it ensures that my readers will not have to scroll through the entirety of the document each time they peruse a footnote. The TEI:XML encoding language enabled these elements. The benefits of using a standardized and pre-existing metalanguage meant that the actual encoding process, while certainly tedious, was also fairly straightforward to implement.

Conversely, the fact that I employed TEI served as a constraint in other ways. An XML language is extensible, but it offered no method for overwriting pre-existing formatting choices. For that reason, I had to create additional tags to use in lieu of the tags designed for a particular part of the text (see my discussion of using the <note> tag in section 1.2.2). My editing experience made me realize that each additional layer of technology I employed would add its own constraints: these are what Norman terms “physical constraints” – constraints inherent in the tool/medium itself.

- 1) **The transcription:** The transcription process immediately forced me to make decisions about character representation, as the limitations of Microsoft Word as a transcription program meant that I could not render some of the complex character forms or completely represent the typeface appropriately. While it proved an affordance through allowing me to easily position and track my annotations, via Word’s commenting feature, the program also constrained my ability to accurately replicate Darwin’s printed work. However, given my own editorial principles of normalization, this constraint had little effect on my editorial objectives.
- 2) **The coding:** The TEI:XML presented its own constraints, as discussed with the <note> tag. It also meant that I had to work with an accepted series of tags that other humanities scholars had deemed appropriate for digital editing. As Fraistat and Jones note, these tags are somewhat limiting, and though XML placed a greater emphasis on bibliographic codes than the older form of TEI encoding, SGML (106), I still had to create additional <rendition> attributes so that I could represent Darwin’s indenting appropriately (see the <tagsDecl> section of my code in Appendix A: TEI:XML). TEI:XML also limited my choice of font-type and line spacing, and these were both constraints that I was not able to overcome, despite exploration.

- 3) **Translating to a web-friendly form:** The translation from TEI to HTML was the most arduous part of my encoding process. While the translation software I used, TEItoHTML running on a Linux virtual machine, worked, I was frustrated to learn that HTML could not represent some of the information encoded in my TEI:XML code. As the code in Appendix A indicates, I encoded line numbers. However, the constraints associated with HTML representation meant that my line numbers never translated into HTML; the constraints of each encoding language were different, and HTML proved unable to represent my line numbers.
- 4) **Putting the HTML online:** Placing my HTML onto Wix, a free content management service, also added a layer of technological, physical constraints. Wix does not allow users to directly author the HTML code that makes up the website. Instead, a user can place HTML objects onto a pre-selected layout. Thus, I was able to compose the various pages of my website with relative ease, using a What-you-see-is-what-you-get (WYSIWYG) interface. The WYSIWYG interface was an affordance in that it greatly reduced the amount of time I had to invest in creating the various apparatuses of my edition. I just wrote the documentation in Word and was able to paste it into the WYSIWYG front-end with minimal rearranging and hyperlinking. However, the WYSIWYG interface also proved a constraint when trying to determine how my actual TEI:XML encoded edition would appear on the page. It forced my edition into a box with a scrollable form. If I increased the size of this form, the hyperlinks in my edition's code no longer worked. Thus, the Wix interface applied a constraint to the presentation aspect of my edition. Working on a server where I could not alter the HTML code of a page directly, I could not overcome the constraint. Given the affordances of Wix as an easy content organization system, and, most importantly, the fact that it was free and accessible, I opted to continue using it despite these constraints.

Each layer of technical mediation of my content came with its own constraints, and by the time my edition made it online, it looked quite different from what I had envisioned. But throughout the process, I knew that constraints would impact what I would be able to achieve, and these constraints did not always take technical forms: a third and non-technical constraint emerged in the process of obtaining facsimiles for reproduction. Norman refers to this type of constraint as a “cultural constraint” – “some constraints rely upon accepted cultural convention even if they do not affect the physical or semantic operation of a device” (121). I wanted users to be able to view original images of Darwin's work: in an academic culture, the expectation is that the use of such images requires copyright permissions and, sometimes, payment for the services of copying. I had to scale back my ambitions in the face of this constraint, as high-quality photographs proved cost-prohibitive. Instead, I opted to obtain copyright permission for the

low-quality reproduction I had; as a result, I was expected to alter elements of my edition's design in order to house the images; for example, I had to introduce a password wall.

I realized, through the analysis of affordances and constraints at work in my editing process, that the bulk of the constraints did not impact the linguistic codes of my edition, but rather the bibliographic codes. So while I was able to reproduce the content of the text and its paratexts, I was often forced to make concessions in terms of the form that content took or the quality of the paratexts included. Thus, while I turned to a digital space for liberation from the limitations of a print space, with the ultimate aim of effective representations particularly of the paratexts of The Loves of the Plants, the physical and cultural constraints of the process prevented me from realizing my ideal edition.

Intrigued by my own failures, particularly in the realm of paratextual representation that was so important to my editorial principles, I decided to explore how other editors responded to these challenges. The section that follows briefly analyzes three editions of poetic works that, like Darwin's poetry, are rife with paratextual representation: the "The Miller's Tale" from Peter Robinson's *The Canterbury Tales Project*; "The Tyger" from *The Blake Archive*, edited by Morris Eaves, Joseph Viscomi and Robert Essick; and the only other critical edition of a work by Erasmus Darwin, Martin Priestman's *The Temple of Nature*, hosted on Fraistat and Jones' *Romantic Circles*.

These editions all prioritize radically different editorial ends. *The Blake Archive*, for instance, is an example of what editor Carole Palmer terms a "thematic research collection" – a "new genre of scholarly production" that uses "information technologies" to recreate "basic resources of research" (para 1). By compiling "every printing of every book" (Eaves, Viscomi and Essick *Principles* para 5) available under certain copyright and accessibility provisions, *The Blake Archive* becomes more than the edition of a single work, but rather a collection. It includes not just Blake's illuminated books but also many of his other works – manuscripts, drawings, prints, and other illustrations. *The Blake Archive*, thus, demonstrates what Apollon, Belisle and Regnier termed "looking outward", capturing the robust publication history of Blake's complex works. By contrast, Robinson's work with Chaucer focuses on tracing variants, as is seen in the sample of "The Miller's Tale" made available to the public, and his work thereby looks backward to trace the evolutionary links between one witness and another. Priestman's edition, like my own, uses editorial commentary to contextualize Darwin's often tangential thinking; Priestman works within the text to highlight the intra- and intertextual connections of a single poem. However, despite these divergent purposes, each edition has to grapple with similar struggles: image representation is an important part of all three editorial ventures, as are questions of how to document information from multiple witnesses, and how to retain a sense of the book's materiality.

Given their distinct intentions, my discussion of each edition will focus solely on this commonality: what do the editors do with the paratexts and how do they facilitate reader access and interaction to paratextual information?

2.2.1: Looking Backward: Peter Robinson's "The Miller's Tale"

Editor Edward Vanhoutte has studied design practice in electronic editions extensively, and he remarks that "an interface [for a digital edition] should be conceived as an aggregate of means by which the user can interact with the text, commentary, and ancillary material" (34). This was a point that Robinson attended to throughout the various evolutions of his *Canterbury Tales Project*. Robinson and his team designed specialty software to enable them to better render the variety of information they encountered in their vast collection of Chaucer manuscripts. In particular, the *Anastasia* program creates the interface for user interaction, and the *Collate* program enables graphemic parallel transcription of the text, programmed with regularization tools to remove spelling and presentation variants to generate a single version for presentation (*Making the CD-ROM* para 1).

With the impressive collation data that *Collate* could identify via comparison, Robinson's team partnered with the Department of Biochemistry at the University of Oxford to gain a "better appreciation of the various phylogenetic methods applicable to textual traditions" (*Making* para 3). This process led to the conclusion that there "was no evidence of word-by-word revision by Chaucer in the groupings" of manuscripts; instead the addition or deletion of large passages, approved by Chaucer, seemed more likely (Robinson 86).

For Robinson and his team, then, the cataloguing and presentation of variants in his witnesses was a crucial component of presenting Chaucer's work. To that end, he provides readers with a "Show Popups" button – when that button is enabled, variants are displayed if a user hovers over a word with their cursor. By providing the option to see variants, Robinson gave his readers the same information he and his team used to make their conclusions about the text's revision history. He furthered this by also providing a variant map, and by explaining his process of categorizing witnesses into groups.

The most impressive aspect of Robinson's edition is the high-quality rendering of images. He presents readers with a variety of choices as to how they would like to read the "The Miller's Tale". They can read from the text/image mode, where a digital facsimile is presented on the left and a plain-text transcription (with some specialty characters necessitated by the Middle English script) on the right. Readers can independently scroll through either of the two panes. Or they can compare plain-text transcriptions from whichever witnesses they choose: the "Compare" tool allows readers to select witnesses and view them at the same time, side-by-side. Differences between the two are highlighted in red.

Due to the editors' interest in the history of the text, the commentary they provide is not interpretative or thematic, but rather stemmatic in its focus. The "Stemmatic Commentary" section breaks down each line of the text and comments on the witnesses' relations to that line.

Robinson's edition is dense with scholarly information; complex variant maps and high-fidelity text rendering, even in the transcriptions, have ensured that his edition of "The Miller's Tale" stays somewhat true to paratextual elements like letterform. The textual analysis that frames his work suggests a scholarly audience, and indeed, the interface design is rife with elements that are likely of more interest to bibliographic scholars than to, say, an undergraduate student audience. However, as Robinson himself indicates in a 2010 book chapter, "traditional print editions acted as filters, straining out all this information so that readers did not have to see it. If readers do not want to see it then including all this is no advantage at all" (2010a 148). His edition employs its purpose-built interface to give readers the choice of what to view through the "Show Popsups" and "Compare" functions, and as with many design choices, these functions simultaneously enable affordances while enacting constraints. The following section breaks down features of Robinson's edition and discusses each feature's affordances and constraints.

1) **Photo Facsimiles**

- a. Affordances: The high-quality photo representations of facsimile images allow readers to appreciate aspects of the text's materiality (colour, letterform, illustrative elements like border scrolls) that are lost in the plain-text transcription.
- b. Constraints: As Sutherland notes (20), the translation to a digital medium is inherently different from a print form: putting a holograph manuscript online "[displaces] onto the e-reader those aspects of production which, in print, situated the text within a social workforce" (20). An online image might encourage readers to disregard the sociology of the text so prized by McKenzie – the distinct feel of hand-made paper, the visible indentations in the page left by scribal hands, the sewn binding of the book. These details are easier to overlook in an image on a screen, and thus the text loses some of its richness.

2) **Compare Witnesses**

- a. Affordances: being able to compare witnesses takes into account an important field of Genette's analysis of paratexts: time. "If, then, a paratext may appear at any time, it may also disappear, definitively or not, by authorial decision or outside intervention or by virtue of the eroding effect of time," he writes (6). Documenting the evolution of a text through collating the variants in its witnesses thus captures a fuller history of the text –

that was the reason I chose to replicate the “Advertisement” published with Loves, for instance. Robinson’s “Compare” function affords the quick examination of witnesses in tandem. Though the feature is limited to one-to-one comparisons of only two witnesses, it facilitates this task by highlighting differences in red.

- b. Constraints: While Robinson’s edition succeeds in its robust collection of variants in the linguistic codes, his compare function enables only the comparison of transcriptions, not of the facsimile images themselves. Thus, the compare function prioritizes the central text, the written codes, over the bibliographic codes. This demonstrates a prioritization that Genette notes; often, editors are more interested in “authorial” elements of a work than those “which are the publisher’s responsibility”, or, in the case of Chaucer, the scribe or illustrator’s responsibly (23).
- 3) **Commentary:**
- a. Affordances: The stemmatic commentary provides in-depth, evidence-based textual analysis; it explicates in particular detail what is generally illustrated in the variant map. It enriches the scholarly worth of the edition because it provides expert readers with a summary of what can be found via exhaustive comparison of all witnesses. Given the impressive bulk of the Chaucer collection the work shared in the “Stemmatic Commentary” section saves subsequent scholars significant time and effort.
 - b. Constraints: The “Stemmatic Commentary” section is written for an audience adept at understanding stemmatic analysis and the process of categorizing witnesses into groupings and tracing their links. The learning curve to comprehension is steep for those who are not already knowledgeable in the field or possessing the tools of textual analysis. The language of the commentary is thus a constraint, a barrier to entry that will daunt those who are not already competent practitioners of this type of study.

The constraints observed in various features of Robinson’s edition are especially significant for novice users, but given the explicit scholarly audience Robinson’s work targets, especially considering the pay-wall behind which it is hidden, it is likely that his readers are either well-studied in Chaucer or well-studied in textual editing. His facsimiles facing images convey bibliographic information about “The Miller’s Tale”, while his text transcription focuses on stemmatic interests. When writing about the *Canterbury Tales Project*, Robinson reveals that a “core belief of the project: that we could use new tools and our materials to change the way people experience a text” (86). The combined interface of photo-representations and transcriptions succeed in enriching the viewing experience; however, the project’s largest gains have been through the use of computer programs to run complex collation and variant

comparisons. The outcomes of these comparisons have reoriented how people think about the transmission history of the *Tales*, and through the edition's comparison features, readers are enabled to explore that history themselves.

2.2.2: Looking Outward: William Blake's "The Tyger"

The editorial history of William Blake's poetry is one of frequent alterations to paratextual elements like size, image representation, colour, and lettering. "Editors have always tried to make Blake more readable, more attuned to the cultural norms of reading" (3), says Morris Eaves in his overview of the history of editing Blake. The result is a "fractured" representation of Blake in the many anthologies that simply produce the words of Blake's illuminated plates without the images intertwined with the text (3). A preference, then, for linguistic over bibliographic codes.

Viscomi, Essick, and Eaves sought to reunite the split codes in their online thematic research collection, *The Blake Archive*. Through collecting full-colour facsimile images of Blake's work with an initial focus on his illuminated books, *The Blake Archive* was built to respond to a need in scholarship. "The historical and artistic value" of the illuminated books, their "editorial and technical fragility, and their widely dispersed present locations" – these were factors that "created for scholars a need for a new map of their [the illuminated books'] place in Blake's lifetime of artistic labour" (*Editorial Principles* para 5).

The resulting archive empowers users to compare each available version of Blake's plates side by side. Readers are given the choice of which and how many witnesses they would like to compare and can then conduct their own evaluations. Exhaustive publication information is provided for each copy a plate is from: the editors explain details of place, time, and persons involved, as well as material elements of the work, like the number of pages, plate order, stab holes for binding, provenance, printing style, and even ink colours employed. Each image can also be enlarged, though the default scale of the reproduction is informed by the actual size of Blake's prints (*Editorial Principles* para 14).

The editors' dedication has always been to the quality of the image representation: "the priority that we grant to the media, the methods, and histories of artistic product has dictated a feature of the Archive that influences virtually every aspect of it. It is utterly fundamental: we *emphasize the physical object - the plate, page, or canvas - over the logical textual unit - the poem or other work abstracted from its physical medium*" (*Editorial Principles* para 8). They own up to a deliberate reversal of the type of prioritization in previous print editions: the bibliographic appreciation of work as material object holds sway. However, linguistic codes, while not at the forefront of the edition, can still be accessed via a drop

down box that offers both an “Image Description” option that provides a written description of the plate and a “Textual Transcription” option.

The “Text Transcription” reproduces a typed version of each plate’s text. Though this function is deliberately not applied as a default, giving readers the option to view a transcription increases the reading ease, especially for an audience new to Blake or an audience reading a poem they are unfamiliar with. Indeed, though “The Tyger” is a fairly readable poem in Blake’s engraving, his other plates demonstrate the way that text can be densely packed on a plate (the Introduction to *Songs of Innocence and of Experience*, for example), and providing a textual transcription can facilitate reading ease and also ensure that each work in the archive is text-searchable – a user can input a word and view a list of all the works in which that word appears.

Given their own admission that “the reproduction of images is a top priority” (*Editorial Principles*, para 18), the editors were also eager to replicate efficient search methods for images. In his essay, “Picture Problems: X-Editing Images” Eaves describes the impressive efforts of the editors in their quest to create “sophisticated tools to search images like you search text” (20). *The Blake Archive* houses over 10,000 images: in order to achieve their purpose, the editors realized they needed a purpose-built tool (20). The result was Image Search, a program “custom tailored to Blake’s work” that is still in development today (27). The tool is functional but awaiting improvements, and thus far it works as follows: each uploaded image is tagged with one of a predefined set of tags created by the editors, ranging from icons like tigers to concepts like death to characters in Blake’s mythology like Urizen. Users can then apply one or several tags (up to nineteen tags can be applied) and search. If the editors have tagged the image with the tags being searched for, then the images will appear. Though some limitations have already been noted, the following section will discuss the affordances and constraints of these novel features.

1) **Photo Facsimiles**

- a. **Affordances:** As in Robinson’s edition, the high-quality photo representations enable appreciation of the materiality of the text. The breadth of images available empowers viewers too, as they are able to witness the great variety in Blake’s renditions of the same plates. In the descriptions provided for each photo facsimile, the editors try to overcome Sutherland’s critique that materiality is inevitably lost in the translation online.
- b. **Constraints:** Original editors of Blake were responding to 1) a cultural constraint that the artist’s work presents and to 2) the same concerns about image reproduction and cost that deter editors today. Surrounded by the illumination, the text of Blake’s plates can be

challenging to read. By providing a transcription process, the editors combat this critique, but by providing that transcription at a removed distance, accessed only via several clicks, they make the reading of Blake's works challenging for unfamiliar viewers.

2) **Compare Witnesses:**

- a. Affordances: *The Blake Archive* improves upon the comparison function, as employed in Robinson's edition, as it allows users to view many witnesses at once, instead of only comparing two witnesses.
- b. Constraints: Unlike the Robinson edition, no commentary is provided on the relation of plates to each other. Information is chunked and provided with each image, and the reader is left to make the connections among time, place, and other publishing information. The stemmatic focus of Robinson's edition means that these connections are made explicit to the reader via commentary; the more archival interests of the *Blake Archive* editors mean that presenting each work is a higher priority than linking between the works.

3) **Image Search:**

- a. Affordances: Many online editors struggle with the concept of image searching: for example, Kiernan in his *Beowulf* had to provide linked descriptions that could be searched so that his users could navigate the many images involved in his edition (264). *The Blake Archive* is a pioneer in its image searching capacity, and its tagging system succeeds so long as a user knows what terms they are able to input. The archive provides a list of terms that can be applied: readers can check boxes of the terms that they would like to search for. All images in the *Archive* are tagged with a subset of the available tags, and all images with tags that match any of the reader's inputs will be returned in a list for the reader to peruse.
- b. Constraints: Tagging images is, like text-encoding and all editorial work, a subjective process. What one editor interprets as a symbol of death may differ from another editor or from the user's interpretation. Thus the use of tags proves an imperfect system, and Eaves admits that developing the Image Search function has taken up the most time from a development perspective, with relatively small return: it is one of the least-used functions of their archive (2009 19). This represents a cultural constraint of the feature: users are familiar with the CTRL+F ability of a computer to search text, but how often are we able to search sites, particular scholarly archives, for tagged images? Perhaps users are also

conceptually unprepared for a tool like Image Search or perhaps they are skeptical of the effectiveness of the tool given the limitations of the function.

Like Robinson's "The Miller's Tale", many of these constraints are borne from the editors' editorial principles. They are interested in facsimile reproduction and a robust representation of Blake's work: thus the absence of any commentary and the hidden nature of the textual transcriptions are not surprising. This edition, like Robinson's, in some ways fits into Martha Smith's "by experts only" term – its ideal users are scholars more than junior students or curious members of the public, and as a result, the *Archive* employs a variety of functions to facilitate cataloguing and searching, and few to facilitate interpretation of the works.

2.2.3: Looking Inward: Martin Priestman's *The Temple of Nature*

As the only critically edited work of fiction by Erasmus Darwin, Priestman's *The Temple of Nature* was of interest for informing my own editorial practice, and in many ways, my edition is modelled on his. Priestman too wrestled with "the fact that [*Temple*] is already extremely well supplied with footnotes of its own, as well as the fifteen Additional Notes... which virtually equal in bulk the already annotated poem itself" (*About* para 3). Like Priestman, I overcame the prospect of messy "notes on notes on notes" with an online edition that "allows readers to travel at will as far down the annotation trail as they wish" (*About* para 3).

While my annotations made use of a footnoting system via hypertext number links and underlined blue links for Darwin's internal references, Priestman uses different signals for the two levels of hyper-linking. He uses green font to indicate an internal note and a blue asterisk to indicate a connection to one of his footnotes.

The images in *The Temple of Nature* were designed by Henry Fuseli and engraved by Moses Haughton. In Priestman's edition, they are embedded within the text of the poem itself, with an explanatory note hyperlinked below. I adopted this model for incorporating images and providing annotation – as I could not place my footnote on particular parts of the image that I was discussing, I opted to follow Priestman and create a more robust note that discussed various elements of the image. For example, in the note for this image, The Creation of Eve, Priestman transcribes the quotation from the engraving and also indicates the artistic genesis of the piece, providing some interpretative supposition as to Fuseli's design choices.

Priestman's edition is hosted on Neil Fraistat and Steven Jones' Romantic period literature website, *Romantic Circles*. Thus, the navigation of the edition is embedded into the *Romantic Circles* website's framework. Readers are able to quickly navigate through sections of *Temple* via the Table of

Contents along the side of each page (where they can also see the many other editions hosted on *Romantic Circles*).

Clearly, Priestman's editorial goals differ from the goals of Robinson's *Canterbury Tales Project* or of a thematic research collection like *The Blake Archive*. His subject matter dictated the form that his edition would take: as Priestman states, his work is "the first fully annotated edition of any of Erasmus Darwin's published works" (*About* para 1). With no existing precedent, Priestman is not responding to an existing editorial tradition like Eaves, Essick, and Viscomi were, and with a limited scope of witnesses, the stemmatic interests of Robinson do not apply. Instead, like my own edition, Priestman aimed to generate a stable, readable and accessible version of the text and to provide elucidation of that version: for instance, as he acknowledges, "Darwin uses Greek and Roman myths as extended similes for scientific phenomena" (*Introduction* para 5) and such references are helpfully explained via editorial commentary. Despite the similarity, then, in our editorial ends, our strategies are somewhat different. To examine those differences, I will discuss affordances and constraints of Priestman's edition.

1) Photo Facsimiles

- a. Affordances: Providing Fuseli and Haugton's images embedded within the poem itself replicates the way they images would have been encountered in the text's original form – as one page of many in a particular place in the reading order. Priestman's editions lack the high-fidelity quality of either *The Blake Archive* or "The Miller's Tale", but the image still succeeds in giving the reader a visual cue to work from, and represents what Priestman terms Darwin's "insistence on the visual" (*Intro* para 5).
- b. Constraints: Unlike my edition, Priestman's edition does not present the facsimile thumbnails for a detailed comparison of his transcription to his copy-text. Nor does it represent a facing-page facsimile layout, as seen in Robinson's edition. Thus, much of the visual and paratextual information encoded on a printed page does not translate to his typed transcription sections.

2) Hyperlinking

- a. Affordances: Priestman's *Temple of Nature* was the only edition surveyed in this section that represented the first critical version of a text. Blake and Chaucer, by contrast, have long been members of the selected canon. As the first critical edition, Priestman's use of hyperlinks was especially important, as it enabled readers to fluidly transition throughout the text itself and to easily access scholarly commentary.

- b. Constraints: For readers to actively use hyperlinks, those links must be visually coded somehow. While I opted for an overt number hyperlink, Priestman chose a less obtrusive symbol, the asterisk. His small symbol runs the risk of being overlooked, but has the added benefit of not intruding too distinctly on the reader's reading process. Unlike my hyperlinks, however, Priestman's do not provide a brief, pop-up explanation of the text that is being linked to. With a brief pop-up, my edition allows readers to either 1) read the entire note if it is short or 2) get a sense of the note's contents to determine if they would like to read further. Without these functions, Priestman's notes might result in frequent transitions back and forth between text and annotation for his readers. The use of a green font for Darwin's own notes is also unobtrusive, but does represent a divergence from the bibliographic codes of the source text.

3) Table of Contents:

- a. Affordances: Because of its small scope, the *Temple of Nature* edition is the most easily navigable of the editions examined in this section. The use of a table of contents allows for quick movement between sections.
- b. Constraints: The Table of Contents also imposes specific distinctions between sections, creating breaks that are stronger than those of the printed page. In a codex book, each page is separated by a page turn, whether or not those are pages within a section or the difference between one Canto and the next. In Priestman's edition, like my own, readers do not have the option to read the text as one continuous scroll, and instead *must* use the hyperlinks to navigate between the breaks that the editor has imposed. While Priestman has mirrored breaks in Darwin's own text, he has also added his own ordering, as seen in his section that showcases only the engravings of a text. Though it is a slight change, it does impact the reading path a reader can take through the work.

Donald Norman discusses the existence of "conceptual models": our interactions with unfamiliar technology and systems result in our mind forming models to explain how "these objects work" or "events take place" (39). I was familiar with Priestman's edition before my own editorial work began and it formed a sort of conceptual model that encouraged me to attempt to replicate aspects of it, particularly in how he dealt with the challenge of annotating an annotated text. However, further experimentation with my own edition and examination of the various tools and strategies employed by other editions has taught me that the affordances embraced by digital editions are all unique, usually chosen not because they *can* be done, but because they suit the needs of the editor and align with their editorial principles. Hence, *The Blake Archive* employs many high-fidelity images while *The Temple of Nature* reproduces a single

version of the text of the single printing of the work. Admittedly, many of the constraints that follow are, in some ways, the result of technological barriers. But very often, the constraints applied by the technology chosen by the editor will be especially detrimental if you are not a member of their target audience. The constraints of a buried text transcription option in *The Blake Archive* do not impact scholars whose interests align with the interests of Viscomi, Eaves, and Essick. Nor does the complexity of the stemmatic commentary in Robinson's work deter exploration by text analysts. In a digital space, then, the realm of editorial decisions expands. Scholarly editions have always been tools for "mediating textual scholarship" (Robinson 2010a 152). By entering a digital space, the tools of mediation are multiplied to include whatever functionalities and resources the editor can imagine and practically realize. Each one of these innovations will carry with its own affordances and constraints that further mediate the reading process.

2.3 Conclusion

Editing has always been a series of transformations to create a readable and useful version of a text for a particular audience. Representing a document online is yet another form of transformation an editor can apply to a work. The question of what needs transforming has occupied editors of all forms of editions. My own prioritization of the paratextual was inspired by Genette's discussion of the critical importance of those paratexts, by McGann's insistence that bibliographic codes were equal to linguistic codes, and by D.F. McKenzie's insistence that those paratextual elements elucidated context that would otherwise be lost. The illustrations in [The Loves of the Plants](#) are an example of this, as they reveal information about both the cycle of production that Darwin participated in and the social circles he travelled in.

Transforming the paratext to a digital environment alongside the text was a task that many editors had already tackled in myriad ways. As my brief survey concludes, the outcomes of those strategies vary and often align particularly with the editorial needs at work in each project. I was frustrated in my own attempts to render paratexts accurately, and I learned through those failures that there are so many more factors at play than the mere technology. Cultural constraints like copyright, the expense of hosting a website, the learning curve of using novel software even when that software is freely provided: all of these served as barriers to the translation of the paratexts of my copy text. But I was encouraged too by the potential displayed in examples like *The Blake Archive*, "The Miller's Tale", and *The Temple of Nature*: with persistence, funding, and co-operation (an inherent element of digital projects, I was realizing), robust paratextual representation could be achieved. By surveying these editions and more, I identified new features that could improve my work, such as the inclusion of hyperlinked facsimile images.

In her condemnation of current electronic editorial practice, Kathryn Sutherland pinpoints Jerome McGann and his 1995 essay “The Rationale of Hypertext” that deliberately attempts to update W.W. Greg’s seminal 1950 paper “The Rationale of Copy-text” (21). Digital editing, as McGann sees it – liberating, equalizing, accessible – only really works for texts that “fret about their bookishness”, says Sutherland (21). She cites examples like McGann’s own work with Dante Gabriel Rossetti, but also mentions names like Emily Dickinson (currently under extensive digital editing in Martha Smith’s *Emily Dickinson Archive*) and, of course, William Blake. Most books, Sutherland implies, are just fine with their bookishness: they do not need experimental formats or extensive online catalogues to showcase their uniqueness. A standard print edition will do (21). What Sutherland highlights in her examples, however, is what I inadvertently had realized, right from the inception of my project.

The digital format and online editions are not *necessary* for all books. I turned to the digital environment not because it was a novel form of technology, but because it was *suited to my editorial purposes*. Each of the examples Sutherland cites are texts rife with paratextual information. Smith discusses the “coffee stains, and traces of ribbons, or flowers” that “offer a view into the manuscript circulation and exchange so central to Dickinson’s literary world” (24). These bibliographic codes are fundamental to the mode of reading Smith wants to capture in her edition of Dickinson’s works. Sutherland’s own editing practice with Jane Austen’s manuscripts, which purports to be “an edition of a series of objects as well of their texts” also falls into this category due to its interest in presenting manuscript facsimiles and preserving spelling, paragraphing, punctuation, and “other distinctive features of her writing hand” (*Editorial Principles* para 2). The online medium is largely embraced by editors of texts that “fret about their bookishness” because is suited to capturing the evidence of that fretting – the illustrations that make Blake’s plates both poetry and art, the unique letter forms of Middle English scribal culture, the dense footnotes and instructive diagrams of eighteenth century scientific poetry. Sutherland’s concerns about overabundance or loss of scholarly rigour can be addressed via all the same methods for addressing quality concerns in print editing: a clear editorial voice and firmly stated, true principles can help contextualize a digital reading experience. As the MLA articulates, whether online or in print: “a scholarly edition is clear about its commitments, and it keeps its promises” (para 2).

In digital editing, then, editors often act to edit that which we struggle to edit in print – complex paratexts and multitudinous witnesses that cannot be contained in the codex form pragmatically. We do so with the existence of collaborative tools and rigorous standards, but we also do so with experimentation. As in the print world, editing decisions in a digital medium are subjective, chosen because of reasons that align with editorial aims and are explained to readers through transparent editorial principles. Erasmus

Darwin chose a scientific poem because he wanted his instructive text to be accessible, interesting, and interactive for his readers: I hope that he would approve of my choice of an electronic medium for all the same reasons.

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Appendix A: TEI-XML Edition Code

Validation Schema Code

The validation schema is used to ensure that the TEI-XML is compliant with TEI P5 Guidelines. Editors input their schema into editing software like Oxygen.

The program can then identify areas of the content that are incorrectly using the tags.

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Front Materials Code

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</author>
<editor>Alana Rigby</editor>
<sponsor>Social Sciences and Humanities Research Council of Canada</sponsor>
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<name>Tristanne Connolly</name>
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<name> Katharine Acheson</name>
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typographical practice of the short s. Spacing before the use of semi-colons has been
regularized and the space removed. Spelling has been converted throughout to
Modern English usage based on the Oxford English Dictionary.</p>
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<anchor xml:id="pn1"/><p> Editor's Note

<note n="1" resp="editor" place="foot"> Darwin always intended The Botanic Garden to be a two poem collection of which "The Loves of the Plants" was the second poem.

Despite this, Loves was published first, in 1789. It was not until 1791, with

"Loves" in its second edition, that the first half "The Economy of Vegetation" was published. Though the copy

text for this edition was a third edition version of "Loves", also published in

1791, it was published as a stand-alone copy of "Loves" and did not contain

"Economy". <ref target="#pn1"> Back. </ref></note> </p>

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<anchor xml:id="pn2"/><p> Editor's Note

<note n="2" resp="editor" place="foot"> This frontispiece by Emma Crewe, a designer for the Wedgewood family with whom Darwin was close, depicts Flora, Roman goddess of flowers, and Cupid, the classical figure associated with love.

<ref target="#pn2"> Back. </ref>

</note>

</p>

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<anchor xml:id="pn3"/> <p> Editor's Note

<note n="3" resp="editor" place="foot"> Lines 5-69 from <hi rend="italic">

>Epithalamium for Emperor Honorius</hi>, a wedding poem by 4th century Latin

poet Claudian. 'The leaves live for love; in every deep grove, the happy tree is

in love: the palms bend down to mate with each other, poplar sighs for passion

for poplar, and plane tree whispers to plane, and alder sighs for alder'. <ref

target="#pn3"> Back. </ref>

</note>

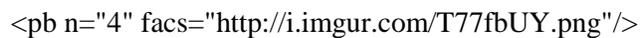
<anchor xml:id="pn4"/>

<note n="4" resp="editor" place="foot"> An eminent publisher in the late 18<hi

rend="superscript">th</hi>century, Joseph Johnson (1738-1809) is primarily

known for his publishing of and support for radical writers like Thomas Paine and Mary Wollstonecraft. He also worked for over two decades with William Blake, the early Romantic poet and engraver who supplied Johnson with many engravings. Although not responsible for "The Loves of the Plants" illustrations, Blake provided illustrations for the other volume of *The Botanic Garden*, "The Economy of Vegetation." [Back](#).

Given a royal charter to operate in 1571, the Stationers' Company controlled printing and copyright in the English book trade until 1911. The right of printers and publishers to print specific works were recorded in the Stationers' Registry. [Back](#).



ADVERTISEMENT

ADVERTISEMENT

In the initial 1789 publication of *The Botanic Garden*, the advertisement immediately preceded the Preface to "The Loves of the Plants." In this stand-alone third edition of "Loves" the advertisement is not included. Given that the advertisement is an oft-cited component of the poem, it has been borrowed from the 1790 second edition to include in this edition. [Back](#).

THE general design of the following sheets is to enlist Imagination under the banner of Science, and to lead her votaries from the looser analogies, which dress out the imagery of poetry, to the stricter ones, which form the ratiocination of philosophy. While their particular design is to induce the ingenious to cultivate the knowledge of BOTANY;

Botany in the late 18th century was becoming a fashionable topic of study, a trend spurred in part by King George III's mother Princess Augusta developing a botanical garden at Kew, and by would-be Royal Society president Joseph Banks' discovery of 1300 new species while on a exploration voyage with Captain James Cook. [Back](#).

by introducing them to the vestibule of that delightful science, and recommending to their attention the immortal works of the Swedish Naturalist

LINNAEUS

Carl Linnaeus (1707-1778) is remembered for pioneering the system of binomial nomenclature still used to classify life, though he also travelled Europe collecting natural specimens and taught botany at Uppsala University in Sweden. [Back](#).

<p rendition="#indent1"> In the first Poem, or Economy of Vegetation, <anchor xml:id="pn9"/>

<note n="9" resp="editor" place="foot"> Although it was not published until 1791, two years after the first two editions of "The Loves of the Plants", Darwin always intended <hi rend="italic">The Botanic Garden </hi> to be a two poem collection of which "Loves" was the second poem. Like "Loves", "Economy" uses heroic couplets and lengthy footnotes; its themes differ in its increased focus on natural philosophers and industrialists. <ref target="#pn9"> Back. </ref>

</note> the physiology of Plants is delivered; and the operation of the Elements, as far as they may be supposed to affect the growth of Vegetables. But the publication of this part is deferred to another year, for the purpose of repeating some experiments on vegetation, mentioned in the notes. In the second poem, or LOVES OF THE PLANTS, which is presented to the Reader, the Sexual System of <persName>LINNAEUS</persName> is explained, with the remarkable properties of the many particular plants. </p>

<p rendition="#indent1"> The author has withheld this work (excepting a few pages) many years from the press according to the rule of <persName>Horace</persName>, <anchor xml:id="pn10"/>

<note n="10" resp="editor" place="foot"> A reference to Roman poet Horace's (65-8 BC) <hi rend="italic">Ars Poetica </hi> in which Horace advises authors to wait until the 9<hi rend="superscript">th</hi> year after composition of a text before publishing. <ref target="#pn10"> Back. </ref>

</note> hoping to have rendered it more worth of the acceptance of the public, - but finds at length, that he is less able, from disuse, to correct the poetry; and, from want of leisure, to amplify the annotations. </p>

</div>

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<head rendition="#large #center"> PREFACE.</head>

<p>

<persName>LINNAEUS</persName> has divided the vegetable world into 24 Classes; these Classes into about 120 Orders; these Orders contain about 2000 Families, or Genera; and these Families about 20,000 Species; besides the innumerable Varieties, which the accidents of climate or cultivation have added to these Species. <anchor xml:id="pn11"/>

<note n="11" resp="editor" place="foot"> In <hi rend="italic">Systema Naturae</hi>(1735), his earliest work of classification, Linnaeus first catalogued life forms, fitting them into twenty-four categories. The categories were refined in subsequent works; <hi rend="italic">Genera Plantarum </hi> (1771) in particular finalizes this categorization process for plant life. <ref target="#pn11"> Back. </ref>

</note>

</p>

<p rendition="#indent1"> The Classes are distinguished from each other in this ingenious system, by the number, situation, adhesion, or reciprocal proportion of the males in each flower. The Orders, in many of these classes, are distinguished by the number, or other circumstances of the females. The

Families, or Genera, are characterized by the analogy of all the parts of the flower or fructification. The Species are distinguished by the foliage of the plant; and the Varieties by any accidental circumstance of colour, taste, or odour; the seeds of these do not always produce plants similar to the parent; as in our numerous fruit-trees and garden flowers; which are propagated by grafts or layers. <anchor xml:id="pn12"/>

<note n="12" resp="editor" place="foot">

<hi rend="bold">Grafts or Layers: </hi>removing a cut section of a plant and using it to engender new plant growth through attaching the cutting to another plant. <ref target="#pn12"> Back. </ref>

</note>

</p>

<p rendition="#indent1"> The first eleven classes include the plants, in whose flowers both the sexes reside; and in which the Males or Stamens <anchor xml:id="pn13"/>

<note n="13" resp="editor" place="foot">

<hi rend="bold">Stamen: </hi>stalk that protrudes from the flower's center; it bears the flower's pollen. Following Linnaeus' system, Darwin also gendered his representations of plant organs. This is an arbitrary imposition of human gender onto plant life: although the stamen and pistils are reproductive organs of plants, their functions are not entirely analogous to those of human male and female reproductive organs. <ref target="#pn13"> Back. </ref>

</note> are neither united nor unequal in height when at maturity; and are therefore distinguished from each other simply by the number of males in each flower, as is seen in the <ref target="#ClsChrt1"> annexed PLATE </ref> , copied from the <title> Dictionaire Botanique </title> of <author><persName><forename>M.</forename>

<surname>BULLIARD</surname></persName></author>, <anchor xml:id="pn14"/>

<note n="14" resp="editor" place="foot"> Jean Bulliard (1742-1793) was a French botanist who, along with fellow botanist Louis-Claude Richard (1727-1791), compiled botanical terms into a single volume which identified and defined the terms which, in their opinions, "[constituted] a grammar of botany" (Bulliard and Richard "Grammar of Botany"). <ref target="#pn14"> Back. </ref>

</note> in which the numbers of each division refer to the Botanic Classes. </p>

<pb n="6" facs="http://i.imgur.com/oKVMj6z.png"/>

<space quantity="1" unit="lines"/>

<p rendition="#indent1"> CLASS I. <hi rend="smallcaps">ONE MALE</hi>, <hi rend="italic">Monandria;</hi>

<anchor xml:id="pn15"/>

<note n="15" resp="editor" place="foot"> Analogizing between plant stamen and human male, Linnaeus' labels for stamen number combine Greek numerical prefixes – “mon” for one, “di” for two etc. – with “andria”, a derivation from Greek word for man: “andros”. <ref target="#pn15"> Back. </ref>

</note> includes the plants which possess but One Stamen in each flower. </p>

<p rendition="#indent1"> II. TWO MALES, <hi rend="italic">Diandria.</hi> Two Stamens. </p>

<p rendition="#indent1"> III. THREE MALES, <hi rend="italic">Triandria. </hi>Three

Stamens. </p>

<p rendition="#indent1"> IV. FOUR MALES, <hi rend="italic">Tetrandria. </hi>Four Stamens. </p>

<p rendition="#indent1"> V. FIVE MALES, <hi rend="italic">Petandria. </hi>Five Stamens. </p>

<p rendition="#indent1"> VI. SIX MALES, <hi rend="italic">Hexandria. </hi>Six Stamens. </p>

<p rendition="#indent1"> VII. SEVEN MALES, <hi rend="italic">Heptandria. </hi>Seven Stamens. </p>

<p rendition="#indent1"> VIII. EIGHT MALES, <hi rend="italic">Octandria. </hi>Eight Stamens. </p>

<p rendition="#indent1"> IX. NINE MALES, <hi rend="italic">Enneandria. </hi>Nine Stamens. </p>

<p rendition="#indent1"> X. TEN MALES, <hi rend="italic">Decandria. </hi>Ten Stamens. </p>

<p rendition="#indent1"> XI. TWELVE MALES. <hi rend="italic">Dodecandria. </hi>Twelve Stamens. </p>

<p rendition="#indent1"> The next two Classes are distinguished not only by the number of equal and disunited males, as in the above eleven Classes, but require an additional circumstance to be attended to, <hi rend="italic">viz.</hi>

<anchor xml:id="pn16"/>

<note n="16" resp="editor" place="foot"> From Latin, meaning “namely”. <ref target="#pn16"> Back. </ref>

</note> whether the males or stamens be situated on the calyx, <anchor xml:id="pn17"/>

<note n="17" resp="editor" place="foot">

<hi rend="bold">Calyx:</hi> a cup-shaped collection of leaves at the top of the stem. It surrounds the base of the flower and protects it, especially at the bud stage. <ref target="#pn17"> Back. </ref>

</note> or not. </p>

<p rendition="#indent1"> XII. TWENTY MALES. <hi rend="italic">Icosandria. </hi>Twenty Stamens inserted on the calyx or flower-cup; as is well seen in the last Figure of No. xii. in the <ref target="#ClsChrt1">annexed plate. </ref></p>

<p rendition="#indent1"> XIII. MANY MALES. <hi rend="italic">Polyandria. </hi> From 20 to 100 Stamens, which do not adhere to the calyx; as is well seen in the first Figure of No. xiii. in the <ref target="#ClsChrt1">annexed Plate.</ref></p>

<p rendition="#indent1"> In the next two Classes, not only the number of stamens are to be observed, but the reciprocal proportions in respect to height. </p>

<p rendition="#indent1"> XIV. TWO POWERS, <hi rend="italic">Didynamia.</hi><anchor xml:id="pn18"/>

<note n="18" resp="editor" place="foot"> Literally “two” from the Greek “di” and “power” from the Greek “dynamis”. Here, Linnaeus equated height of plant stamens with different levels of power. Because there are two heights of stamens, there are two levels of power represented. The same logic applies to the tetradynamia class, where four heights and thus four powers are represented. <ref target="#pn18"> Back. </ref>

</note> Four Stamens, of which two are lower than the other two; as is seen in the two first Figures of No. xiv. </p>

<p rendition="#indent1"> XV. FOUR POWERS, <hi rend="italic">Tetradynamia. </hi>Six Stamens; of which four are taller, and the two lower ones opposite to each other; as is seen in the <ref target="#ClsChrt2">third Figure of the upper row in No. 15.</ref>

</p>

<pb n="7" facs="http://i.imgur.com/W9r7Er7.png"/>

<space quantity="1" unit="lines"/>

<p rendition="#indent1"> The five subsequent Classes are distinguished not by the number of males, or stamens, but by their union or adhesion, either by their anthers, <anchor xml:id="pn19"/>

<note n="19" resp="editor" place="foot">

<hi rend="bold">Anther: </hi> pollen-bearing portion of the stamen; they are situated on top of the filaments. <ref target="#pn19"> Back. </ref>

</note> or filaments, <anchor xml:id="pn20"/>

<note n="20" resp="editor" place="foot">

<hi rend="bold">Filament: </hi>stalk portion of the stamen which holds the anther. <ref target="#pn20"> Back. </ref>

</note> or to the female or pistil. <anchor xml:id="pn21"/>

<note n="21" resp="editor" place="foot">

<hi rend="bold">Pistil:</hi> central part of the flower with a swollen base (ovary) which contains seeds, a stalk (style) which rises out of the ovary, and a tip to receive pollen (stigma). <ref target="#pn21"> Back. </ref>

</note>

</p>

<p rendition="#indent1"> XVI. ONE BROTHERHOOD, <hi rend="italic">Monodelphia.</hi>

<anchor xml:id="pn22"/>

<note n="22" resp="editor" place="foot"> Literally “one” from the Greek “mon” and “brotherhood” from the Greek “adelphia”. Linnaeus saw the stamens in this category of plants as united brothers clustered together by the filaments into single tubes or rings. <ref target="#pn22"> Back. </ref>

</note> Many Stamens united by their filaments into one company; as in the <ref target="#ClsChrt2">second Figure below of No xvi.</ref>

</p>

<p rendition="#indent1"> XVII. TWO BROTHERHOODS, <hi rend="italic">Diadelphia. </hi>

Many Stamens united by their filaments into two companies; as in the <ref target="#ClsChrt2">uppermost Fig. No. xvii.</ref>

</p>

<p rendition="#indent1"> XVIII. MANY BROHERHOODS, <hi rend="italic">Polydelphia.

</hi>Many Stamens united by their filaments into three or more companies, as in <ref target="#ClasChrt2">No. xviii.</ref>

</p>

<p rendition="#indent1">XIX. CONFEDERATE MALES, <hi rend="italic">Syngenesia. </hi>

<anchor xml:id="pn23"/>

<note n="23" resp="editor" place="foot"> From the Greek “syn” meaning “together” and “genesis” meaning “birth”, Linnaeus identified this class of plants by the fact that their filaments cluster together around joined anthers. <ref target="#pn23"> Back. </ref>

</note> Many Stamens united by their anthers; as <ref target="#ClsChrt2"> in first and second Figures, No. xix.</ref>

</p>

<p rendition="#indent1"> XX. FEMININE MALES, <hi rend="italic">Gynandria. </hi>

<anchor xml:id="pn24"/>

<note n="24" resp="editor" place="foot"> Because the stamens connect to what Linnaeus called the female part of the flower, the pistil, this class derives its name from "gyna" or "woman" in Greek and "andros", or "man".

<ref target="#pn24"> Back. </ref>

</note> Many Stamens attached to the pistil. </p>

<p rendition="#indent1"> The next three Classes consist of plants, whose flowers contain but one of these sexes; or if some of them contain both sexes, there are other flowers accompanying them of but one sex.</p>

<p rendition="#indent1"> XXI. ONE HOUSE, <hi rend="italic">Monæcia. </hi>

<anchor xml:id="pn25"/>

<note n="25" resp="editor" place="foot"> The stamen and pistils of plants usually occupy one flower, but in this class they are separated onto different flowers. This separation may have influenced Linnaeus' use of Greek the root word for injury - "aikia". <ref target="#pn25"> Back. </ref>

</note> Male flowers and female flowers separate, but on the same plant. </p>

<p rendition="#indent1"> XXII. TWO HOUSES, <hi rend="italic">Diæcia. </hi> Male flowers and female flowers separate, on different plants. </p>

<p rendition="#indent1"> XXIII. POLYGAMY, <hi rend="italic">Polygamia. </hi>

<anchor xml:id="pn26"/>

<note n="26" resp="editor" place="foot"> Literally "many" from the Greek "poly" and "marriages" from the Greek "gamos", Linnaeus identified this class of plants by the fact that they contain both flowers with stamens and pistils and flowers with either one or the other part. <ref target="#pn26"> Back. </ref>

</ref>

</note> Male and female flowers on one or more plants, which have at the same time flowers of both sexes. </p>

<p rendition="#indent1"> The last Class contains the plants whose flowers are not discernible. </p>

<p rendition="#indent1"> XXIV. CLANDESTINE MARRIAGE, <hi rend="italic">>Cryptogamia.</hi>

<anchor xml:id="pn27"/>

<note n="27" resp="editor" place="foot"> From the Greek "kryptos", meaning "hidden" and "gamos", meaning "marriage", Linnaeus could not discern the reproductive processes of these plants (such as ferns and fungi which reproduce by spores instead of pollen exchange). Thus, he labelled the class "hidden marriages", suggesting that they kept their reproductive process secret from human observers. <ref target="#pn27"> Back. </ref>

</note>

</p>

<p rendition="#indent1"> The Orders of the first thirteen Classes are founded on the number of Females, or Pistils, and distinguished by the names, ONE </p>

<pb n="8" facs="http://i.imgur.com/BLh96QF.png"/>

<space quantity="1" unit="lines"/>

<p> FEMALE, <hi rend="italic">Monogynia. </hi>

<anchor xml:id="pn28"/>

<note n="28" resp="editor" place="foot"> The female equivalent to the monandria

label, the Greek "gyna" meaning women. Linnaeus uses the number of pistils on a plant to determine its order. Stamens were his indication for distinctions at the class level, while number of pistils distinguished between the lower level of categorization: the order. <ref target="#pn28"> Back. </ref>

</note> TWO FEMALES, <hi rend="italic">Digynia. </hi> THREE FEMALES. <hi rend="italic">Trigynia, &c. </hi>as is seen in <ref target="#ClsChrt1">No. I.</ref> which represents a plant of one male, one female; and in the <ref target="#ClsChrt1"> first Figure of No. xi </ref> which represents a flower with twelve males, and three females; (for, where the pistils have no apparent styles, the summits, or stigmas, are to be numbered) and in the <ref target="#ClsChrt1">first Figure of No. xii.</ref> which represents a flower with twenty males and many females; and in the <ref target="#ClsChrt1"> last Figure of the same No. </ref> which has twenty males and one female; and in <ref target="#ClsChrt1">No. xiii. </ref>which represents a flower with many males and many females. </p>

<p rendition="#indent1"> The Class of TWO POWERS, is divided into two natural Orders; into such as have their seeds naked at the bottom of the calyx, or flower cup; and such as have their seeds covered; as is seen in <ref target="ClsChrt1">No. xiv. Fig. 3. and 5.</ref>

</p>
<p rendition="#indent1"> The Class of FOUR POWERS, is divided also into two Orders; in one of these the seeds are <reg>enclosed</reg> in the <reg>silique,</reg>

<anchor xml:id="pn29"/>

<note n="29" resp="editor" place="foot">
<hi rend="bold">Silique:</hi> a dry, elongated fruit. <ref target="#pn29">

Back. </ref>

</note> as in <hi rend="italic">Shepherd's purse. </hi>
<ref target="#ClsChrt2">No. xiv. Fig 5.</ref> In the other they are enclosed in a silique, as in <hi rend="italic">Wall-Flower. </hi>
<ref target="#ClsChrt1">Fig 4.</ref>

</p>
<p rendition="#indent1"> In all the other Classes, excepting the Classes Confederate Males, and Clandestine Marriage, as the character of each class is distinguished by the situations of the males; the character of the Orders is marked by the numbers of them. In the Class ONE BROTHERHOOD, <ref target="#ClsChrt2">No. xvi. Fig. 3.</ref> the Order of ten males is represented. And in the Class TWO BROTHERHOODS, <ref target="#ClsChrt2">No. xvii. Fig. 2. </ref> the Order ten males is represented. </p>

<p rendition="#indent1"> In the class CONFEDERATE MALES, the Orders are chiefly distinguished by the fertility or barrenness of the flowers of the disk, <anchor xml:id="pn30"/>

<note n="30" resp="editor" place="foot">

<hi rend="bold">Disk flowers: </hi>flowers situated on the circular area in the center of a flower <ref target="#pn30"> Back. </ref>

</note> or ray <anchor xml:id="n31"/>

<note n="31" resp="editor" place="foot">

<hi rend="bold">Ray flowers: </hi>Flowers surrounding the circular area in the center of the flower <ref target="#pn31"> Back. </ref>

</note> of the compound flower. </p>



 <space quantity="1" unit="lines"/>
 <p rendition="#indent1"> And in the class of CLANDESTINE MARRIAGE, the four Orders are termed FERNS, MOSSES, FLAGS, <anchor xml:id="pn32"/>
 <note n="32" resp="editor" place="foot">
 <hi rend="bold">Flags: </hi> A type of plant whose stem grows based on internal deposits, new wood inside itself instead of outside, typically found in moist places <ref target="#pn32"> Back. </ref>
 </note> and <reg>FUNGUSES</reg>. </p>
 <p rendition="#indent1"> The Orders are again divided into Genera, or Families, which are all natural associations, and are described from the general resemblances of the parts of fructification, in respect to their number, form, situation, and reciprocal proportion. These are the Calyx, or Flower-cup, as seen in <ref target="#ClsChrt1">No. iv. Fig. 1. No.x. Fig. I. and 3. </ref> <ref target="#ClsChrt2"> No. xiv. Fig. 1.2.3.4. </ref> Second, the Corol, or Blossom, as seen in <ref target="#ClsChrt1">No. i .ii. &c.</ref> Third, the Males, or Stamens; as in <ref target="#ClsChrt1">No. iv. Fig. I. and No. viii. Fig. 2. </ref> Fourth, the Females, or Pistils, as in <ref target="#ClsChrt1">No.i. No. xii. Fig. I.</ref> <ref target="#ClsChrt2">No. xiv. Fig. 3. No. xv. Fig. 3. </ref> Fifth, the Pericarp or Fruit-vessel; as <ref target="@ClsChrt2">No. xv. Fig. 4.5. No. xvii. Fig. 2.</ref> Sixth, the Seeds. </p>
 <p rendition="#indent1"> The illustrious author of the Sexual System of Botany, in his preface to his account of the Natural Orders, ingeniously imagines, that one plant of each Natural Order was created in the beginning; and that the intermarriages of these produced one plant of every Genus, or Family; and that the intermarriages of these Generic, or Family plants, produced all the Species: and lastly, that the intermarriages of the individuals of the Species produced Varieties. </p>
 <p rendition="#indent1"> In the following POEM, the name or number of the Class or Order of each plant is printed in Italics; as <hi rend="italic">"Two</hi> brother swains." <hi rend="italic">"One</hi> House contains them." and the word <hi rend="italic">"secret."</hi> expresses the Class of Clandestine Marriage. </p>
 <p rendition="#indent1"> The Reader, who wishes to become further acquainted with this delightful field of science, is advised to study the words of the Great Master, <anchor xml:id="pn33"/>
 <note n="33" resp="editor" place="foot"> Linnaeus <ref target="#pn33"> Back. </ref>
 </note> and is apprized that they are exactly and literally translated into English, by a Society at LICHFIELD, in four Volumes Octavo. <anchor xml:id="pn34"/>
 <note n="34" resp="editor" place="foot"> Founded by Darwin in 1778, the Botanical Society of Lichfield had only three members, Darwin included, and existed for the express purpose of translating Linnaeus' botanical works. The society translated two of Linnaeus' works from Latin to English. The first was a translation of <hi rend="italic">Systema Vegetabilium, </hi> a later edition of Linnaeus' <hi rend="italic">Systema Naturae </hi>(translated by the Society as <hi rend="italic">A System of Vegetables</hi> and published 1740-1791). The second was a more

complicated project which combined Linnaeus' *Genera Plantarum* and his *Mantissae Plantarum* with a supplementary work, *Supplementarum Plantarum*, by Linnaeus' son. The result was *The Families of Plants*, published 1787. [Back](#).



[To the SYSTEM OF VEGETABLES*](#)

[To the SYSTEM OF VEGETABLES*](#)

This is an English rendition of the 13th edition of *Systema Naturae*, a work first published by Linnaeus in 1735. This 13th edition was retitled *Systema Vegetabilium* by its editor Johan Murray (1740-1791), the Swedish pupil of Linnaeus. It includes an introduction by Murray entitled *Regnum Vegetabile* in which Murray elaborates on Linnaeus' classification system. [Back](#).

is prefixed a copious explanation of all the Terms used in Botany, translated from a thesis of Dr. [ELMGREN](#).

Johannes Elmgren wrote a thesis under the supervision of Linnaeus. The thesis was called *Termini Botanici*; it defined botanical terms and had been translated by Darwin in 1781. [Back](#).

with the plates and references from the *Philosophia Botannica* of

[LINNAEUS](#).

[Published in 1751](#), this work was the

culmination of Linnaeus' theorizing about botany; in it, he conveys the

binomial system still in use today. [Back](#).

[To the FAMILIES OF PLANTS†](#)

In this 1737 work, Linnaeus organizes all known genera of plants using his system. *Families of Plants* is the English translation of this work, translated by Darwin and the Botanical Society of Lichfield. [Back](#).

is prefixed a Catalogue of the names of plants and other Botanic Terms, carefully accented to show their proper pronunciation; a work of great labour, and which was much wanted, not only by beginners, but by proficients in BOTANY.

[_____](#)

[* The SYSTEM OF VEGETABLES translated from the Systema Vegetabilium](#)

in two Vols. is sold by LEIGH and SOTHEBY, [_____](#)

<note n="39" resp="editor" place="foot"> A prevalent printing house that still exists today as the largest and oldest auctioning firm in the world. <ref target="#pn39"> Back. </ref>

</note>

<hi rend="italic"> York Street, Covent Garden: </hi> Price eighteen Shillings, in Boards. </p>

<p rendition="#indent1 #smallest"> †<hi rend="italic">The FAMILIES OF PLANTS translated from the Genera Plantarum, </hi> in two Vols. By JOHNSON, <anchor xml:id="pn40"/>

<note n="40" resp="editor" place="foot"> An eminent printer in the late 18<hi rend="superscript">th</hi> century, Joseph Johnson (1738-1809) is primarily known for his publishing of and support for radical writers like Thomas Paine and Mary Wollstonecraft. He also worked for over two decades with William Blake, the early Romantic poet and engraver who supplied Johnson with many engravings, including ones for the other volume of <hi rend="italic">The Botanic Garden</hi>, "The Economy of Vegetation." <ref target="#pn40"> Back. </ref>

</note>

<hi rend="italic">St. Paul's Church-Yard, London: </hi> Price sixteen Shillings, in Boards. </p>

<pb n="11"/>

<anchor xml:id="ClsChrt1"/>

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<pb n="13" facs="http://i.imgur.com/8bb8YK8.png"/>

<div type="proem">

<head rendition="#center #large">PROEM</head>

<p rendition="#indent1 #smallest"> GENTLE READER! </p>

<p><seg rendition="#large"> LO</seg><seg rendition="#medium">, here a CAMERA OBSCURA

<anchor xml:id="pn41"/>

<note n="41" resp="editor" place="foot"> A box with a small hole through which light enters, reflects off the inside, and is projected outwards again. The result is a 2-D image of the box's surroundings that is then cast on the wall. Though the image does appear upsidedown, due to the reflective mirrors within the camera, the projected image does maintain both colour and perspective. <ref target="#pn41"> Back. </ref>

</note> is presented to thy view, in which are lights and shades dancing on a whited canvas, and magnified into apparent life! – if thou art perfectly at leisure for such trivial amusement, walk in, </seg>

</p>

<pb n="14" facs="http://i.imgur.com/mTVPIe8.png"/>

<space quantity="1" unit="lines"/>

<p rendition="#medium"> and view the wonders of my <reg>ENCHANTED</reg> GARDEN.</p>

<p rendition="#indent1 #medium"> Whereas <persName>P. OVIDIUS NASO,</persName>

<anchor xml:id="pn42"/>

<note n="42" resp="editor" place="foot"> The full name of Ovid, a Roman poet who wrote in the court of Gaius Octavius Augustus. <ref target="#pn42"> Back.

</ref>

</note> a great Necromancer in the famous Court of AUGUSTUS CAESAR, did by art poetic transmute Men, Women, and even Gods and Goddesses, into Trees and Flowers; <anchor xml:id="pn43"/>

<note n="43" resp="editor" place="foot"> Darwin is referring to Ovid's <hi rend="italic">Metamorphoses,</hi> a 15 book epic poem that recounted hundreds of classical myths. In many of these, Ovid described the transformation of people into plants, a common motif in classical myth; Darwin saw <hi rend="italic">The Loves of the Plants </hi> as reversing this transformation through his personification of plant life as human. <ref target="#pn43"> Back. </ref>

</note> I have undertaken by similar art to restore some of them to their original animality, after having remained prisoners so long in their respective vegetable mansions; and have here exhibited them before thee. Which thou may'st contemplate as diverse little pictures suspended over the chimney of a Lady's dressing-room, <hi rend="italic">connected</hi>

</p>

<pb n="15" facs="http://i.imgur.com/G99RFor.png"/>

<space quantity="1" unit="lines"/>

<p rendition="#medium">

<hi rend="italic"> only by a slight festoon of ribbons. </hi>And which, though thou may'st not be acquainted with the originals, may amuse thee by the beauty of their persons, their graceful attitudes, or the brilliancy of their dress. </p>

<p rendition="#right #large">FAREWELL.</p>

<p> </p>

<graphic url="http://i.imgur.com/ePKinQ3.jpg" rend="#center" height="5cm" width="5cm"/>

<anchor xml:id="pn44"/>

<note n="44" resp="editor" place="foot"> This small engraved sigil is by Thomas Holloway (1748-1827), a London-born engraver. Holloway's work varied in scale from small seals like this one to larger projects like his contribution of approximately 300 plate illustrations to an English Edition of J.C. Lavater's <hi rend="italic">Essays on Physiognomy. </hi> 800 illustrations were required for this project. The contributing artists, including Holloway, worked under the management of artist Henry Fuseli, an acquaintance of Darwin's who is directly cited by the poet in both the first Interlude and third Canto of <hi rend="italic"> The Loves of the Plants. </hi>

<ref target="#pn44"> Back. </ref>

</note>

</div>

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typographical practice of the short s. Diphthong characters are rendered as
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regularized and the space removed. Spelling has been converted throughout to
Modern English usage based on the Oxford English Dictionary. Printer marks
have been deleted. Author annotations that continued over page breaks have
been moved to the page on which the plant they notate is first mentioned.
The text (Continued p.#) has been added to indicate wher the page break
originally occured.The reg tag was used to these note placement changes.</p>
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<head>

<p rendition="#center #small">THE</p>

<p rendition="#center #large">LOVES OF THE PLANTS.</p>

</head>

<head rendition="#center">CANTO I.</head>

<lg>

<l>DESCEND, ye hovering Sylphs! aerial choirs,</l>

<l>And sweep with little hands your silver lyres;</l>

<l>With fairy footsteps print your grassy rings,</l>

<l>Ye Gnomes! accordant to the tinkling strings;</l>

<l n="5"> While in soft notes I tune to oaten <anchor xml:id="n1"/>

<note n="1" resp="editor" place="end">

<hi rend="bold">Oaten: </hi> Describing a musical pipe made of straw or the stem of a plant; often a symbol associated with rustic or pastoral poetry. <ref target="#n1"> Back. </ref>

</note> reed </l>

<l>Gay hopes, and amorous sorrows of the mead. —</l>

<l>From giant Oaks, that wave their branches dark,</l>

<l>To the dwarf Moss, that clings upon their bark,</l>

<pb n="2" facs="http://i.imgur.com/mdWQHr3.png"/>

<l>What Beaux and Beauties crowd the gaudy groves,</l>

<l n="10">And woo and win their vegetable Loves. </l>

<l>How Snowdrops cold, and blue-eyed Harebells blend </l>

<l>Their tender tears, as o'er the stream they bend;</l>

<l>The lovesick Violet, and the Primrose pale</l>

<l>Bow their sweet heads, and whisper to the gale;</l>

<l n="15">With secret sighs the Virgin Lily droops, </l>

<l>And jealous Cowslips hang their tawny cups.</l>

<l>How the young Rose in beauty's damask pride</l>

<l>Drinks the warm blushes of his bashful bride;</l>

<l>With honey'd lips enamour'd Woodbines meet,</l>

<l n="20">Clasp with fond arms, and mix their kisses sweet. — </l>

</lg>

<lg>

<l rendition="#indent1">Stay thy soft-murmuring waters, gentle Rill;</l>

<l>Hush, whispering Winds, ye rustling Leaves, be still;</l>

<l>Rest, silver Butterflies, your quivering wings;</l>

<l>Alight, ye Beetles, from your airy rings;</l>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">
<hi rend="italic">Vegetable Loves. </hi> I.10.
<persName>Linnaeus</persName>, the celebrated Swedish naturalist, has demonstrated, that all flowers contain families of males or females, or both; and on their marriages has constructed his invaluable system of Botany. </p>

<pb n="3" facs="http://i.imgur.com/DH4Unl1.png"/>
<l n="25">Ye painted Moths, your gold-eyed plumage furl,</l>
<l>Bow your wide horns, your spiral trunks uncurl;</l>
<l>Glitter, ye Glow-worms, on your mossy beds;</l>
<l>Descend, ye Spiders, on your lengthened threads;</l>
<l>Slide here, ye horned Snails, with varnish'd shells;</l>
<l n="30">Ye Bee-nymphs, listen in your waxen cells! – </l>
</lg>
<lg>

<l rendition="#indent1"> BOTANIC MUSE! <anchor xml:id="n2"/>
<note n="2" resp="editor" place="end"> Imitating the classical invocation to the muses, Darwin addresses an invented muse who governs over gardens, suggesting that she was responsible for inspiring Linnaeus, the Swedish Sage named here. <ref target="#n2"> Back. </ref>
</note> who in this latter age </l>
<l>Led by your airy hand the Swedish sage,</l>
<l>Bade his keen eye your secret haunts explore</l>
<l>On dewy dell, high wood, and winding shore;</l>
<l n="35">Say on each leaf how tiny Graces dwell;</l>
<l>How laugh the Pleasures in a blossom's bell;</l>
<l>How insect Loves arise on cobweb wings,</l>
<l>Aim their light shafts, and point their little stings.</l>
</lg>
<lg>

<l rendition="#indent1">“First the tall CANNA lifts his curled brow</l>
<l n="40">Erect to heaven, and plights his nuptial vow;</l>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">Canna </hi>I.39 Cane, or Indian Reed. One male and one female inhabit each flower. It is brought from between the tropics to our hot-houses, and bears a beautiful crimson flower; the seeds are used as shot <anchor xml:id="n3"/>
<note n="3" resp="editor" place="end">
<hi rend="bold">Shot</hi>: A pellet used for ammunition in a weapon <ref target="#n3"> Back. </ref>
</note> by the Indians, and are strung for prayer-beads in some catholic countries. </p>

<pb n="4" facs="http://i.imgur.com/kjLoeH9.png"/>
<l>The virtuous pair, in milder regions born, </l>
<l>Dread the rude blast of Autumn's icy morn;</l>
<l>Round the chill fair he folds his crimson vest,</l>
<l>And clasps the timorous beauty to his breast.</l>

</lg>
 <lg>
 <l n="45" rendition="#indent1"> Thy love, CALLITRICHE, two -
 <anchor xml:id="n4"/>
 <note n="4" resp="editor" place="end"> Darwin uses italics to indicate either the class (number of stamens) or order (number of pistils) of the plant. In this case, Callitriche possesses two pistils, so Darwin personifies these parts as “two virgins”. <ref target="#n4"> Back.
 </ref>
 </note> Virgins share, </l>
 <l>Smit with thy starry eye and radiant hair; -</l>
 <l>On the green margin sits the youth, and laves</l>
 <l>His floating train of tresses in the waves;</l>
 <l>Sees his fair features paint the streams that pass,</l>
 <l n="50">And bends for ever o’er the watery glass. </l>
 </lg>
 <lg>
 <l rendition="#indent1"><hi rend="italic">Two </hi> brother swains, of COLLIN’S gentle name, </l>
 <l>The same their features, and their forms the same</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Callitriche </hi> I.45 Fine-Hair, Stargrass. One male and two females inhabit each flower. The upper leaves grow in form of a star, whence it is called *Stellaria Aquatica* by
 <persName><surname>Ray</surname></persName>
 <anchor xml:id="n5"/>
 <note n="5" resp="editor" place="end"> A theologian and naturalist who flourished in the late 17th century, John Ray (1627-1705) published several works on botany and plant classification. <ref target="#n5"> Back. </ref>
 </note> and others; its stems and leaves float far on the water, and are often so matted together, as to bear a person walking on them. The male sometimes lives in a separate flower.</p>
 <pb n="5" facs="http://i.imgur.com/zELGauD.png"/>
 <l><anchor xml:id="collinsonia"/>With rival love for COLLINIA sigh,</l>
 <l>Knit the dark brow, and roll the unsteady eye.</l>
 <l n="55">With sweet concern the pitying beauty mourns,</l>
 <l>And soothes with smiles the jealous pair by turns.</l>
 </lg>
 <lg>
 <l rendition="#indent1"><anchor xml:id="genista"/>Sweet blooms GENISTA in the myrtle shade,</l>
 <l>And <hi rend="italic">ten </hi>fond brothers woo the haughty maid.</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Collinsonia</hi> I.51. Two males, one female. I have lately observed a very singular circumstance in this flower; the two males stand widely diverging from each other, and the female bends herself into

contact first with one of them, and after some time leaves this, and applies herself to the other. It is probable one of the anthers may be mature before
<add rend="i">Continued p.6</add> <reg>the other? See note on
<ref target="#gloriosa">Gloriosa </ref> and <ref target="#genista">Genista</ref>. The females in Nigella, devil in the bush, are very tall compared to the males; and bending over in a circle to them, give the flower some resemblance to a regal crown. The female of the epilobium augustifolium, rose bay willow herb, bends down amongst the males for several days, and becomes upright again when impregnated.</reg>

</p>

<p rendition="#indent1 #smallest">

<hi rend="italic">Genista. </hi>I.57. Dyer's broom. Ten males and one female inhabit this flower. The males are generally united at the bottom in two sets, whence Linnaeus has named the class "two brotherhoods." In the Genista, however, they are united in but one set. The flowers of this class are called papilionaceous, from their resemblance to a butterfly, as the pea-blossom. In Spartium Scoparium, or common broom, I have lately observed a curious circumstance, the males or stamens are in two sets, one set rising a quarter of an inch above the other; the upper set does not arrive at their maturity so soon as the lower, and the stigma, or head of the female, is produced amongst the upper or immature set; but as soon as the pistil grows tall enough to burst open the keel-leaf, <anchor xml:id="n6"/>

<note n="6" resp="editor" place="end">

<hi rend="bold">Keel-leaf: </hi> In translating Linnaeus, Darwin coined many English botanical terms still used. The term keel-leaf, however, was not widely adopted. Darwin uses it to identify an overhanging petal on the flower, one that initially envelops the bud and is later pushed open by the growing pistils or stamens. <ref target="#n6"> Back. </ref></note> or hood of the flower, it bends itself round in an instant, like a french horn, and inserts its head, or stigma, amongst the lower or mature set of males. The pistil, or female, continues to grow in length; and in a few days the stigma arrives again amongst the upper set, by the time they become mature. This wonderful contrivance is readily seen by opening the keel-leaf of the flowers of broom before the burst spontaneously. See note on <ref target="#collinsonia">Collinsonia, </ref>

<ref target="#gloriosa">Gloriosa,</ref>

<ref target="#draba">Draba.</ref>

</p>

<pb n="6" facs="http://i.imgur.com/MINjGxc.png"/>

<l n="60"><hi rend="italic">Two </hi>knights before thy fragrant altar bend,</l>
<l>Adored MELISSA! and <hi rend="italic">two </hi>squires attend. </l>
<l>MEADIA'S soft chains <hi rend="italic">five </hi>suppliant beaux confess,</l>
<l>And hand in hand the laughing belle address;</l>
<l>Alike to all, she bows with wanton air,</l>
<l>Rolls her dark eye, and waves her golden hair.</l>
</lg>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest"><hi rend="italic">Melissa. </hi>I.60. Balm. In each flower there are four males and one female; two of the males stand higher than the other two; whence the name of the class "two powers." I have observed in the Ballota, and others of this class, that the two lower stamens, or males become mature before the two higher. After they have shed their dust, they turn themselves away outwards; and the pistil, or female, continuing to grow a little taller, is applied to the upper stamens. See <ref target="#gloriosa">Gloriosa,</ref> and <ref target="#genista">Genista.</ref></p>

<p rendition="#indent1 #smallest">All the plants of this class, which have naked seeds, are aromatic. The Marum, and Nepeta are particularly delightful to cats; no other brute animals seem delighted with any odours but those of their food or prey. </p>

<p rendition="#indent1 #smallest">

<hi rend="italic">Meadia,</hi> I.61. Dodecatheon, American Cowslip. Five males and one female. The males, or anthers, touch each other. The uncommon beauty of this flower occasioned Linnaeus to give it a name signifying the twelve heathen gods; <anchor xml:id="n7"/>

<note n="7" resp="editor" place="end"> An interpretation based on the Greek root words for "dodecatheon", "dodeca" meaning "twelve" and "theo" meaning "god". Refers to the twelve major Olympian gods of the Greeks. <ref target="#n7"> Back. </ref>

</note> and Dr. Mead <anchor xml:id="n8"/>

<note n="8" resp="editor" place="end"> English physician and book collector Richard Mead (1673-1754) also funded the studies of naturalists George Edwards and Mark Catesby. Catesby demonstrated his gratitude by naming the American cowslip Meadia, after Mead. <ref target="#n8"> Back. </ref>

</note> to affix his own name to it. The pistil is much longer than the stamens, hence the flower-stalks have their elegant bend, that the stigma may hang downwards to receive the fecundating dust of the anthers. And the petals are so beautifully turned back to prevent the rain or dew drops from sliding down and washing off this dust prematurely; and at the same time exposing it to the light and air. As soon as the seeds are formed, it erects all the flower stalks to prevent them from falling out; and thus loses the beauty of its figure. Is this a mechanical effect, or does it indicate a vegetable storgé <anchor xml:id="n9"/>

<note n="9" resp="editor" place="end">

<hi rend="bold">Storgé:</hi> Feelings of affection, typically those from parent to offspring. <ref target="#n9"> Back. </ref>

</note> to preserve its offspring? See note on <ref target="#ilex">Ilex,</ref> and <ref target="#gloriosa">Gloriosa.</ref>

</p>

<p rendition="#indent1 #smallest"> In the Maedia, the Borago, Cyclamen, Solanum, and many others, the filaments are very short compared with the style. Hence it became necessary, 1st. to furnish the stamens <add rend="i">Continued p.7</add><reg>with long anthers. 2d. To

lengthen and bend the peduncle or flower-stalk, that the flower might hang downwards. 3d. To reflect the petals. 4th. To erect these peduncles when the germ was fecundated. We may reason upon this by observing, that all this apparatus might have been spared, if the filaments alone had grown longer; and that thence in these flowers that the filaments are the most

unchangeable parts; and that thence their comparative length, in respect to the style, would afford a most permanent mark of their genetic character.</reg>
</p>

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<pb n="7" facs="http://i.imgur.com/MINjGxc.png"/>
<lg>
<l rendition="#indent1" n="65">Woo'd with long care, CURCUMA cold and shy </l>
<l>Meets her fond husband with averted eye:</l>
<l><hi rend="italic">Four </hi> beardless youths the obdurate beauty move</l>
<l>With soft attentions of Platonic love.</l>
</lg>

<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">Curcuma.</hi> I.65. Turmeric. One male and one female inhabit this flower; but there are besides four imperfect males, or filaments without anthers upon them, called by Linnaeus eunuchs. <anchor xml:id="n10"/>
<note n="10" resp="editor" place="end"> Lacking the anther means that the stamens of the turmeric plant do not carry pollen. Without pollen, Linnaeus did not understand how turmeric could reproduce – hence the term eunuch. Today, turmeric is classified as a rhizome, a type of plant that reproduces by underground stems spreading roots which develop into new plants.<ref target="#n10"> Back. </ref>

</note> The flax of our country has ten filaments, but five of them are terminated with anthers; the Portugal flax has ten perfect males, or stamens; the Verbena of our country has four males; that of Sweden has but two; the genus *Albuca*, the *Bignonia Catalpa*, *Gratiola*, and hemlock-leaved *Geranium* have only half their filaments crowned with anthers. In like manner the florets, which form the rays of the flowers of the order frustraneous <anchor xml:id="n11"/>
<note n="11" resp="editor" place="end">

<hi rend="bold">Frustraneous Polygamy: </hi>An order within the class of syngensia, plants in this category have neither stamen or pistil on ray florets but have both on the disk florets. <ref target="#n11"> Back. </ref>

</note> polygamy of the class syngenesia, or confederate males, as the sun-flower, are furnished with a style only, and no stigma: and are thence barren. There is also a style without a stigma in the whole order diœcia gynandria; the male flowers of which are thence barren. The *Opulus* is another plant, which contains some unprolific <anchor xml:id="n12"/>

<note n="12" resp="editor" place="end">
<hi rend="bold">Unprolific: </hi> failure to promote production and fertilization <ref target="#n12"> Back. </ref>

</note> flowers. In like manner some tribes of insects of males, females, and neuters among them: as bees, wasps, and ants. <anchor xml:id="n13"/>
<note n="13" resp="editor" place="end"> Darwin frequently draws parallels across

kingdoms – from plant life, to animal life, to human life. He seems to have believed that many traits and abilities - such as locomotion, thought and, in this case, reproductive strategy - are in fact similarly demonstrated across all 3 kingdoms. <ref target="#n13"> Back. </ref>

</note>

</p>

<p rendition="#indent1 #smallest"> There is a curious circumstance belonging to the class of insects which have two wings, or diptera, analogous to the rudiments of stamens above described; viz. two little knobs are found placed on each a stalk or peduncle, generally under a little arched scale; which appear to be rudiments of hinder wings; and are called by <persName>Linnaeus,</persName> halteres, or poisers, a term of his introduction. <persName><forename>A.

T.</forename><surname>Bladh.</surname></persName>

Amæn Acad V.7.

<anchor xml:id="n14"/>

<note n="14" resp="editor" place="end">

<hi rend="italic">Amoenitates Academicae</hi> is the title of a series of scientific volumes, most published by Linnaeus, that included doctoral dissertations from Scandinavian natural philosophers. Included in Volume VII was Andreas Johannes Bladh's 1767 essay on insects, <hi rend="italic">>Fundamenta Entomologiae </hi>or the Foundations of Entomology. <ref target="#n14"> Back. </ref>

</note> Other animals have marks of having in a long process of time undergone changes in some parts of their bodies, <anchor xml:id="n15"/>

<note n="15" resp="editor" place="end"> Darwin's 1803 poem <hi rend="italic">The Temple of Nature</hi>was published post-humously and presents a more robust theory of evolution than the snippets of evolutionary thought found in <hi rend="italic">Loves</hi>. Because evolutionary theory was often coupled with atheism, the subject was doubly contentious, and writing about it in <hi rend="italic">Temple </hi>offended acquaintances of Darwin such as Samuel Taylor Coleridge and Joseph Priestly. <ref target="#n15"> Back.

</ref>

</note> which may have been effected to accommodate them to new ways of procuring their food. The existence of teats on the breasts of male animals, and which are generally <add rend="i">Continued p.8</add><reg>replete with a thin kind of milk at their nativity, is

a wonderful instance of this kind. Perhaps all the productions of nature are in their progress to greater perfection? an idea countenanced by the modern discoveries and deductions concerning the progressive formation of the solid parts of the terraqueous <anchor xml:id="n16"/>

<note n="16" resp="editor" place="end">

<hi rend="bold">Terraqueous: </hi> formed of both land and water <ref target="#n16"> Back. </ref>

</note> globe, and consonant to the dignity of the Creator of all things.</reg>

</p>

<pb n="8" facs="http://i.imgur.com/ByeLk0m.png"/>

<lg>

<l rendition="#indent1">With vain desires the pensive ALCEA burns,</l>

<l n="70"> And, like sad ELOISA, <anchor xml:id="n17"/>
 <note n="17" resp="editor" place="end"> While Darwin uses all capital letters to emphasize flower names, he also uses them when inserting external references either fictional or actual. Here, 'ELOISA' refers to the doomed romance of Eloise, a noble, and Abelard, her hired tutor. Upon learning of their tryst, Eloise's uncle had Abelard castrated. She was sent to a convent, he to a monastery. Their ill-fated love captured the imagination of many 18<hi rend="superscript">th</hi> century writers. <ref target="#n17"> Back. </ref>
 </note> loves and mourns.</l>
 <l>The freckled IRIS owns a fiercer flame,</l>
 <l>And<hi rend="italic"> three </hi> unjealous husbands wed the dame.</l>
 </lg>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <anchor xml:id="alcea"/>
 <hi rend="italic">Alcea. </hi>I.69. Flore pleno. Double hollyhock. The double flowers, so much admired by the florists, are termed by the botanist vegetable monsters; in some of these the petals are multiplied three or four times, but without excluding stamens, hence they produce some seeds, as Campanula and Stramonium; but in others the petals become so numerous as totally to exclude the stamens, or males; as Caltha, Peonia, and Alcea; these produce no seeds, and are termed eunuchs. Philos. Botan. No. 150. <anchor xml:id="n18"/>
 <note n="18" resp="editor" place="end"> Refers to <hi rend="italic">Philosophia Botanica</hi>(1751), a botanical treatise which amalgamated all of Linneaus' theorizing about botany; in it, he conveys the binomial nomenclature system still in use today. <ref target="#n18"> Back. </ref>
 </note>
 </p>
 <p rendition="#indent1 #smallest"> These vegetable monsters are formed in many ways. 1st. By the multiplication of the petals and the exclusion of the nectaries, <anchor xml:id="n19"/>
 <note n="19" resp="editor" place="end">
 <hi rend="bold"> Nectary:</hi>A nectar-secreting gland in a plant <ref target="#n19"> Back. </ref>
 </note> as in larkspur. 2d.. By the multiplication of the nectaries and the exclusion of the petals, as in columbine. 3d. In some flowers growing in cymes, the wheel-shape flowers in the margin are multiplied to the exclusion of the bell-shape flowers in the centre; as in gelder-rose. 4th. By the elongation of the florets in the centre. Instances of both these are found in daisy and feverfew; for other kinds of vegetable monsters, see <ref target="#plantago">Plantago</ref>
 </p>
 <p rendition="#indent1 #smallest"> The perianth <anchor xml:id="n20"/>
 <note n="20" resp="editor" place="end">
 <hi rend="bold">Perianth:</hi> a structure surrounding or forming the outer part of a flower <ref target="#20"> Back. </ref>
 </note> is not changed in double flowers, hence the genus or family may be often discovered by the calyx, <anchor xml:id="n21"/>
 <note n="21" resp="editor" place="end">

<hi rend="bold">Calyx:</hi>a cup-shaped collection of leaves at the top of the stem. It surrounds the base of the flower and protects it, especially at the bud stage.<ref target="#n21"> Back. </ref>

</note> as in Hepatica, Ranunculus, Alcea. In those flowers, which have many petals, the lowest series of the petals remains unchanged in respect to number; hence the natural number of the petals is easily discovered. As in poppies, roses, and Nigella, or devil in a bush. Phil. Bot. p.128.

<anchor xml:id="n22"/>

<note n="22" resp="editor" place="end"> Published in 1751, the <hi rend="italic">Philosophia Botanica</hi> culminated Linnaeus' theorizing about botany; in it, he conveys the binomial system still in use today. <ref target="#n22"> Back. </ref>

</note>

</p>

<p rendition="#indent1 #smallest">

<hi rend="italic">Iris.</hi> 1.71. Flower de Luce. Three males, one female. Some of the species have a beautifully freckled flower; the large stigma or head of the female covers the three males, counterfeiting a petal with its divisions. </p>

<pb n="9" facs="http://i.imgur.com/sRAsGaZ.png"/>

<lg>

<l>CUPRESSUS dark disdains his dusky bride,</l>

<l><hi rend="italic">One </hi>dome contains them, but <hi rend="italic">two </hi>beds divide.</l>

<l n="75">The proud OSYRIS flies his angry fair,</l>

<l><hi rend="italic">Two </hi>houses hold the fashionable pair.</l>

</lg>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<hi rend="italic">Cupressus</hi>. I.73.Cypress. One House. The male lives in separate flowers, but on the same plant. The males of some of these plants which are in separate flowers from the females, have an elastic membrane; which disperses their dust to a considerable distance, when the anthers burst open. This dust, on a fine day, may often be seen like a cloud hanging round the common nettle. The males and females of all the cone-bearing plants <anchor xml:id="n23"/>

<note n="23" resp="editor" place="end">

<hi rend="bold" xml:space="preserve">Cone-bearing plants: </hi>plants that reproduce via cone, such as most conifers.<ref target="#n22"> Back. </ref>

</note> are in separate flowers, either on the same or on different plants; they produce resins, and many of them are supposed to supply the most durable timber: what is called Venice-turpentine <anchor xml:id="n24"/>

<note n="24" resp="editor" place="end"> Turpentine has many uses from creating paints and varnishes to acting as topical medicine. Venice turpentine, in particular, is formed from larch and is often used to harden horse hooves.<ref target="#n24"> Back. </ref>

</note> is obtained from the larch by wounding the bark about two feet from the ground, and catching it as it exudes; Sandarach <anchor xml:id="n25"/>

<note n="25" resp="editor" place="end">

<hi rend="bold">Sandarach: </hi>A soft red arsenic-containing mineral used

as a pigment in medicine <ref target="#n25"> Back. </ref>
</note> is procured from the common juniper; and Incense from a juniper with yellow fruit. The unperishable chests, which contain the Egyptian mummies, were of Cypress; and the Cedar, with which black lead pencils are covered, is not liable to be eaten by worms. See <persName><surname>Miln's</surname></persName> Bot. Dict. art.coniferæ.

<anchor xml:id="n26"/>

<note n="26" resp="editor" place="end"> An Anglican preacher and hobbyist botanist, Colin Milne (c.1743–1815) authored both a 1770 botanical dictionary of terms, cited here, and a 1771-2 translation of Linnaeus' <hi rend="italic">Genera Plantarum</hi>, a work that would inform Darwin's later translations of Linnaeus. <ref target="#n26"> Back. </ref>

</note> The gates of St. Peter's church at Rome, which had lasted from the time of Constantine to that of Pope Eugene the fourth, <anchor xml:id="n27"/>

<note n="27" resp="editor" place="end"> Approximately 300-1450 CE.<ref target="#n27"> Back. </ref>

</note> that is to say, eleven hundred years, were of Cypress, and had in that time suffered no decay. According to Thucydides, <anchor xml:id="n28"/>

<note n="28" resp="editor" place="end"> An Ancient Greek historian, Thucydides (460-395) is known for his anecdotal retelling - and sometimes inventing - of historical events and cultural practices, particularly of those surrounding the Peloponnesian War between Athens and Sparta. <ref target="#n28"> Back. </ref>

</note> the Athenians buried the bodies of their heroes in coffins of Cypress, as being not subject to decay. A similar durability has also been ascribed to Cedar. Thus Horace, </p>

<foreign>

<p rendition="#indent1 #smallest">

<hi rend="italic">-----Speramus carmina fingi</hi></p>

<p rendition="#indent1 #smallest">

<hi rend="italic">Posse linenda cedro & ævi servanda cupresso. <anchor xml:id="n29"/>

<note n="29" resp="editor" place="end"> We hope to make poems fit/ to be smeared with cedar oil and stored in preserving cypress (<hi rend="italic">Ars Poetica, </hi>331-2).<ref target="#n29"> Back.

</ref>

</note>

</hi>

</p>

</foreign>

<p rendition="#indent1 #smallest">

<hi rend="italic">Osyrisi. </hi>I.75. Two houses. The males and females are on different plants. There are many instances on record, where female plants have been impregnated at very great distance from their male; the dust discharged from the anthers is very light, small, and copious, so that it may spread very wide in the atmosphere, and be carried to the distant pistils, without the supposition of any particular attraction; these plants resemble some insects, as the ants, and cochineal insect, of which the males have wings, but not the female. </p>

<pb n="10" facs="http://i.imgur.com/1WPtE7J.png"/>
 <lg>
 <anchor xml:id="plantago"/>
 <l rendition="#indent1">With strange deformity PLANTAGO treads,</l>
 <l>A Monster-birth! and lifts his hundred heads;</l>
 <l>Yet with soft love a gentle belle he charms,</l>
 <l n="80">And clasps the beauty in his hundred arms.</l>
 <l>So hapless DESDEMONA, fair and young,</l>
 <l>Won by OTHELLO'S <anchor xml:id="n30"/>
 <note n="30" resp="editor" place="end"> A reference to Act 1 Scene 3 of Shakespeare's <hi rend="italic" xml:space="preserve">Othello, </hi> in which Othello recounts the tales with which he regaled Desdemona, winning her love. Darwin likens Othello's charm to that of the plantago's many stamens, lulling the pistil into co-operation. <ref target="#n30"> Back. </ref>
 </note> captivating tongue, </l>
 <l>Sigh'd o'er each strange and piteous tale, distress'd,</l>
 <l>And sunk enamour'd on his sooty breast.</l>
 </lg>
 <lg>
 <l rendition="#indent1 " n="85"><hi rend="italic">Two </hi>gentle shepherds and their sister-wives</l>
 <l>With thee, ANTHOXA! lead ambrosial lives;</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Plantago</hi>. I.77. Rosea. Rose Plantain. In this vegetable monster the bracts, <anchor xml:id="n31"/>
 <note n="31" resp="editor" place="end">
 <hi rend="bold">Bract: </hi>A scale or leaf growing directly under the flower-cup <ref target="#n31"> Back. </ref>
 </note> or divisions of the spike, become wonderfully enlarged; and are converted into leaves. The chaffy <anchor xml:id="n32"/>
 <note n="32" resp="editor" place="end">
 <hi rend="bold">Chaffy: </hi>resembling chaff, the thin dry leaves surrounding flowers on grass plants <ref target="#n32"> Back. </ref>
 </note> scales of the calyx in Xeranthemum, and in a species of Dianthus, and the glume <anchor xml:id="n33"/>
 <note n="33" resp="editor" place="end">
 <hi rend="bold">Glume: </hi>a dry, thin and small leaf that surrounds the central flower cup of a plant <ref target="#n33"> Back. </ref>
 </note> in some alpine grasses, and the scales of the ament in the salix rosea, rose willow, grow into leaves; and produce other kinds of monsters. <anchor xml:id="n34"/>
 <note n="34" resp="editor" place="end"> The plants Darwin lists here all possess bracts, chaffy scales, or glumes: outer shell leaves that add a sort of second skin around the central flowers. To Darwin and Linnaeus, such deviation from the more typical flower arrangement (i.e., without bracts, chaffy scales, or glumes) resulted in a more 'monstrous' appearance. <ref target="#n34"> Back. </ref>
 </note> The double flowers become monsters by the multiplication of their

petals or nectaries. <anchor xml:id="n35"/>
 <note n="35" resp="editor" place="end">
 <hi rend="bold">Nectary: </hi> A nectar-secreting gland in a plant <ref
 target="#n35"> Back. </ref>
 </note> See note on <ref target="#alcea"> Alcea. </ref>
 </p>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Anthexanthum</hi>. I.83. Vernal grass. Two males, two
 females. The other grasses have three males and two females. The flowers of
 this grass give the fragrant scent to hay. I am informed it is frequently
 viviparous, that is, that it bears sometimes roots or bulbs instead of
 seeds, which after a time drop off and strike root in the ground. This
 circumstance is said to obtain in many of the alpine grasses, whose seeds
 are perpetually devoured by small birds. The Festunca Dumetorum, fescue
 grass of the buses, produces bulbs from the sheaths of its straw. The Allium
 Magicum, or magical onion, produces <add rend="i">Continued p.11</add><reg> onions on its head,
 instead of
 seeds. The Polygonum Viviparum, viviparous bistort, <anchor xml:id="n36"/>
 <note n="36" resp="editor" place="end">
 <hi rend="bold">Bistort: </hi>A species of plant bearing a
 cylindrical spike of small flesh-coloured flowers <ref target="#n36"
 > Back. </ref>
 </note> rises about a end high, with a beautiful spike of flowers, which
 are succeeded by buds or bulbs, which fall off and take root. There is a
 bush frequently seen on birch-trees, like a bird's nest, which seems to
 be a similar attempt of nature, to produce another tree; which falling
 off might take root in spongy ground. </reg></p>
 <reg>
 <p rendition="#indent1 #smallest"> There is an instance of this double mode
 of production in the animal kingdom, which is equally extraordinary; the
 same species of Aphis is viviparous <anchor xml:id="n37"/>
 <note n="37" resp="editor" place="end">
 <hi rend="bold">Viviparous: </hi> bringing forth young in a live
 state <ref target="#n37"> Back. </ref>
 </note> in the summer, and oviparous <anchor xml:id="n38"/>
 <note n="38" resp="editor" place="end">
 <hi rend="bold">Oviparous: </hi> producing young which are hatched
 outside the body of the parent <ref target="#n38"> Back. </ref>
 </note> in autumn. <persName><forename>A.T.</forename><surname>
 Bladh.</surname></persName>
 Amæn. Acad. V.7.
 <anchor xml:id="n39"/>
 <note n="39" resp="editor" place="end"> Amoenitates Academicae is the
 title of a series of scientific volumes, most published by Linnaeus,
 that included doctoral dissertations from Scandinavian natural
 philosophers. Included in Volune VII was Andreas Johannes Bladh's
 1767 essay on insects, <hi rend="italic">Fundamenta
 Entomologiae</hi>, or the Foundations of Entomology. <ref
 target="#n39"> Back. </ref>
 </note>

</p>
</reg>

<pb n="11" facs="http://i.imgur.com/9LJihQm.png"/>
<l>Where the wide heath in purple pride extends,</l>
<l>And scatter'd furze its golden lustre blends,</l>
<l>Closed in green recess, unenvy'd lot! </l>
<l n="90">The blue smoke rises from their turf-built cot;</l>
<l>Bosom'd in fragrance blush their infant train,</l>
<l>Eye the warm sun, or drink the silver rain.</l>
</lg>
<lg>
<l rendition="#indent1">The fair OSMUNDA seeks the silent dell,</l>
<l>The ivy canopy, and dripping cell;</l>
<l n="95">There hid in shades in <hi rend="italic" xml:space="preserve">clandestine </hi>
<anchor xml:id="n40"/>
<note n="40" resp="editor" place="end"> Darwin uses this word to indicate
plants of the Linnaean class cryptogamia – plants which reproduce not by
seed but a method Linnaeus could not discern (often by spore or
root).<ref target="#n40"> Back. </ref>
</note> rites approves,</l>
<l>Till the green progeny betrays her loves.</l>
</lg>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">Osmunda</hi>. I.93. This plant grows on moist rocks; the parts
of its flower or its seeds are scarce discernible; whence Linnaeus has given the
name of clandestine marriage to this class. The young plants are of a beautiful
vivid green. </p>

<pb n="12" facs="http://i.imgur.com/2kYbNSh.png"/>
<lg>
<l rendition="#indent1">With charms despotic fair CHONDRILLA reigns</l>
<l>O'er the soft hearts of <hi rend="italic">five </hi>fraternal swains;</l>
<l>If sighs the changeful nymph, alike they mourn;</l>
<l n="100">And, if she smiles, with rival raptures burn.</l>
<l>So, tun'd in unison, Eolian Lyre! <anchor xml:id="n41"/>
<note n="41" resp="editor" place="end">
<hi rend="bold">Eolian Lyre:</hi> Also known as an Aeolian harp; a
stringed instrument that produces musical sounds when currents of air
pass over the strings <ref target="#n41"> Back. </ref>
</note>
</l>
<l>Sounds in sweet symphony thy kindred wire;</l>
<l>Now gently swept by Zephyr's <anchor xml:id="n42"/>
<note n="42" resp="editor" place="end">
<hi rend="bold">Zephyr:</hi> classical god of the winds <ref
target="#n42"> Back. </ref>
</note> vernal wings,</l>
<l>Sink in soft cadences the love-sick strings;</l>

<l n="105">And now with mingling chords, and voices higher, </l>
 <l>Peal the full anthems of the aerial choir.</l>
 </lg>
 <lg>
 <l rendition="#indent1"><hi rend="italic">Five</hi>sister-nymphs to join Diana's
 train</l>
 <l>With thee, fair LYCHNIS! vow, - but vow in vain;</l>
 <space quantity="1" unit="lines"/>
 <anchor xml:id="chondrilla"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Chondrilla.</hi> 1.97. Of the class Confederate Males. The
 numerous florets, <anchor xml:id="n43"/>
 <note n="43" resp="editor" place="end">
 <hi rend="bold">Floret:</hi>a small flower <ref target="#n43"> Back.
 </ref>
 </note> which constitute the disk of the flowers in this class, contain in
 each five males, surrounding one female, which are connected at top, whence
 the name of the class. An <persName name="Giovambatista dal Colvolo">
 Italian writer </persName>, in a discourse on the irritability of
 flowers, <anchor xml:id="n44"/>
 <note n="44" resp="editor" place="end">
 <hi rend="italic">A Discourse Concerning the Irritability of Some
 Flowers, </hi> by Italian Giovambatista dal Colvolo, relates
 Colvolo's experiments on the centaurea calcitrapoides, focusing
 particularly on the plant's responses to external stimuli. The version
 Darwin read was most likely British botanist Benjamin Stillingfleet's
 (1702-1771) translation, published 1767. <ref target="#n44"> Back.
 </ref>
 </note> asserts, that if the top of the floret be touched, all the filaments
 which support the cylindrical anther will contract themselves, and that by
 thus raising or depressing the anther the whole of the prolific dust is
 collected on the stigma. He adds, that if one filament be touched after it
 is separated from the floret that it will contract like the muscular fibres
 of animal bodies; his experiments were tried on the Centaurea
 Calcitrapoides, and on artichokes, and globe-thistles. Discourse on
 irritability of plants.
 <persName><surname>Dodsley. </surname></persName>
 <anchor xml:id="n45"/>
 <note n="45" resp="editor" place="end"> James Dodsley (1724-97) was the
 English bookseller who sold the English translation of the Italian work
 on the irritability of plants.<ref target="#n45"> Back. </ref>
 </note>
 </p>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Lychnis</hi>. I.108. Ten males and five females. The
 flowers which contain the five females, and those which contain the ten
 males, are found on different plants; and often <add rend="i">Continued p.13</add><reg>at a great
 distance
 from each other. Five of the ten males arrive at their maturity some
 days before the other five, as may be seen by opening the corol <anchor

xml:id="n46"/>
<note n="46" resp="editor" place="end">
<hi rend="bold"> Corol: </hi> The whorl of leaves or petals that
form the inner envelope of the flower <ref target="#n46"> Back.
</ref>
</note> before it naturally expands itself. When the females arrive at
their maturity, they rise above the petals, as if looking abroad for
their distant husbands; the scarlet ones contribute much to the beauty
of our meadows in May and June.</reg>
</p>

<pb n="13" facs="http://i.imgur.com/nlKodII.png"/>
<l>Beneath one roof resides the virgin band,</l>
<l n="110">Flies the fond swain, and scorns his offer'd hand;</l>
<l>But when soft hours on breezy pinions move,</l>
<l> And smiling May <anchor xml:id="n47"/>
<note n="47" resp="editor" place="end"> A personified reference to the month
in which some flowers of the lychnis family come to bloom. Missouri
Botanical Garden <ref target="#n47"> Back. </ref>
</note> attunes her lute to love,</l>
<l>Each wanton beauty, trick'd in all her grace,</l>
<l>Shakes the bright dew-drops from her blushing face;</l>
<l n="115">In gay undress displays her rival charms,</l>
<l>And calls her wondering lovers to her arms.</l>
</lg>
<lg>
<l rendition="#indent1">When the young Hours amid her tangled hair</l>
<l>Wove the fresh rose-bud, and the lily fair,</l>
<l><anchor xml:id="gloriosa"/>Proud GLORIOSA led <hi rend="italic">three</hi>
chosen swains,</l>
<l n="120">The blushing captives of her virgin chains-</l>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">Gloriosa.</hi> I.119. Superba. Six males, one female. The
petals of this beautiful flower with three of the stamens, which are first
mature, stand up in apparent disorder; and the <add rend="i">Continued p.14</add><reg>pistil bends at
nearly a
right angle to insert its stigma amongst them. In a few days, as these
decline, the other three stamens bend over, and approach the pistil. In
the Fritillaria Persica, the six stamens are of equal lengths, and the
anthers lie at a distance from the pistil, and three alternate ones
approach first; and, when these decline, the other three approach: in
the Lithrum Salicaria (which has twelve males and one female) a
beautiful red flower, which grows on the banks of rivers, six of the
males arrive at maturity, and surround the female some time before the
other six; when these decline, the other six rise up, and supply their
places. Several other flowers have in a similar manner two sets of
stamens of different ages, as Adoxa, Lychnis, Saxifraga. <ref
target="#genista">See Genista. </ref> Perhaps a difference in the
time of their maturity obtains in all these flowers, which have numerous

stamens. In the Kalmia the ten stamens lie round the pistil like the radii of a wheel; and each anther is concealed in a niche of the corol to protect it from cold and moisture; these anthers rise separately from their niches, and approach the pistil for a time, and then recede to their former situations.</reg>
</p>

<pb n="14" facs="http://i.imgur.com/Gho9Hgb.png"/>
<l>When Time's rude hand a bark of wrinkles spread</l>
<l>Round her weak limbs, and silver'd o'er her head,</l>
<l><hi rend="italic" xml:space="preserve">Three </hi>other youths her ripper years engage,</l>
<l>The flatter'd victims of her wily age.</l>
</lg>

<lg>
<l rendition="#indent1" n="125">So, in her wane of beauty, NINON <anchor xml:id="n48"/>

<note n="48" resp="editor" place="end">
<hi rend="bold">Ninon de l'Enclos </hi>(1620-1705) was a French writer, courtesan and neo-Epicurean philosopher. She was renowned as a lover of many high society Frenchmen, and, upon her retirement as a courtesan, she opened a school to educate noble sons in the art of love. It was there that she was alleged to unintentionally win the love of her son, Chevalier de Gersay. L'Enclos had given up Gersay as an infant, and thus he was unaware that she was his mother. Hoping to discourage further pursuit from Gersay, L'Enclos revealed to him his parentage. Tragically, Gersay was so distraught from the knowledge that he killed himself. This is the incident that Darwin recounts here. <ref target="#n48"> Back.
</ref>

</note> won</l>
<l>With fatal smiles her gay unconscious son. - </l>
<l>Clasp'd in his arms she own'd a mother's name, - </l>
<l>"Desist, rash youth! restrain your impious flame,</l>

<pb n="">
<figure>
<graphic rend="inline" url="http://i.imgur.com/jY7BOCu.png" height="20cm" width="16cm"/>
</figure>

<pb n="">
<figure>
<graphic rend="inline" url="http://i.imgur.com/53EVQu6.png" height="20cm" width="16cm"/>
</figure>

<pb n="15" facs="http://i.imgur.com/3WmhHsd.png"/>
<l> "First on that bed your infant-form was press'd,</l>
<l n="130">"Born by my throes, and nurtured at my breast." -</l>
<l>Back as from death he sprung, with wild amaze</l>
<l>Fierce on the fair he fix'd his ardent gaze;</l>
<l>Dropp'd on one knee, his frantic arms outspread,</l>

<l>And stole a guilty glance toward the bed;</l>
 <l n="135">Then breath'd from quivering lips a whispered vow, </l>
 <l>And bent on heaven his pale repentant brow;</l>
 <l>"Thus, thus!" he cried, and plung'd the furious dart,</l>
 <l>And life and love gush'd mingled from his heart.</l>
 </lg>
 <lg>
 <l rendition="#indent1" n="140">The fell SILENE and her sisters fair,</l>
 <l>Skill'd in destruction, spread the viscous snare.</l>
 <l>The harlot-band <hi rend="italic">ten </hi>lofty bravoes screen,</l>
 <l>And frowning guard the magic nets, unseen. -</l>
 <space quantity="1" unit="lines"/>
 <anchor xml:id="silene"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Silene.</hi> 1.139. Catchfly. Three females and ten males
 inhabit each flower; the viscous material, which surrounds the stalks under
 the flowers of this plant, and of the Cucubalus Otites, is a curious
 contrivance to prevent various insects from plundering the honey, or
 devouring the seed. In the Dionæa Muscipula there is a still more wonderful
 contrivance to prevent the depredations <anchor xml:id="n49"/>
 <note n="49" resp="editor" place="end">
 <hi rend="bold">Depredation: </hi> The action of making prey of; in this
 case, the Dionæa Muscipula has defense mechanisms against insects that
 prey on it <ref target="#n49"> Back. </ref>
 </note> of insects: The leaves are armed with long teeth, like the antennæ
 of insects, and lie spread upon the ground round the stem; and <add rend="i">Continued p.16</add>
 <reg> are so
 irritable, that when an insect creeps upon them, they fold up and crush
 or pierce it to death. The last professor <persName>Linnaeus</persName>,
 in his Supplementum Plantarum,
 <anchor xml:id="n50"/>
 <note n="50" resp="editor" place="end">Supplementum Plantarum: A work
 written by Linneaus' son to supplement the Genera Plantarum, the
 Supplementum Plantarum added notes to Carl Linneaus senior text.
 <ref target="#n50"> Back. </ref> It was also translated into
 English by Darwin and was published in Lichfield in 1783. </note>
 gives the following account of the Arum Muscivorum. The flower has the
 smell of carrion; by which the flies are invited to lay their eggs in
 the chamber of the flower, but in vain endeavor to escape, being
 prevented by the hairs pointing inwards; and thus perish in the flower,
 whence its name of fly-eater. P.411. in the Dypsacus is another
 contrivance for this purpose, a basin of water is placed round each
 joint of the stem. In the Drosera is another kind of fly-trap. See <ref
 target="#dypsacus">Dypsacus</ref> and <ref target="#drosera"
 >Drosera</ref>; the flowers of Silene and Cucubalus are closed all
 day, but are open and give an agreeable odour in the night. See Cerea.
 <ref target="#addnts">See additional notes at the end of the
 poem.</ref>
 </reg>
 </p>

<pb n="16" facs="http://i.imgur.com/x0a5f8U.png"/>
 <l>Haste, glittering nations, tenants of the air,</l>
 <l>Oh, steer <cor>from</cor> hence your viewless course afar!</l>
 <l n="145">If with soft words, sweet blushes, nods, and smiles,</l>
 <l>The <hi rend="italic" xml:space="preserve">three </hi>dread Sirens <anchor
 xml:id="n51"/>
 <note n="51" resp="editor" place="end">
 <hi rend="bold">Sirens:</hi> Mythological monsters, part women, part
 bird, who lured sailors to destruction by their enchanted singing <ref
 target="#n51"> Back. </ref>
 </note> lure you to their toils,</l>
 <l>Limed <anchor xml:id="n52"/>
 <note n="52" resp="editor" place="end">
 <hi rend="bold">Limed:</hi> Caught in birdlime, a glutinous substance
 used to catch birds <ref target="#n52"> Back. </ref>
 </note> by their art in vain you point your stings,</l>
 <l>In vain the efforts of your whirring wings! –</l>
 <l n="150">Go, seek your gilded mates and infant hives,</l>
 <l>Nor taste the honey purchas'd with your lives!</l>
 </lg>
 <lg>
 <l rendition="#indent1">When heaven's high vault condensing clouds deform,
 <anchor xml:id="n53"/>
 <note n="53" resp="editor" place="end"> The formation and condensation of clouds
 was a process Darwin was intimately familiar with. In 1788, his article on
 cloud formation was published in the <hi rend="italic">Philosophical
 Transactions, </hi> the world's longest running international scientific
 journal. <ref target="#n53"> Back. </ref>
 </note></l>
 <l>Fair AMARYLLIS flies the incumbent storm,</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Amaryllis. </hi>I.152. Formosissima. Most beautiful
 Amaryllis. Six males, one female. Some of the bell-flowers close their
 apertures at night, or in rainy or in cold weather, as the convolvulus, and
 <add rend="i">Continued p.17</add>
 thus protect their included stamens and pistils. Other bell-flowers
 <reg>hang their apertures downwards, as many of the lilies; in those the
 pistil, when at maturity, is longer than the stamens; and by this
 pendant <anchor xml:id="n54"/>
 <note n="54" resp="editor" place="end">
 <hi rend="bold">Pendant: </hi>downward hanging <ref target="#n54">
 Back. </ref>
 </note> attitude of the bell, when the anthers burst, their dust falls
 on the stigma: and these are at the same time sheltered as with an
 umbrella from rain and dews. But, as a free exposure to the air is
 necessary for their fecundation, the style and filaments in many of
 these flowers continue to grow longer after the bell is open, and hang
 down below its rim. In others, as in the martagon, the bell is deeply

divided, and the divisions are reflected upwards, that they may not prevent the access of air, and at the same time afford some shelter from perpendicular rain or dew. Other bell-flowers, as the hemerocallis and amaryllis, have their bells nodding only, as it were, or hanging obliquely toward the horizon; which, as their stems are slender, turn like a weather cock from the wind and thus vey effectually preserve their inclosed stamens and anthers from the rain and cold. Many of these flowers, both before and after their season of fecundation, erect their heads perpendicular to the horizon, like the [Meadia](#), which cannot be explained from mere mechanism.

The Amaryllis formosissima is a flower of the last mentioned kind,

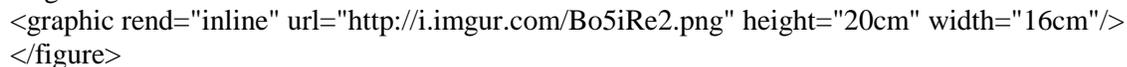
The kind of flower that lifts its head perpendicular to the horizon, after fertilization. Back.

and affords an agreeable example of *art* in the vegetable economy. 1. The pistil is of great length compared with the stamens; and this I suppose to have been the most unchangeable part of the flower, as in Meadia, which see. 2. To counteract this circumstance the pistil and the stamens are made to decline downwards, that the prolific dust might fall from the anthers on the stigma. 3. To produce this effect and to secure it when produced, the corol

The whorl of leaves or petals that form

the inner envelope of the flower Back.

is lacerated, contrary to what occurs in other flowers of this genus, and the lowest division with the two next lowest ones are wrapped closely over the style and filaments, binding them forcibly down lower to the horizon than the usual inclination of the bell in this genus, and thus constitutes a most elegant flower. There is another contrivance for this purpose in the Hemerocallis flava: the long pistil is often bent somewhat like the capital letter *N*, with design to shorten it, and thus to bring the stigma amongst the anthers.



Seeks with unsteady step the shelter'd vale,

And turns her blushing beauties from the gale. —

Six rival youths, with soft concern impress'd,

Calm all her fears, and charm her cares to rest. —

So shines at eve the sun-illumin'd fane,

Fane: a weathercock used to determine wind direction Back.

</note></l>

<l>Lifts its bright cross, and waves its golden vane;

<anchor xml:id="n58"/>

<note n="58" resp="editor" place="end">

<hi rend="bold">Vane: </hi>Part of a weathercock; the metal plate that points in the direction of the wind. Though a weathercock or weathervane may seem an unusual analogy, Darwin was a hobbyist meteorologist. His good friend and fellow natural scientist, John Whitehurst, invented and installed dozens of specialty weathervanes which had spindles that extended downward into the house, allowing for indoor weather forecasting. This allowed Darwin to observe wind direction from the comfort of his living-room armchair. <ref target="#n58"> Back. </ref>

</note></l>

<pb n="18" facs="http://i.imgur.com/R4zHDRh.png"/>

<l>From every breeze the polish'd axle turns,</l>

<l n="160">And high in air the dancing meteor burns.

<anchor xml:id="n59"/>

<note n="59" resp="editor" place="end"> In 1783, Darwin himself witnessed a meteor passing over his then-hometown of Derby. He made calculations about the trajectory of the meteor, sending them to the Royal Society. <ref target="#n59"> Back. </ref>

</note></l>

</lg>

<lg>

<l rendition="#indent1"><hi rend="italic">Four </hi>of the giant brood with ILEX stand,</l>

<l>Each grasps a thousand arrows in his hand;</l>

<l>A thousand steely points on every scale.</l>

<l>Form the bright terrors of his bristly mail. –</l>

<l n="165">So arm'd, immortal Moore uncharm'd the spell,</l>

<l>And slew the wily dragon of the well. –</l>

<l>Sudden with rage their <hi rend="italic">injur'd </hi>bosoms burn,</l>

<l>Retort the insult, or the wound return;</l>

<l><hi rend="italic">Unwrong'd,</hi>

<anchor xml:id="n60"/>

<note n="60" resp="editor" place="end"> As these italics do not correspond to Linnaean classes or orders, Darwin is likely using them for literary emphasis here. <ref target="#n60"> Back. </ref>

</note> as gentle as the breeze that sweeps</l>

<l n="170">The unbending harvests or undimpled deeps,</l>

<l>They guard, the Kings of Needwood's <anchor xml:id="n61"/>

<note n="61" resp="editor" place="end"> Needwood Forest was a small forest near the town of Lichfield where Darwin lived from 1756-1781. The forest was memorialized in a poem by friend and witness at Darwin's second wedding, Francis Mundy. Parts of the poem are cited in the Additional Notes section that follows "Loves of the Plants", Canto IV. <ref target="#n61"> Back. </ref>

</note> wide domains,</l>

<l>Their sister-wives and fair infantine trains;</l>

<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<anchor xml:id="ilex"/>
<hi rend="italic">Ilex. </hi>I.161. Holly. Four males, four females. Many plants, like many animals, are furnished with arms for their protection; these are either aculei, <anchor xml:id="n62"/>
<note n="62" resp="editor" place="end">
<hi rend="bold">Aculeus: </hi>a sharply pointed projection on a plant, such as a thorn or spine <ref target="#n62"> Back. </ref>
</note> prickles, as in rose and barberry, which are formed from the outer bark of the plant; or spinæ, thorn, as in hawthorn, which are an elongation of the wood, and hence more difficult to be torn off than the former; or stimuli, stings, as in the nettles, which are armed with a
<add rend="i">Continued p.19</add><reg> venomous fluid for the annoyance of naked animals. The shrubs and trees, which have prickles or thorns, are grateful food to many animals, as gooseberry, and gorse; and would be quickly devoured, if not thus armed; the stings seem a protection against some kinds of insects, as well as the naked mouths of quadrupeds. Many plants lose their thorns by cultivation, as wild animals lose their ferocity; and some of them their horns. A curious circumstance attends the large hollies in Needwood-forest, they are armed with thorny leaves about eight feet high, and have smooth leaves above; as if they were conscious that horses and cattle could not reach their upper branches. See note on Meadia, and on Manicinella. The numerous clumps of hollies in Needwood-forest serve as land-marks to direct the travelers across it in various directions; and as a shelter to the deer and cattle in the winter; and in scarce seasons supply them with much food. For when the upper branches, which are without prickles, are cut down, the deer crop the leaves and peel off the bark. The bird-lime <anchor xml:id="n63"/>
<note n="63" resp="editor" place="end">
<hi rend="bold">Bird-Lime: </hi>a glutinous substance used to catch birds <ref target="#n63"> Back. </ref>
</note> made from the bark of Hollies seems to be a very similar material to the elastic gum, or Indian rubber, as it is called. There is a fossil elastic bitumen <anchor xml:id="n64"/>
<note n="64" resp="editor" place="end">
<hi rend="bold">Elastic Bitumen: </hi> a flexible mineral substance found, in particular, in the mines at Matlock about twenty miles north of Derby, Darwin's home from 1783-1802 <ref target="#n64"> Back. </ref>
</note> found at Matlock in Derbyshire, <anchor xml:id="n65"/>
<note n="65" resp="editor" place="end"> Matlock is a town in Derbyshire, a county in England's eastern midlands.<ref target="#n65"> Back. </ref>
</note> which much resembles these substances in its elasticity and inflammability. The thorns of the mimosa cornigera resemble cow's horns in appearance as well as in use. System of Vegetables, p. 782 </reg>
<anchor xml:id="n66"/>

<note n="66" resp="editor" place="end"> This is an English rendition of the 13th edition of Systema Naturae , a work first published by Linnaeus in 1735. This 13th edition was retitled Systema Vegetabilium by its editor Johan Murray (1740-1791), the Swedish pupil of Linnaeus. It includes an introduction by Murray entitled Regnum Vegetabile in which he elaborates on Linnaeus' classification system. <ref target="#n66"> Back. </ref>
</note>
</p>

<pb n="19" facs="http://i.imgur.com/h3BaoJt.png"/>
<l>Lead the lone pilgrim through the trackless glade,</l>
<l>Or guide in leafy winds the wandering maid.</l>
</lg>
<lg>
<l rendition="#indent1" n="175">So WRIGHT'S <anchor xml:id="n67"/>
<note n="68" resp="editor" place="end"> Joseph Wright, painter and friend of Darwin's. Here, Darwin is making explicit reference to Wright's largest and most expensive painting (£420), the <hi rend="italic">View of Gibraltar. </hi> Now lost, the painting depicted the destruction of the Spanish fleet. <ref target="#n68"> Back. </ref>
</note> bold pencil from Vesuvio's <anchor xml:id="n69"/>
<note n="69" resp="editor" place="end"> A volcano in Italy, famous for its 79 AD eruption that demolished the city of Pompeii. Darwin is likening the violence of Wright's painting, the <hi rend="italic">View of Gibraltar</hi>, to a volcanic eruption. <ref target="#n69"> Back. </ref>
</note> height</l>
<l>Hurls his red lavas to the troubled night;</l>
<l>From Calpè <anchor xml:id="n70"/>
<note n="70" resp="editor" place="end"> The Latin name for the Rock of Gibraltar, a coastal promontory overlooking the sea where the Spanish and English battled in 1588. <ref target="#n70"> Back. </ref>
</note> starts the intolerable flash,</l>
<l>Skies burst in flames, and blazing oceans dash;</l>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">Hurls his red lavas. </hi>I.179. Alluding to the grand paintings of the eruptions of Vesuvius, and of the destruction of the Spanish vessels before Gibraltar; and to the beautiful landscapes and moonlight scenes, by Mr. Wright of Derby. </p>

<pb n="20" facs="http://i.imgur.com/ZjEFyMY.png"/>
<l>Or bids in sweet repose his shades recede,</l>
<l n="180">Winds the still vale, and slopes the velvet mead;</l>
<l>On the pale stream expiring Zephyrs sink,</l>
<l>And Moonlight sleeps upon its hoary brink.</l>
</lg>
<lg>
<l rendition="#indent1">Gigantic Nymph! The fair KLEINHOVIA reigns,</l>

<l>The grace and terror of Orixas's <anchor xml:id="n71"/>
 <note n="71" resp="editor" place="end">
 <hi rend="bold">Orixas: </hi>A genus within the rutaceae family, the
 family in which most citrus plants are found <ref target="#n71"> Back.
 </ref>
 </note> plains;</l>
 <l>O'er her warm cheek the blush of beauty swims,</l>
 <l>And nerves Herculean bend her sinew limbs;</l>
 <l>With frolic eye she views the affrighted throng,</l>
 <l n="190">And shakes the meadows, as she towers along,</l>
 <l>With playful violence displays her charms,</l>
 <l>And bears her trembling lovers in her arms.</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Kleinhovia.</hi> 1.183. In this class the males in each
 flower are supported by the female. The name of the class maybe translated
 "Viragoes," or "Feminine males." The largest tree perhaps in the world is of
 the same natural order as Kleinhovia, it is the Adansonia, <anchor
 xml:id="n72"/>
 <note n="72" resp="editor" place="end"> Named for the natural scientist,
 Michael Adanson (1727-1806), who first catalogued the tree for an
 English audience. <ref target="#n72"> Back. </ref>
 </note> or Ethiopian Sour-gourd, or African Calabash tree. <persName>Mr.
 <surname>Adanson</surname></persName>
 <anchor xml:id="n73"/>
 <note n="73" resp="editor" place="end"> A correspondent of the Royal
 Society, French-born Michael Adanson (1727-1806) was an explorer from a
 young age. The preface to his <hi rend="italic">Voyage to Senegal </hi>
 travel text holds "that if a young man is ambitious to raise a
 reputation in the world or to improve in knowledge and wisdom, he should
 travel into foreign countries" (i-ii). Though Darwin never travelled out
 of England, he made use of travel texts such as Adanson's to research
 exotic plants.<ref target="#n73"> Back. </ref>
 </note> says the diameter of the trunk frequently exceeds 25 feet, and the
 horizontal branches are from 45 to 55 feet long, and so large that each
 branch is equal to the largest trees of Europe. The breadth of the top is
 from 120 to 150 feet. And of the roots bared only in part by the washing
 away of the earth by the river, near which it grew, measured 110 feet long;
 and yet these stupendous trees never exceed 70 feet in height. Voyage
 to Senegal.
 <anchor xml:id="n74"/>
 <note n="74" resp="editor" place="end"> Fully titled <hi rend="italic">A
 Voyage to Senegal, the Isle of Goree, and the River Gambia</hi>,
 Adanson's travel account compiles five years worth of observations on
 "the various curiosities, natural and artificial, of Negroland" (iv).
 Adanson is thorough in this intent, documenting plant, human and animal
 life, climate, geography and more within a clear, chronological and
 categorical framework.<ref target="#n74"> Back. </ref>
 </note>
 </p>

<pb n="21" facs="http://i.imgur.com/yEkfPEo.png"/>
 <l>So fair THALESTRIS <anchor xml:id="n75"/>
 <note n="75" resp="editor" place="end">
 <hi rend="bold">Thalestris</hi>: Mythological Amazonian Queen who
 supposedly spent thirteen nights with Alexander the Great, hoping to
 conceive a child from the successful military leader.<ref target="#n75">
 Back. </ref>
 </note> shook her plummy crest,</l>
 <l>And bound in rigid mail her jutting breast;</l>
 <l n="195">Poised her long lance amid the walks of war,</l>
 <l>And Beauty thunder'd from Bellona's car <anchor xml:id="n76"/>
 <note n="76" resp="editor" place="end">
 <hi rend="bold">Bellona's car</hi>: Bellona is Roman goddess of war,
 described here to be riding a wheeled, horse-drawn wagon.<ref
 target="#n76"> Back. </ref>
 </note></l>
 <l>Greece arm'd in vain, her captive heroes wove</l>
 <l>The chains of conquest with the wreaths of love.</l>
 </lg>
 <lg>
 <l rendition="#indent1">When o'er the cultured lawns and dreary wastes</l>
 <l n="200">Retiring Autumn flings her howling blasts,</l>
 <l>Bends in tumultuous waves the struggling woods,</l>
 <l>And showers their leafy honours on the floods,</l>
 <l>In withering heaps collects the flowery spoil,</l>
 <l>And each chill insect sinks beneath the soil;</l>
 <l n="205">Quick flies fair TULIPA the loud alarms,</l>
 <l>And folds her infant closer in her arms;</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Tulipa. </hi>I.205. Tulip. What is in common language
 called a bulbous root, is by Linnaeus termed the Hybernacle, or Winter-lodge
 of the young plant. As these bulbs in every respect resemble buds, except in
 their being produced under ground, and include the leaves and flower in
 miniature, which are to be expanded in the ensuing spring. By cautiously
 cutting in the winter through the concentric coats of a tulip-root,
 longitudinally from the top to the base, and taking them off successively,
 the whole <add rend="i">Continued p.22</add><reg>flower of the next summer's
 tulip is beautifully seen by the
 naked eye, with its petals, pistil, and stamens; the flowers exist in
 other bulbs, in the same manner, as in Hyacinths, but the individual
 flowers of these being less, they are not so easily dissected, or so
 conspicuous to the naked eye.</reg>
 </p>
 <p rendition="#indent1 #smallest"> In the seeds of the Nymphæa Nelumbo, the
 leaves of the plant are seen so distinctly, that <persName>Mr.
 <surname>Ferber</surname></persName>
 <anchor xml:id="n77"/>
 <note n="77" resp="editor" place="end"> John James Ferber published a paper
 entitled "Prolepsis Plantarum" in the <hi rend="italic">Amoenitates

Academicae</hi>(Vol. VI, 1764). Amoenitates Academicae is the title of a series of scientific volumes, most published by Linnaeus, that included doctoral dissertations from Scandinavian natural philosophers.<ref target="#n77"> Back. </ref>

</note> found out by them to what plant the seeds belonged. Amæn. Acad.V. vi. No. 120. He says that <persName><surname>Mariotte </surname></persName>

<anchor xml:id="n78"/>

<note n="78" resp="editor" place="end"> Dominus Mariotte is cited in chapter 10 of Ferber's article.<ref target="#n78"> Back. </ref>

</note> first observed the future flower and foliage in the bulb of a Tulip; and adds, that it is pleasant to see in the buds of the Hepatica and Pedicularis hirsuta, yet lying in the earth; and in the gems of Daphne Mezereon; and at the base of Osmunda Lunaria, a perfect plant of the future year complete in all its parts. Ibid. </p>

<pb n="22" facs="http://i.imgur.com/5LuKXVg.png"/>

<l>In some lone cave, secure pavilion, lies,</l>

<l>And waits the courtship of serener skies. -</l>

<l>So, fix cold moons, the Dormouse <anchor xml:id="n79"/>

<note n="79" resp="editor" place="end">

<hi rend="bold">Dormouse: </hi>a small rodent <ref target="#n79"> Back. </ref>

</note> charm'd to rest,</l>

<l n="210">Indulgent Sleep! beneath thy eider <anchor xml:id="n80"/>

<note n="80" resp="editor" place="end">

<hi rend="bold">Eider: </hi>soft feather <ref target="#n80"> Back. </ref>

</note> breast,</l>

<l>In fields of Fancy climbs the kernel'd <anchor xml:id="n81"/>

<note n="81" resp="editor" place="end">

<hi rend="bold">Kernel'd</hi>: To contain kernels, bodies of seeds within plant husks <ref target="#n81"> Back. </ref>

</note> groves,</l>

<l>Or shares the golden harvest with his loves. -</l>

<l>But bright form earth amid the troubled air</l>

<l>Ascends fair COLCHICA with radiant hair,</l>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<hi rend="italic">Colchicum autumnale. i. 2134. </hi>Autumnal Meadow-saffron. Six males, three females. The germ is buried within the root, which thus seems to constitute a part of the flower. Families of Plants, p.242. <anchor xml:id="n82"/>

<note n="82" resp="editor" place="end"> In this 1737 work, Linnaeus organizes all known genera of plants using his system. <hi rend="italic">Families of Plants</hi> is the English translation of this work, translated by Darwin and the Botanical Society of Lichfield. <ref target="#n82"> Back. </ref>

</note> These singular flowers appear in autumn without any leaves, whence in some countries they are called Naked Ladies: in the March following the

green leaves spring up, and in April the seed-vessel rises from the ground; the seeds ripen in May, contrary to the usual habits of vegetables which flower in the spring, and ripen their seeds in the autumn. Miller's Dict.

<anchor xml:id="n83"/>

<note n="83" resp="editor" place="end">

<hi rend="italic">Miller's Dictionary of Gardening, Botany, and Agriculture; including Planting, Landscape, Gardening, and Rural Architecture with the Management of Domestic Animals, </hi> English horticulturalist Philip Miller (1691-1771) compiled and defined botanical terms in a detailed and illustrated compendium for would-be botanists. <ref target="#n83"> Back. </ref>

</note> The juice of the root of this plant is so acrid as to produce violent effects on the human constitution, which also prevents it from being eaten by subterranean insects, and thus guards the seed-vessel during the winter. </p>

<p rendition="#indent1 #smallest"> <add rend="i">Continued p.23</add><reg>The defoliation of deciduous trees is

announced by the flowering of the Colchicum; of these the ash is the last that puts forth its leaves, and the first that loses them. Phil.

Bot. p. 275. <anchor xml:id="n84"/>

<note n="84" resp="editor" place="end"> Published in 1751, the <hi rend="italic">Philosophia Botannica</hi> culminated Linnaeus' theorizing about botany; in it, he conveys the binomial system still in use today. <ref target="#n84"> Back. </ref>

</note></reg>

</p>

<p rendition="#indent1 #smallest"> <reg>The Hamamelis, Witch Hazel, is another plant which flowers in autumn; when the leaves fall off, the flowers come out in clusters from the joints of the branches, and in Virginia ripen their seed in the ensuing spring; but in this country their seeds seldom ripen. Lin. Spec. Plant. Miller's Dict. <anchor xml:id="n85"/>

<note n="85" resp="editor" place="end">

<hi rend="bold">Lin. Spec: </hi> Linnaeus' 1753 text <hi rend="italic">Species Plantarum</hi> listed all plant species then known in the world - about 8000. <ref target="#n85"> Back. </ref>

</note>

</p>

<anchor xml:id="n86"/>

<note n="86" resp="editor" place="end">

<hi rend="bold">Miller's Dict.:</hi> English horticulturalist Philip Miller (1691-1771) compiled and defined botanical terms in <hi rend="italic">Miller's Dictionary, </hi> a detailed and illustrated compendium for would-be botanists. <ref target="#n86"> Back. </ref>

</note> </reg>

</p>

<pb n="23" facs="http://i.imgur.com/KShULGv.png"/>

<l n="215">Warms the cold bosom of the hoary year,</l>
 <l>And lights with Beauty's blaze the dusky sphere.</l>
 <l><hi rend="italic" xml:space="preserve">Three </hi>blushing Maids the intrepid
 Nymph attend,</l>
 <l>And <hi rend="italic">six </hi>gay Youths, enamour'd train! defend.</l>
 <l>So shines with silver guards the Georgian star, <anchor xml:id="n87"/>
 <note n="87" resp="editor" place="end"> Astronomer William Herschel
 discovered the planet Uranus; he named it after his king, calling it the
 Georgian planet, while continental astronomers resisted the name, and
 referred to it as Uranus instead. <ref target="#n87"> Back. </ref>
 </note></l>
 <l n="220">And drives on Night's blue arch his glittering car; <anchor
 xml:id="n88"/>
 <note n="88" resp="editor" place="end">
 <hi rend="bold">Car: </hi>a wheeled, usually horse drawn carriage, cart
 or wagon <ref target="#n88"> Back. </ref>
 </note></l>
 <l>Hangs o'er the billowy clouds his lucid form</l>
 <l>Wades through the mist, and dances in the storm.</l>
 </lg>
 <lg>
 <l>GREAT HELIANTHUS guides o'er twilight plains</l>
 <l>In gay solemnity his Dervise-trains; <anchor xml:id="n89"/>
 <note n="89" resp="editor" place="end">
 <hi rend="bold">Dervise: </hi>a Muslim religious figure who has taken
 vows of poverty and austere life; also spelt Dervish. Darwin personifies
 each sunflower stamen as a dervish, moving together in a train or line.
 <ref target="#n89"> Back. </ref>
 </note></l>
 <space quantity="1" unit="lines"/>
 <anchor xml:id="helianthus"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Helianthus. </hi>I.223. Sun-flower. The numerous florets,
 which constitute the disk of this flower, contain in each five males
 surrounding one female, the five stamens have their anthers connected at top
 whence the name of the class, "confederate males;" see note on <ref
 target="#chondrilla">Chondrilla.</ref> The sun-flower follows the course
 of the sun by nutation, <anchor xml:id="n90"/>
 <note n="90" resp="editor" place="end">
 <hi rend="bold">Nutation: </hi>the oscillation on the axis of a rotating
 object; in this case, the head of the sunflower oscillates to follow the
 sun as it moves through the sky <ref target="#n90"> Back. </ref>
 </note> not by twisting its stems (Hales veg.stat.) <anchor xml:id="n91"/>
 <note n="91" resp="editor" place="end"> British natural philosopher Stephen
 Hales (1677-1761) was a fellow of the Royal Society. His 1727 work <hi
 rend="italic">Vegetable Staticks </hi>shares the results of
 experiments which examined the role of the sun's rays on plant sap. <ref
 target="#n91"> Back. </ref>
 </note> Other plants, when they are confined in a room, turn the shining

surface of their leaves, and bend their whole branches to the light. <ref target="#mimosa">See Mimosa.</ref>
</p>

<pb n="24" facs="http://imgur.com/RicSG1P"/>
<l n="225">Marshall'd in <hi rend="italic">fives </hi>each gaudy band proceeds,</l>
<l>Each gaudy band a plumed Lady leads;</l>
<l>With zealous step he climbs the upland lawn,</l>
<l>And bows in homage to the rising dawn;</l>
<l>Imbibes with eagle-eye the golden ray,</l>
<l n="230">And watches, as it moves, the orb of day.</l>
</lg>
<lg>
<l rendition="#indent1">Queen of the marsh, imperial DROSEREA treads</l>
<l>Rush-fringed banks, and moss-embroider'd beds;</l>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">A plumed Lady leads. </hi>I.226. The seeds of many plants of this class are furnished with a plume, by which admirable mechanism they are disseminated by the winds far from their parent stem, and look like a shuttlecock, as they fly. Other seeds are disseminated by animals; of these some attach themselves to their hair or feathers by a gluten, <anchor xml:id="n92"/>
<note n="92" resp="editor" place="end">
<hi rend="bold">Gluten: </hi>a glue-like animal or plant secretion; sometimes used by birds for the construction of nests <ref target="#n92"> Back. </ref>
</note> as mistletoe; others by hooks, as cleavers, burdock, hounds-tongue; and others are swallowed whole for the sake of the fruit, and voided uninjured, as the hawthorn, juniper, and some grasses. Other seeds again disperse themselves by means of an elastic seed-vessel, <anchor xml:id="n93"/>
<note n="93" resp="editor" place="end">
<hi rend="bold">Elastic seed-vessel</hi>: structures containing seeds of a flowering plant that can open to release the seeds but then return to their previous form <ref target="#n93"> Back. </ref>
</note> as Oats, Geranium, and Impatiens; and the seeds of aquatic plants, and of those which grow on the banks of rivers, are carried many miles by the currents, into which they fall. See <ref target="#impatiens">Impatiens.</ref><ref target="#zoftera"> Zoftera.</ref>
<ref target="#cassia"> Cassia.</ref>
<ref target="#carlina"> Carlina. </ref>
</p>
<p rendition="#indent1 #smallest">
<anchor xml:id="drosera"/>
<hi rend="italic">Drosera</hi>. I. 231. Sun-dew. Five males, five females. The leaves of this marsh-plant are purple, and have a fringe very unlike other vegetable productions. And, which is curious, at this point of every thread in this erect fringe stands a pellucid <anchor xml:id="n94"/>
<note n="94" resp="editor" place="end">

<hi rend="bold">Pellucid drop of mucilage: </hi>transparent drop of a sticky material naturally present in seeds, roots, or other parts of plants <ref target="#n94"> Back. </ref>

</note> drop of mucilage, resembling a ducal coronet. <anchor xml:id="n95"/>

<note n="95" resp="editor" place="end">

<hi rend="bold">Ducal Coronet: </hi> a small crown that serves as a heraldic symbol of rank. Darwin suggests that the viscous drops on the tips of the drosera fringe cause the fringes to resemble a crown.<ref target="#n95"> Back. </ref>

</note> This mucus is a secretion from certain glands, and like the viscous material round the flower-stalks of Silene (catchfly) prevents small insects from infesting the leaves. As the ear-wax in animals seems to be in part designed to prevent fleas and other insects from getting into their ears. See <ref target="#silene">Silene.</ref>

<persName><surname>Mr. Wheatley</surname></persName>, an eminent surgeon in Cateaton-street, London, observed these leaves to bend upwards, when an insect settled on them, like the leaves of the muscipula veneris, and pointing <add rend="i">Continued p.25</add><reg>all their globules of mucus to the centre, that they completely entangled and destroyed it.

<persName>M.<surname>Broussonet,</surname></persName>

<anchor xml:id="n96"/>

<note n="96" resp="editor" place="end"> Pierre Broussonet was a professor and botanical garden director at Montpellier medical school in France. <ref target="#n96"> Back. </ref>

</note> in the Mem. D'l' Acad. Des Sciences <anchor xml:id="n97"/>

<note n="97" resp="editor" place="end"> Broussonet's work was published in the Memoirs of the French Academy of Sciences. The memoirs were a widely cited source in Britain's equivalent publication, the Royal Society's

<hi rend="italic" xml:space="preserve">Philosophical Transactions. </hi>

Although nominally focusing on mathematics and physics, the French scholarly journal published articles from all fields of natural science.Scholarly Societies Project, Academie des Sciences. <ref target="#n97"> Back. </ref>

</note> for the year 1784, p. 615. after having described the motion of the Dionæa, adds, that a similar appearance has been observed in the leaves of two species of Drosera.</reg>

</p>

<pb n="25" facs="http://i.imgur.com/FsMV3u5.png"/>

<l>Redundant folds of glossy silk surround</l>

<l>Her slender waist, and trail upon the ground;</l>

<l n="235"><hi rend="italic">Five </hi>sister-nymphs collect with graceful ease,</l>

<l>Or spread the floating purple to the breeze;</l>

<l>And <hi rend="italic">five </hi>fair youths with duteous love comply</l>

<l>With each soft mandate of her moving eye.</l>

<l>As with sweet grace her snowy neck she bows,</l>

<l n="240">A zone of diamonds trembles round her brows;</l>

<l>Bright shines the silver halo, as she turns;</l>

<l>And, as she steps, the living lustre burns.</l>

</lg>

<lg>
 <l>Fair LONICERA prints the dewy lawn,</l>
 <l>And decks with brighter blush the vermil <anchor xml:id="n98"/>
 <note n="98" resp="editor" place="end">
 <hi rend="bold">Vermil: </hi>bright scarlet or red <ref target="#n98">
 Back. </ref>
 </note> dawn;</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Lonicera. </hi>I.243. Caprisolium. Honeysuckle. Five
 males, one female. Nature has in many flowers used a wonderful apparatus to
 guard the nectary, <anchor xml:id="n99"/>
 <note n="99" resp="editor" place="end">
 <hi rend="bold">Nectary: </hi>A nectar-secreting gland in a plant <ref
 target="#n99"> Back. </ref>
 </note> or honey-gland, from insects. In the honey-suckle the petal
 terminates in a long tube like a cornucopiæ, or horn of plenty; and the
 honey is produced at the bottom of it. In Aconitum, monkshood, the nectaries
 stand upright like two horns covered with a hood, which abounds <add rend="i">Continued
 p.26</add><reg>with
 such acrid matter that no insects penetrate it. In Helleborus,
 hellebore, the main nectaries are placed in a circle like little
 pitchers, and add much to the beauty of the flower. In the columbine,
 Aquilegia, the nectary is imagined to be like the neck and body of a
 bird, and the two petals standing upon each side to represent wings;
 whence its name of columbine, as if resembling a nest of young pigeons
 fluttering whilst their parent feeds them. The importance of the nectary
 in the economy of vegetation is explained at large in the notes on part
 the first.</reg>
 </p>
 <p rendition="#indent1 #smallest">
 <reg> Many insects are provided with a long and pliant proboscis for the
 purpose of acquiring this grateful food, as a variety of bees, moths,
 and butterflies: but the Sphinx Convolvuli, or unicorn moth, is
 furnished with the most remarkable proboscis in this climate. It carries
 it rolled up in concentric circles under its chin, and occasionally
 extends it to above three inches in length. This trunk consists of
 joints and muscles, and seems to have more versatile movements than the
 trunk of the elephant; and near its termination is split into two
 capillary tubes. The excellence of this contrivance for robbing the
 flowers of their honey, keeps this beautiful insect fat and bulky;
 though it flies only in the evening, when the flowers have closed their
 petals, and are thence more difficult of access; at the same time the
 brilliant colours of the moth contribute to its safety, by making it
 mistaken by the late sleeping birds for the flower its rests on.</reg>
 </p>
 <p rendition="#indent1 #smallest">
 <reg> Besides these there is a curious contrivance attending the Ophrys,
 commonly called the Bee-orchis, and the Fly-orchis, which some kinds of
 the Delphinium, called Bee-larkspurs, to preserve their honey; in these

the nectary and petals resemble in form and colour the insects, which plunder them: and thus it may be supposed they often escape these hourly robbers, by having the appearance of being pre-occupied. See note on <ref target="#rubia">Rubia </ref>, and <ref target="#conferva">Conferva polymorpha. </ref>
</reg>
</p>

<pb n="26" facs="http://i.imgur.com/buIfx2n.png"/>
<l n="245">Winds round the shadowy rocks, and pansied <anchor xml:id="n100"/>
<note n="100" resp="editor" place="end">
<hi rend="bold">Pansied: </hi>abounding in pansies <ref target="#n100">
Back. </ref>
</note> vales,</l>
<l>And scents with sweeter breath the summer-gales;</l>
<l>With artless grace and native ease she charms,</l>
<l>And bears the horn of plenty in her arms.</l>
<l><hi rend="italic">Five </hi>rival Swains their tender cares unfold,</l>
<l n="250">And watch with eye askance the treasured gold.</l>
</lg>

<pb n="27" facs="http://i.imgur.com/Npn4a3o.png"/>
<lg>
<l rendition="#indent1"> Where rears huge Tenerife <anchor xml:id="n101"/>
<note n="101" resp="editor" place="end"> The largest of the Canary Islands.
Although under the control of Spain, the island was considered exotic to
English readers as it was often a stopover for voyages to and from the
Americas. <ref target="#n101"> Back. </ref>
</note> his azure crest, </l>
<l>Aspiring DRABA builds her eagle nest;</l>
<l>Her pendant aerie icy caves surround,</l>
<l>Where erst Volcanoes min'd the rocky ground.</l>
<l n="255">Pleased round the Fair <hi rend="italic">four </hi>rival Lords
ascend</l>
<l>The shaggy steeps, <hi rend="italic">two </hi>menial youths attend.</l>
<l>High in the setting ray the beauty stands, </l>
<l>And her tall shadow waves on distant lands.</l>
</lg>
<lg>
<l rendition="#indent1">Oh, stay, bright habitant of air, alight, </l>
<l n="260">Ambitious <anchor xml:id="visca"/> VISCA, from thy angel-flight! </l>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<anchor xml:id="draba"/>
<hi rend="italic">Draba</hi>. Alpina. Alpine Whitlow-grass. One female and
six males. Four of these males stand above the other two; whence the name of
the class, "four powers." I have observed in several plants of this class,
that the two lower males arise, in a few days after the opening of the
flower, to the same height as the other four, not being mature as soon as
the higher ones. See note on <ref target="#gloriosa">Gloriosa.</ref> All the

plants of this class possess similar virtues; they are termed acrid and antiscorbutic [n102](#)

Antiscorbutic: can be used against scurvy [n102](#) Back.

in their raw state, as mustard, watercress; when cultivated and boiled, they become a mild wholesome food, as cabbage, turnip.

There was formerly a Volcano on the Peak of the Tenereife, which became extinct about the year 1684. *Philos. Trans.* [n103](#)

The *Philosophical Transactions of the Royal Society of London* is the world's longest running international scientific journal. Its first issue was published in 1665. [n103](#) Back.

In many excavations of the mountain, much below the summit, there is now found abundance of ice at all seasons. Tench's Expedition to Botany Bay, p.12. [n104](#)

Watkin Tench (1759-1833) was a British marine officer and author who fought for Britain in their attempts to suppress both the American and French Revolutions. His 1789 book *Expedition to Botany Bay* describes his 1788 voyage to New South Wales on the south-east coast of Australia. [n104](#) Back.

Are these congelations [n105](#)

Congelations: crystallizations, frozen objects [n105](#) Back.

in consequence of the daily solution of the hoar-frost, [n106](#)

Hoar-frost: frozen dew or vapour [n106](#) Back.

which is produced on the summit during the night?

Viscum. Mistletoe. Two houses. This plant never grows upon the ground; the foliage is yellow, and the berries milk-white; the berries are so viscous, as to serve ⁱContinued p.28<reg> for bird-lime; and when they fall, adhere to the branches of the tree of which the plant grows, and strike root into its bark; or are carried to distant trees by birds. The Tillandisia, or wild pine, grows on other trees, like the Mistletoe, but take little or no nourishment from them, having large buckets in its leaves to collect and retain the rain water. See note on [Dypsacus](#). The mosses, which grow on the bark of trees, take much nourishment from them; hence it is observed that trees, which are annually cleared from moss by a brush, grow nearly twice as fast. (*Phil. Transact.*) [n107](#)

The *Philosophical Transactions of the Royal Society of London* is the words longest running international scientific journal.

Its first issue was published in 1665.<ref target="#n107"> Back.
</ref>

</note> In the cider countries <anchor xml:id="n108"/>

<note n="108" resp="editor" place="end">

<hi rend="bold">Cider countries</hi>: those countries that make
cider, a fermented apple juice beverage, from the apples of trees.

<ref target="#n108"> Back. </ref>

</note> the peasants brush their apple trees annually.</reg>
</p>

<pb n="28" facs="http://i.imgur.com/WpboGlc.png"/>

<l>- Scorning the sordid soil, aloft the springs,</l>

<l>Shakes her white plume, and claps her golden wings;</l>

<l>High o'er the fields of boundless ether roves,</l>

<l>And seeks amid the clouds her soaring loves!</l>

</lg>

<lg>

<l rendition="#indent1" n="265">Stretch'd on her mossy couch, in trackless
deeps,</l>

<l>Queen of the coral groves, ZOSTERA sleeps;</l>

<l>The silvery sea-weed matted round her bed,</l>

<l>And distant surges murmuring o'er her head. —</l>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<hi rend="italic">Zostera</hi>. Grass-wrack. Class, Feminine Males. Order,
Many Males. It grows at the bottom of the sea, and rising to the surface
when in flower, covers many leagues: and is driven at length to the shore.
During its time of floating on the sea, numberless animals live on the under
surface of it; and being specifically lighter than the sea-water, or being
repelled by it, have legs placed as it were on their backs for the purpose
of walking under it. As the Scyllœa.

See<persName><surname>Barbut's</surname></persName>Genera
Vermium.

<anchor xml:id="n109"/>

<note n="109" resp="editor" place="end"> English naturalist James Barbut's

<hi rend="italic">Genera Vermium </hi>explores the order of
mollusca, described by the author as the “inhabitants of shells, whose
usual abode is in the depths of the Ocean” (iv). The Scylla cited here
is described as a creature with a “compressed and fluted” body,” a mouth
which “consists of a hole without teeth”, and “three pair of tentacula
or arms” (68). <ref target="#n109"> Back. </ref>

</note> It seems necessary that the marriages of plants should be celebrated
in the open air, either because the powder of the anther, or the mucilage on
the stigma, or the reservoir of honey might receive injury from the water.

Mr. Needham <anchor xml:id="n110"/>

<note n="110" resp="editor" place="end"> Priest and natural scientist, John
Tuberville Needham (1713-1781) was the first English Catholic to be
elected to the Royal Society of London. His works were published in the
<hi rend="italic">Philosophical Transactions </hi> and focused in

particular on studies conducted with a microscope. <ref target="#n110"> Back. </ref>

</note> observed, that in the ripe dust of every flower, examined by the microscope, some vesicles are perceived, from which a fluid had <reg> escaped; and that those, which still retain it, explode if they be wetted, like an eolopile <anchor xml:id="n111"/>

<note n="111" resp="editor" place="end">

<hi rend="bold">Eolopile: </hi>an early form of steam technology: a container filled with steam/heated vapours which escape through apertures with sufficient force to cause the container to rotate.

<ref target="#n111"> Back. </ref>

</note> suddenly exposed to a strong heat. These observations have been verified by Spallanzani and others. Hence rainy seasons make a scarcity of grain, or hinder its fecundity, by bursting the pollen before it arrives at the moist stigma of the flower. Spallanzani's Dissertations, V.11 p.321. <anchor xml:id="n112"/>

<note n="112" resp="editor" place="end"> Italian biologist Lazzaro Spallanzani (1729-1799) conducted experiments in a variety of fields. His <hi rend="italic">Dissertations on the Nature of Animals and Vegetables </hi>(1780) reported results of these various experiments and ranged in subject from the use of gastric juice in digestion to artificial insemination. His artificial insemination of a dog is one of the earliest records of this process. <ref target="#n112"> Back. </ref>

</note> Thus the flowers of the male Vallisneria are produced under water, and when ripe detach themselves from the plant, and rising to the surface are wafted by the air to the female flowers. See <ref target="#vallisneria"> Vallisneria.</ref></reg>

<pb n="29" facs="http://i.imgur.com/ml0n6Y9.png"/>

<l>High in the flood her azure dome ascends,</l>

<l n="270">The crystal arch on crystal columns bends;</l>

<l>Roof'd with translucent shell the turrets blaze,</l>

<l>And far in ocean dart their colour'd rays;</l>

<l>O'er the white floor successive shadows move,</l>

<l>As rise and break the ruffled waves above. -</l>

<l n="275">Around the nymph her mermaid-trains repair,</l>

<l>And weave with orient pearl her radiant hair;</l>

<l>With rapid fins she cleaves the watery way,</l>

<l>Shoots like a silver meteor up to day;</l>

<l>Sounds a loud conch, convokes a scaly band,</l>

<l n="280">Her sea-born lovers, and ascends the strand.</l>

</lg>

<lg>

<l rendition="#indent1">E'en round the pole the flames of Love aspire,</l>

<l>And icy bosoms feel the <hi rend="italic">secret</hi>

<anchor xml:id="n113"/>

<note n="113" resp="editor" place="end"> Darwin uses the word 'secret' to reflect the class cryptogamia – i.e., those plants which do not have

apparent pistils or stamens and thus reproduce in a method that Linnaeus could not perceive. <ref target="#n113"> Back. </ref>
</note> fire! -</l>

<pb n="30" facs="http://i.imgur.com/rnbOrEL.png"/>

<l>Cradled in snow and fann'd by arctic air</l>

<l>Shines, gentle BAROMETZ! Thy golden hair;</l>

<l n="285">Rooted in earth each cloven hoof descends,</l>

<l>And round and round her flexile <anchor xml:id="n114"/>

<note n="114" resp="editor" place="end">

<hi rend="bold" xml:space="preserve">Flexile: </hi>bends easily <ref target="#n114"> Back. </ref>

</note> neck she bends;</l>

<l>Crops the grey coral moss, and hoary thyme,</l>

<l>Or laps with rosy tongue the melting rime;</l>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<hi rend="italic">Barometz. </hi> Polypodium Barometz. Tartarian Lamb.

Clandestine Marriage. This species of Fern is a native of China, with a decumbent root, thick, and everywhere covered with the most soft and dense wool, intensely yellow. <persName>Lin. </persName>Spec.

Plant.

<anchor xml:id="n115"/>

<note n="115" resp="editor" place="end">

<hi rend="bold">Lin. Spec: </hi>Linnaeus' 1753 text <hi rend="italic">

>Species Plantarum</hi> listed all plant species then known in the

world - about 8000. <ref target="#n115"> Back. </ref>

</note>

</p>

<p rendition="#indent1 #smallest"> This curious item is sometimes pushed out of the ground in its horizontal situation by some of the inferior branches of the root, so as to give it some resemblance to a Lamb standing on four legs; and has been said to destroy all other plants in its vicinity. Sir

<persName><forename>Hans</forename><surname>

Sloane</surname></persName>

<anchor xml:id="n116"/>

<note n="116" resp="editor" place="end"> Eminent English physician and curio collector, Hans Sloane (1660-1753) travelled much and acquired many natural history artifacts through deliberate search or the good will of his many acquaintances. Famously, Sloane bequeathed his possessions to the king and the Royal Society, leaving behind a vast collection that would serve as the beginnings of the British Museum. <ref target="#n116">

> Back. </ref> </note> describes it in the name of Tartarian Lamb, and has given a print of it Philos. Trans.abridged, v.II. p.646. <anchor

xml:id="n117"/>

<note n="117" resp="editor" place="end"> The <hi rend="italic">Philosophical Transactions of the Royal Society of London </hi>is the world's longest running international scientific journal. Its first issue was published in 1665. <ref target="#n117"> Back. </ref>

</note> but thinks some art has been used to give it an animal appearance.

<persName>Dr. <surname>Hunter</surname></persName>, <anchor xml:id="n118"/>

<note n="118" resp="editor" place="end"> Alexander Hunter (1729?-1809) was a Scottish physician best known for his illustrated editions with notes of John Evelyn's (1620-1706) works. Writer and hobbyist botanist, Evelyn published extensively on the topic of gardening. <hi rend="italic">Terra: A Philosophical Discourse </hi>was first published in 1676 and focuses on soil. Hunter's edition was released in 1778.<ref target="#n118"> Back. </ref>

</note> in his edition of the Terra of Evelyn, has given a more curious print of it, much resembling a sheep. The down is used in India externally for stopping hemorrhages, and is called golden moss. </p>

<p rendition="#indent1 #smallest"> The thick downy clothing of some vegetables seems designed to protect them from the injuries of cold, like the wool of animals. Those bodies, which are bad conductors of electricity, are also bad conductors of heat, as glass, wax, air. Hence either of the two former of these may be melted by the flame of a blow-pipe very near the fingers which hold it without burning them; and the last, by being confined to the surface of animal bodies, in the interstices of their fur or wool, prevents the escape of their natural warmth; to which should be added, that the hairs themselves are imperfect conductors. The fat or oil of whales, and other northern animals, seems designed for the same purpose of preventing the too sudden escape of the heat of the body in cold climates. Snow protects vegetables which are covered by it from cold, both because it is a bad conductor of heat itself, and contains much air in its pores. If a piece of camphor <anchor xml:id="n119"/>

<note n="119" resp="editor" place="end">

<hi rend="bold">Camphor: </hi>A translucent crystalline substance that is chemically similar to vegetable oils; Darwin suggests it for this experiment because it is highly flammable.<ref target="#n119"> Back.

</ref>

</note> be immersed in a snowball, except one extremity of it, on setting fire to this, as the snow melts, the water becomes absorbed into the surrounding snow by capillary <anchor xml:id="n120"/>

<note n="120" resp="editor" place="end">

<hi rend="bold">Capillary attraction</hi>: the process by which liquids are drawn upwards through small tube-like spaces. Here, the water is drawn up through miniscule spaces in the snow. <ref target="#n120">

Back. </ref>

</note> attractions; on this account, when living animals are buried in snow, they are not moistened by it; but the cavity enlarges as the snow dissolves affording them both a dry and warm habitation. </p>

<pb n="31" facs="http://i.imgur.com/3FYNMbZ.png"/>

<l>Eyes with mute tenderness her distant dam,</l>

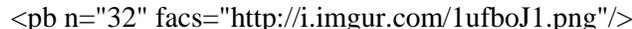
<l n="290">Or seems to bleat, a <hi rend="italic">Vegetable Lamb.</hi></l>

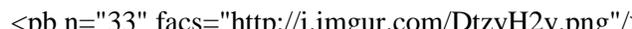
<l>- So warm and buoyant in his oily mail,</l>

<l>Gambols <anchor xml:id="n121"/>

<note n="121" resp="editor" place="end">

<hi rend="bold">Gambol: </hi>an energetic leap <ref target="#n121">
 Back. </ref>
 </note> on seas of ice the unwieldy Whale;</l>
 <l>Wide-waving fins round floating islands urge</l>
 <l>His bulk gigantic through the troubled surge;</l>
 <l n="295">With hideous yawn the flying shoals he seeks,</l>
 <l>Or clasps with fringe of horn his massy cheeks;</l>
 <l>Lifts o'er the tossing wave his nostrils bare,</l>
 <l>And spouts pellucid <anchor xml:id="n122"/>
 <note n="122" resp="editor" place="end">
 <hi rend="bold">Pellucid: </hi>transparent <ref target="#n122"> Back.
 </ref>
 </note> columns into air;</l>
 <l>The silvery arches catch the setting beams,</l>
 <l n="300">And transient rainbows tremble o'er the streams.</l>
 </lg>
 <lg>
 <l rendition="#indent1">Weak with nice sense, the chaste MIMOSA stands,</l>
 <l>From each rude touch withdraws her timid hands;</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <anchor xml:id="mimosa"/>
 <hi rend="italic">Mimosa. </hi>The sensitive plant. Of the class Polygamy,
 one house. Naturalists have not explained the immediate cause of the
 collapsing of the sensitive plant; the leaves meet and close in the night
 during the sleep of the plant, or when exposed to much cold in the day-time,
 in the same manner as when they are affected by external violence, folding
 their upper surfaces together, and in part over each other like scales or
 tiles; so as to expose as little of the upper surface as may be to the air;
 but do not indeed collapse quite <add rend="i">Continued p.32</add><reg> so far, since I have found,
 when
 touched in the night during their sleep, they fall still further;
 especially when touched on the foot-stalks between the stems and the
 leaflets, which seems to be their most sensitive or irritable part. Now
 as their situation after being exposed to external violence resembles
 their sleep, but with a greater degree of collapse, may it not be owing
 to a numbness or paralysis consequent to too violent irritation, like
 the fainting of animals from pain or fatigue? I kept a sensitive plant
 in a dark room till some hours after day-break; its leaves and
 leaf-stalks were collapsed as in its most profound sleep, and on
 exposing it to the light, above twenty minutes passed before the plant
 was thoroughly awake and had quite expanded itself. During the night the
 upper or smoother surfaces of the leaves are pressed together; this
 would seem to show that the office of this surface of the leaf was to
 expose the fluids of the plant to the light as well as to the air. See
 note on <ref target="#helianthus">Helianthus. </ref> Many flowers close
 up their petals during the night. See note on vegetable respiration in
 Part I.</reg>
 </p>


<l>Oft as light clouds o'er-pass the Summer-glade,</l>
<l>Alarm'd she trembles at the moving shade;</l>
<l>And feels, alive through all her tender form,</l>
<l n="305">The whisper'd murmurs of the gathering storm;</l>
<l>Shuts her sweet eye-lids to approaching night,</l>
<l>And hails with freshen'd charms the rising light.</l>
<l>Veil'd, with gay decency and modest pride,</l>
<l>Slow to the mosque she moves, an eastern bride;</l>
<l n="310">There her soft vows unceasing love record,</l>
<l>Queen of the bright seraglio <anchor xml:id="n123"/>
<note n="123" resp="editor" place="end"> Seraglios were an increasingly
common fixture of 18<hi rend="superscript">th</hi>century western
literature about the east, inspired by writers such as Lady Mary Wortley
Montagu (<hi rend="italic">bap</hi>. 1689-1762), wife to Britain's
Turkish ambassador. Montagu's <hi rend="italic">Turkish Embassy Letters
</hi> (published posthumously in 1763) document her experiences in
Turkey; one letter discusses Turkish female bathhouses. Though Montagu
was writing from personal experience, many writers were not and
hyperbolized depictions of the east. The seraglio, seen by English
readers as the apartments reserved for wives and concubines, became a
highly salacious image that represented not actual cultural practices
but rather a western fantasy about the east. <ref target="#n123"> Back.
</ref>
</note> of her Lord. -</l>
<l>So sinks or rises with the changeful hour</l>
<l>The liquid silver in its glassy tower.</l>


<l n="315">So turns the needle to the pole it loves,</l>
<l>With fine librations <anchor xml:id="n124"/>
<note n="124" resp="editor" place="end">
<hi rend="bold">Libration</hi>: the action of being carefully balanced
<ref target="#n124"> Back. </ref>
</note> quivering as it moves.</l>
</lg>
<lg>
<l rendition="#indent1">All wan and shivering in the leafless glade</l>
<l>The sad ANEMONE reclin'd her head;</l>
<l>Grief on her cheeks had paled the roseate hue,</l>
<l n="320">And her sweet eye-lids dropp'd with pearly dew.</l>
<l>- "See, from bright regions, borne on odorous gales</l>
<l>"The Swallow, herald of the summer, sails;</l>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">Anemone. </hi>Many males, many females. <persName>Pliny </persName>
<anchor xml:id="n125"/>
<note n="125" resp="editor" place="end"> Roman author Pliny the Elder
(23-79) discusses the anemone in his <hi rend="italic">Naturalis

Historia, </hi>an encyclopedia of natural history (389).<ref target="#n125"> Back. </ref>

</note> says this flower never opens its petals but when the wind blows; whence its name: it has properly no calyx, <anchor xml:id="n126"/>

<note n="126" resp="editor" place="end">

<hi rend="bold">Calyx:</hi>a cup-shaped collection of leaves at the top of the stem - it surrounds the base of the flower and protects it, especially at the bud stage <ref target="#n126"> Back. </ref>

</note> but two or three sets of petals, three in each set, which are folded over the stamens and pistil in a singular and beautiful manner, and differs also from ranunculus in not having a melliferous <anchor xml:id="n127"/>

<note n="127" resp="editor" place="end">

<hi rend="bold">Melliferous:</hi>producing honey <ref target="#n127"> Back. </ref>

</note> pore on the claw <anchor xml:id="n128"/>

<note n="128" resp="editor" place="end">

<hi rend="bold" xml:space="preserve">Claw:</hi>in botany, the narrow base of the petal which attaches to the plant <ref target="#n128"> Back. </ref>

</note> of each petal. </p>

<p rendition="#indent1 #smallest">

<hi rend="italic">The Swallow.</hi>There is a wonderful conformity between the vegetation of some plants, and the arrival of certain birds of passage. Linnaeus observes that the wood anemone blows in Sweden on the arrival of the swallow; and the marsh mary-gold, Caltha, when the cuckoo sings. Near the same coincidence was observed in England by

<persName><surname>Stillingfleet</surname></persName>. <anchor xml:id="n129"/>

<note n="129" resp="editor" place="end"> Benjamin Stillingfleet (1702-1771) was an English botanist and writer, well-known for his 1759 translation of Linnaeus, entitled <hi rend="italic">Miscellaneous Tracts </hi>- a work which both communicated Linnaeus' classification system while advocating increased study of the natural sciences. <ref target="#n129"> Back. </ref>

</note> The word Coccux in Greek signifies both a young fig and a cuckoo, which is supposed to have arisen from the coincidence of their appearance in Greece. Perhaps a similar coincidence of appearance in some parts of Asia gave occasion to the story of the love of the rose and the nightingale, <anchor xml:id="n130"/>

<note n="130" resp="editor" place="end"> Letter XXXI of Lady Mary Wortley Montagu's <hi rend="italic">Turkish Embassy Letters </hi>included a loose retelling of the Persian legend of the nightingale and rose. The motif was taken up and popularized by later writers such as judge and eastern-enthusiast William Jones (1746-94) in his 1771 work <hi rend="italic">Grammar of the Persian Language. </hi> "The nightingale now wanders in the vines/Her passion is to seek roses," Montagu writes. (Montagu Let.XXXI). <ref target="#n130"> Back. </ref>

</note> so much celebrated by eastern poets. See <ref target="#dianthus">Dianthus.</ref> The times however of the appearance of vegetables in spring seem occasionally to be influenced by their acquired habits, as well

as by their sensibility to heat: for the roots of potatoes, onions, &c. will germinate with much less heat in the spring than in the autumn: as is easily observable where these roots are stored for use;<add rend="i">Continued p.34</add><reg> and hence malt

is being made in the spring. 2d. The grains and roots brought from more southern latitudes germinate here sooner than those which are brought from northern ones, owing to their acquired habits.

<persName><surname>Fordyce</surname></persName> on Agriculture.

<anchor xml:id="n131"/>

<note n="131" resp="editor" place="end"> Scottish-born physician George Fordyce (1736-1802) was an active Fellow of the Royal Society and author of many papers. His <hi rend="italic">Elements of Agriculture and Vegetation </hi> (1789) analyzes the chemical compounds that drive plant growth.<ref target="#n131"> Back. </ref>

</note> 3d. It was observed by one of the scholars of

<persName>Linnaeus</persName>, that the apple-trees sent from hence to New England blossomed for a few years too early for that climate, and bore no fruit; but afterwards learnt to accommodate themselves to their new situation (<persName><surname>Kalm's</surname></persName> Travels). <anchor xml:id="n132"/>

<note n="132" resp="editor" place="end"> Swedish botanist Pehr Kalm (1716-1779) was a student of Linnaeus who travelled in England and North America collecting plant specimens. He shared his experiences via his 1771 account Travels into North America. <ref target="#n132"> Back. </ref>

</note> 4th. The parts of animals become more sensible to heat after having been previously exposed to cold, as our hands glow on coming into the house after having held snow in them; this seems to happen to vegetables; for vines in grape-houses, which have been exposed to the winter's cold, will become forwarder and more vigorous than those which have been kept during the winter in the house. (Kennedy on Gardening.)

<anchor xml:id="n133"/>

<note n="133" resp="editor" place="end"> Fully titled the <hi rend="italic">Treatise upon Planting, Gardening and the Management of the Hot-House</hi> , this 1776 publication was a handbook by John Kennedy, gardener to Sir Thomas Gascoigne, the eighth baronet of Parlington, Yorkshire. The book describes, among many subjects, the growth of exotic plants and experimentations in fodder crops. <ref target="#n133"> Back. </ref>

</note> This accounts for the very rapid vegetation in the northern latitudes after the solution of the snows.</reg>

</p>

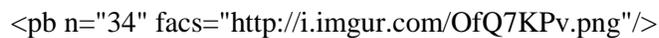
<p rendition="#indent1 #smallest"><reg> The increase of the irritability of plants in respect to heat, after having been previously exposed to cold, is further illustrated by an experiment of Dr. Walker's. <anchor xml:id="n134"/>

<note n="134" resp="editor" place="end"> John Walker (1731-1803) was a minister of the Church of Scotland and professor of natural history at the University of Edinburgh. An extensive collector of natural

specimens, he was also in correspondence with Linnaeus. He was a leading figure in the planning and establishment of the Royal Society of Edinburgh and contributed seven papers to their scholarly journal, *The Transactions of the Royal Society of Edinburgh*.

[Back](#).

He cut apertures into a birch-tree at different heights; and on the 26th of March some of these apertures bled, or oozed with sap-juice, when the thermometer was at 39; which same apertures did not bleed on the 13th of March, when the thermometer was at 44. The reason of this I apprehend was, because on the night of the 25th the thermometer was at 34; whereas on the night of the 12th it was at 41; though the ingenious author ascribes it to another cause. *Trans. Of Royal Soc. Of Edinburgh*, v.I. p.19.



“Breathe, gentle AIR! from cherub-lips impart

“Thy balmy influence to my anguish’d heart’

“Thou, whose soft voice calls forth the tender blooms,

“Whose pencil paints them, and whose breath perfumes:

“O chase the Fiend of Frost, with leaden mace

“Who fears in death-like sleep my hapless race;

“Melt his hard heart, release his iron hand,

“And give my ivory petals to expand.



“So may each bud, that decks the brow of spring,

“Shed all its incense on thy waiting wing!”

To her fond prayer propitious Zephyr

resp="editor" place="end"

Zephyr: classical god of the winds

resp="editor" place="end"

Sweeps on his sliding shell through azure fields,

O’er her fair mansion waves his whispering wand,

And gives her ivory petals to expand;

Gives with new life her filial train to rise,

And hail with kindling smiles the genial skies.

So shines the Nymph in beauty’s blushing pride,

When Zephyr wafts her deep calash

resp="editor" place="end"

Calash: A hood of silk

resp="editor" place="end"

Tears with rude kiss her bosom’s gauzy veil,

And flings the fluttering kerchief to the gale.

So bright, the folding canopy undrawn,

Glides the gilt Landau

resp="editor" place="end"

<hi rend="bold">Landau: </hi>A four wheeled carriage, the top of which
 may be closed or opened <ref target="#n137"> Back. </ref>
 </note> o'er the velvet lawn,</l>
 <l n="345">Of beaux and belles displays the glittering throng,</l>
 <l>And soft airs fan them, as they roll along.</l>
 </lg>
 <lg>
 <l rendition="#indent1">Where frowning Snowdon <anchor xml:id="n138"/>
 <note n="138" resp="editor" place="end"> The highest mountain in Wales. <ref
 target="#n138"> Back. </ref>
 </note> bends his dizzy brow,</l>
 <l>O'er Conwy, <anchor xml:id="n139"/>
 <note n="139" resp="editor" place="end"> A river in north Wales that flows
 by Snowdon mountain.<ref target="#n139"> Back. </ref>
 </note> listening to the surge below; </l>

<pb n="36" facs="http://i.imgur.com/209QbIT.png"/>
 <l>Retiring LICHEN climbs the topmost stone,</l>
 <l n="350">And drinks the aerial solitude alone. </l>
 <l>Bright shine the stars unnumber'd <hi rend="italic">o'er her head,</hi>
 <anchor xml:id="n140"/>
 <note n="140" resp="editor" place="end"> O'er her head/beneath: As these
 italics do not correspond to Linnaean classes or orders, Darwin is
 likely using them for literary emphasis here, expressing wonder at
 Lichen's resilience in growing in such remote locations. <ref
 target="#n140"> Back. </ref>
 </note></l>
 <l>And the cold moon-beam gilds her flinty bed;</l>
 <l>While round the rifted rocks hoarse whirlwinds breathe,</l>
 <l>And dark with thunder sail the clouds <hi rend="italic">beneath. </hi></l>
 <l n="355">The steepy path her plighted swain pursues,</l>
 <l>And tracks her light steps o'er th' imprinted dews;</l>
 <l>Delighted Hymen <anchor xml:id="n141"/>
 <note n="141" resp="editor" place="end">
 <hi rend="bold" xml:space="preserve">Hymen: </hi>Greek god of marriage,
 represented as a young man carrying a torch and veil. <ref
 target="#n141"> Back. </ref>
 </note> gives his torch to blaze,</l>
 <l>Winds round the crags, and lights the mazy ways;</l>
 <l>Sheds o'er their <hi rend="italic">secret</hi>
 <anchor xml:id="n142"/>
 <note n="142" resp="editor" place="end"> Darwin uses the word 'secret' to
 reflect the class cryptogamia – i.e., those plants which do not have
 apparent pistils or stamens and thus reproduce in a method that Linnaeus
 could not perceive. <ref target="#n142"> Back. </ref>
 </note> vows his influence chaste,</l>
 <l>And decks with roses the admiring waste.</l>
 </lg>
 <lg>
 <l rendition="#indent1">High in front of heaven when Sirius <anchor

xml:id="n143"/>

<note n="143" resp="editor" place="end">

<hi rend="bold">Sirius: </hi>A fixed star in the constellation Canis Major; the brightest star in the sky <ref target="#n143"> Back. </ref>

</note> glares,</l>

<l>And o'er Britannia shakes his fiery hairs;</l>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<hi rend="italic">Lichen</hi>. Calcareum. Liver-wort. Clandestine Marriage.

This plant is the first that vegetates on naked rocks, covering them with a kind of tapestry, and draws its nourishment perhaps chiefly from the air; after it perishes, earth enough is left for other mosses to root themselves; and after some ages a soil is produced sufficient for the growth of more succulent and large vegetables. In this manner perhaps the whole earth has been gradually covered with vegetation, after it was raised out of the primeval ocean by subterraneous fires. </p>

<pb n="37" facs="http://i.imgur.com/2TKcY3F.png"/>

<l>When no soft shower descends, no dew distills,</l>

<l>Her wave-worn channels dry, and mute her rills;</l>

<l n="365">When droops the sickening herb, the blossom fades,</l>

<l>And parch'd earth gapes beneath the withering glades;</l>

<l>- With languid step fair DYPsACA retreats,</l>

<l>"Fall gentle dews!" the fainting nymph repeats,</l>

<l>Seeks the low dell, and in the sultry shade</l>

<l n="370">Invokes in vain the Naiads to her aid. —</l>

<l><hi rend="italic">Four </hi>sylvan youths in crystal goblets bear</l>

<l>The untasted treasure to the grateful fair;</l>

<l>Pleased from their hands with modest grace she sips,</l>

<l>And the cool wave reflects her coral lips.</l>

</lg>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<anchor xml:id="dypsacus"/>

<hi rend="italic">Dypsacus.</hi> 1.367. Teasel. One female, and four males.

There is a cup around every joint of the stem of this plant, which contains from a spoonful to a half a pint of water; and serves both for the nutriment of the plant in dry seasons, and to prevent insects from creeping up to devour its seed. See <ref target="#silene">Silene</ref>. The Tillandsia, or wild pine, of the West Indies, has every leaf terminated near the stalk with a hollow bucket, which contains from half a pint to a quart of water.

<persName><surname>Dampier's</surname></persName> Voyage to Campeachy.

<anchor xml:id="n144"/>

<note n="144" resp="editor" place="end"> William Dampier (1651-1715), buccaneer and explorer, describes in his published journals his experiences on a merchant ship sailing for the Bay of Campechy, Mexico. The 1675 work discusses the region's wildlife and unruly inhabitants.<ref target="#n144"> Back. </ref>

</note> Dr. Sloane <anchor xml:id="n145"/>

<note n="145" resp="editor" place="end"> Eminent English physician and curio collector, Hans Sloane (1660-1753) travelled much and acquired many natural history artifacts through deliberate search or the good will of his many acquaintances. Famously, Sloane bequeathed his possessions to the king and Royal Society, leaving behind a vast collection that would serve as the beginnings of the British Museum. <ref target="#n145"> Back. </ref>

</note> mentions one kind of aloe furnished with leaves, which, like the wild pine and Banana, hold water; and thence afford necessary refreshment to travelers in hot countries. Nepenthes has a bucket for the same purpose at the end of every leaf. <persName><surname>Burm.</surname></persName> Zeyl. 42.17. <anchor xml:id="n146"/>

<note n="146" resp="editor" place="end"> Reference to the <hi rend="italic">Thesaurus Zeylanicus</hi> by Johannes Burman (1707-1780), Dutch botanist and teacher of Linnaeus, which provided a catalogue of plants found in Burman's travels throughout Africa (Gunn and Codd, 266). <ref target="#n146"> Back. </ref>

</note>

<pb n="38" facs="http://i.imgur.com/slASoHT.png"/>

<lg>

<l rendition="#indent1" n="375">With nice selection modest RUBIA blends</l>

<l>Her vermilion dyes, and o'er the cauldron bends;</l>

<l>Warm 'mid the rising steam the Beauty glows,</l>

<l>As blushes in a mist of dewy rose.</l>

<l>With chemic art <hi rend="italic">four </hi>favour'd youths aloof</l>

<l n="380">Stain the white fleece, or stretch the tinted woof; <anchor xml:id="n147"/>

<note n="147" resp="editor" place="end">

<hi rend="bold">Woof: </hi>in weaving, the threads that cross horizontally from side to side, perpendicular to the vertically oriented threads called the warp. <ref target="#n147"> Back. </ref>

</note>

</l>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<anchor xml:id="rubia"/>

<hi rend="italic">Rubia</hi>. Madder. Four males and one female. This plant is cultivated in very large quantities for dying red. If mixed with the food of young pigs or chickens, it colours their bones red. If they are fed alternate fortnights, with a mixture of madder, and with their usual food alone, their bones will consist of concentric circles of white and red.

<persName><surname>Belchier.</surname></persName> Phil. Trans, 1736

<anchor xml:id="n148"/>

<note n="148" resp="editor" place="end"> John Belchier was an English surgeon who was elected to the Royal Society in 1736. <ref target="#n148"> Back. </ref>

</note> . Animals fed with madder for the purpose of these experiments were found upon dissection to have thinner gall <anchor xml:id="n149"/>

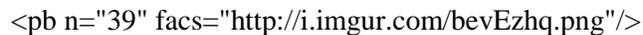
<note n="149" resp="editor" place="end">

Gall: A secretion of the liver [Back](#).

. Comment. de rebus. Lipsiæ [Back](#).

Commentarii de rebus in scientia naturali et medicina gestis. Volvminis I. Pars I, or *Commentaries about Achievements in Natural Science and Medicine* was a Latin scientific journal compiled by Johannes Friedrich Gleditsch in Leipzig. Though *rubia tinctorum* is discussed in multiple volumes of the journal, Darwin is likely referring to Volume 33, published 1791, which cites Dutch natural philosopher Levinus Lemnius' work using madder to dye animal bones (Vol 38 pg 272). [Back](#).

. This circumstance is worth further attention. The colouring materials of vegetables, like those which serve the purpose of tanning, varnishing, and the various medical purposes, do not seem essential to the life of the plant; but seem given it as a defense against the depredations of insects or other animals, to whom these materials are nauseous or deleterious. The colours of insects and many smaller animals contribute to conceal them from the larger ones which prey upon them. Caterpillars which feed on leaves are generally green; and earth-worms the colour of the earth which they inhabit; Butter-flies, which frequent flowers, are coloured like them; small birds which frequent hedges have greenish backs like the leaves, and light coloured bellies like the sky, and are hence less visible to the hawk, who passes under them or over them. Those birds which are much amongst flowers, as the gold-finch (*Fringilla carduelis*), are furnished with vivid colours. The lark, partridge, hare, are the colour of dry vegetables or earth on which they rest. And frogs vary their colour with the mud of the streams which they frequent; and those which live on trees are green. Fish, which are generally suspended in water, and swallows, which are generally suspended in air, have their backs the colour of the distant ground, and their bellies of the sky. In the colder climates many of these become white during the existence of the snows. Hence there is apparent design in the colours of animals, whilst those of vegetables seem consequent to the other properties of the materials which possess them.



O'er Age's cheek the warmth of youth diffuse,

Or deck the pale-eyed nymph in roseate hues.

So when MEDEA [Back](#)

Daughter of the King of Colchis (modern day Georgia), Medea fell in love with Jason, defied her family, and helped him steal the golden fleece, fleeing to Corinth, Greece, with him. [Back](#) to exulting Greece

From plunder'd COLCHIS bore the golden fleece;

On the loud shore a magic pile she rais'd,

The cauldron bubbled, and the faggots blaz'd;

Pleased on the boiling wave old Æson [Back](#)

<note n="152" resp="editor" place="end"> Medea performs magic on Aeson, Jason's old father, to extend his life. Though Darwin uses the point to argue for the benefits of regular bathing, Ovid's original rendition of the story in the <hi rend="italic">Metamorphosis </hi>describes Medea slitting Aeson's throat and replacing his blood with a magical concoction she had brewed. <ref target="#n152"> Back. </ref>

</note> swims,</l>

<l>And feels new vigour stretch his swelling limbs:</l>

<l>Through his thrill'd nerves forgotten ardors dart,</l>

<l n="390">And warmer eddies circle round his heart;</l>

<l>With softer fires his kindling eye-balls glow,</l>

<l>And dark tresses wanton round his brow.</l>

</lg>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<hi rend="italic">Pleased on the boiling wave. </hi> The story of Aeson becoming young, from the medicated bath of Medea, seems to have been intended to teach the efficacy of warm bathing in retarding the progress of old age. The words <hi rend="italic">relaxing and bracing, </hi>which are generally thought expressive of the effects of warm and cold bathing, are mechanical terms, properly applied to drums or strings; but are only metaphors when applied to the effects of cold or warm bathing on animal bodies. The immediate cause of old age seems to reside in the inirritability of the finer vessels or parts of our system; hence these cease to act, and collapse or become horny or bony. The warm bath is peculiarly adapted to prevent these circumstances by its increasing our irritability, and by moistening and softening the skin, and the extremities of the finer vessels, which terminate in it. To those who are past the meridian of life, and have dry skins, and begin to be emaciated, the warm bath, for half an hour twice a week, I believe to be eminently serviceable in retarding the advances of age. </p>

<pb n=""/>

<note n="183" resp="editor" place="end">

This page has been added from the 1799 printing of the 4th edition. Although still entitled the 4th edition, this passage is an addition to the earlier 1794 4th edition. Because it is from a different edition, no facsimile image is included.

<ref target="#n183"> Back. </ref></note>

<lg>

<l>Where Java's isle, horizon'd with the floods,</l>

<l>Lifts to the skies her canopy of woods;</l>

<l>Please EPIDENDRA climbs the waving pines,</l>

<l>And high in heaven the intrepid beauty shines,</l>

<l>Gives to the tropic breeze her radiant hair,</l>

<l>Drinks the bright shower, and feeds upon the air.</l>

<l>Her brood delighted stretch their callow wings,</l>

<l>As poised aloft their pendent cradle swings,</l>

<l>Eye the warm sun, the spicy zephyr breathe,</l>

<l>And gaze unenvious on the world beneath. </l>

</lg>
<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<hi rend="italic">Epidendrum flos aeris.</hi> Of the class of gynandria, or feminine males. This parasite plant is found in Java, and is said to live on air without taking root in the trees on which it grows; and its flowers resemble spiders. Syst. Veg. a Reichard. Vol IV. P. 35. <anchor xml:id="n184"/>
<note n="184" resp="editor" place="end">
Johann Reichard (1742-1782) was a German botanist and editor of Linnaeus' works, including <hi rend="italic">Systema Vegetabilium.</hi>
<ref target="#n184"> Back. </ref></note>
By this curious similitude the bees and butterflies are supposed to be deterred from plundering the nectaries. <ref target="#visca">See Visca.</ref></p>

<pb n="40" facs="http://i.imgur.com/08a36K7.png"/>
<lg>
<l rendition="#indent1">As dash the waves on India's breezy strand,</l>
<l>Her flush'd cheek press'd upon her lily hand,</l>
<l n="395">VALLISNER sits, up-turns her tearful eyes,</l>
<l>Calls her lost lover, and upbraids the skies;</l>
<l>For him she breathes the silent sign, forlorn,</l>
<l>Each setting-day; for him each rising morn. --</l>
<l>"Bright orbs, that light yon high ethereal plain,</l>
<l n="400">"Or bathe your radiant tresses in the main;</l>
<l>"Pale moon, that silver'st o'er night's sable brow;-</l>
<l>"For ye were witness to his parting vow! --</l>
<l>"Ye shelving rocks, dark waves, and sounding shore, --</l>
<l>"Ye echoed sweet the tender words he swore! --</l>

<space quantity="1" unit="lines"/>
<p rendition="#indent1 #smallest">
<anchor xml:id="vallisneria"/>
<hi rend="italic">Vallisneria. </hi>This extraordinary plant is of the class Two Houses. It is found in the East Indies, in Norway, and various parts of Italy. <persName>Lin.</persName> Spec. Plant.
<anchor xml:id="n153"/>
<note n="153" resp="editor" place="end">
<hi rend="bold">Lin. Spec. </hi>Linnaeus' 1753 text <hi rend="italic">Species Plantarum</hi> listed all plant species then known in the world - about 8000. <ref target="#n153"> Back. </ref>

</note> They have their roots at the bottom of the Rhone, <anchor xml:id="n154"/>
<note n="154" resp="editor" place="end"> A river that runs through Switzerland and France. <ref target="#n154"> Back. </ref>
</note> the flowers of the female plant float on the surface of the water, and are furnished with an elastic spiral stalk, which extends or contracts as the water rises and falls; this rise or fall, from the rapid descent of the river, and the mountain torrents which flow into it, often amounts to many feet in a few hours. The flowers of the male plant are produced under water, and as soon as their farina, <anchor

xml:id="n155"/>

<note n="155" resp="editor" place="end">

<hi rend="bold">Farina: </hi>pollen (Darwin uses dust to represent the same item) <ref target="#n155"> Back. </ref>

</note> or dust, is mature; they detach themselves from the plant, and rise to the surface, continue to flourish, and are wasted by the air, or borne by the currents to the female flowers. In this resembling those tribes of insects, where the males at certain seasons acquire wings, but not the females, as ants, Coccus, Lampyris, Phalaena, Brumata, Lichanella. These male flowers are in such numbers, though very minute, as frequently to cover the surface of the river to considerable extent. See Families of Plants translated from

<persName>Linnaeus,</persName> p.677. <anchor xml:id="n156"/>

<note n="156" resp="editor" place="end"> In this 1737 work, Linnaeus organizes all known genera of plants using his system. <hi rend="italic">Families of Plants</hi> is the English translation of this work, translated by Darwin and the Botanical Society of Lichfield. <ref target="#n156"> Back. </ref>

</note>

</p>

<pb n="">

<figure>

<graphic rend="inline" url="http://i.imgur.com/Kths9Y7.png" height="20cm" width="16cm"/>

</figure>

<pb n="41" facs="http://i.imgur.com/F8zCwfH.png"/>

<l n="405">“Can stars or seas the sails of love retain?</l>

<l>“O guide my wanderer to my arms again!”</l>

</lg>

<lg>

<l rendition="#indent1">Her buoyant skiff intrepid ULVA guides,</l>

<l>And seeks her Lord amid the trackless tides;</l>

<space quantity="1" unit="lines"/>

<p rendition="#indent1 #smallest">

<hi rend="italic">Ulva. </hi> Clandestine marriage. This kind of sea-weed is buoyed up by bladders of air, which are formed in the duplicatures <anchor xml:id="n157"/>

<note n="157" resp="editor" place="end">

<hi rend="bold">Duplicatures: </hi>folds <ref target="#n157"> Back. </ref>

</note> of its leaves; and forms immense floating fields of vegetation; the young ones, branching out from the larger ones, and born on similar little air-vessels. It is also found in the warm baths of Patavia; where the leaves are formed in curious cells or labyrinths for the purpose of floating on the water. See ulva labyrinthi-formis

<persName>Lin.</persName> Spec Plant.

<anchor xml:id="n158"/>

<note n="158" resp="editor" place="end">

<hi rend="bold"> Spec: </hi>Linneaus' 1753 text <hi rend="italic">Species Plantarum</hi>listed all plant species then known in the world - about 8000.<ref target="#n158"> Back. </ref>

</note> The air contained in these cells was found by Dr. Priestley <anchor xml:id="n159"/>

<note n="159" resp="editor" place="end"> Primarily known for the discovery of oxygen by isolating it in its gaseous state, Joseph Priestley (1733-1804) was a natural philosopher and dissenting clergyman acquainted with Darwin via the Lunar Society of Birmingham, a group of inventors, natural philosophers and manufacturers who held regular meetings between c.1765-c.1800. <ref target="#n159"> Back. </ref>

</note> to be sometimes purer than the common air, and sometimes less pure; the air-bladders of fish seem to be similar organs, and serve to render them buoyant in the water. In some of these, as in the Cod and Haddock, a red membrane, consisting of a great number of leaves or duplicatures, is found within the air-bag, which probably secretes this air from the blood of the animal.

(<persName><surname>Monro.</surname></persName> Physiol. Of Fish. P.28.) <anchor xml:id="n160"/>

<note n="160" resp="editor" place="end"> Scottish-born anatomist, Alexander Monro's (1733-1817) <hi rend="italic">The structure and physiology of fishes explained, and compared with those of man and other animals (1785)</hi> provides an illustrated examination of fish anatomy, drawing comparisons from fish anatomy to other forms of life. <ref target="#n160"> Back. </ref>

</note> To determine whether this air, when first separated from the blood of the animal or plant, be phlogisticated <anchor xml:id="n161"/>

<note n="161" resp="editor" place="end">

<hi rend="bold" xml:space="preserve">Phlogisticated: </hi>to contain phlogiston, a hypothetical substance, supposed to exist in all combustible bodies, that is released upon combustion <ref target="#n161"> Back. </ref>

</note> air, is worth inquiry. The bladder-sena (Colutea), and bladder-nut (Staphylæa), have their seed vessels distended with air; the Ketmia has the upper join of the stem immediately under the receptacle of the flower much distended with air; these seem to be analogous to the air-vessel at the broad end of the egg, and may probably become less pure as the seed ripens; some, which I tried, had the purity of the surrounding atmosphere. The air at the broad end of the egg is probably an organ serving the purpose of respiration to the young chick, some of whose vessels are spread upon it like a placenta or permeate it. Many are of opinion that even the placenta of the human fetus, and cotyledons of quadrupeds, are respiratory organs rather than nutritious ones. </p>

<p rendition="#indent1 #smallest"> The air in the hollow stems of grasses, and of some umbelliferous <anchor xml:id="n162"/>

<note n="162" resp="editor" place="end">

<hi rend="bold" xml:space="preserve">Umbelliferous: </hi>plants with multiple stalks leading to multiple flower heads <ref target="#n162"> Back. </ref>

</note> plants, bears analogy to the air in the quills, and in some of the bones of birds; supplying the place of the pith, which shrivels up after it has performed its office of protruding the young stem or feather. Some of these cavities of the bones are said to communicate with the lungs in birds. Phil. Trans.

<anchor xml:id="n163"/>

<note n="163" resp="editor" place="end"> The <hi rend="italic">Philosophical Transactions of the Royal Society of London </hi> is the world's longest running international scientific journal. Its first issue was published in 1665. <ref target="#n163"> Back. </ref>

</note>

</p>

<p rendition="#indent1 #smallest">The air-bladders of fish are nicely adapted to their intended purpose for though they render them buoyant near the surface without the labour of using their fins, yet, when they rest at greater depths, they are no inconvenience, as the increased pressure of the water condenses the air which they contain into less space. Thus, if a cork or bladder<reg> of air was immersed a very great depth in the ocean, it would be so much compressed as to become specifically as heavy as the water, and would remain there. It is probable the unfortunate <persName>Mr.

<surname>Day,</surname></persName>

<anchor xml:id="n164"/>

<note n="164" resp="editor" place="end"> John Day, an English millwright, had his accidental death immortalized in the 1775 work

<hi rend="italic" xml:space="preserve">A philosophical dissertation on the diving vessel projected by Mr Day and sunk in Plymouth sound. </hi>

The tract was written by Nikolai Detlef Flack, the author of several works on medicine and technology. <ref target="#n164">

Back. </ref>

</note> who was drowned in a diving ship of his own construction, miscarried from not attending to this circumstance: it is probable the quantity of air he took down with him, if he descended much lower than he expected, was condensed into so small a space as not to render the ship buoyant when he endeavoured to ascend.</reg>

</p>

<pb n="42" facs="http://i.imgur.com/uNdn3b4.png"/>

<l>Her <hi rend="italic">secret </hi>vows the Cyprian Queen <anchor xml:id="n165"/>

<note n="165" resp="editor" place="end"> Refers to Aphrodite, Greek goddess of love, who is mythologically associated with the island of Cyprus. <ref target="#n165"> Back. </ref>

</note> approves,</l>

<l n="410">And hovering Halcyons <anchor xml:id="n166"/>

<note n="166" resp="editor" place="end">

<hi rend="bold">Halcyon</hi>: birds fabled to calm the seas <ref target="#n166"> Back. </ref>

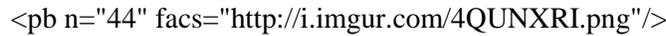
</note> guard her infant-loses;</l>
<l>Each in his floating cradle round they throng,</l>
<l>And dimpling Ocean bears the fleet along. —</l>
<l>Thus o'er the waves, which gently bend and swell,</l>
<l>Fair GALATEA <anchor xml:id="n167"/>
<note n="167" resp="editor" place="end">
<hi rend="bold">Galatea: </hi>A sea nymph courted by the Cyclops
Polyphemus. <ref target="#n167"> Back. </ref>
</note> steers her silver shell;</l>
<l n="415">Her playful Dolphins stretch the silken rein, </l>
<l>Hear her sweet voice, and glide along the main.</l>
<l>As round the wild meandering coast she moves</l>
<l>By gushing rills, <anchor xml:id="n168"/>
<note n="168" resp="editor" place="end">
<hi rend="bold" xml:space="preserve">Rill: </hi>a brook <ref
target="#n168"> Back. </ref>
</note> rude cliffs, and nodding groves;</l>
<l>Each by her pine the Wood-nymphs wave their locks,</l>
<l n="420">And wondering Naiads <anchor xml:id="n169"/>
<note n="169" resp="editor" place="end">
<hi rend="bold" xml:space="preserve">Naiad: </hi>a nymph that lives
in fresh water <ref target="#n169"> Back. </ref>
</note> peep amid the rocks;</l>
<l>Pleased trains of Mermaids rise from coral cells;</l>
<l>Admiring Tritons <anchor xml:id="n170"/>
<note n="170" resp="editor" place="end">
<hi rend="bold">Triton: </hi>a creature with a human head and fish
tail <ref target="#n170"> Back. </ref>
</note> found their twisted shells;</l>
<l>Charm'd o'er the car <anchor xml:id="n171"/>
<note n="171" resp="editor" place="end">
<hi rend="bold">Car: </hi>a wheeled, horse-drawn carriage <ref
target="#n171"> Back. </ref>
</note> pursuing Cupids sweep,</l>
<l>Their snow-white pinions <anchor xml:id="n172"/>
<note n="172" resp="editor" place="end">
<hi rend="bold" xml:space="preserve">Pinions: </hi>>wings <ref
target="#n172"> Back. </ref>
</note> twinkling in the deep; </l>

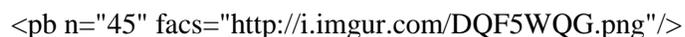
<pb n="43" facs="http://i.imgur.com/wYGcJV8.png"/>
<l n="425">And, as the lustre of her eye she turns,</l>
<l>Soft sighs the Gale, and the amorous Ocean burns.</l>
</lg>
<lg>

<l rendition="#indent1">On DOVE's <anchor xml:id="n173"/>
<note n="173" resp="editor" place="end">
<hi rend="bold">Dove</hi>: A river that runs through the English
midlands, not far from Lichfield and Derby, the two principle
hometowns of Darwin. <ref target="#n173"> Back. </ref>

</note> green brink the fair TREMELLA stood,</l>
 <l>And view'd her playful image in the flood;</l>
 <l>To each rude rock, lone dell, and echoing grove</l>
 <l n="430">Sung the sweet sorrows of her
 <hi rend="italic" xml:space="preserve">secret </hi>love.</l>
 <space quantity="1" unit="lines"/>
 <p rendition="#indent1 #smallest">
 <hi rend="italic">Tremella. </hi>Clandestine marriage. I have frequently
 observed funguses of this Genus on old rails and on the ground to become
 a transparent jelly, after they have been frozen in autumnal mornings;
 which is a curious property, and distinguishes them from some other
 vegetable mucilage; <anchor xml:id="n174"/>
 <note n="174" resp="editor" place="end">
 <hi rend="bold">Mucilage: </hi>a sticky material naturally present
 in seeds, roots, or other parts of plants <ref target="#n174"> Back.
 </ref>
 </note> for I have observed that the paste, made by boiling what-flour
 in water, ceases to be adhesive after having been frozen. I suspected
 that the Tremella Nostoc, or star-gelly, also had been thus produced;
 but have since been well informed, that the Tremella Nostoc, is a
 mucilage voided by Herons after they have eaten frogs; hence it has the
 appearance of having been pressed through a hole; and limbs of frogs are
 said sometimes to be found amongst it; it is always seen upon plains or
 by the sides of water, places which Herons generally frequent. </p>
 <p rendition="#indent1 #smallest"> Some of the funguses are so acrid, that a
 drop of their juice blisters the tongue; others intoxicate those who eat
 them. The Ostiacks <anchor xml:id="n175"/>
 <note n="175" resp="editor" place="end">
 <hi rend="bold">Ostiacks</hi>: an indigenous people of western
 Siberia <ref target="#n175"> Back. </ref>
 </note> in Siberia use them for the latter purpose; one Fungus of the
 species, Agaricus muscarum, eaten raw; or the decoction of three of
 them, produces intoxication for 12 to 16 hours. History of
 Russia.<persName><forename> V. I.
 </forename><surname>Nichols.</surname></persName> 1780. <anchor
 xml:id="n176"/>
 <note n="176" resp="editor" place="end">
 <hi rend="italic">Russia: or, a compleat Historical Account of All
 the Nations which Compose that Empire </hi> (1780) was printed
 for J. Nichols and authored by Johann Georgi. It provides European
 readers with a “general account of Siberia and of the Mongouls”
 (Georgi v). <ref target="#n176"> Back. </ref>
 </note> As all acrid plants become less so, if exposed to a boiling
 heat, it is probably the common mushroom may sometimes disagree from
 being not sufficiently stewed. The Ostiacks blister their skin by a
 fungus found on Birch-trees; and use the Agaricus officin. for Soap.
 ibid. </p>
 <p rendition="#indent1 #smallest"> There was a dispute whether the funguses
 should be classed into the animal or vegetable department. Their animal
 taste in cookery, and their animal smell when burnt, together with their

tendency to putrefaction, insomuch that the Phallus impudicus has gained the name of stinkhorn; and lastly, their growing and continuing healthy without light, as the Licoperdon tuber or truffle, and the fungus vinosus or mucor in dark cellars, and the esculent [Esculent](#) suitable to be eaten [Back](#). mushrooms on beds covered thick with straw, would seem to show that they approach towards the animals, or make a kind of isthmus connecting the two mighty kingdoms of animal and vegetable nature.


<l>“Oh, stay! --- return!” --- along the sounding shore</l>
<l>Cry’d the sad Naiads, --- she return’d no more!---</l>
<l>Now girt [Girt](#) to secure around [Back](#).
</note> with clouds the sullen Evening frown’d,</l>
<l>And withering Eurus [Eurus](#) a god of the east winds [Back](#).
</note> swept along the ground;</l>
<l n="435">The misty moon withdrew her horned light,</l>
<l> And sunk with Hesper [Hesper](#) an evening star [Back](#).
</note> in the skirt of night;</l>
<l>No dim electric streams, (the northern dawn)</l>
<l> With meek effulgence [Effulgence](#): the quality of being splendidly radiant [Back](#).
</note> quiver’d o’er the lawn;</l>
<l>No star benignant shot one transient ray</l>
<l n="440">To guide or light the wanderer on her way.</l>
<l>Round the dark crags he murmuring whirlwinds blow,</l>
<l>Woods groan above, and waters roar below;</l>
<l>As o’er the steeps with pausing foot she moves,</l>
<l>The pitying Dryads shriek amid their groves.</l>
<l n="445">She flies, -- she stops, -- she pants, -- she looks behind,</l>
<l>And hears a demon howl in every wind.</l>
<l>-- As the bleak blast unfurls her fluttering vest, </l>
<l>Cold beats the snow upon her shuddering breast;</l>
<l>Through her numb’d limbs the chill sensations dart,</l>
<l n="450">And the keen ice-bolt trembles at hear heart.</l>



<l>“I sink, I fall! oh, help me, help!” she cries,</l>
 <l>Her stiffening tongue the unfinish’d sound denies;</l>
 <l>Tear after tear adown her cheek succeeds,</l>
 <l>And pearls of ice bestrew the glittering meads;</l>
 <l n="455">Congealing snows her lingering feet surround,</l>
 <l>Arrest her flight, and root her to the ground;</l>
 <l>With suppliant arms she pours the silent prayer;</l>
 <l>Her suppliant arms hang crystal in the air;</l>
 <l> Pellucid <anchor xml:id="n182"/>
 <note n="182" resp="editor" place="end">
 <hi rend="bold" xml:space="preserve">Pellucid: </hi>transparent <ref
 target="#n182"> Back. </ref>
 </note> films her shivering neck o’erspread,</l>
 <l n="460">Seal her mute lips, and silver o’er her head,</l>
 <l>Veil her pale bosom, glaze her lifted hands,</l>
 <l>And shrined in ice the beauteous statue stands.</l>
 <l> -- DOVE’s <anchor xml:id="n183"/>
 <note n="183" resp="editor" place="end">
 <hi rend="bold">Dove</hi>: A river that runs through the English
 midlands, not far from Lichfield and Derby, the two principle
 hometowns of Darwin.<ref target="#n183"> Back. </ref>
 </note> azure nymphs on each revolving year</l>
 <l>For fair TREMELLA shed the tender tear;</l>
 <l n="465">With rush-wove crowns in sad procession move,</l>
 <l>And sound the sorrowing shell to hapless love.”</l>
 </lg>
 <lg>
 <l rendition="#indent1">Here paused the MUSE, -- across the darken’d
 pole</l>
 <l>Sail the dim clouds, the echoing thunders roll;</l>

<pb n="46" facs="http://i.imgur.com/gjOV0cK.png"/>
 <l>The trembling Wood-nymphs, as the tempest lowers,</l>
 <l n="470">Lead the gay Goddess to their inmost bowers;</l>
 <l>Hang the mute lyre the laurel shade beneath,</l>
 <l>And round her temples bind the myrtle wreath.</l>
 <l>-- Now the light swallow with her airy brood</l>
 <l>Skims the green meadow, and the dimpled flood;</l>
 <l n="475">Loud shrieks the lone thrush from his leafless thorn,</l>
 <l>Th’ alarmed beetle sounds his bugle horn;</l>
 <l>Each pendant spider winds with fingers fine</l>
 <l>His ravel’d clue, and climbs along the line;</l>
 <l>Gay Gnomes in glittering circles stand aloof</l>
 <l n="480">Beneath a spreading mushroom’s fretted roof;</l>
 <l>Swift bees returning seek their waxen cells,</l>
 <l>And Sylphs cling quivering in the lily’s bells.</l>
 <l>Through the still air descend the genial showers.</l>
 <l>And pearly rain-drops deck the laughing flowers.</l>
 </lg>
 </p>

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</author>

<editor>Alana Rigby</editor>

<sponsor>Social Sciences and Humanities Research Council of Canada</sponsor>

<respStmt>

<resp>Project Supervisor</resp>

<name>Tristanne Connolly</name>

<resp>Project Second Reader</resp>

<name> Katharine Acheson</name>

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Interlude I Code

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<p rendition="#center #large"> INTERLUDE.</p>
</head>
<p rendition="#indent1">
<hi rend="italic">Bookseller. </hi>
<hi rend="bold">YOUR</hi> verses, Mr. Botanist, consist of <hi rend="italic">
>pure description</hi>, I hope there is <hi rend="italic">sense </hi>in the
notes. </p>
<p rendition="#indent1"><hi rend="italic">Poet</hi>. I am only a flower-painter, or
occasionally attempt a landscape; and leave the human figure with the subjects
of history to abler artists. </p>
<p rendition="#indent1">
<hi rend="italic">B. </hi>It is well to know what subjects are within the limits
of your pencil; many have failed of success from the want of this
self-knowledge. But pray, tell me, what is the essential difference between
Poetry and Prose? is it solely the melody or measure of the language? </p>
<p rendition="#indent1">
<hi rend="italic">P. </hi>I think not solely; for some prose has its melody, and
even measure. And good verses, well spoken in a language unknown to the hearer,
are not easily to be distinguished from good prose. </p>
<p rendition="#indent1">
<hi rend="italic">B. </hi>Is it the sublimity, beauty, or novelty of the
sentiments? </p>
<p rendition="#indent1">
<hi rend="italic">P. </hi> Not so; for sublime sentiments are often better
expressed in prose. Thus when Warwick <anchor xml:id="in1"/>
<note n="1" resp="editor" place="end"> From Shakespeare's <hi rend="italic">
>Henry VI Part 3</hi>, Act V, Scene II. Somerset and Warwick, traitors
to Henry VI, lament their defeat as Warwick lies dying on the field of
battle. The lines are as follows:Somerset: Ah, could'st thou fly!WarwicK:
Why, then I would not fly. <ref target="#in1"> Back. </ref>
</note> in one of the plays of
<persName><surname>Shakespeare,</surname></persName>
<anchor xml:id="in2"/>
<note n="2" resp="editor" place="end"> English playwright William Shakespeare
(1564-1616). After the Restoration and into the 18<hi rend="superscript">
>th</hi> century his original works were frequently staged, as were
revised versions of his major plays (Davendant's <hi rend="italic">
>MacBeth.</hi>Tate's <hi rend="italic">King Lear</hi>, abridged versions
of <hi rend="italic">Othello</hi>).<ref target="#in2"> Back. </ref>
</note> is left wounded on the field after the loss of the battle, and his
```

friend says to him, "O could you but fly!" what can be more sublime than his answer, "Why then, I would not fly." No measure of verse, I imagine, could add dignity to this sentiment. </p>

<pb n="48" facs="http://i.imgur.com/cxDcNgv.png"/>

<space quantity="1" unit="lines"/>

<p>And it would be easy to select examples of the beautiful or new from prose writers, which I suppose no measure of verse could improve.</p>

<p rendition="#indent1">

<hi rend="italic">B. </hi>In what then consists the essential difference between Poetry and Prose? </p>

<p rendition="#indent1">

<hi rend="italic">P. </hi>Next to the measure of the language, the principle distinction appears to me to consist in this: that Poetry admits but few words expressive of very abstracted ideas, whereas Prose abounds with them. And as our ideas derived from visible objects are more distinct than those derived from the objects of our other senses, the words expressive of these ideas belonging to vision make up the principal part of poetic language. That is, the Poet writes principally to the eye, the Prose-writer uses more abstracted terms.

<persName>Mr. <surname>Pope</surname></persName> has written a bad verse in the Windsor Forest: </p>

<l rendition="#indent2">"And Kennet swift for silver Eels" <hi rend="italic">>renown'd.</hi>

<anchor xml:id="in3"/>

<note n="3" resp="editor" place="end"> English poet, essayist, and satirist Alexander Pope's (1688-1744) Windsor Forest (1714) is an optimistic Georgic poem that both describes the English countryside where Pope lived and acts as a panegyric praising 17th and 18th century historical events. The couplet from which this line is drawn: "The <hi rend="italic">Kennet</hi> swift, for silver eels renown'd; The <hi rend="italic">Loddon</hi>slow, with verdant alders crown'd" (339-40) contrasts tributaries of the River Thames: the Kennet and the Loddon. <ref target="#in3"> Back. </ref>

</note>

</l>

<p>The word renown'd does not present the idea of a visible object to the mind, and is thence prosaic. But change the line thus,</p>

<l rendition="#indent2">"And Kennet swift, where silver Graylings <hi rend="italic">>play."</hi></l>

<p>and it becomes poetry, because the scenery is then brought before the eye.</p>

<p rendition="#indent1">

<hi rend="italic">B. </hi>This may be done in prose.</p>

<p rendition="#indent1">

<hi rend="italic">P. </hi>And when it is done in a single word, it animates the prose; so it is more agreeable to read in <persName>Mr.

<surname>Gibbon's</surname></persName>

History,

<anchor xml:id="in4"/>

<note n="4" resp="editor" place="end"> In Chapter 9 of his six-volume historical work, <hi rend="italic"> The History of the Decline and Fall of the Roman Empire</hi>, historian Edward Gibbon (1737-1794) wrote " In the time of

Caesar, the reindeer, as well as the elk and the wild bull, was a native of the Hercynian forest, which then overshadowed a great part of Germany and Poland” (“Climate”). It is likely this passage that Darwin is paraphrasing.

[Back.](#)

“Germany



[space quantity="1" unit="lines"/>](#)

was at this time *over-shadowed* with extensive forests”; than Germany was at this time *full* of extensive forests.

But where this mode of expression occurs too frequently, the prose approaches to poetry: and in graver works, where we expect to be instructed rather than amused, it becomes tedious and impertinent. Some parts of [Mr. Edmund Burke's](#)

[anchor xml:id="in5"/>](#)

[note n="5" resp="editor" place="end"> Irish-born politician and author Edmund Burke \(1729-1797\) was renowned for his oratorical ability; he employed ornaments of all kinds - vivid imagery, metaphor, puns – in both his speech and writing. Largely conservative in his views, Burke's works ranged from the political – the pro-monarchy book *Reflections on the Revolution in France* – to topics as varied as aesthetic treatises \(*A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful*\) and historical accounts \(*The Abridgement of the History of England*\).](#)

[Back.](#)

eloquent orations become intricate and enervated by superfluity of poetic ornament; which quantity of ornament would have been agreeable in a poem, where much ornament is expected.

[p rendition="#indent1">](#)

B. Is then the office of Poetry only to amuse?

[p rendition="#indent1">](#)

P. The Muses are young Ladies, we expect to see them dressed; though not like some modern beauties with so much gauze and feather, that “the Lady herself is the least part of her.” There are however didactic pieces of poetry which are much admired, as the Georgics of

[Virgil,](#)

[anchor xml:id="in6"/>](#)

[note n="6" resp="editor" place="end"> Georgics are didactic poems giving instruction on or praising rural life; Roman writer Virgil's \(70-19 BCE\) series of georgic poems \(29 BCE\) were organized in four books: the first discussed crops, the second trees and shrubs, the third livestock and husbandry, and the fourth bee-keeping. English poets of the 18th century often imitated Virgil's form \(John Dyer's “The Fleece”, 1757; James Grainger's “The Sugar-cane”, 1759\); like classical georgics, these poems differ from the pastoral in that they emphasize necessary labour instead of harmonious idleness in nature.](#)

[Back.](#)

[William Mason's](#) English Garden, [anchor xml:id="in7"/>](#)

<note n="7" resp="editor" place="end"> William Mason (1725-1797) was an English poet, church deacon, and garden designer. He wrote in diverse modes as a poet, creating odes, elegies, and epic blank verse while also using an alter-ego writing identity named Malcolm MacGreggor to pen subversive satirical works. <hi rend="italic">The English Garden </hi>(1772-81) is a four-book poem in blank verse based on Virgil's <hi rend="italic">Georgics.</hi> It is didactic, concerning art, landscape, and gardening.<ref target="#in7"> Back. </ref></note>

<persName name="William Hayley"><surname>Hayley's</surname></persName> Epistles; <anchor xml:id="in8"/>

<note n="8" resp="editor" place="end"> English poet and biographer, William Hayley (1745-1820) wrote several epistles – poems in the form of letters - and essays addressed to other English poets, artists, and writers, such as Joseph Wright, Darwin's acquaintance and a painter from Derby, and Edward Gibbon, historian. <ref target="#in8"> Back. </ref></note>

nevertheless Science is best delivered in Prose, as its mode of reasoning is from stricter analogies than metaphors or similes. </p>

<p rendition="#indent1">

<hi rend="italic">B. </hi>Do not Personifications and Allegories distinguish poetry? </p>

<p rendition="#indent1">

<hi rend="italic">P. </hi>There are other arts of bringing objects before the eye; or expressing sentiments in the language of vision; and are indeed better suited to the pen than the pencil. </p>

<p rendition="#indent1">

<hi rend="italic">B. </hi> That is strange, when you have just said they are used to bring their objects before the eye. </p>

<p rendition="#indent1">

<hi rend="italic">P. </hi>In poetry the personification or allegoric figure is generally indistinct, and therefore does not strike us so forcibly as to make us attend to its improbability; but in painting, the figures being all much more distinct, their improbability becomes apparent, and seizes our attention to it. Thus the person of Concealment is very </p>

<pb n="50" facs="http://i.imgur.com/WrYWWn6.png"/>

<space quantity="1" unit="lines"/>

<p>indistinct, and therefore does not compel us to attend to its improbability, in the following beautiful lines of <persName name="William Shakespeare"><surname>Shakespeare</surname></persName></p>

<l rendition="#ident2"><“—She never told her love;</l>

<l rendition="#ident2">But let Concealment, like a worm i' th' bud.</l>

<l rendition="#ident2">Feed on her damask cheek." <anchor xml:id="in9"/>

<note n="9" resp="editor" place="end"> From <hi rend="italic">Twelfth Night,</hi> Act 2, Scene 4. <ref target="#in9"> Back. </ref></note></l>

<p>But in these lines below the person of Reason obtrudes itself into our company, and becomes disagreeable by its distinctness, and consequent improbability.</p>

<l rendition="#indent2">“To Reason I <anchor xml:id="in10"/>
 <note n="10" resp="editor" place="end"> Darwin quotes a popular folk song attributed to Lord Cantalupe and set to music by theatre composer Thomas Arne (1710–1778). <ref target="#in10"> Back. </ref>
 </note> flew, and intreated her aid, </l>
 <l rendition="#indent2">Who paused on my case, and each circumstance weigh'd;</l>
 <l rendition="#indent2">Then gravely reply'd in return to my prayer,</l>
 <l rendition="#indent2">That Hebe <anchor xml:id="in11"/>
 <note n="11" resp="editor" place="end"> Greek goddess of youth, daughter of Zeus and Hera. <ref target="#in11"> Back. </ref>
 </note> was the fairest of all that were fair.</l>
 <l rendition="#indent2">That's a truth, reply'd I, I've no need to be taught,</l>
 <l rendition="#indent2">I came to you, Reason, to find out a fault.</l>
 <l rendition="#indent2">If that's all, says Reason, return as you came,</l>
 <l rendition="#indent2">To find fault with Hebe would forfeit my name.”</l>
 <p rendition="#indent1"> Allegoric figures are on this account in general less manageable in painting and in statuary than in poetry: and can seldom be introduced in the two former arts in company with natural figures, as is evident from the ridiculous effect of many of the paintings of <persName name="Peter Paul Reubens"><surname>Reubens </surname></persName> <anchor xml:id="in12"/>
 <note n="12" resp="editor" place="end"> Sir Peter Paul Rubens (1577-1640), Flemish Baroque painter. Darwin is likely referring here to Ruben's series of 25 enormous paintings (painted 1622-5) commissioned by Queen Marie de Medicis of France. These epic pieces depict Marie throughout her life and often feature celestial beings. They were initially housed in the Luxembourg Palace in Paris. Rubens was so eminent a painter that the wing which held the paintings was entitled the <hi rend="italic">Galerie de Rubens. </hi> <ref target="#in12"> Back. </ref>
 </note> in Luxemburgh gallery; and for this reason because their improbability becomes more striking, when there are figures of real persons by their side to compare them with. </p>
 <p rendition="#indent1"> Mrs. <persName><forename>Angelica</forename> <surname>Kauffman</surname></persName>, <anchor xml:id="in13"/>
 <note n="13" resp="editor" place="end"> Angelica Kauffman (1741-1807), Austrian portrait painter, largely painted within distinct genres, either completing portraits of her acquaintances or commissions or painting either historical, classical or pastoral scenes. <ref target="#n13"> Back. </ref>
 </note> well apprised of this circumstance, has introduced no mortal figures amongst her Cupids and her Graces. And the great Roubiliac, <anchor xml:id="in14"/>
 <note n="14" resp="editor" place="end"> Louis Francois Rubiliac (1702-1762) was a French sculptor known for his statues, busts and monuments. The monument to Field Marshall George Wade was installed at Wade's grave in Westminster Abbey; it depicts a medallion portrait of Wade's head between an angel, Fame, pushing away another angel, Time. Roubilliac said this monument was his favourite work. <ref target="#in14"> Back. </ref>
 </note> in his unrivalled monument of Time and Fame struggling for the trophy of <persName>General <surname>Wade</surname></persName>, has only hung up a medallion on the head of the hero of the piece. There are however </p>

<pb n="51" facs="http://i.imgur.com/707zICA.png"/>

<space quantity="1" unit="lines"/>

<p>some allegoric figures, which we have so often heard described or seen delineated, that we almost forget that they do not exist in common life; and thence view them without astonishment; as the figures of the heathen mythology, of angels, devils, death and time; and almost believe them to be realities, even when they are mixed with representations of the natural forms of man. Whence I conclude, that a certain degree of probability is necessary to prevent us from revolting with distaste from unnatural images, unless we are otherwise so much interested in the contemplation of them as not to perceive their improbability.</p>

<p rendition="#indent1">

<hi rend="italic">B. </hi>Is this reasoning about degrees of probability just? –

When Sir <persName><forename>Joshua</forename>

<surname>Reynolds</surname></persName>, <anchor xml:id="in15"/>

<note n="15" resp="editor" place="end"> Joshua Reynolds (1732-1792) was an eminent English portrait and history painter. As president of the Royal Academy of Arts, Reynolds gave regular public addresses like the one Darwin discusses below. Entitled “Discourses”, Reynold’s reflections on aesthetic issues were always published after the public delivery; he gave fifteen discourses between 1769 and 1790. <ref target="#in15"> Back. </ref>

</note> who is unequalled both in the theory and practice of his art, and who is a great master of the pen as well as the pencil, has asserted in a discourse delivered to the Royal Academy, <anchor xml:id="in16"/>

<note n="16" resp="editor" place="end"> The Royal Academy of Arts was founded in 1768 by a group of thirty-six artists nominated by the king. Joshua Reynolds was the Academy’s inaugural president and was re-elected to the role multiple times, holding it until his death in 1792. <ref target="#in16"> Back. </ref>

</note> December 11, 1786, that “the higher styles of painting, like the higher kinds of Drama, do not aim at any thing like deception; or have any expectation, that the spectators should think the events there represented are really passing before them.” And he then accuses Mr. Fielding <anchor xml:id="in17"/>

<note n="17" resp="editor" place="end"> Referring to contemporary artists and actors in his time, Reynold’s says that “Raffaelle is praised for naturalness and deception, which he certainly has not accomplished... and our late great actor, Garrick, has been as ignorantly praised by his friend Fielding; who doubtless imagined he had hit upon an ingenious device, by introducing, in one of his novels... an ignorant man mistaking Garrick's representation of a scene in "Hamlet" for reality. A very little reflection will convince us, that there is not one circumstance in the whole scene that is of the nature of deception. The merit and excellence of Shakespeare, and of Garrick, when they were engaged in such scenes, is of a different and much higher kind. But what adds to the falsity of this intended compliment is, that the best stage-representation appears even more unnatural to a person of such a character, who is supposed never to have seen a play before, than it does to those who have had a habit of allowing for those necessary deviations from nature which the Art requires" (Discourse XIII, 223). <ref target="#in17"> Back. </ref>

</note> of bad judgment, when he attempts to compliment Mr. Garrick in one of his novels, by introducing an ignorant man, mistaking the representation of a scene in Hamlet for a reality; and thinks, because he was an ignorant man, he was less liable to make such a mistake. </p>

<p rendition="#indent1">

<hi rend="italic">P. </hi>It is a metaphysical question, and requires more attention than Sir Joshua has bestowed upon it. – You will allow, that we are perfectly deceived in our dreams; and that even in our waking reveries, we are often so much absorbed in the contemplation of what passes in our imaginations, that for a while we do not attend to the lapse of time or to our own locality; and thus suffer a similar kind of deception as in our dreams. That is, we believe things present before are eyes, which are not so. </p>

<pb n="52" facs="http://i.imgur.com/bJeLQ5v.png"/>

<space quantity="1" unit="lines"/>

<p rendition="#indent1"> There are two circumstances, which contribute to this complete description in our dreams. First, because in sleep the organs of sense are closed or inert, and hence the trains of ideas associated in our imaginations are never interrupted or dissevered by the irritations of external objects, and can not therefore be contrasted with our sensations. On this account, though we are affected with a variety of passions in our dreams; as anger, love, joy; yet we never experience surprise. – For surprise is only produced when any external irritations suddenly obtrude themselves, and dissever our passing trains of ideas. <anchor xml:id="in18"/>

<note n="18" resp="editor" place="end"> Darwin invokes a conception of human mental processes prevalent in the 18<hi rend="superscript">th</hi> century. In 1699, a new edition of English philosopher John Locke’s (1632-1704) <hi rend="italic">Essay Concerning Human Understanding </hi>was published, containing a chapter on the association of ideas in which he assert that “as far as we can comprehend thinking, thus ideas seem to be produced in our minds; or, if they are not, this may serve to explain their following one another in an habitual train” (6). Physician and philosopher David Hartley’s (1705-1757) 1749 work <hi rend="italic">Observations on Man </hi>uses Locke’s term “association” to discuss both visible and audible “trains” of ideas (147). Darwin reiterates Hartley’s writing that the “trains of ideas that are presented in dreams... are taken to be real” (241). <ref target="#in18"> Back. </ref>

</note>

</p>

<p rendition="#indent1">Secondly, because in sleep there is a total suspension of our voluntary power, both over the muscles of our bodies, and the ideas of our minds; for we neither walk about, nor reason in complete sleep. Hence, as the trains of our ideas are passing in our imaginations in dreams, we cannot compare them with our previous knowledge of things, as we do in our waking hours; for this is a voluntary exertion; and thus we cannot perceive their incongruity.</p>

<p rendition="#indent1"> Thus we are deprived in sleep of the only two means by which we can distinguish the trains of ideas passing in our imaginations from those excited by our sensations; and are led by their vivacity to believe them to belong to the latter. For the vivacity of these trains of ideas passing in the imagination, is greatly increased by the causes above-mentioned; that is, by

their not being disturbed or dissevered either by the appulses [xml:id="in19"/>](#)

<note n="19" resp="editor" place="end">

Appulse: a driving or energetic motion toward or against a place [ref target="#in19"> Back.](#)

</note> of external bodies, as in surprise; or by our voluntary exertions in comparing them with our previous knowledge of things, as in reasoning upon them.

<p rendition="#indent1">

B. Now to apply.

<p rendition="#indent1">

P. When by the art of the Painter or Poet a train of ideas is suggested to our imaginations, which interests us so much by the pain



<space quantity="1" unit="lines">

or pleasure it affords, than we cease to attend to the irritations of common external objects, and cease also to use an voluntary efforts to compare these interesting trains of ideas with out previous knowledge of things, a complete reverie is produced: during which time, however short, if it be but for a moment, the objects themselves appear to exist before us. This, I think, has been called by an ingenious critic, “the ideal presence” of such objects.

(Elements of Criticism by [persName](#)

[name="Henry Home, Lord Kames">Lord Kames](#)). [xml:id="in20"/>](#)

<note n="20" resp="editor" place="end"> In his 1762 treatise *Elements of Criticism*, Scottish judge and writer Henry Home, Lord Kames’ (1696-1782) advocated a aesthetic theory of criticism drawn primarily from human nature. Homes distinguishes between “real” and “ideal” presence, indicating that the ideal occurs “when I recall any thing in the distinctest manner, so as to form an idea or image of it as present; I have not the words to describe this act, other than that I perceive the thing as a spectator, and as existing in my presence. This means not that I am really a spectator; but only that I conceive myself to be a spectator, and have a consciousness of presence similar to what a real spectator hath” (107-8). [ref target="#in20"> Back.](#)

</note> And in respect to the compliment intended by Mr. Fielding to Mr. Garrick, it would seem than an ignorant Rustic at the play of Hamlet, who has some previous belief in the appearance of Ghosts, would sooner be liable to fall into a reverie, and continue in it longer, than one who possessed more knowledge of the real nature of things, and had a greater facility of exercising his reason.

<p rendition="#indent1">

B. It must require great art in the Painter or Poet to produce this kind of deception?

P. The matter must be interesting from its sublimity, beauty, or novelty; [xml:id="in21"/>](#)

<note n="21" resp="editor" place="end"> Eighteenth century aesthetic treatises often concerned these three topics, questioning how humans identify and respond to the beautiful, the awe-striking, or the unusual.

Notable participants in this discussion were philosopher and writer Francis Hutcheson (1694-1746) and the publisher of a popular periodical,

The Spectator, Joseph Addison (1672-1719). Addison's 1712 essay 'Pleasures of the Imagination' elevates aesthetics to an empirical study akin to the natural sciences. Later, Edmund Burke examines human responses to viewed stimuli with this kind of empirical lens. In *A Philosophical Inquiry into the Origin of Our Ideas of the Sublime and the Beautiful* (1757), he assesses human responses to objects viewed, distinguishing between the sublime – darkness, vastness, infinity, terror – and the beautiful – smallness, smoothness, brightness. Burke also dedicates a chapter to novelty, examining it as a product of curiosity and identifying the pleasure of beholding the new. [Back](#).

this is the scientific part; and the art consists in bringing these distinctly before the eye, so as to produce (as above-mentioned) the ideal presence of the object, in which the great [William Shakespeare](#) [Shakespeare](#)

[Back](#)

English playwright William Shakespeare (1564-1616). After the Restoration and into the 18th century his original works were frequently staged, as were revised versions of his major plays (Davidant's *MacBeth*, Tate's *King Lear*, abridged versions of *Othello*). [Back](#).

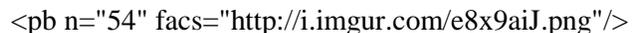
particularly excels.

[Back](#)

B. Then it is not of any consequence whether the representations correspond with nature?

[Back](#)

P. Not if they so much interest the reader or spectator as to induce the reverie above described. Nature may be seen in the marketplace, or at the card-table; but we expect something more than this in the play-house or picture-room. The further the artists recedes from nature, the greater novelty he is likely to produce; if he rises above nature, he produces the sublime; and beauty is probably a



selection and new combination of her most agreeable parts. Yourself will

be sensible to the truth of this doctrine by recollecting over in your mind the works of three celebrated artists. Sir

[Joshua Reynolds](#)

[Back](#)

Joshua Reynolds (1732-1792) was an eminent English portrait and history painter. [Back](#).

has introduced sublimity even into its portraits; we admire the representation of persons, whose reality we should have passed by

unnoticed. Mrs. [Angelica Kauffman](#) (1741-1807), Austrian portrait painter, largely painted within distinct genres, either completing portraits of her acquaintances or commissions or painting either historical, classical or pastoral scenes. [Back](#).

attracts our eyes with beauty, which I suppose no where exists; certainly few Grecian faces are seen in this country. And the daring pencil of [Henry Fuseli](#), Swiss painter and writer Henry Fuseli (1741-1825) whose paintings are known for their sensational, demoniac or strange subject matter and dramatic representation. In 1781, Darwin met Fuseli in London and it was in this year that Fuseli's most successful and renown painting, The Nightmare, was first exhibited(King-Hele 171). The Nightmare typifies the type of sensationalism Darwin discusses here. He refers directly to it in Canto III of Loves of the Plants and would later do so in an extended verse passage in The Economy of Vegetation. Darwin and Fuseli both worked with radical publisher Joseph Johnson, and Fuseli would later engrave the frontispiece for the compiled Botanic Garden. [Back](#).

transports us beyond the boundaries of nature, and ravishes us with the charm of the most interesting novelty. And [William Shakespeare](#) English playwright William Shakespeare (1564-1616). After the Restoration and into the 18th century his original works were frequently staged, as were revised versions of his major plays (Davendant's *MacBeth*, Tate's *King Lear*, abridged versions of *Othello*). [Back](#).

who excels in all these together, so far captivates the spectator, as to make him unmindful of every kind of violation of Time, Place, or Existence. As at the first appearance of the Ghost of Hamlet, "his ear must be dull as the fat weed which roots itself on Lethe's brink" who can attend to the improbability of the exhibition. So in many scenes of the Tempest [Probably written in 1611, Shakespeare's The Tempest is a fantastical play about Prospero, former duke and magician ruler of a remote island, and his attempts to restore his family's status through both his own magic and assistance from the island's fairy and demon inhabitants. Back](#).

we perpetually believe the action passing before our eyes, and relapse with somewhat of distaste into common life at the intervals of

the representation. </p>
<p rendition="#indent1">
<hi rend="italic">B. </hi>I suppose a poet of less ability would find such great machinery difficult and cumbersome to manage. </p>
<p rendition="#indent1">
<hi rend="italic">P. </hi>Just so, we should be shocked at the apparent improbabilities. As in the gardens of Sicilian nobleman, as described in <persName name="Patrick Brydone"><surname>Mr. Brydone's</surname></persName> <anchor xml:id="in28"/>
<note n="28" resp="editor" place="end"> In summer of 1770, Scottish author Patrick Brydone (1736-1818) travelled from Naples to Sicily and Malta, locations that were unfamiliar to the British at the time. Thus, Brydone published in 1773. His work met with critical acclaim and his reflections on volcanoes and electricity had him elected to the Royal Society. In Volume 2 of his travel narrative, Brydone recounts the terrible statues Darwin discusses here: outside a Prince's house, he witnessed an "amazing crowd of statues" stating that "of all of that immense group, there is not one made to represent any object in nature"(95). The artist responsible has "put the heads of men to the bodies of every sort of animal" and "sometimes he makes a compound of five or six animals that have no sort of resemblance in nature". <ref target="#in28"> Back. </ref></note> and in <persName name="Henry Swinburne">Mr. <surname>Swinburn's</surname></persName> travels, <anchor xml:id="in29"/>
<note n="29" resp="editor" place="end"> Henry Swinburne (1743-1803) was an Englishman whose travels took him over much of continental Europe, including an extended stay in the Kingdom of the Two Sicilies, the largest Italian state before Italian unification. From 1783-5, he published <hi rend="italic">Travels in the Two Sicilies, 1777-1780</hi>. <ref target="#in29"> Back. </ref> </note> there are said to be six hundred statues of imaginary monsters, which so disgust the spectators, that the state had once a serious design of destroying them; and yet the very improbably monsters in Ovid's Metamorphoses have entertained the world for many centuries. </p>
<p rendition="#indent1">
<hi rend="italic">B. </hi>The monsters in your Botanic Garden, I hope, are of the latter kind? </p>
<p rendition="#indent1">
<hi rend="italic">P. </hi>The candid reader must determine. </p>
</p>
</p>
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Appendix B: Transcriptions and Annotations

Images are not represented in the transcription. Text has been used to indicate image placement. The first section of this appendix presents a transcription of The Loves of the Plants. This is followed by the annotations for the online edition.

Poetic Transcription

THE
BOTANIC GARDEN
--
PART II

Engraving, flora at play with cupid

THE
BOTANIC GARDEN
PART II
CONTAINING
THE LOVES OF THE PLANTS
A POEM.
WITH
Philosophical Notes

Vivunt in Venerem frondes; nemus omne per
altum

Felix Arbor amat; nutant ad mutua Palmæ

Fædera, populeo suspirat Populus ictu,

Et Plantani Platanis, Alnoque, assibiliant alnus.

CLAUD. EPITH.

--

THE THIRD EDITION

--

LONDON,

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--

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ADVERTISEMENT

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THE general design of the following sheets is to **enlist** Imagination under the banner of Science, and to lead her votaries from the looser analogies, which dress out the imagery of poetry, to the stricter ones, which form the ratiocination of philosophy. While their particular design is to induce the ingenious to cultivate the knowledge of **BOTANY**; by introducing them to the vestibule of that delightful science, and recommending to their attention the immortal works of the Swedish Naturalist **LINNAEUS** .

In the first Poem, or Economy of Vegetation, the physiology of Plants is delivered; and the operation of the Elements, as far as they may be supposed to affect the growth of Vegetables. But the publication of this part is deferred to another year, for the purpose of repeating some experiments on vegetation, mentioned in the notes. In the second poem, or **LOVES OF THE PLANTS**, which is presented to the Reader, the Sexual System of **LINNAEUS** is explained, with the remarkable properties of the many particular plants.

The author has withheld this work (excepting a few pages) many years from the press according to the rule of Horace, hoping to have rendered it more worth of the acceptance of the public, - but finds at length, that he is less able, from disuse, to correct the poetry; and, from want of leisure, to amplify the annotations.

PREFACE

--

LINNAEUS has divided the vegetable world into 24 Classes; these Classes into about 120 Orders; these Orders contain about 2000 Families, or Genera; and these Families about 20,000 Species; besides the innumerable Varieties, which the accidents of climate or cultivation have added to these Species.

The Classes are distinguished from each other in this ingenious system, by the number, situation, adhesion, or reciprocal proportion of the males in each flower. The Orders, in many of these classes, are distinguished by the number, or other circumstances of the females. The Families, or Genera, are characterized by the analogy of all the parts of the flower or fructification. The Species are distinguished by the foliage of the plant; and the Varieties by any accidental circumstance of colour, taste, or odour; the seeds of these do not always produce plants similar to the parent; as in our numerous fruit-trees and garden flowers; which are propagated by grafts or layers.

The first eleven classes include the plants, in whose flowers both the sexes reside; and in which the Males or Stamens are neither united nor unequal in height when at maturity; and are therefore distinguished from each other simply by the number of males in each flower, as is seen in the annexed PLATE, copied from the Dictionaire Botanique of M. BULLIARD, in which the numbers of each division refer to the Botanic Classes.

ii PREFACE

CLASS I. ONE MALE, *Monandria*; includes the plants which possess but One Stamen in each flower.

II. TWO MALES, *Diandria*. Two Stamens.

III. THREE MALES, *Triandria*. Three Stamens.

IV. FOUR MALES, *Tetrandria*. Four Stamens.

V. FIVE MALES, *Petandria*. Five Stamens.

VI. SIX MALES, *Hexandria*. Six Stamens.

VII. SEVEN MALES, *Heptandria*. Seven Stamens.

VIII. EIGHT MALES, *Octandria*. Eight Stamens.

IX. NINE MALES, *Enneandria*. Nine Stamens.

X. TEN MALES, *Decandria*. Ten Stamens.

XI. TWELVE MALES. *Dodecandria*. Twelve Stamens.

The next two Classes are distinguished not only by the number of equal and disunited males, as in the above eleven Classes, but require an additional circumstance to be attended to, *viz.* whether the males or stamens be situated on the calyx, or not.

XII. TWENTY MALES. *Icosandria*. Twenty Stamens inserted on the calyx or flower-cup; as is well seen in the last Figure of No. xii. in the annexed plate.

XIII. MANY MALES. *Polyandria*. From 20 to 100 Stamens, which do not adhere to the calyx; as is well seen in the first Figure of No. xiii. in the annexed Plate.

In the next two Classes, not only the number of stamens are to be observed, but the reciprocal proportions in respect to height.

XIV. TWO POWERS, *Didynamia*. Four Stamens, of which two are lower than the other two; as is seen in the two first Figures of No. xiv.

XV. FOUR POWERS, *Tetradynamia*. Six Stamens; of which four are taller, and the two lower ones opposite to each other; as is seen in the third Figure of the upper row in No. 15.

PREFACE iii

The five subsequent Classes are distinguished not by the number of males, or stamens, but by their union or adhesion, either by their anthers, or filaments, or to the female or pistil.

XVI. ONE BROTHERHOOD, *Monadelphia*.

Many Stamens united by their filaments into one company; as in the second Figure below of No. xvi.

XVII. TWO BROTHERHOODS, *Diadelphia*.

Many Stamens united by their filaments into two companies; as in the uppermost Fig. No. xvii.

XVIII. MANY BROTHERHOODS, *Polydelphia*.

Many Stamens united by their filaments into three or more companies, as in No. xviii.

XIX. CONFEDERATE MALES, *Syngenesia*.

Many Stamens united by their anthers; as in first and second Figures, No. xix.

XX FEMININE MALES, *Gynandria*. Many Stamens attached to the pistil.

The next three Classes consist of plants, whose flowers contain but one of these sexes; or if some of them contain both sexes, there are other flowers accompanying them of but one sex.

XXI. ONE HOUSE, *Monœcia*. Male flowers and female flowers separate, but on the same plant.

XXII. TWO HOUSES, *Diœcia*. Male flowers and female flowers separate, on different plants.

XXIII. POLYGAMY, *Polygamia*. Male and female flowers on one or more plants, which have at the same time flowers of both sexes.

The last Class contains the plants whose flowers are not discernible.

XXIV. CLANDESTINE MARRIAGE, *Cryptogamia*.

The Orders of the first thirteen Classes are founded on the number of Females, or Pistils, and distinguished by the names, ONE

iv PREFACE

FEMALE, *Monogynia*. TWO FEMALES, *Digynia*. THREE FEMALES. *Trigynia*, &c. as is seen in No. i. which represents a plant of one male, one female; and in the first Figure of No. xi which represents a flower with twelve males, and three females; (for, where the pistils have no apparent styles, the summits, or stigmas, are to be numbered) and in the first Figure of No. xii. which represents a flower with twenty males and many females; and in the last Figure of the same No. which has twenty males and one female; and in No. xiii. which represents a flower with many males and many females.

The Class of TWO POWERS, is divided into two natural Orders; into such as have their seeds naked at the bottom of the calyx, or flower cup; and such as have their seeds covered; as is seen in No. xiv. Fig. 3. and 5.

The Class of FOUR POWERS is divided also into two Orders; in one of these the seeds are enclosed in the **silique**, as in *Shepherd's purse*. No. xiv. Fig. 5. In the other they are enclosed in a siliqua (**first one normalized to match this one**), as in *Wall-Flower*. Fig. 4.

In all the other Classes, excepting the Classes Confederate Males, and Clandestine Marriage, as the character of each class is distinguished by the situations of the males; the character of the Orders is marked by the numbers of them. In the Class ONE BROTHERHOOD, No. xvi. Fig. 3. the Order of ten males is represented. And in the Class TWO BROTHERHOODS, No. xvii. Fig. 2. The Order ten males is represented.

In the class CONFEDERATE MALES, the Orders are chiefly distinguished by the fertility or barrenness of the flowers of the disk, or ray of the compound flower.

v PREFACE

And in the class of CLANDESTINE MARRIAGE, the four Orders are termed FERNS, MOSSES, FLAGS, and FUNGUSES.

The Orders are again divided into Genera, or Families, which are all natural associations, and are described from the general resemblances of the parts of fructification, in respect to their number, form, situation, and reciprocal proportion. These are the Calyx, or Flower-cup, as seen in No. iv. Fig. 1. No. x. Fig. I. and 3. No. xiv. Fig. 1.2.3.4. Second, the Carol, or Blossom, as seen in No. i. ii. &c. Third, the Males, or Stamens; as in No. iv. Fig. I. and No. viii. Fig. 2. Fourth, the Females, or Pistils, as in No. i. No. xii. Fig. I. No. xiv. Fig. 3. No. xv. Fig. 3. Fifth, the Pericarp or Fruit-vessel; as No. xv. Fig. 4.5. No. xvii. Fig. 2. Sixth, the Seeds.

The illustrious author of the Sexual System of Botany, in his preface to his account of the Natural Orders, ingeniously imagines, that one plant of each Natural Order was created in the beginning; and that the intermarriages of these produced one plant of every Genus, or Family; and that the intermarriages of these Generic, or Family plants, produced all the Species and lastly, that the intermarriages of the individuals of the Species produced Varieties.

In the following POEM, the name or number of the Class or Order of each plant is printed in Italics; as "*Two* brother swains." "*One* House contains them." and the word "*secret*." expresses the Class of Clandestine Marriage.

The Reader, who wishes to become further acquainted with this delightful field of science, is advised to study the words of the Great Master, and is apprized that they are exactly and literally translated into English, by a Society at LICHFIELD, in four Volumes Octavo.

vi PREFEACE

To the SYSTEM OF VEGETABLES* is prefixed a copious explanation of all the Terms used in Botany, translated from a thesis of Dr. ELMGREN, with the plates and references from the Philosophia Botannica of LINNAEUS.

To the FAMILIES OF PLANTS† is prefixed a Catalogue of the names of plants and other Botanic Terms, carefully accented to show their proper pronunciation; a work of great labour, and which was much wanted, not only by beginners, but by proficients in BOTANY.

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* *The SYSTEM OF VEGETABLES translated from the Systema Vegetabilium* in two Vols. is sold by LEIGH and SOTHEBY, *York Street, Covent Garden*: Price eighteen Shillings, in Boards.

† *The FAMILIES OF PLANTS translated from the Genera Plantarum*, in two Vols. By JOHNSON, *St. Paul's Church-Yard, London*: Price sixteen Shillings, in Boards.

PLATE ACCOMPANIMENT – DIAGRAM

PLATE ACCOMPANIMENT – DIAGRAM

--

PROEM

--

GENTLE READER!

LO, here a CAMERA OBSCURA is presented to thy view, in which are lights and shades dancing on a **whited** canvas, and magnified into apparent life! – if thou art perfectly at **leisure** for such trivial amusement, walk in,

(viii)

and view the wonders of my **INCHANTED GARDEN**.

Whereas P. OVIDIUS NASO, a great Necromancer in the famous Court of AUGUSTUS CAESAR, did by art poetic transmute Men, Women, and even Gods and Goddesses, into Trees and Flowers; I have undertaken by similar art to restore some of them to their original animality, after having remained prisoners so long in their respective vegetable mansions; and have here exhibited them before thee. Which thou may'st contemplate as diverse little pictures suspended over the chimney of a Lady's dressing-room, *connected*

only by a slight festoon of ribbons. And which, though thou may'st not be acquainted with the originals, may amuse thee by the beauty of their persons, their graceful attitudes, or the brilliancy of their dress.

FAREWELL

LITTLE ANGEL SIGIL (T. Holloway sculp)

THE
LOVES OF THE PLANTS.

--

CANTO I.

--

DESCEND, ye hovering Sylphs! aerial choirs,
And sweep with little hands your silver lyres;
With fairy footsteps print your grassy rings,
Ye Gnomes! accordant to the tinkling strings;
While in soft notes I tune to oaten reed

5

Gay hopes, and amorous sorrows of the mead. –
From giant Oaks, that wave their branches dark,
To the dwarf Moss, that clings upon their bark,

[2]

What Beaux and Beauties crowd the gaudy
groves,

And woo and win their vegetable Loves.

10

How Snowdrops cold, and blue-eyed Harebells
blend

Their tender tears, as o'er the stream they bend;
The lovesick Violet, and the Primrose pale
Bow their sweet heads, and whisper to the gale;
With secret sighs the Virgin Lily droops,

15

And jealous Cowslips hang their tawny cups.
How the young Rose in beauty's damask pride
Drinks the warm blushes of his bashful bride;
With honey'd lips enamour'd Woodbines meet,
Clasp with fond arms, and mix their kisses
sweet. –

20

Stay thy soft-murmuring waters, gentle Rill;
Hush, whispering Winds, ye rustling Leaves, be
still;

Rest, silver Butterflies, your quivering wings;
Alight, ye Beetles, from your airy rings;

Vegetable Loves. I.10. Linnaeus, the celebrated
Swedish naturalist, has demonstrated, that all
flowers contain families of males or females, or
both; and on their marriages has constructed his
invaluable system of Botany.

[3]

Ye painted Moths, your gold-eyed plumage furl,
25

Bow your wide horns, your spiral trunks uncurl;
Glitter, ye Glow-worms, on your mossy beds;
Descend, ye Spiders, on your lengthened
threads;

Slide here, ye horned Snails, with varnish'd
shells;

Ye Bee-nymphs, listen in your waxen cells! –
30

BOTANIC MUSE! who in this latter age
Led by your airy hand the Swedish sage,
Bade his keen eye your secret haunts explore
On dewy dell, high wood, and winding shore;
Say on each leaf how tiny Graces dwell;

35

How laugh the Pleasures in a blossom's bell;
How insect Loves arise on cobweb wings,
Aim their light shafts, and point their little
stings.

“First the tall CANNA lifts his curled brow
Erect to heaven, and plights his nuptial vow;

40

Canna I.39 Cane, or Indian Reed. One male and
one female inhabit each flower. It is brought
from between the tropics to our hot-houses, and
bears a beautiful crimson flower; the seeds are
used as shot by the Indians, and are strung for
prayer-beads in some catholic countries.

[4]

The virtuous pair, in milder regions born,
Dread the rude blast of Autumn's icy morn;
Round the chill fair he folds his crimson vest,
And clasps the timorous beauty to his breast.

Thy love, CALLITRICHE, *two* Virgins share,
45

Smit with thy starry eye and radiant hair; –
On the green margin sits the youth, and laves
His floating train of tresses in the waves;
Sees his fair features paint the streams that pass,
And bends for ever o'er the watery glass.

50

Two brother swains, of COLLIN'S gentle name,
The same their features, and their forms the
same

Callitriche I.45 Fine-Hair, Stargrass. One male
and two females inhabit each flower. The upper
leaves grow in form of a star, whence it is called
Stellaria Aquatica by Ray and others; its stems
and leaves float far on the water, and are often
so matted together, as to bear a person walking
on them. The male sometimes lives in a separate
flower.

Collinsonia I.51. Two males, one female. I have
lately observed a very singular circumstance in
this flower; the two males stand widely
diverging from each other, and the female bends
herself into contact first with one of them, and
after some time leaves this, and applies herself
to the other. It is probable one of the anthers
may be mature before

[5]

With rival love for COLLINIA sigh,
Knit the dark brow, and roll the unsteady eye.
With sweet concern the pitying beauty mourns,

55

And soothes with smiles the jealous pair by turns.

Sweet blooms GENISTA in the myrtle shade,
And *ten* fond brothers woo the haughty maid.
the other? See note on *Gloriosa* and *Genista*.
The females in *Nigella*, devil in the bush, are
very tall compared to the males; and bending
over in a circle to them, give the flower some
resemblance to a regal crown. The female of the
epilobium augustifolium, rose bay willow herb,

bends down amongst the males for several days, and becomes upright again when impregnated. *Genista*. I.57. Dyer's broom. Ten males and one female inhabit this flower. The males are generally united at the bottom in two sets, whence Linnaeus has named the class "two brotherhoods." In the *Genista*, however, they are united in but one set. The flowers of this class are called papilionaceous, from their resemblance to a butterfly, as the pea-blossom. In *Spartium Scoparium*, or common broom, I have lately observed a curious circumstance, the males or stamens are in two sets, one set rising a quarter of an inch above the other; the upper set does not arrive at their maturity so soon as the lower, and the stigma, or head of the female, is produced amongst the upper or immature set; but as soon as the pistil grows tall enough to burst open the keel-leaf, or hood of the flower, it bends itself round in an instant, like a french horn, and inserts its head, or stigma, amongst the lower or mature set of males. The pistil, or female, continues to grow in length; and in a few days the stigma arrives again amongst the upper set, by the time they become mature. This wonderful contrivance is readily seen by opening the keel-leaf of the flowers of broom before the burst spontaneously. See note on *Collinsonia*, *Gloriosa*, *Draba*.

[6]

Two knights before thy fragrant altar bend,
60

Adored MELISSA! and *two* squires attend.
MEADIA'S soft chains *five* suppliant beaux
confess,

And hand in hand the laughing belle address;
Alike to all, she bows with wanton air,
Rolls her dark eye, and waves her golden hair.

Melissa. I.60. Balm. In each flower there are four males and one female; two of the males stand higher than the other two; whence the name of the class "two powers." I have observed in the *Ballota*, and others of this class, that the two lower stamens, or males become mature before the two higher. After they have shed their dust, they turn themselves away outwards; and the pistil, or female, continuing to grow a little taller, is applied to the upper stamens. See *Glorisa*, and *Genista*.

All the plants of this class, which have naked seeds, are aromatic. The *Marum*, and *Nepeta* are particularly delightful to cats; no other brute animals seem delighted with any odours but those of their food or prey.

Meadia, I.61. Dodecatheon, American Cowslip. Five males and one female. The males, or anthers, touch each other. The uncommon beauty of this flower occasioned Linnaeus to give it a name signifying the twelve heathen gods; and Dr. Mead to affix his own name to it. The pistil is much longer than the stamens, hence the flower-stalks have their elegant bend, that the stigma may hang downwards to receive the fecundating dust of the anthers. And the petals are so beautifully turned back to prevent the rain or dew drops from sliding down and washing off this dust prematurely; and at the same time exposing it to the light and air. As soon as the seeds are formed, it erects all the flower stalks to prevent them from falling out; and thus loses the beauty of its figure. Is this a mechanical effect, or does it indicate a vegetable storgé to preserve its offspring? See note on *Ilex*, and *Gloriosa*.

In the *Maedia*, the *Borago*, *Cyclamen*, *Solanum*, and many others, the filaments are very short compared with the style. Hence it became necessary, 1st. to furnish the stamens

[7]

Woo'd with long care, CURCUMA cold and shy

Meets her fond husband with averted eye:

Four beardless youths the obdurate beauty move
With soft attentions of Platonic love.

with long anthers. 2d. To lengthen and bend the peduncle or flower-stalk, that the flower might hang downwards. 3d. To reflect the petals. 4th.

To erect these peduncles when the germ was fecundated. We may reason upon this by observing, that all this apparatus might have been spared, if the filaments alone had grown longer; and that thence in these flowers that the filaments are the most unchangeable parts; and that thence their comparative length, in respect to the style, would afford a most permanent mark of their genetic character.

Curcuma, I.65. Turmeric. One male and one female inhabit this flower; but there are besides four imperfect males, or filaments without anthers upon them, called by Linnaeus eunuchs. The flax of our country has ten filaments, but five of them are terminated with anthers; the Portugal flax has ten perfect males, or stamens; the Verbena of our country has four males; that of Sweden has but two; the genus *Albuca*, the *Bignonia* *Catalpa*, *Gratiola*, and hemlock-leaved *Geranium* have only half their filaments crowned with anthers. In like manner the florets, which form the rays of the flowers of the order frustraneous polygamy of the class syngenesia, or confederate males, as the sun-flower, are furnished with a style only, and no stigma: and are thence barren. There is also a style without a stigma in the whole order diœcia gynandria; the male flowers of which are thence barren. The *Opulus* is another plant, which contains some unprolific flowers. In like manner some tribes of insects of males, females, and neuters among them: as bees, wasps, and ants.

There is a curious circumstance belonging to the class of insects which have two wings, or diptera, analogous to the rudiments of stamens above described; viz. two little knobs are found placed on each a stalk or peduncle, generally under a little arched scale; which appear to be rudiments of hinder wings; and are called by Linnaeus halteres, or poisers, a term of his introduction. A. T. Bladh. *Amæn Acad* V.7. Other animals have marks of having in a long process of time undergone changes in some

parts of their bodies, which may have been effected to accommodate them to new ways of procuring their food. The existence of teats on the breasts of male animals, and which are generally

[8]

With vain desires the pensive ALCEA burns,
And, like sad ELOISA, loves and mourns.
The freckled IRIS owns a fiercer flame,
And *three* unjealous husbands wed the dame.
replete with a thin kind of milk at their nativity,
is a wonderful instance of this kind. Perhaps all
the productions of nature are in their progress to
greater perfection? an idea countenanced by the
modern discoveries and deductions concerning
the progressive formation of the solid parts of
the terraqueous globe, and consonant to the
dignity of the Creator of all things.

Alcea L. 69. Flore pleno. Double hollyhock. The
double flowers, so much admired by the florists,
are termed by the botanist vegetable monsters;
in some of these the petals are multiplied three
or four times, but without excluding stamens,
hence they produce some seeds, as *Campanula*
and *Stramonium*; but in others the petals
become so numerous as totally to exclude the
stamens, or males; as *Caltha*, *Peonia*, and *Alcea*;
these produce no seeds, and are termed eunuchs.
Philos. Botan. No. 150.

These vegetable monsters are formed in many
ways. 1st. By the multiplication of the petals and
the exclusion of the nectaries, as in larkspur. 2nd.
By the multiplication of the nectaries and the
exclusion of the petals, as in columbine. 3d. In
some flowers growing in cymes, the wheel-
shape flowers in the margin are multiplied to the
exclusion of the bell-shape flowers in the centre;
as in gelder-rose. 4th. By the elongation of the
florets in the centre. Instances of both these are
found in daisy and feverfew; for other kinds of
vegetable monsters, see *Plantago*.

The perianth is not changed in double flowers,
hence the genus or family may be often
discovered by the calyx, as in *Hepatica*,
Ranunculus, *Alcea*. In those flowers, which
have many petals, the lowest series of the petals
remains unchanged in respect to number; hence
the natural number of the petals is easily
discovered. As in poppies, roses, and *Nigella*, or
devil in a bush. *Phil. Bot. p.128.*

Iris. 1.71. Flower de Luce. Three males, one
female. Some of the species have a beautifully
freckled flower; the large stigma or head of the
female covers the three males, counterfeiting a
petal with its divisions.

[9]

CUPRESSUS dark disdains his dusky bride,
One dome contains them, but *two* beds divide.
The proud OSYRIS flies his angry fair,
Two houses hold the fashionable pair.

Cupressus. I.73. Cypress. One House. The male lives in separate flowers, but on the same plant. The males of some of these plants which are in separate flowers from the females, have an elastic membrane; which disperses their dust to a considerable distance, when the anthers burst open. This dust, on a fine day, may often be seen like a cloud hanging round the common nettle. The males and females of all the cone-bearing plants are in separate flowers, either on the same or on different plants; they produce resins, and many of them are supposed to supply the most durable timber: what is called Venice-turpentine is obtained from the larch by wounding the bark about two feet from the ground, and catching it as it exudes; Sandarach is procured from the common juniper; and Incense from a juniper with yellow fruit. The unperishable chests, which contain the Egyptian mummies, were of Cypress; and the Cedar, with which black lead pencils are covered, is not liable to be eaten by worms. See Miln's Bot. Dict. art.coniferae. The gates of St. Peter's church at Rome, which had lasted from the time of Constantine to that of Pope Eugene the fourth, that is to say, eleven hundred years, were of Cypress, and had in that time suffered no decay. According to Thucydides, the Athenians buried the bodies of their heroes in coffins of Cypress, as being not subject to decay. A similar durability has also been ascribed to Cedar. Thus Horace,

– *Speramus carmina fingi*

Posse linenda cedro & ævi servanda cupresso.

Osyrisi. I.75. Two houses. The males and females are on different plants. There are many instances on record, where female plants have been impregnated at very great distance from their male; the dust discharged from the anthers is very light, small, and copious, so that it may spread very wide in the atmosphere, and be carried to the distant pistils, without the supposition of any particular attraction; these plants resemble some insects, as the ants, and cochineal insect, of which the males have wings, but not the female.

[10]

With strange deformity PLANTANGO treads,
A Monster-birth! and lifts his hundred heads;
Yet with soft love a gentle belle he charms,
And clasps the beauty in his hundred arms.
So hapless DESDEMONA, fair and young,
Won by OTHELLO'S captivating tongue,
Sigh'd o'er each strange and piteous tale,
distress'd,
And sunk enamour'd on his sooty breast.

Two gentle shepherds and their sister-wives
With thee, ANTHOXA! lead ambrosial lives;

Plantago. I.77. Rosea. Rose Plantain. In this vegetable monster the bracts, or divisions of the spike, become wonderfully enlarged; and are converted into leaves. The chaffy scales of the calyx in *Xeranthemum*, and in a species of *Dianthus*, and the glume in some alpine grasses, and the scales of the ament in the *salix rosea*, rose willow, grow into leaves; and produce other kinds of monsters. The double flowers become monsters by the multiplication of their petals or nectaries. See note on *Alcea*.

Anthexanthum. I.83. Vernal grass. Two males, two females. The other grasses have three males and two females. The flowers of this grass give the fragrant scent to hay. I am informed it is frequently viviparous, that is, that it bears sometimes roots or bulbs instead of seeds, which after a time drop off and strike root in the ground. This circumstance is said to obtain in many of the alpine grasses, whose seeds are perpetually devoured by small birds. The *Festuca Dumetorum*, fescue grass of the buses, produces bulbs from the sheaths of its straw. The *Allium Magicum*, or magical onion, produces

[11]

Where the wide heath in purple pride extends,
And scatter'd furze its golden lustre blends,
Closed in green recess, unenvy'd lot!
The blue smoke rises from their turf-built cot;
Bosom'd in fragrance blush their infant train,
Eye the warm sun, or drink the silver rain.

The fair OSMUNDA seeks the silent dell,
The ivy canopy, and dripping cell;
There hid in shades in *clandestine* rites
approves,
Till the green progeny betrays her loves.

onions on its head, instead of seeds. The Polygonum Viviparum, viviparous bistort, rises about a foot high, with a beautiful spike of flowers, which are succeeded by buds or bulbs, which fall off and take root. There is a bush frequently seen on birch-trees, like a bird's nest, which seems to be a similar attempt of nature, to produce another tree; which falling off might take root in spongy ground.

There is an instance of this double mode of production in the animal kingdom, which is equally extraordinary; the same species of Aphis is viviparous in the summer, and oviparous in autumn. A.T. Bladh. Amæn. Acad. V.7.

Osmunda. I.93. This plant grows on moist rocks; the parts of its flower or its seeds are scarce discernible; whence Linnaeus has given the name of *clandestine* marriage to this class. The young plants are of a beautiful vivid green.

[12]

With charms despotic fair CHONDRILLA
reigns
O'er the soft hearts of *five* fraternal swains;
If sighs the changeful nymph, alike they mourn;
And, if she smiles, with rival raptures burn.
So, tun'd in unison, Eolian Lyre!
Sounds in sweet symphony thy kindred wire;
Now gently swept by Zephyr's vernal wings,
Sink in soft cadences the love-sick strings;
And now with mingling chords, and voices
higher,
Peal the full anthems of the aerial choir.

Five sister-nymphs to join Diana's train
With thee, fair LYCHNIS! vow, - but vow in
vain;

Chondrilla. 1.97. Of the class Confederate Males. The numerous florets, which constitute the disk of the flowers in this class, contain in each five males, surrounding one female, which are connected at top, whence the name of the class. An Italian writer, in a discourse on the irritability of flowers, asserts, that if the top of the floret be touched, all the filaments which support the cylindrical anther will contract themselves, and that by thus raising or depressing the anther the whole of the prolific dust is collected on the stigma. He adds, that if one filament be touched after it is separated from the floret that it will contract like the muscular fibres of animal bodies; his experiments were tried on the *Centaurea Calcitrapoides*, and on artichokes, and globe-thistles. Discourse on irritability of plants. Dodsley.

Lychnis. I.108. Ten males and five females. The flowers which contain the five females, and those which contain the ten males, are found on different plants; and often

[13]

Beneath one roof resides the virgin band,
Flies the fond swain, and scorns his offer'd
hand;
But when soft hours on breezy pinions move,
And smiling May attunes her lute to love,
Each wanton beauty, trick'd in all her grace,
Shakes the bright dew-drops from her blushing
face;
In gay undress displays her rival charms,
And calls her wondering lovers to her arms.
When the young Hours amid her tangled hair
Wove the fresh rose-bud, and the lily fair,
Proud GLORIOSA led *three* chosen swains,
The blushing captives of her virgin chains--

at a great distance from each other. Five of the ten males arrive at their maturity some days before the other five, as may be seen by opening the corol before it naturally expands itself. When the females arrive at their maturity, they rise above the petals, as if looking abroad for their distant husbands; the scarlet ones contribute much to the beauty of our meadows in May and June.

Gloriosa. I.119. Superba. Six males, one female. The petals of this beautiful flower with three of the stamens, which are first mature, stand up in apparent disorder; and the

[14]

When Time's rude hand a bark of wrinkles
spread
Round her weak limbs, and silver'd o'er her
head,
Three other youths her riper years engage,
The flatter'd victims of her wily age.

So, in her wane of beauty, NINON won
With fatal smiles her gay unconscious son. –
Clasp'd in his arms she own'd a mother's name,
--
“Desist, rash youth! restrain your impious
flame,

pistil bends at nearly a right angle to insert its stigma amongst them. In a few days, as these decline, the other three stamens bend over, and approach the pistil. In the *Fritillaria Persica*, the six stamens are of equal lengths, and the anthers lie at a distance from the pistil, and three alternate ones approach first; and, when these decline, the other three approach: in the *Lithrum Salicaria* (which has twelve males and one female) a beautiful red flower, which grows on the banks of rivers, six of the males arrive at maturity, and surround the female some time before the other six; when these decline, the other six rise up, and supply their places. Several other flowers have in a similar manner two sets of stamens of different ages, as *Adoxa*, *Lychnis*, *Saxifraga*. See *Genista*. Perhaps a difference in the time of their maturity obtains in all these flowers, which have numerous stamens. In the *Kalmia* the ten stamens lie round the pistil like the radii of a wheel; and each anther is concealed in a niche of the corol to protect it from cold and moisture; these anthers rise separately from their niches, and approach the pistil for a time, and then recede to their former situations.

GLORIOSA Engraving

DOPMAEA ENGRAVING

[15]

“First on that bed your infant-form was press’d,
“Born by my throes, and nurtured at my breast.”

–

Back as from death he sprung, with wild amaze
Fierce on the fair he fix’d his ardent gaze;
Dropp’d on one knee, his frantic arms
outspread,
And stole a guilty glance toward the bed;
Then breath’d from quivering lips a whispered
vow,
And bent on heaven his pale repentant brow;
“Thus, thus!” he cried, and plung’d the furious
dart,
And life and love gush’d mingled from his
heart.

The fell SILENE and her sisters fair,
Skill’d in destruction, spread the viscous snare.
The harlot-band *ten* lofty bravoës screen,
And frowning guard the magic nets, unseen. –

Silene. 1.139. Catchfly. Three females and ten males inhabit each flower; the viscous material, which surrounds the stalks under the flowers of this plant, and of the *Cucubalus Otites*, is a curious contrivance to prevent various insects from plundering the honey, or devouring the seed. In the *Dionæa Muscipula* there is a still more wonderful contrivance to prevent the depredations of insects: The leaves are armed with long teeth, like the antennæ of insects, and lie spread upon the ground round the stem; and

[16]

Haste, glittering nations, tenants of the air,
Oh, steer from hence your viewless course afar!
If with soft words, sweet blushes, nods, and
smiles,
The *three* dread Sirens lure you to their toils,
Limed by their art in vain you point your stings,
In vain the efforts of your whirring wings! –
Go, seek your gilded mates and infant hives,
Nor taste the honey purchas’d with your lives!

When heaven’s high vault condensing clouds
deform,

Fair AMARYLLIS flies the incumbent storm,
are so irritable, that when an insect creeps upon
them, they fold up and crush or pierce it to
death. The last professor Linnaeus, in his
Supplementum Plantarum, gives the following
account of the *Arum Muscivorum*. The flower
has the smell of carrion; by which the flies are
invited to lay their eggs in the chamber of the
flower, but in vain endeavor to escape, being
prevented by the hairs pointing inwards; and
thus perish in the flower, whence its name of
fly-eater. P.411. in the *Dypsacus* is another
contrivance for this purpose, a basin of water is
placed round each joint of the stem. In the
Drosera is another kind of fly-trap. See
Dypsacus and *Drosera*; the flowers of *Silene* and
Cucubalus are closed all day, but are open and
give an agreeable odour in the night. See *Cereæ*.
See additional notes at the end of the poem.
Amaryllis. I.152. *Formosissima*. Most beautiful
Amaryllis. Six males, one female. Some of the
bell-flowers close their apertures at night, or in
rainy or in cold weather, as the *convolvulus*, and
thus protect their included stamens and pistils.
Other bell-flowers

[17]

Seeks with unsteady step the shelter'd vale,
And turns her blushing beauties from the gale. –
Six rival youths, with soft concern impress'd,
Calm all her fears, and charm her cares to rest. -
-

So shines at eve the sun-illumin'd fane,
Lifts its bright cross, and waves its golden vane;
hang their apertures downwards, as many of the
lilies; in those the pistil, when at maturity, is
longer than the stamens; and by this pendant
attitude of the bell, when the anthers burst, their
dust falls on the stigma: and these are at the
same time sheltered as with an umbrella from
rain and dews. But, as a free exposure to the air
is necessary for their fecundation, the style and
filaments in many of these flowers continue to
grow longer after the bell is open, and hang
down below its rim. In others, as in the
martagon, the bell is deeply divided, and the
divisions are reflected upwards, that they may
not prevent the access of air, and at the same
time afford some shelter from perpendicular rain
or dew. Other bell-flowers, as the hemerocallis
and amaryllis, have their bells nodding only, as
it were, or hanging obliquely toward the
horizon; which, as their stems are slender, turn
like a weather cock from the wind and thus vey
effectually preserve their inclosed stamens and
anthers from the rain and cold. Many of these
flowers, both before and after their season of
fecundation, erect their heads perpendicular to
the horizon, like the Meadia, which cannot be
explained from mere mechanism.

The Amaryllis formosissima is a flower of the
last mentioned kind, and affords an agreeable
example of *art* in the vegetable economy. 1. The
pistil is of great length compared with the
stamens; and this I suppose to have been the
most unchangeable part of the flower, as in
Meadia, which see. 2. To counteract this
circumstance the pistil and the stamens are made
to decline downwards, that the prolific dust
might fall from the anthers on the stigma. 3. To
produce this effect and to secure it when
produced, the corol is lacerated, contrary to
what occurs in other flowers of this genus, and
the lowest division with the two next lowest
ones are wrapped closely over the style and
filaments, binding them forcibly down lower to
the horizon than the usual inclination of the bell
in this genus, and thus constitutes a most elegant

flower. There is another contrivance for this purpose in the *Hemerocallis flava*: the long pistil is often bent somewhat like the capital letter *N*, with design to shorten it, and thus to bring the stigma amongst the anthers.

[18]

From every breeze the polish'd axle turns,
And high in air the dancing meteor burns.

Four of the giant brood with ILEX stand,
Each grasps a thousand arrows in his hand;
A thousand steely points on every scale.
Form the bright terrors of his bristly mail. –
So arm'd, immortal Moore uncharm'd the spell,
And slew the wily dragon of the well. –
Sudden with rage their *injur'd* bosoms burn,
Retort the insult, or the wound return;
Unwrong'd, as gentle as the breeze that sweeps
The unbending harvests or undimpled deeps,
They guard, the Kings of Needwood's wide domains,
Their sister-wives and fair infantine trains;

Ilex. I.161. Holly. Four males, four females.
Many plants, like many animals, are furnished with arms for their protection; these are either aculei, prickles, as in rose and barberry, which are formed from the outer bark of the plant; or spinæ, thorn, as in hawthorn, which are an elongation of the wood, and hence more difficult to be torn off than the former; or stimuli, stings, as in the nettles, which are armed with a

[19]

Lead the lone pilgrim through the trackless
glade,
Or guide in leafy winds the wandering maid.

So WRIGHT's bold pencil from Vesuvio's
height
Hurls his red lavas to the troubled night;
From Calpè starts the intolerable flash,
Skies burst in flames, and blazing oceans dash;--

venomous fluid for the annoyance of naked animals. The shrubs and trees, which have prickles or thorns, are grateful food to many animals, as gooseberry, and gorse; and would be quickly devoured, if not thus armed; the stings seem a protection against some kinds of insects, as well as the naked mouths of quadrupeds. Many plants lose their thorns by cultivation, as wild animals lose their ferocity; and some of them their horns. A curious circumstance attends the large hollies in Needwood-forest, they are armed with thorny leaves about eight feet high, and have smooth leaves above; as if they were conscious that horses and cattle could not reach their upper branches. See note on Meadia, and on Manicinella. The numerous clumps of hollies in Needwood-forest serve as land-marks to direct the travelers across it in various directions; and as a shelter to the deer and cattle in the winter; and in scarce seasons supply them with much food. For when the upper branches, which are without prickles, are cut down, the deer crop the leaves and peel off the bark. The bird-lime made from the bark of Hollies seems to be a very similar material to the elastic gum, or Indian rubber, as it is called. There is a fossil elastic bitumen found at Matlock in Derbyshire, which much resembles these substances in its elasticity and inflammability. The thorns of the mimosa cornigera resemble cow's horns in appearance as well as in use. System of Vegetables, p. 782
Hurls his red lavas. I.179. Alluding to the grand paintings of the eruptions of Vesuvius, and of the destruction of the Spanish vessels before Gibraltar; and to the beautiful landscapes and moonlight scenes, by Mr. Wright of Derby.

[20]

Or bids in sweet repose his shades recede,
Winds the still vale, and slopes the velvet mead;
On the pale stream expiring Zephyrs sink,
And Moonlight sleeps upon its hoary brink.

Gigantic Nymph! The fair KLEINHOVIA
reigns,
The grace and terror of Orixia's plains;
O'er her warm cheek the blush of beauty swims,
And nerves Herculean bend her sinew limbs;
With frolic eye she views the affrighted throng,
And shakes the meadows, as she towers along,
With playful violence displays her charms,
And bears her trembling lovers in her arms.

Kleinhovia. 1.183. In this class the males in each flower are supported by the female. The name of the class maybe translated "Viragoes," or "Feminine males."

The largest tree perhaps in the world is of the same natural order as Kleinhovia, it is the Adansonia, or Ethiopian Sour-gourd, or African Calabash tree. Mr. Adanson says the diameter of the trunk frequently exceeds 25 feet, and the horizontal branches are from 45 to 55 feet long, and so large that each branch is equal to the largest trees of Europe. The breadth of the top is from 120 to 150 feet. And of the roots bared only in part by the washing away of the earth by the river, near which it grew, measured 110 feet long; and yet these stupendous trees never exceed 70 feet in height. Voyage to Senegal.

[21]

So fair THALESTRIS shook her plumy crest,
And bound in rigid mail her jutting breast;
Poised her long lance amid the walks of war,
And Beauty thunder'd from Bellona's car;
Greece arm'd in vain, her captive heroes wove
The chains of conquest with the wreaths of love.

When o'er the cultured lawns and dreary wastes
Retiring Autumn flings her howling blasts,
Bends in tumultuous waves the struggling
woods,

And showers their leafy honours on the floods,
In withering heaps collects the flowery spoil,
And each chill insect sinks beneath the soil;
Quick flies fair TULIPA the loud alarms,
And folds her infant closer in her arms;

Tulipa. I.205. Tulip. What is in common
language called a bulbous root, is by Linnaeus
termed the Hybernacle, or Winter-lodge of the
young plant. As these bulbs in every respect
resemble buds, except in their being produced
under ground, and include the leaves and flower
in miniature, which are to be expanded in the
ensuing spring. By cautiously cutting in the
winter through the concentric coats of a tulip-
root, longitudinally from the top to the base, and
taking them off successively, the whole

[22]

In some lone cave, secure pavilion, lies,
And waits the courtship of serener skies. --
So, fix cold moons, the Dormouse charm'd to
rest,

Indulgent Sleep! beneath thy eider breast,
In fields of Fancy climbs the kernel'd groves,
Or shares the golden harvest with his loves. ---

But bright form earth amid the troubled air
Ascends fair COLCHICA with radiant hair,
flower of the next summer's tulip is beautifully
seen by the naked eye, with its petals, pistil, and
stamens; the flowers exist in other bulbs, in the
same manner, as in Hyacinths, but the individual
flowers of these being less, they are not so
easily dissected, or so conspicuous to the naked
eye.

In the seeds of the *Nymphæa Nelumbo*, the
leaves of the plant are seen so distinctly, that
Mr. Ferber found out by them to what plant the
seeds belonged. *Amæn. Acad.V. vi. No. 120*. He
says that Mariotte first observed the future
flower and foliage in the bulb of a Tulip; and
adds, that it is pleasant to see in the buds of the
Hepatica and *Pedicularis hirsuta*, yet lying in the
earth; and in the gems of *Daphne Mezereon*; and
at the base of *Osmunda Lunaria*, a perfect plant
of the future year complete in all its parts. *Ibid.*
Colchicum autumnale. i. 2134. Autumnal
Meadow-saffron. Six males, three females. The
germ is buried within the root, which thus seems
to constitute a part of the flower. *Families of
Plants, p.242*. These singular flowers appear in
autumn without any leaves, whence in some
countries they are called Naked Ladies: in the
March following the green leaves spring up, and
in April the seed-vessel rises from the ground;
the seeds ripen in May, contrary to the usual
habits of vegetables which flower in the spring,
and ripen their seeds in the autumn. *Miller's
Dict.* The juice of the root of this plant is so
acrid as to produce violent effects on the human
constitution, which also prevents it from being
eaten by subterranean insects, and thus guards
the seed-vessel during the winter.

[23]

Warms the cold bosom of the hoary year,
And lights with Beauty's blaze the dusky
sphere.

Three blushing Maids the intrepid Nymph
attend,

And *six* gay Youths, enamour'd train! defend.
So shines with silver guards the Georgian star,
And drives on Night's blue arch his glittering
car;
Hangs o'er the billowy clouds his lucid form
Wades through the mist, and dances in the
storm.

GREAT HELIANTHUS guides o'er twilight
plains

In gay solemnity his Dervise-trains;

The defoliation of deciduous trees is announced
by the flowering of the Colchicum; of these the
ash is the last that puts forth its leaves, and the
first that loses them. Phil. Bot. p. 275.

The Hamamelis, Witch Hazel, is another plant
which flowers in autumn; when the leaves fall
off, the flowers come out in clusters from the
joints of the branches, and in Virginia ripen their
seed in the ensuing spring; but in this country
their seeds seldom ripen. Lin. Spec. Plant.
Miller's Dict.

Helianthus. I.223. Sun-flower. The numerous
florets, which constitute the disk of this flower,
contain in each five males surrounding one
female, the five stamens have their anthers
connected at top whence the name of the class,
"confederate males;" see note on Chondrilla.
The sun-flower follows the course of the sun by
nutations, not by twisting its stems (Hales
veg.stat.) Other plants, when they are confined
in a room, turn the shining surface of their
leaves, and bend their whole branches to the
light. See Mimosa.

[24]

Marshall'd in *fives* each gaudy band proceeds,
Each gaudy band a plumed Lady leads;
With zealous step he climbs the upland lawn,
And bows in homage to the rising dawn;
Imbibes with eagle-eye the golden ray,
And watches, as it moves, the orb of day.

Queen of the marsh, imperial DROSERA treads
Rush-fringed banks, and moss-embroider'd
beds;

A plumed Lady leads. I.226. The seeds of many
plants of this class are furnished with a plume,
by which admirable mechanism they are
disseminated by the winds far from their parent
stem, and look like a shuttlecock, as they fly.
Other seeds are disseminated by animals; of
these some attach themselves to their hair or
feathers by a gluten, as mistletoe; others by
hooks, as cleavers, burdock, hounds-tongue; and
others are swallowed whole for the sake of the
fruit, and voided uninjured, as the hawthorn,
juniper, and some grasses. Other seeds again
disperse themselves by means of an elastic seed-
vessel, as Oats, Geranium, and Impatiens; and
the seeds of aquatic plants, and of those which
grow on the banks of rivers, are carried many
miles by the currents, into which they fall. See
Impatiens. Zoftera. Cassia. Carlina.

Drosera. I. 231. Sun-dew. Five males, five
females. The leaves of this marsh-plant are
purple, and have a fringe very unlike other
vegetable productions. And, which is curious, at
this point of every thread in this erect fringe
stands a pellucid drop of mucilage, resembling a
ducal coronet. This mucus is a secretion from
certain glands, and like the viscous material
round the flower-stalks of *Silene* (catchfly)
prevents small insects from infesting the leaves.
As the ear-wax in animals seems to be in part
designed to prevent fleas and other insects from
getting into their ears. See *Silene*. Mr. Wheatley,
an eminent surgeon in Cateaton-street, London,
observed these leaves to bend upwards, when an
insect settled on them, like the leaves of the
muscipula veneris, and pointing

[25]

Redundant folds of glossy silk surround
Her slender waist, and trail upon the ground;
Five sister-nymphs collect with graceful ease,
Or spread the floating purple to the breeze;
And *five* fair youths with duteous love comply
With each soft mandate of her moving eye.
As with sweet grace her snowy neck she bows,
A zone of diamonds trembles round her brows;
Bright shines the silver halo, as she turns;
And, as she steps, the living lustre burns.

Fair LONICERA prints the dewy lawn,
And decks with brighter blush the vermil dawn;

all their globules of mucus to the centre, that they completely entangled and destroyed it. M. Broussonet, in the Mem. D'I' Acad. Des Sciences for the year 1784, p. 615. after having described the motion of the *Dionæa*, adds, that a similar appearance has been observed in the leaves of two species of *Drosera*.

Lonicera. I.243. *Caprisolium*. Honeysuckle. Five males, one female. Nature has in many flowers used a wonderful apparatus to guard the nectary, or honey-gland, from insects. In the honey-suckle the petal terminates in a long tube like a cornucopiæ, or horn of plenty; and the honey is produced at the bottom of it. In *Aconitum*, monkshood, the nectaries stand upright like two horns covered with a hood, which abounds

[26]

Winds round the shadowy rocks, and panted vales,
And scents with sweeter breath the summer-gales;
With artless grace and native ease she charms,
And bears the horn of plenty in her arms.
Five rival Swains their tender cares unfold,
And watch with eye askance the treasured gold.
with such acrid matter that no insects penetrate it. In *Helleborus*, hellebore, the main nectaries are placed in a circle like little pitchers, and add much to the beauty of the flower. In the columbine, *Aquilegia*, the nectary is imagined to be like the neck and body of a bird, and the two petals standing upon each side to represent wings; whence its name of columbine, as if resembling a nest of young pigeons fluttering whilst their parent feeds them. The importance of the nectary in the economy of vegetation is explained at large in the notes on part the first. Many insects are provided with a long and pliant proboscis for the purpose of acquiring this grateful food, as a variety of bees, moths, and butterflies: but the *Sphinx Convolvuli*, or unicorn moth, is furnished with the most remarkable proboscis in this climate. It carries it rolled up in concentric circles under its chin, and occasionally extends it to above three inches in length. This trunk consists of joints and muscles, and seems to have more versatile movements than the trunk of the elephant; and near its termination is split into two capillary tubes. The excellence of this contrivance for robbing the flowers of their honey, keeps this beautiful insect fat and bulky; though it flies only in the evening, when the flowers have closed their petals, and are thence more difficult of access; at the same time the brilliant colours of the moth contribute to its safety, by making it mistaken by the late sleeping birds for the flower its rests on.

Besides these there is a curious contrivance attending the *Ophrys*, commonly called the Bee-orchis, and the Fly-orchis, which some kinds of the *Delphinium*, called Bee-larkspurs, to preserve their honey; in these the nectary and petals resemble in form and colour the insects, which plunder them: and thus it may be supposed they often escape these hourly robbers, by having the appearance of being pre-

occupied. See note on Rubia, and Conferva polymorpha.

[27]

Where rears huge Tenerife his azure crest,
Aspiring DRABA builds her eagle nest;
Her pendant aerie icy caves surround,
Where erst Volcanoes min'd the rocky ground.
Pleased round the Fair *four* rival Lords ascend
The shaggy steeps, *two* menial youths attend.
High in the setting ray the beauty stands,
And her tall shadow waves on distant lands.

Oh, stay, bright habitant of air, alight,
Ambitious VISCA, from thy angel-flight!
Draba. Alpina. Alpine Whitlow-grass. One female and six males. Four of these males stand above the other two; whence the name of the class, "four powers." I have observed in several plants of this class, that the two lower males arise, in a few days after the opening of the flower, to the same height as the other four, not being mature as soon as the higher ones. See note on Gloriosa. All the plants of this class possess similar virtues; they are termed acrid and antiscorbutic in their raw state, as mustard, watercress; when cultivated and boiled, they become a mild wholesome food, as cabbage, turnip.

There was formerly a Volcano on the Peak of the Tenereife, which became extinct about the year 1684. Philos. Trans. In many excavations of the mountain, much below the summit, there is now found abundance of ice at all seasons. Tench's Expedition to Botany Bay, p.12. Are these congelations in consequence of the daily solution of the hoar-frost, which is produced on the summit during the night?

Viscum. Mistletoe. Two houses. This plant never grows upon the ground; the foliage is yellow, and the berries milk-white; the berries are so viscous, as to serve

[28]

-- Scorning the sordid soil, aloft the springs,
Shakes her white plume, and claps her golden
wings;
High o'er the fields of boundless ether roves,
And seeks amid the clouds her soaring loves!

Stretch'd on her mossy couch, in trackless
deeps,
Queen of the coral groves, ZOSTERA sleeps;
The silvery sea-weed matted round her bed,
And distant surges murmuring o'er her head. –
for bird-lime; and when they fall, adhere to the
branches of the tree of which the plant grows,
and strike root into its bark; or are carried to
distant trees by birds. The Tillandisia, or wild
pine, grows on other trees, like the Mistletoe,
but take little or no nourishment from them,
having large buckets in its leaves to collect and
retain the rain water. See note on *Dypsacus*. The
mosses, which grow on the bark of trees, take
much nourishment from them; hence it is
observed that trees, which are annually cleared
from moss by a brush, grow nearly twice as fast.
(Phil. Transact.) In the cider countries the
peasants brush their apple trees annually.
Zostera. Grass-wrack. Class, Feminine Males.
Order, Many Males. It grows at the bottom of
the sea, and rising to the surface when in flower,
covers many leagues: and is driven at length to
the shore. During its time of floating on the sea,
numberless animals live on the under surface of
it; and being specifically lighter than the sea-
water, or being repelled by it, have legs placed
as it were on their backs for the purpose of
walking under it. As the Scyllœa. See Barbut's
Genera Vermium. It seems necessary that the
marriages of plants should be celebrated in the
open air, either because the powder of the
anther, or the mucilage on the stigma, or the
reservoir of honey might receive injury from the
water. Mr. Needham observed, that in the ripe
dust of every flower, examined by the
microscope, some vesicles are perceived, from
which a fluid had

[29]

High in the flood her azure dome ascends,
The crystal arch on crystal columns bends;
Roof'd with translucent shell the turrets blaze,
And far in ocean dart their colour'd rays;
O'er the white floor successive shadows move,
As rise and break the ruffled waves above. –
Around the nymph her mermaid-trains repair,
And weave with orient pearl her radiant hair;
With rapid fins she cleaves the watery way,
Shoots like a silver meteor up to day;
Sounds a loud conch, convokes a scaly band,
Her sea-born lovers, and ascends the strand.

E'en round the pole the flames of Love aspire,
And icy bosoms feel the *secret* fire! –
escaped; and that those, which still retain it,
explode if they be wetted, like an eolopile
suddenly exposed to a strong heat. These
observations have been verified by Spallanzani
and others. Hence rainy seasons make a scarcity of
grain, or hinder its fecundity, by bursting the
pollen before it arrives at the moist stigma of the
flower. Spallanzani's *Dissertations*, V.11 p.321.
Thus the flowers of the male *Vallisneria* are
produced under water, and when ripe detach
themselves from the plant, and rising to the surface
are wafted by the air to the female flowers. See
Vallisneria.

[30]

Cradled in snow and fann'd by arctic air
Shines, gentle BAROMETZ! Thy golden hair;
Rooted in earth each cloven hoof descends,
And round and round her flexile neck she bends;
Crops the grey coral moss, and hoary thyme,
Or laps with rosy tongue the melting rime;

Barometz. Polypodium Barometz. Tartarian Lamb. Clandestine Marriage. This species of Fern is a native of China, with a decumbent root, thick, and everywhere covered with the most soft and dense wool, intensely yellow. Lin. Spec. Plant.

This curious item is sometimes pushed out of the ground in its horizontal situation by some of the inferior branches of the root, so as to give it some resemblance to a Lamb standing on four legs; and has been said to destroy all other plants in its vicinity. Sir Hans Sloane describes it in the name of Tartarian Lamb, and has given a print of it Philos. Trans. abridged, v.II. p.646. but thinks some art has been used to give it an animal appearance. Dr. Hunter, in his edition of the Terra of Evelyn, has given a more curious print of it, much resembling a sheep. The down is used in India externally for stopping hemorrhages, and is called golden moss.

The thick downy clothing of some vegetables seems designed to protect them from the injuries of cold, like the wool of animals. Those bodies, which are bad conductors of electricity, are also bad conductors of heat, as glass, wax, air. Hence either of the two former of these may be melted by the flame of a blow-pipe very near the fingers which hold it without burning them; and the last, by being confined to the surface of animal bodies, in the interstices of their fur or wool, prevents the escape of their natural warmth; to which should be added, that the hairs themselves are imperfect conductors. The fat or oil of whales, and other northern animals, seems designed for the same purpose of preventing the too sudden escape of the heat of the body in cold climates. Snow protects vegetables which are covered by it from cold, both because it is a bad conductor of heat itself, and contains much air in its pores. If a piece of camphor be immersed in a snowball, except one extremity of it, on setting fire to this, as the snow melts, the water becomes absorbed into the surrounding snow by capillary attractions; on this account, when living animals are buried in snow, they are not moistened by it; but the cavity enlarges as the snow dissolves affording them both a dry and warm habitation.

[31]

Eyes with mute tenderness her distant dam,
Or seems to bleat, a *Vegetable Lamb*.
-- So warm and buoyant in his oily mail,
Gambols on seas of ice the unwieldy Whale;
Wide-waving fins round floating islands urge
His bulk gigantic through the troubled surge;
With hideous yawn the flying shoals he seeks,
Or clasps with fringe of horn his massy cheeks;
Lifts o'er the tossing wave his nostrils bare,
And spouts pellucid columns into air;
The silvery arches catch the setting beams,
And transient rainbows tremble o'er the streams.

Weak with nice sense, the chaste MIMOSA stands,
From each rude touch withdraws her timid hands;

Mimosa. The sensitive plant. Of the class Polygamy, one house. Naturalists have not explained the immediate cause of the collapsing of the sensitive plant; the leaves meet and close in the night during the sleep of the plant, or when exposed to much cold in the day-time, in the same manner as when they are affected by external violence, folding their upper surfaces together, and in part over each other like scales or tiles; so as to expose as little of the upper surface as may be to the air; but do not indeed collapse quite

[32]

Oft as light clouds o'er-pass the Summer-glade,
Alarm'd she trembles at the moving shade;
And feels, alive through all her tender form,
The whisper'd murmurs of the gathering storm;
Shuts her sweet eye-lids to approaching night,
And hails with freshen'd charms the rising light.
Veil'd, with gay decency and modest pride,
Slow to the mosque she moves, an eastern bride;
There her soft vows unceasing love record,
Queen of the bright seraglio of her Lord. –
So sinks or rises with the changeful hour
The liquid silver in its glassy tower.

so far, since I have found, when touched in the night during their sleep, they fall still further; especially when touched on the foot-stalks between the stems and the leaflets, which seems to be their most sensitive or irritable part. Now as their situation after being exposed to external violence resembles their sleep, but with a greater degree of collapse, may it not be owing to a numbness or paralysis consequent to too violent irritation, like the fainting of animals from pain or fatigue? I kept a sensitive plant in a dark room till some hours after day-break; its leaves and leaf-stalks were collapsed as in its most profound sleep, and on exposing it to the light, above twenty minutes passed before the plant was thoroughly awake and had quite expanded itself. During the night the upper or smoother surfaces of the leaves are pressed together; this would seem to show that the office of this surface of the leaf was to expose the fluids of the plant to the light as well as to the air. See note on *Helianthus*. Many flowers close up their petals during the night. See note on vegetable respiration in Part I.

[33]

So turns the needle to the pole it loves,
With fine librations quivering as it moves.

All wan and shivering in the leafless glade
The sad ANEMONE reclin'd her head;
Grief on her cheeks had paled the roseate hue,
And her sweet eye-lids dropp'd with pearly dew.

-- "See, from bright regions, borne on odorous gales

"The Swallow, herald of the summer, sails;
Anemone. Many males, many females. Pliny says this flower never opens its petals but when the wind blows; whence its name: it has properly no calyx, but two or three sets of petals, three in each set, which are folded over the stamens and pistil in a singular and beautiful manner, and differs also from *ranunculus* in not having a melliferous pore on the claw of each petal.

The Swallow. There is a wonderful conformity between the vegetation of some plants, and the arrival of certain birds of passage. Linnaeus observes that the wood anemone blows in Sweden on the arrival of the swallow; and the marsh mary-gold, *Caltha*, when the cuckoo sings. Near the same coincidence was observed in England by Stillingfleet. The word *Coccyx* in Greek signifies both a young fig and a cuckoo, which is supposed to have arisen from the coincidence of their appearance in Greece. Perhaps a similar coincidence of appearance in some parts of Asia gave occasion to the story of the love of the rose and the nightingale, so much celebrated by eastern poets. See *Dianthus*. The times however of the appearance of vegetables in spring seem occasionally to be influenced by their acquired habits, as well as by their sensibility to heat: for the roots of potatoes, onions, &c. will germinate with much less heat in the spring than in the autumn: as is easily observable where these roots are stored for use;

[34]

“Breathe, gentle AIR! from cherub-lips impart
“Thy balmy influence to my anguish’d heart’
“Thou, whose soft voice calls forth the tender
blooms,
“Whose pencil paints them, and whose breath
perfumes:
“O chase the Fiend of Frost, with leaden mace
“Who fears in death-like sleep my hapless race;
“Melt his hard heart, release his iron hand,
“And give my ivory petals to expand.

and hence malt is being made in the spring. 2d. The grains and roots brought from more southern latitudes germinate here sooner than those which are brought from northern ones, owing to their acquired habits. Fordyce on Agriculture. 3d. It was observed by one of the scholars of Linnaeus, that the apple-trees sent from hence to New England blossomed for a few years too early for that climate, and bore no fruit; but afterwards learnt to accommodate themselves to their new situation (Kalm’s Travels). 4th. The parts of animals become more sensible to heat after having been previously exposed to cold, as our hands glow on coming into the house after having held snow in them; this seems to happen to vegetables; for vines in grape-houses, which have been exposed to the winter’s cold, will become forwarder and more vigorous than those which have been kept during the winter in the house. (Kennedy on Gardening.) This accounts for the very rapid vegetation in the northern latitudes after the solution of the snows.

The increase of the irritability of plants in respect to heat, after having been previously exposed to cold, is further illustrated by an experiment of Dr. Walker’s. He cut apertures into a birch-tree at different heights; and on the 26th of March some of these apertures bled, or oozed with sap-juice, when the thermometer was at 39; which same apertures did not bleed on the 13th of March, when the thermometer was at 44. The reason of this I apprehend was, because on the night of the 25th the thermometer was at 34; whereas on the night of the 12th it was at 41; though the ingenious author ascribes it to another cause. Trans. Of Royal Soc. Of Edinburgh, v.I. p.19.

[35]

“So may each bud, that decks the brow of
spring,
“Shed all its incense on thy waiting wing!” –
To her fond prayer propitious Zephyr yields,
Sweeps on his sliding shell through azure fields,
O’er her fair mansion waves his whispering
wand,
And gives her ivory petals to expand;
Gives with new life her filial train to rise,
And hail with kindling smiles the genial skies.
So shines the Nymph in beauty’s blushing pride,
When Zephyr wafts her deep calash aside,
Tears with rude kiss her bosom’s gauzy veil,
And flings the fluttering kerchief to the gale.
So bright, the folding canopy undrawn,
Glides the gilt Landau o’er the velvet lawn,
Of beaux and belles displays the glittering
throng,
And soft airs fan them, as they roll along.

Where frowning Snowdon bends his dizzy
brow,
O’er Conwy, listening to the surge below:

[36]

Retiring LICHEN climbs the topmost stone,
And drinks the aerial solitude alone. –
Bright shine the stars unnumber'd *o'er her*
head,
And the cold moon-beam gilds her flinty bed;
While round the rifted rocks hoarse whirlwinds
breathe,
And dark with thunder sail the clouds *beneath.* –
The steepy path her plighted swain pursues,
And tracks her light steps o'er th' imprinted
dews;
Delighted Hymen gives his torch to blaze,
Winds round the crags, and lights the mazy
ways;
Sheds o'er their *secret* vows his influence
chaste,
And decks with roses the admiring waste.

High in front of heaven when Sirius glares,
And o'er Britannia shakes his fiery hairs;

Lichen. Calcareum. Liver-wort. Clandestine
Marriage. This plant is the first that vegetates on
naked rocks, covering them with a kind of
tapestry, and draws its nourishment perhaps
chiefly from the air; after it perishes, earth
enough is left for other mosses to root
themselves; and after some ages a soil is
produced sufficient for the growth of more
succulent and large vegetables. In this manner
perhaps the whole earth has been gradually
covered with vegetation, after it was raised out
of the primeval ocean by subterraneous fires.

[37]

When no soft shower descends, no dew distills,
Her wave-worn channels dry, and mute her rills;
When droops the sickening herb, the blossom
fades,
And parch'd earth gapes beneath the withering
glades;
-- With languid step fair DYPsACA retreats,
"Fall gentle dews!" the fainting nymph repeats,
Seeks the low dell, and in the sultry shade
Invokes in vain the Naiads to her aid. –
Four sylvan youths in crystal goblets bear
The untasted treasure to the grateful fair;
Pleased from their hands with modest grace she
sips,
And the cool wave reflects her coral lips.

Dypsacus. Teasel. One female, and four males.
There is a cup around every joint of the stem of
this plant, which contains from a spoonful to a
half a pint of water; and serves both for the
nutriment of the plant in dry seasons, and to
prevent insects from creeping up to devour its
seed. See *Silene.* The *Tillandsia*, or wild pine, of
the West Indies, has every leaf terminated near
the stalk with a hollow bucket, which contains
from half a pint to a quart of water. *Dampier's*
Voyage to Campeachy. Dr. *Sloane* mentions one
kind of aloe furnished with leaves, which, like
the wild pine and Banana, hold water; and
thence afford necessary refreshment to travelers
in hot countries. *Nepenthes* has a bucket for the
same purpose at the end of every leaf. *Burm.*
Zeyl. 42.17.

[38]

With nice selection modest RUBIA blends
Her vermil dyes, and o'er the cauldron bends;
Warm 'mid the rising steam the Beauty glows,
As blushes in a mist of dewy rose.
With chemic art *four* favour'd youths aloof
Stain the white fleece, or stretch the tinted woof;
Rubia. Madder. Four males and one female.
This plant is cultivated in very large quantities
for dying red. If mixed with the food of young
pigs or chickens, it colours their bones red. If
they are fed alternate fortnights, with a mixture
of madder, and with their usual food alone, their
bones will consist of concentric circles of white
and red. Belchier. Phil. Trans, 1736. Animals
fed with madder for the purpose of these
experiments were found upon dissection to have
thinner gall. Comment. de rebus. Lipsiæ. This
circumstance is worth further attention. The
colouring materials of vegetables, like those
which serve the purpose of tanning, varnishing,
and the various medical purposes, do not seem
essential to the life of the plant; but seem given
it as a defense against the depredations of
insects or other animals, to whom these
materials are nauseous or deleterious. The
colours of insects and many smaller animals
contribute to conceal them from the larger ones
which prey upon them. Caterpillars which feed
on leaves are generally green; and earth-worms
the colour of the earth which they inhabit;
Butter-flies, which frequent flowers, are
coloured like them; small birds which frequent
hedges have greenish backs like the leaves, and
light coloured bellies like the sky, and are hence
less visible to the hawk, who passes under them
or over them. Those birds which are much
amongst flowers, as the gold-finch (*Fringilla
carduelis*), are furnished with vivid colours. The
lark, partridge, hare, are the colour of dry
vegetables or earth on which they rest. And
frogs vary their colour with the mud of the
streams which they frequent; and those which
live on trees are green. Fish, which are generally
suspended in water, and swallows, which are
generally suspended in air, have their backs the
colour of the distant ground, and their bellies of
the sky. In the colder climates many of these
become white during the existence of the snows.
Hence there is apparent design in the colours of
animals, whilst those of vegetables seem
consequent to the other properties of the

materials which posses them.

[39]

O'er Age's cheek the warmth of youth diffuse,
Or deck the pale-eyed nymph in roseate hues.
So when MEDEA to exulting Greece
From plunder'd COLCHIS bore the golden
fleece;
On the loud shore a magic pile she rais'd,
The cauldron bubbled, and the faggots blaz'd;
Pleased on the boiling wave old Æson swims,
And feels new vigour stretch his swelling limbs:
Through his thrill'd nerves forgotten ardors dart,
And warmer eddies circle round his heart;
With softer fires his kindling eye-balls glow,
And dark tresses wanton round his brow.

Pleased on the boiling wave. The story of Aeson becoming young, from the medicated bath of Medea, seems to have been intended to teach the efficacy of warm bathing in retarding the progress of old age. The words *relaxing and bracing*, which are generally thought expressive of the effects of warm and cold bathing, are mechanical terms, properly applied to drums or strings; but are only metaphors when applied to the effects of cold or warm bathing on animal bodies. The immediate cause of old age seems to reside in the irritability of the finer vessels or parts of our system; hence these cease to act, and collapse or become horny or bony. The warm bath is peculiarly adapted to prevent these circumstances by its increasing our irritability, and by moistening and softening the skin, and the extremities of the finer vessels, which terminate in it. To those who are past the meridian of life, and have dry skins, and begin to be emaciated, the warm bath, for half an hour twice a week, I believe to be eminently serviceable in retarding the advances of age.

Where Java's isle, horizon'd with the floods,
Lifts to the skies her canopy of woods;
Please EPIDENDRA climbs the waving pines,
And high in heaven the intrepid beauty shines,
Gives to the tropic breeze her radiant hair,
Drinks the bright shower, and feeds upon the
air.

Her brood delighted stretch their callow wings,
As poised aloft their pendent cradle swings,
Eye the warm sun, the spicy zephyr breathe,
And gaze unenvious on the world beneath.

Epidendrum flos aeris. Of the class of gynandria, or feminine males. This parasite plant is found in Java, and is said to live on air without taking root in the trees on which it grows; and its flowers resemble spiders. Syst. Veg. a Reichard. Vol IV. P. 35. By this curious similitude the bees and butterflies are supposed to be deterred from plundering the nectaries. See Visca.

[40]

As dash the waves on India's breezy strand,
 Her flush'd cheek press'd upon her lily hand,
 VALLISNER sits, up-turns her tearful eyes,
 Calls her lost lover, and upbraids the skies;
 For him she breathes the silent sign, forlorn,
 Each setting-day; for him each rising morn. –
 “Bright orbs, that light yon high ethereal plain,
 “Or bathe your radiant tresses in the main;
 “Pale moon, that silver'st o'er night's sable
 brow;--
 “For ye were witness to his parting vow! –
 “Ye shelving rocks, dark waves, and sounding
 shore, --
 “Ye echoed sweet the tender words he swore! –

Vallisneria. This extraordinary plant is of the class Two Houses. It is found in the East Indies, in Norway, and various parts of Italy. Lin. Spec. Plant. They have their roots at the bottom of the Rhone, the flowers of the female plant float on the surface of the water, and are furnished with an elastic spiral stalk, which extends or contracts as the water rises and falls; this rise or fall, from the rapid descent of the river, and the mountain torrents which flow into it, often amounts to many feet in a few hours. The flowers of the male plant are produced under water, and as soon as their farina, or dust, is mature; they detach themselves from the plant, and rise to the surface, continue to flourish, and are wasted by the air, or borne by the currents to the female flowers. In this resembling those tribes of insects, where the males at certain seasons acquire wings, but not the females, as ants, Coccus, Lampyris, Phalaena, Brumata, Lichanella. These male flowers are in such numbers, though very minute, as frequently to cover the surface of the river to considerable extent. See Families of Plants translated from Linnaeus, p.677.

[41]

“Can stars or seas the sails of love retain?

“O guide my wanderer to my arms again!”

Her buoyant skiff intrepid ULVA guides,
And seeks her Lord amid the trackless tides;

Ulva. Clandestine marriage. This kind of seaweed is buoyed up by bladders of air, which are formed in the duplicatures of its leaves; and forms immense floating fields of vegetation; the young ones, branching out from the larger ones, and born on similar little air-vessels. It is also found in the warm baths of Patavia; where the leaves are formed in curious cells or labyrinths for the purpose of floating on the water. See *ulva labyrinthi-formis* Lin. Spec Plant. The air contained in these cells was found by Dr. Priestley to be sometimes purer than the common air, and sometimes less pure; the air-bladders of fish seem to be similar organs, and serve to render them buoyant in the water. In some of these, as in the Cod and Haddock, a red membrane, consisting of a great number of leaves or duplicatures, is found within the air-bag, which probably secretes this air from the blood of the animal. (Monro. Physiol. Of Fish. P.28.) To determine whether this air, when first separated from the blood of the animal or plant, be phlogisticated air, is worth inquiry. The bladder-sena (*Colutea*), and bladder-nut (*Staphylæa*), have their seed vessels distended with air; the *Ketmia* has the upper join of the stem immediately under the receptacle of the flower much distended with air; these seem to be analogous to the air-vessel at the broad end of the egg, and may probably become less pure as the seed ripens; some, which I tried, had the purity of the surrounding atmosphere. The air at the broad end of the egg is probably an organ serving the purpose of respiration to the young chick, some of whose vessels are spread upon it like a placenta or permeate it. Many are of opinion that even the placenta of the human fetus, and cotyledons of quadrupeds, are respiratory organs rather than nutritious ones. The air in the hollow stems of grasses, and of some umbelliferous plants, bears analogy to the air in the quills, and in some of the bones of birds; supplying the place of the pith, which shrivels up after it has performed its office of

protruding the young stem or feather. Some of these cavities of the bones are said to communicate with the lungs in birds. Phil. Trans.

The air-bladders of fish are nicely adapted to their intended purpose for though they render them buoyant near the surface without the labour of using their fins, yet, when they rest at greater depths, they are no inconvenience, as the increased pressure of the water condenses the air which they contain into less space. Thus, if a cork or bladder

[42]

Her *secret* vows the Cyprian Queen approves,
And hovering Halcyons guard her infant-loves;
Each in his floating cradle round they throng,
And dimpling Ocean bears the fleet along. –
Thus o'er the waves, which gently bend and
swell,
Fair GALATEA steers her silver shell;
Her playful Dolphins stretch the silken rein,
Hear her sweet voice, and glide along the main.
As round the wild meandering coast she moves
By gushing rills, rude cliffs, and nodding
groves;
Each by her pine the Wood-nymphs wave their
locks,
And wondering Naiads peep amid the rocks;
Pleased trains of Mermaids rise from coral cells;
Admiring Tritons found their twisted shells;
Charm'd o'er the car pursuing Cupids sweep,
Their snow-white pinions twinkling in the deep;

of air was immersed a very great depth in the ocean, it would be so much compressed as to become specifically as heavy as the water, and would remain there. It is probable the unfortunate Mr. Day, who was drowned in a diving ship of his own construction, miscarried from not attending to this circumstance: it is probable the quantity of air he took down with him, if he descended much lower than he expected, was condensed into so small a space as not to render the ship buoyant when he endeavoured to ascend.

[43]

And, as the lustre of her eye she turns,
Soft sighs the Gale, and the amorous Ocean
burns.

On DOVE's green brink the fair TREMELLA
stood,
And view'd her playful image in the flood;
To each rude rock, lone dell, and echoing grove
Sung the sweet sorrows of her *secret* love.
Tremella. Clandestine marriage. I have
frequently observed funguses of this Genus on
old rails and on the ground to become a
transparent jelly, after they have been frozen in
autumnal mornings; which is a curious property,
and distinguishes them from some other
vegetable mucilage; for I have observed that the
paste, made by boiling what-flour in water,
ceases to be adhesive after having been frozen. I
suspected that the Tremella Nostoc, or star-
gelly, also had been thus produced; but have
since been well informed, that the Tremella
Nostoc, is a mucilage voided by Herons after
they have eaten frogs; hence it has the
appearance of having been pressed through a
hole; and limbs of frogs are said sometimes to
be found amongst it; it is always seen upon
plains or by the sides of water, places which
Herons generally frequent.

Some of the funguses are so acrid, that a drop of
their juice blisters the tongue; others intoxicate
those who eat them. The Ostiacks in Siberia use
them for the latter purpose; one Fungus of the
species, *Agaricus muscarum*, eaten raw; or the
decoction of three of them, produces
intoxication for 12 to 16 hours. History of
Russia. V. I. Nichols. 1780. As all acrid plants
become less so, if exposed to a boiling heat, it is
probably the common mushroom may
sometimes disagree from being not sufficiently
stewed. The Ostiacks blister their skin by a
fungus found on Birch-trees; and use the
Agaricus officin. for Soap. *ibid.*

There was a dispute whether the funguses
should be classed into the animal or vegetable
department. Their animal taste in cookery, and
their animal smell when burnt, together with
their tendency to putrefaction, insomuch that the
Phallus impudicus has gained the name of
stinkhorn; and lastly, their growing and
continuing healthy without light, as the

Licoperdon tuber or truffle, and the fungus vinosus or mucor in dark cellars, and the esculent mushrooms on beds covered thick with straw, would seem to show that they approach towards the animals, or make a kind of isthmus connecting the two mighty kingdoms of animal and vegetable nature.

[44]

“Oh, stay! --- return!” --- along the sounding shore
Cry’d the sad Naiads, --- she return’d no more!--
-

Now girt with clouds the sullen Evening
frown’d,
And withering Eurus swept along the ground;
The misty moon withdrew her horned light,
And sunk with Hesper in the skirt of night;
No dim electric streams, (the northern dawn)
With meek effulgence quiver’d o’er the lawn;
No star benignant shot one transient ray
To guide or light the wanderer on her way.
Round the dark crags he murmuring whirlwinds
blow,
Woods groan above, and waters roar below;
As o’er the steeps with pausing foot she moves,
The pitying Dryads shriek amid their groves.
She flies, -- she stops, -- she pants, -- she looks
behind,
And hears a demon howl in every wind.
-- As the bleak blast unfurls her fluttering vest,
Cold beats the snow upon her shuddering breast;
Through her numb’d limbs the chill sensations
dart,
And the keen ice-bolt trembles at hear heart.

[45]

“I sink, I fall! oh, help me, help!” she cries,
Her stiffening tongue the unfinish’d sound
denies;
Tear after tear adown her cheek succeeds,
And pearls of ice bestrew the glittering meads;
Congealing snows her lingering feet surround,
Arrest her flight, and root her to the ground;
With suppliant arms she pours the silent prayer;
Her suppliant arms hang crystal in the air;
Pellucid films her shivering neck o’erspread,
Seal her mute lips, and silver o’er her head,
Veil her pale bosom, glaze her lifted hands,
And shrined in ice the beauteous statue stands.
-- DOVE’s azure nymphs on each revolving
year
For fair TREMELLA shed the tender tear;
With rush-wove crowns in sad procession move,
And sound the sorrowing shell to hapless love.”

Here paused the MUSE, -- across the darken’d
pole
Sail the dim clouds, the echoing thunders roll;

[46]

The trembling Wood-nymphs, as the tempest
lowers,
Lead the gay Goddess to their inmost bowers;
Hang the mute lyre the laurel shade beneath,
And round her temples bind the myrtle wreath.
-- Now the light swallow with her airy brood
Skims the green meadow, and the dimpled flood;
Loud shrieks the lone thrush from his leafless
thorn,
Th’ alarmed beetle sounds his bugle horn;
Each pendant spider winds with fingers fine
His ravel’d clue, and climbs along the line;
Gay Gnomes in glittering circles stand aloof
Beneath a spreading mushroom’s fretted roof;
Swift bees returning seek their waxen cells,
And Sylphs cling quivering in the lily’s bells.
Through the still air descend the genial showers.
And pearly rain-drops deck the laughing flowers.

INTERLUDE

--

Bookseller. YOUR verses, Mr. Botanist, consist of *pure description*, I hope there is *sense* in the notes.

Poet. I am only a flower-painter, or occasionally attempt a landscape; and leave the human figure with the subjects of history to abler artists.

B. It is well to know what subjects are within the limits of your pencil; many have failed of success from the want of this self-knowledge. But pray, tell me, what is the essential difference between Poetry and Prose? is it solely the melody or measure of the language?

P. I think not solely; for some prose has its melody, and even measure. And good verses, well spoken in a language unknown to the hearer, are not easily to be distinguished from good prose.

B. Is it the sublimity, beauty, or novelty of the sentiments?

P. Not so; for sublime sentiments are often better expressed in prose. Thus when Warwick in one of the plays of Shakespeare, is left wounded on the field after the loss of the battle, and his friend says to him, "O could you but fly!" what can be more sublime than his answer, "Why then, I would not fly." No measure of verse, I imagine, could add dignity to this sentiment.

[48]

And it would be easy to select examples of the beautiful or new from prose writers, which I suppose no measure of verse could improve.

B. In what then consists the essential difference between Poetry and Prose?

P. Next to the measure of the language, the principle distinction appears to me to consist in this: that Poetry admits but few words expressive of very abstracted ideas, whereas Prose abounds with them. And as our ideas derived from visible objects are more distinct than those derived from the objects of our other senses, the words expressive of these ideas belonging to vision make up the principal part of poetic language. That is, the Poet writes principally to the eye, the Prose-writer uses more abstracted terms. Mr. Pope has written a bad verse in the Windsor Forest:

"And Kennet swift for silver Eels
renown'd."

The word *renown'd* does not present the idea of a visible object to the mind, and is thence prosaic. But change the line thus,

"And Kennet swift, where silver Graylings
play."

and it becomes poetry, because the scenery is then brought before the eye.

B. This may be done in prose.

P. And when it is done in a single word, it animates the prose; so it is more agreeable to read in Mr. Gibbon's History, "Germany

[49]

was at this time *over-shadowed* with extensive forests"; than Germany was at this time *full* of extensive forests. But where this mode of expression occurs too frequently, the prose approaches to poetry: and in graver works, where we expect to be instructed rather than amused, it becomes tedious and impertinent. Some parts of Mr. Burke's eloquent orations become intricate and enervated by superfluity of poetic ornament; which quantity of ornament would have been agreeable in a poem, where much ornament is expected.

B. Is then the office of Poetry only to amuse?

P. The Muses are young Ladies, we expect to see them dressed; though not like some modern beauties with so much gauze and feather, that "the Lady herself is the least part of her." There are however didactic pieces of poetry which are much admired, as the Georgics of Virgil, Mason's English Garden, Hayley's Epistles; nevertheless Science is best delivered in Prose, as its mode of reasoning is from stricter analogies than metaphors or similes.

B. Do not Personifications and Allegories distinguish poetry?

P. There are other arts of bringing objects before the eye; or expressing sentiments in the language of vision; and are indeed better suited to the pen than the pencil.

B. That is strange, when you have just said they are used to bring their objects before the eye.

P. In poetry the personification or allegoric figure is generally indistinct, and therefore does not strike us so forcibly as to make us attend to its improbability; but in painting, the figures being all much more distinct, their improbability becomes apparent, and seizes our attention to it. Thus the person of Concealment is very

[50]

indistinct, and therefore does not compel us to attend to its improbability, in the following beautiful lines of Shakespeare:

"—She never told her love;

But let Concealment, like a worm i' th' bud.

Feed on her damask cheek." —

But in these lines below the person of Reason obtrudes itself into our company, and becomes disagreeable by its distinctness, and consequent improbability.

"To Reason I flew, and intreated her aid,

Who paused on my case, and each circumstance weigh'd;

Then gravely reply'd in return to my prayer,

That Hebe was the fairest of all that were fair.

That's a truth, reply'd I, I've no need to be taught,
I came to you, Reason, to find out a fault.

If that's all, says Reason, return as you came,

To find fault with Hebe would forfeit my name."

Allegoric figures are on this account in general less manageable in painting and in statuary than in poetry: and can seldom be introduced in the two former arts in company with natural figures, as is evident from the ridiculous effect of many of the paintings of Reubens in Luxemburgh gallery; and for this reason because their improbability becomes more striking, when there are figures of real persons by their side to compare them with. Mrs. Angelica Kauffman, well apprised of this circumstance, has introduced no mortal figures amongst her Cupids and her Graces. And the great Roubiliac, in his unrivalled monument of Time and Fame struggling for the trophy of General Wade, has only hung up a medallion on the head of the hero of the piece. There are however

[51]

some allegoric figures, which we have so often heard described or seen delineated, that we almost forget that they do not exist in common life; and thence view them without astonishment; as the figures of the heathen mythology, of angels, devils, death and time; and almost believe them to be realities, even when they are mixed with representations of the natural forms of man. Whence I conclude, that a certain degree of probability is necessary to prevent us from revolting with distaste from unnatural images, unless we are otherwise so much interested in the contemplation of them as not to perceive their improbability.

B. Is this reasoning about degrees of probability just? – When Sir Joshua Reynolds, who is unequalled both in the theory and practice of his art, and who is a great master of the pen as well as the pencil, has asserted in a discourse delivered to the Royal Academy, December 11, 1786, that “the higher styles of painting, like the higher kinds of Drama, do not aim at any thing like deception; or have any expectation, that the spectators should think the events there represented are really passing before them.” And he then accuses Mr. Fielding of bad judgment, when he attempts to compliment Mr. Garrick in one of his novels, by introducing an ignorant man, mistaking the representation of a scene in Hamlet for a reality; and thinks, because he was an ignorant man, he was less liable to make such a mistake.

P. It is a metaphysical question, and requires more attention than Sir Joshua has bestowed upon it. – You will allow, that we are perfectly deceived in our dreams; and that even in our waking reveries, we are often so much absorbed in the contemplation of what passes in our imaginations, that for a while we do not attend to the lapse of time or to our own locality; and thus suffer a similar kind of deception as in our dreams. That is, we believe things present before our eyes, which are not so.

[52]

There are two circumstances, which contribute to this complete description in our dreams. First, because in sleep the organs of sense are closed or inert, and hence the trains of ideas associated in our imaginations are never interrupted or dissevered by the irritations of external objects, and can not therefore be contrasted with our sensations. On this account, though we are affected with a variety of passions in our dreams; as anger, love, joy; yet we never experience surprise. – For surprise is only produced when any external irritations suddenly obtrude themselves, and dissever our passing trains of ideas.

Secondly, because in sleep there is a total suspension of our voluntary power, both over the muscles of our bodies, and the ideas of our minds; for we neither walk about, nor reason in complete sleep. Hence, as the trains of our ideas are passing in our imaginations in dreams, we cannot compare them with our previous knowledge of things, as we do in our waking hours; for this is a voluntary exertion; and thus we cannot perceive their incongruity.

Thus we are deprived in sleep of the only two means by which we can distinguish the trains of ideas passing in our imaginations from those excited by our sensations; and are led by their vivacity to believe them to belong to the latter. For the vivacity of these trains of ideas passing in the imagination, is greatly increased by the causes above-mentioned; that is, by their not being disturbed or dissevered either by the appulses of external bodies, as in surprise; or by our voluntary exertions in comparing them with our previous knowledge of things, as in reasoning upon them.

B. Now to apply.

P. When by the art of the Painter or Poet a train of ideas is suggested to our imaginations, which interests us so much by the pain

[53]

or pleasure it affords, than we cease to attend to the irritations of common external objects, and cease also to use any voluntary efforts to compare these interesting trains of ideas with our previous knowledge of things, a complete reverie is produced: during which time, however short, if it be but for a moment, the objects themselves appear to exist before us. This, I think, has been called by an ingenious critic, "the ideal presence" of such objects. (Elements of Criticism by Lord Kames). And in respect to the compliment intended by Mr. Fielding to Mr. Garrick, it would seem that an ignorant Rustic at the play of Hamlet, who has some previous belief in the appearance of Ghosts, would sooner be liable to fall into a reverie, and continue in it longer, than one who possessed more knowledge of the real nature of things, and had a greater facility of exercising his reason.

B. It must require great art in the Painter or Poet to produce this kind of deception?

P. The matter must be interesting from its sublimity, beauty, or novelty; this is the scientific part; and the art consists in bringing these distinctly before the eye, so as to produce (as above-mentioned) the ideal presence of the object, in which the great Shakespeare particularly excels.

B. Then it is not of any consequence whether the representations correspond with nature?

P. Not if they so much interest the reader or spectator as to induce the reverie above described. Nature may be seen in the marketplace, or at the card-table; but we expect something more than this in the play-house or picture-room. The further the artist recedes from nature, the greater novelty he is likely to produce; if he rises above nature, he produces the sublime; and beauty is probably a

[54]

selection and new combination of her most agreeable parts. Yourself will be sensible to the truth of this doctrine by recollecting over in your mind the works of three celebrated artists. Sir Joshua Reynolds has introduced sublimity even into his portraits; we admire the representation of persons, whose reality we should have passed by unnoticed. Mrs. Angelica Kauffman attracts our eyes with beauty, which I suppose nowhere exists; certainly few Grecian faces are seen in this country. And the daring pencil of Fuseli transports us beyond the boundaries of nature, and ravishes us with the charm of the most interesting novelty. And Shakespeare, who excels in all these together, so far captivates the spectator, as to make him unmindful of every kind of violation of Time, Place, or Existence. As at the first appearance of the Ghost of Hamlet, "his ear must be dull as the fat weed which roots itself on Lethe's brink" who can attend to the improbability of the exhibition. So in many scenes of the Tempest we perpetually believe the action passing before our eyes, and relapse with somewhat of distaste into common life at the intervals of the representation.

B. I suppose a poet of less ability would find such great machinery difficult and cumbersome to manage.

P. Just so, we should be shocked at the apparent improbabilities. As in the gardens of Sicilian noblemen, as described in Mr. Brydone's and in Mr. Swinburn's travels, there are said to be six hundred statues of imaginary monsters, which so disgust the spectators, that the state had once a serious design of destroying them; and yet the very improbable monsters in Ovid's Metamorphoses have entertained the world for many centuries.

B. The monsters in your Botanic Garden, I hope, are of the latter kind?

P. The candid reader must determine.

THE
LOVES OF THE PLANTS

--

CANTO II

--

AGAIN the Goddess strikes the golden lyre,
And tunes to wilder notes the warbling wire;
With soft suspended step Attention moves,
And silence hovers o'er the listening groves;
Orb within orb the charmed audience throng,
And the green vault reverberates the song

[56]

“Breathe soft ye Gales!” the fair CARLINA cries,
“Bear on broad wings your Votress to the skies.
“How sweetly mutable yon orient hues,
“as Morn’s fair hand her opening roses strews;
“How bright, when Iris blending many a ray
“Binds in embroider’d wreath the brow of Day;
“Soft, when the pendant Moon with lustres pale
“O’er heaven’s blue arch unfurls her milk veil;
“While from the north long threads of silver light
“Dart on swift shutters o’er the tissued night!

Carlina. Carline Thistle. Of the class Confederate Males. The seeds of this and of many other plants of the same class are furnished with a plume, by which admirable mechanism they perform long aerial journeys, crossing lakes and deserts, and are thus disseminated far from the original plant, and have much the appearance of a Shuttlecock as they fly. The wings are of different construction, some being like a divergent tuft of hairs, others are branched like feathers, some are elevated from the crown of the seed by a slender foot-stalk, which gives them a very elegant appearance, others sit immediately on the crown of the seed.

Nature has many other curious vegetable contrivances for the dispersion of seeds: see notes on *Helianthus*. But perhaps none of them has more the appearance of design than the admirable apparatus of *Tillandsia* for this purpose. This plant grows on the branches of trees, like the mistletoe, and never on the grow; the seeds are furnished with many long threads on their crowns; which as they are driven forwards by the winds, wrap round the arms of trees, and thus hold them fast till they vegetate. This is very analogous to the migration of Spiders on the gossamer, who are said to attached themselves to the end of a long thread, and rise thus to the tops of trees or buildings, as the accidental breezes carry them.

[57]

“Breath soft, ye Zephyrs! Hear my fervent signs,
“Bear on broad wings of your Votress to the skies!” –

-- Plume over plume in long divergent lines
On whale-bone ribs the fair Mechanic joins;
Inlays with eider down the silken strings,
And weaves in wide expanse Daedalian wings;
Round her bold sons the waving pennons binds,
And walks with angel-step upon the winds.

So on the shoreless air the intrepid Gaul
Launch’d the vast concave of his buoyant ball. –
Journeying on high, the silken castle glides
Bright as a meteor through the azure tides;
O’er towns and towers and temples winds its way,
Or mounts sublime, and gilds the vault of day.
Silent with upturn’d eyes unbreathing crowds
Pursue the floating wonder to the clouds;
And, flush’d with transport or benumb’d with fear,
Watch, as it rises, the diminish’d sphere.

[58]

-- Now less and less – and now a speck is seen! ---
And now the fleeting rack obtrudes between!
With bended knees, raised arms, and suppliant
brow
To every shine with mingled cries they vow.
“Save him, ye Saints! who o’er the good preside;
“Bear him, ye Winds! ye Stars benignant! Guide.”
-- The calm Philosopher in either fails,
Views broader stars, and breathes in purer gales;
Sees, like a map, in many a waving line
Round Earth’s blue plains her lucid waters shine;
Sees at his feet the forky lightnings glow,
And hears innocuous thunders roar below.
-- Rise, great MONTGOLFIER! urge thy
venturous flight
High o’er the Moon’s pale ice-reflected light;
Hangs in the east, gay harbinger of morn;
Leave the red eye of Mars on rapid wing,
Jove’s silver guards, and Saturn’s crystal ring;
Leave the fair beams, which, issuing from afar,
Play with new lustres round the Georgian star;

[59]

Shun with strong oars the Sun’s attractive throne,
The sparkling Zodiack, and the milky zone;
Where headlong Comets with increasing force
Thro’ other systems bend their blazing course. –
For thee Cassiope her chair withdraws,
For thee the Bear retracts his shaggy paws;
High o’er the North thy golden orb shall roll,
And blaze eternal round the wondering pole.
So Argo, rising from the southern main,
Lights with new stars the blue ethereal plain;
With favouring beams the mariner protects,
And the bold course, which first is steer’d, directs.

Inventress of the Woof, fair LINA flings
The flying shuttle through the dancing strings;

For thee the Bear. Tibi jam brachia contrahit
ardens Scorpius. Virg. Georg. 1.1.34. A new star
appeared in Cassiope’s chair in 1572. Herschel’s
Construction of the Heavens. Phil. Trans. V. 75.
P.266

Linum. Flax. Five males and five females. It was
first found on the banks of the Nile. The Linum
Lusitanicum, or Portugal flax, has ten males: see
the note on Curcuma. Isis was said to invent
spinning and weaving: mankind before that time
were clothed with the skins of animals. The fable
of Arachne was to compliment this new art of
spinning and weaving, supposed to surpass in
fineness the web of the Spider.

[60]

Inlays the broider'd west with flower dyes,
Quick beat the reeds, the pedals fall and rise;
Slow from the beam the lengths of warp unwind,
And dance and nod the mass weights behind. –
Taught by her labours, from the fertile soil
Immortal ISIS clothed the banks of Nile;
And fair ARACHNE with her rival loom
Found undeserved a melancholy doom. –
Five Sister-nymphs with dewy fingers twine
The beam flax, and stretch the fibre-line;
Quick eddying threads from rapid spindles reel,
Or whirl with beating foot the dizzy wheel.
--Charm'd round the busy fair *five* shepherds
press,
Praise the nice texture of their snowy dress,
Admire the Artists , and the art approve,
And tell with honey'd words the tale of love.

SO now, where Derwent rolls his dusky floods
Through vaulted mountains, and a night of woods,

[61]

The Nymph, GOSSYPPIA, treads the velvet sod,
And warms with rosy smiles the watery God;
His ponderous oars to slender spindles turns,
And pours o'er massy wheels his foamy urns!
With playful charms her hoary lover wins,
And wields his trident, -- while the Monarch spins.
-- First with nice eye emerging Naiads cull
From leather pods the vegetable wood; *Gossypia*.
Gossypium. The cotton plant. On the river
Derwent near Matlock in Derbyshire, SIR
RICHARD ARKWRIGHT has erected his
curious and magnificent machinery for spinning
cotton; which had been in vain attempted by many
ingenious artists before him. The cotton-wool is
first picked from the pods and seeds by women. It
is then carded by *cylindrical cards*, which move
against each other, with different velocities. It is
taken from these by an *iron-hand* or comb, which
has a motion similar to that of scratching, and
takes the wool off the cards longitudinally in
respect to the fibres or staple, producing a
continued line loosely cohering called a *Rove* or
Raving. This Rove, yet loosely twisted, is then
received or drawn into a *whirling canister*, and is
rolled by the centrifugal force in spiral lines within
it; being yet too tender for the spindle. It then
passed between *two pairs of rollers*; the second
pair moving faster than the first elongate the thread
with greater equality than can be done by hand;
and is then twisted on spools or bobbins. The
great fertility of the Cotton-plant in these fine
flexile threads, whilst those from Flax, Hemp, and
Nettles, or from the bark of the Mulberry-tree,
require a previous putrefaction of the
parenchymatous substance, and much mechanical
labour, and afterwards bleaching, renders this plant
of great importance to the world. And since Sir
Richard Arkwright's ingenious machine has not
only greatly abbreviated and simplified the labour
and art of carding and spinning the Cotton-wool,
but performs both these circumstances *better* than
can be done by hand, it is probable, that the
clothing of this small seed will become the
principal clothing of mankind, though animal wool
and silk may be preferable in colder climates, as
they are more imperfect conductors of heat and are
thence a warm clothing.

Emerging Naiads – eam circum Milesia vellera
Nymphue

Carpebant, hyali saturo sucata colore. Vir. Georg.
Iv. 334

[62]

With wiry teeth *revolving cards* release
The tangled knots, and smooth the ravell'd fleece;
Next moves the *iron-band* with fingers fine,
Combs the wide card, and forms the eternal line;
Slow, with soft lips, the *whirling Can* acquires
The tender skeins, and wraps in rising spires;
With quicken'd pace *successive rollers* move,
And these retain, and those extend the *rove*;
Then fly the spokes, the rapid axles glow,
And slowly circumvolves the laboring wheel
below.

PAPYRA, throned upon the banks of Nile,
Spread her smooth leaf, and waved her silver style.

Cyprus. Papyrus. Three males, one female. The leaf of this plant was first used for paper; whence the word *paper*; and leaf, or folium, for a fold of a book. Afterwards the bark of a spices of mulberry was used; whence the *liber* signifies a book, and perpetually in their infancy, as the arts of one age of country generally died with their inventors. Whence arose the policy, which still continues in Indostan, of obliging the son to practice the profession of his father. After the discovery of letters, the facts of Astronomy and Chemistry became recorded in written language, though the ancient hieroglyphic characters for the planets and metals continue in use at this day. The antiquity of the invention of music, of astronomical observations, and the manufacture of Gold and Iron, are now recorded in Scripture.

[63]

-- The storied pyramid, the laurel'd bust,
The trophy'd arch had crumbled into dust;
The sacred symbol, and the epic song,
(Unknown the character, forgot the tongue,)
With each unconquer'd chief, or fainted maid,
Sunk undistinguish'd in Oblivion's shade.
Sad o'er the scatter'd ruins Genius sigh'd,
And infant Arts but learn'd to lisp and died.
Till to astonish'd realms, PAPYRA taught
To paint in mystic colours Sound and Thought.
With Wisdom's voice to print the page sublime,
And mark in adamant the steps of Time.
-- *Three* favour'd youths her soft attention share,
The fond disciples of the studious Fair,
About twenty letters, ten cyphers, and seven
crotchets, represent by their numerous
combinations all our ideas and sensations! the
musical characters are probably arrived at their
perfection, unless emphasis, and tone, and swell
could be expressed, as well as note and time.
Charles the Twelfth of Sweden had a design to
have introduced a numeration by squares, instead
of by decimation, which might have served the
purposes of philosophy better than the present
mode, which is said to be of Arabic invention. The
alphabet is yet in a very imperfect state; perhaps
seventeen letters could express all the simple
sounds in the European languages. In China they
have not yet learned to divide their words into
syllables, and are thence necessitated to employ
many thousand characters; it is said above eighty
thousand. It is to be wished, in this ingenious age,
that the European nations would accord to reform
our alphabet.

[64]

Hear her sweet voice, the golden process prove;
Gaze, as they learn; and, as they listen, love.
The first from Alpha to Omega joins
The letter'd tribes along the level lines;
Weighs with nice ear the vowel, liquid, surd,
And breaks in syllables the Volant word.
Then forms *the next* upon the marshal'd plain
In deepening ranks his dexterous cypher-train;
And counts, as wheel the decimating bands,
The dews of Ægypt, or Arabia's sands.
And then *the third* on four concordant lines
Prints the lone crotchet, and the quaver joins;
Marks the gay trill, the solemn pause inscribes,
And parts with bars the undulating tribes.
Pleased round her cane-wove throne, the
applauding crowd
Clap'd their rude hands, their swarthy foreheads
bow'd;
With loud acclaim "A present God!" they cry'd,
"A present God!" rebelling shores reply'd. –
Then peal'd at intervals with mingled swell
The echoing harp, shrill clarion, horn, and shell;

[65]

While Bards ecstatic, bending o'er the lyre,
Struck deeper chords, and wing'd the song with
fire
Then mark'd Astronomers with Keener eyes
The Moon's refulgent journey through the skies;
Watch'd the swift Cornets urge their blazing cars,
And weigh'd the Sun with his revolving Stars.
High raised the Chemists their Hermetic wands,
(And changing forms obey'd their waving hands,)
Her treasur'd Gold from Earth's deep chambers
tore,
Or fused with harden'd her chalybeate ore.
All with bent knee from fair POPYRA claim
Wove by her hands the wreath of deathless fame.
-- Exulting Genius crown'd his darling child,
The young Arts clasp'd her knees, and Virtue
smiled.

So now DELANY forms her mimic bowers,
Her paper foliage, and her silken flowers;
So now Delany. Mrs. Delany has finished nine
hundred and seventy accurate and elegant
representations of different vegetables with the
parts of their flowers, fructification, &c, according
with the classification of Linnaeus, in what she
terms paper-mosaic. She began this work at the
age of 74, when her sight would no longer serve
her to paint

[66]

Her virgin train the tender scissors ply,
Vein the green leaf, the purple petal dye:
Round wiry stems the flaxen tendril bends,
Moss creeps below, and waxen fruit impends.
Cold Winter views amid his realms of snow
DELANY'S vegetable statues blow;
Smooths his stern brow, delays his hoary wing,
And eyes with wonder all the blooms of spring.

The gentle LAPSANA, NYMPHÆA fair,
And bright CALENDULA with golden hair,
in which she much excelled: between her age of 74
and 82, at which time her eyes quite failed her, she
executed the curious Hortus siccus above-
mentioned, which I suppose contains a greater
number of plants than were ever before drawn
from life by any one person. Her method consisted
in placing the leaves of each plant with the petals,
and all other parts of the flowers on coloured
paper, and cutting them with scissors accurately to
the natural size and form, and then pasting them on
a dark ground; the effect of which is wonderful,
and their accuracy less liable to fallacy than
drawings. She is at this time (1788) in her 89th
year, with all the powers of a fine understanding
still unimpaired. I am informed another very
ingenious lady, Mrs. North, is construction a
similar Hortus siccus or Paper-garden; which she
executes on a ground of vellum with such elegant
taste and scientific accuracy, that it cannot fail to
become a work of inestimable value.

Lapsana, Nymphæa alba, Calendula. And many
other flowers close and open their petals at certain
hours of the day; and thus constitute what Linneus
calls the Horologe, or Watch of Flora. He
enumerates 46 flowers, which possess this kind of
sensibility. I shall mention a few of them with their
respecting hours of rising and setting,

[67]

Watch with nice eye the Erath's diurnal way,
Marking her solar and sidereal day,
Her flow nutation, and her varying clime,
And trace with mimic art the march of Time;
Round his light foot a magic chain they fling,
And count the quick vibrations of his wing. –
First in its brazen cell reluctant roll'd
Bends the dark spring in many a steel fold;
as Linneus terms them. He divided them first in
meteoric flowers, which less accurately observe
the hour of unfolding, but are expanded sooner or
later, according to the cloudiness, moisture, or
pressure of the atmosphere. 2d. *Tropical* flowers
open in the morning and close before evening
every day; but the hour of the expanding becomes
earlier or later, as the length of the day increases or
decreases. 3dly. *Æquinoctial* flowers which open
at a certain and exact hour of the day, and for the
most part close at another determinate hour.
Hence the Horologe or Watch of Flora is formed
from numerous plants, of which the following are
the most common in this country. *Leontodon*
taraxacum, Dandelion, opens at 5-6, closes at 8-9.
Hieracium pilosella, mouse-ear hawkweed, opens
at 8, closes at 2. *Sonchus lœvis*, smooth Sw-
thistle, at 5 and 11-12. *Lactuca sativa*, cultivated
Lettice, at 7 and 10. *Tragopogon luteum*, yellow
Goatsbeard, at 3-5 and at 9-10. *Lapsana*, nipple
wort, at 5-6 and at 10-1. *Nymphæa alba*, white
water lily, at 7 and 5. *Papaver nudicaule*, naked
poppy, at 5 and at 7. *Hemerocallis fulva*, tawny
Day-lily, at 5 and at 7-8. *Convolvulus*, at 5-6.
Malva, Mallow, at 9-10, and at 1. *Arenaria*
purpurea, purple Sandwort, at 9-10, and at 2-3.
Anagallis, pimpernel, at 7-8. *Portulaca hortensis*,
garden Purslain, at 9-10, and at 11-12. *Dianthus*
prolifer, proliferous Pink, at 8 and at 1.
Cichoreum. Succory, at 4-5, and at 12. *Calendula*
field, at 9, and at 3. *Calendula* African, at 7, and at
3-4.

As these observations were probably made in the
botanic gardens at Upsal, they must require further
attention to suit them to our climate. See
Stillingfleet's Calendar of Flora.

[68]

On spiral brass is stretch'd the wiry thong,
Tooth urges tooth, and wheel drives wheel along;
In diamond-eyes the polish'd axles flow,
Smooth slides the hand, the balance pants below.
Round the white circlet in relieve bold
A Serpent twines his scaly length in gold;
And brightly pencil'd on the enamel'd sphere
Live the fair trophies of the passing year.
-- Here *Time*'s huge fingers grasp his giant mace,
'And dash proud Superstition from her base,
Rend her strong towers and gorgeous fanes, and shed
The crumbling fragments round her guilty head.
There the gay *Hours*, whom wreaths of roses deck,
Lead their young trains amid the cumberous wreck,
And, slowly purpling o'er the mighty waste,
Plant the fair growths of Science and of Taste.
While each light *Moment*, as it dances by
With feathery foot and pleasure-twinkling eye,
Feeds from its baby-hand, with many a kiss,
The callow nestlings of domestic Bliss.

[69]

As yon gay clouds, which canopy the skies,
Change their thin forms, and lose their lucid dyes;
So the soft bloom of Beauty's vernal charms
Fades in our eyes, and withers in our arms.
-- Bright as the silvery plume, or pearly shell,
The snow-white rose, or lily's virgin bell,
The fair HELLEBORAS attractive shone,
Warm'd every Sage, and every Shepherd won. --
Round the gay sisters press the *enamour'd bands*,
And seek with soft solicitude their hands.
-- Erewhile how chang'd -- in dim suffusion lies
The glance divine, that lighten'd in their eyes;
Cold are those lips, which smiles seductive hung,
And the weak accents linger on their tongue:
Helleborus. Many males, many females. The
Helleborus niger; or Christmas rose, as a large
beautiful white flower, adorned with a circle of
tubular two-lipp'd nectaries. After impregnation
the flower undergoes a remarkable change, the
nectaries drop off, but the white corol remains, and
gradually becomes quite green. This curious
metamorphose of the corol, when then nectaries
fall off, seems to shew that the white juices of the
corol were before carried to the nectaries, for the
purpose of producing honey: because when these
nectaries fall off, no more of the white juice is
secreted in the corol, but it becomes green, and
degenerates into a calyx. See note on *Lonicera*.
The nectary of the *Tropæolum*, garden naturation,
is a coloured horn growing from the calyx.

[70]

Each roseate feature fades to livid green, --
-- Disgust with face averted shuts the scene.
SO from his gorgeous throne, which awed the
world,
The mighty Monarch of Assyria hurl'd,
Sojourn'd with brutes beneath the midnight storm,
Changed by avenging Heaven in mind and form.
-- Prone to the earth He bends his brow superb,
Crops the young floret and the bladed herb;
Lolls his red tongue, and from the reed side
Of slow Euphrates laps the muddy tide.
Long eagle plums his arching neck invest,
Steal round his arms, and clasp his sharpen'd
breast;
Dark brinded hairs in bristling ranks, behind,
Rise o'er his back, and rustle in the wind,
Clothe his lank sides, his shirvel'd limbs surround,
And human hands with talons print the ground.
Silent in shining troops the Courtier-throng
Pursue their monarch, as he crawls along;

[71]

E'en Beauty pleads in vain with smiles and tears,
Nor Flattery's self can pierce his pendant ears.

*Two Sister-nymphs to Ganges' flower brink
Bend their light steps, the lucid water drink,
Wind through the dewy rice, and nodding canes,
(As eight black Eunuchs guard the sacred plains),
With playful malice watch the scaly brood,
And shower the inebriate berries on the flood. --
Stay in your crystal chambers, silver tribes!
Turn your bright eyes, and shun the dangerous
bribes;
The tramel'd net with less destruction sweeps
Your curling shallows, and your azure deeps;
With less deceit, the gilded fly beneath,
Lurks the fell hook unseen, -- to taste is death!
--Dim your slow eyes, and dull your pearly coat,
Drunk on the waves your languid forms shall float,
Two Sister-Nymphs. Menispermum, Cocculus.
Indian berry. Two houses, twelve males. In the
female flower there are two styles and eight
filaments without anthers on their summits; which
are called by Linneus eunuchs. See the note on
Curcuma. The berry intoxicates fish. Saint
Anthony of Padua, when the people refused to
hear him, preached to the fish, and converted
them. Addison's travels in Italy.*

[72]

ON useless fins in giddy circles play,
And Herons and Otters seize you for their prey. –

SO, when the saint from Padua's graceless land
In Silent anguish fought the barren strand,
High on the shatter'd beech sublime HE stood,
Still'd with his waving arm the babbling flood;
"To Man's dull ear," He cry'd, "I call in vain,
"Hear me, ye scaly tenants of the main!" –
Mishappen Seals approach in circling flocks,
IN dusky mail the Tortoise climbs the rocks,
Torpedoes, Sharks, Rays, Porpus, Dolphins, pour
Their twinkling squadrons round the glittering
shore;
With tangled fins, behind, huge Phocæ glide,
And whales and Grampi swell the distant tide.
Then kneel'd the hoar Seer, to heaven adres'd
His fiery eyes, and smote his sounding breast;
"Bless ye the Lord" with thundering voice he
cry'd,
"Bless ye the Lord!" the bending shores reply'd;

[73]

The winds and waters caught the sacred word,
And mingling echoes shouted "Bless the Lord!"
The listening shoals the quick contagion feel,
Pant on the floods, inebriate with their zeal,
Ope their wide jaws, and bow their slimy heads,
And dash with frantic fins their foamy beds.

Sopha'd on silk, amid her charm-built towers
Her meads of asphodel, and amaranth bowers,
Where Sleep and Silence guard the soft abodes
In sullen apathy PAPVER nods.
Faint o'er her couch in scintillating streams
Pass the thin forms of Fancy and of Dreams;
Papaver. Poppy. Many males, many females. The
plants of this class are almost all of them
poisonous; the finest opium is procured by
wounding the heads of large poppies with a three-
edged knife, and tying muscle-shells to them to
catch the drops. In small quantities it exhilarates
the mind, raises the passions, and invigorates the
body: in large ones it is succeeded by intoxication,
languor, stupor, and death. It is customary in India
for a messenger to travel above a hundred miles
without rest or food, except an appropriated bit of
opium for himself, and a larger one for his horse at
certain stages. The emaciated and decrepit
appearance, with the ridiculous and idiotic
gestures, of the opium-eaters in Constantinople is
well described in the Memoirs of Baron de Tott.

[74]

Froze by enchantment on the velvet ground
Fair youths and beauteous ladies glitter round;
ON crystal pedestals they seem to sigh,
Bend the meek knee, and lift the imploring eye.
-- And now the Sorceress bares her shrivel'd hand,
And circles thrice in air her ebon wand;
Flush'd with new life descending statues talk,
The pliant marble softening as they walk;
With deeper sobs reviving lovers breathe,
Fair bosoms rise, and soft hearts pant beneath;
With warmer lips relenting damsels speak,
And kindling blushes tinge the Parian cheek;
To viewless lutes aerial voices sing,
And hovering loves are heard on rustling wing.
--She waves her wand again! --fresh horrors seize
Their stiffening limbs, their vital currents freeze;
By each cold nymph her marble lovers lies,
And iron slumbers seal their glassy eyes.
So with his dread Caduceus HERMES led
From the dark regions of the imprison'd dead,

[75]

Or drove in silent shoals the lingering train
To Night's dull shore, and PLUTO's dreary reign.

So with her waving pencil CREWE commands
The realms of Taste, and Fancy's fair lands;
Calls up with magic voice the shapes, that sleep
In earth's dark bosom, or unfathom'd deep;
That shrined in air on viewless wings aspire,
Or blazing bathe in elemental fire.
As with nice touch her plastic hand she moves,
Rise the fine forms of Beauties, Graces, Loves;
Kneel to the fair Enchantress, smile or sigh,
And fade or flourish, as she turns her eye.

Fair CISTA, rival of the rosy dawn,
Call'd her light choir, and trod the dewy lawn;
So with her waving pencil. Alluding to the many
beautiful paintings by Miss EMMA CREW; to
whom the author is indebted for the very elegant
Frontispiece, where Flora, at play with Cupid, is
loading him with garden-tools.
Cistus labdaniferus. Many males, one female. The
petals of this beautiful and fragrant shrub, as well
as of the *Cenothera*, tree primrose, and others
continue expanded

[76]

Hail'd with rude melody the new-born May,
As cradled yet in April's lap she lay.

I.

"Born in yon blaze of orient sky,
"Sweet MAY!" thy radiant form unfold,
"Unclose thy blue voluptuous eye,
"And wave thy shadowy locks of gold.

II.

"For Thee the fragrant zephyrs blow,
"For Thee descends the sunny shower;
"The rills in softer murmurs flow,
"And brighter blossoms gem the bower.

but a few hours, falling off about noon, or soon after, in hot weather. The most beautiful flowers of the *Cactus grandiflorus* (see *Cereia*) are of equally short duration, but have their existence in the night. And the flowers of the *Hibiscus trionum* are said to continue but a single hour. The courtship between the males and females in these flowers might be easily watched; the males are said to approach and recede from the females alternately. The flowers of the *Hibiscus sinensis*, mutable rose, live in the West Indies, their native climate, but one day; but have this remarkable property, they are white at their first expansion, then change to deep red, and become purple as they decay.

The gum or resin of this fragrant vegetable is collected from extensive underwoods of it in the East by a singular contrivance. Long leathern thongs are tied to poles and cords, and drawn over the tops of these shrubs about noon; which thus collect the dust of the anthers, which adheres to the leather, and is occasionally scraped off. Thus in some degree is the manner imitated, in which the bee collects on his thighs and legs the same material for the construction of his combs.

[77]

III.

"Light Graces dress'd in flowery wreaths
"And tiptoe Joys their hands combine;
"And Love his sweet contagion breathes,
"And laughing dances round thy shrine.

IV.

"Warm with new life the glittering throngs
"On quivering fin and rustling wing
"Delighted join their votive songs,
"And hail thee, GODDESS OF THE SPRING."

O'er the green brinks of Severn's oozy bed,
IN changeful rings, her sprightly troops She led;
PAN tripp'd before, where Eudness shades the mead,
And blew with glowing lip his sevenfold reed;
Emerging Naiads swell'd the jocund strain,
And aped with mimic step the dancing train. –
Sevenfold reed. The sevenfold reed, with which Pan is frequently described, seems to indicate, that he was the inventor of the musical gamut.

[78]

"I faint, I fall!" – at noon the Beauty cried,
"Weep o'er my tomb, ye Nymphs!" – and sunk
and died.

-- Thus, when white Winter o'er the shivering
clime
Drives the still snow, or showers the silver rime;
As the lone shepherd o'er the dazzling rocks
Prints his steep step, and guides his vagrant flocks;
Views the green holly veil'd in net-work nice,
Her vermil clusters twinkling in the ice;
Admires the lucid vales, and slumbering floods,
Fantastic cataracts, and crystal woods,
Transparent towns, with seas of milk between,
And eyes with transport the refulgent scene: --
If breaks the sunshine o'er the spangled trees,
Or flits on tepid wing the western breeze,
In liquid dews descends the transient glare,
And all the glittering pageant melts in air.

Where Andes hides his cloud-wreath'd crest in
snow,
And roots his base on burning sands below;

[79]

CINCHONA, fairest of the Peruvian maids,
TO Health's bright Goddess in the breezy glades
On Quito's temperate plain an altar rear'd
Trill'd the loud hymn, the solemn prayer preferr'd:
Each balmy bud she cull'd, and honey'd flower,
And hung with fragrant wreaths the sacred bower;
Each pearly sea she search'd, and sparkling mine,
And piled their treasures on the gorgeous shrine;
Her suppliant voice for sickening Loxa raised,
Sweet breath'd the gale, and bright the censor
blazed.

"—Divine HYGEIA! on thy votaries bend
"Thy angel-looks, oh, hear us, and defend!
"While streaming o'er the night with baleful glare
"The star of Autumn rays his misty hair;
"Fierce from his fens the Giant AGUE springs,
"And wrapp'd in fogs descends on vampire wings;
Cinchona. Peruvian bark-tree. Five males, and one
female. Several of these trees were felled for other
purposes into a lake, when an epidemic fever of a
very mortal kind prevailed at Loxa in Peru, and the
woodmen accidentally drinking the water, were
cured; and thus were discovered the virtues of this
famous drug.

[80]

“Before, with shuddering limbs cold Tremor reels,
“And Fever’s burning nostril dogs his heels;
“Loud clasps the grinning Fiend his iron hands,
“Stamps with his marble feet, and shouts along the
lands;
“Withers the damask cheek, unnerves the strong,
“And drives with scorpion-lash the shrieking
throng.
“Oh, Goddess! on thy kneeling votaries bend
“Thy angel-looks, oh, hear us, and defend!”
--HYGEIA, leaning from the blest abodes,
Thy crystal mansions of the immortal gods,
Saw the sad Nymph uplift her dewy eyes,
Spread her white arms, and breathe her fervid
sighs;
Call’d to her fair associates, Youth and Joy,
And shot all radiant through the glittering sky;
Loose waved behind her golden train of hair,
Her sapphire mantle swam diffus’d in air. –
O’er the grey matted moss, and pansied sod,
With step sublime the glowing Goddess trod,
Gilt with her beamy eye the conscious shade,
And with her smile celestial bless’d the maid.

[81]

“Come to my arms,” with seraph voice she cries,
“Thy vows are heard, benignant Nymph! Arise;
“Where yon aspiring trunks fantastic wreath
“Their mingled roots, and drink the rill beneath,
“Yield to the biting axe thy sacred wood,
“And strew the bitter foliage on the flood.”
IN silent homage bow’d the blushing maid, --
Five youths athletic hasten to their aid,
O’er the scar’d hills re-echoing strokes resound,
And headlong forests thunder on the ground.
Round the dark roots, rent bark, and shatter’d
boughs,
From ocherous beds the swelling fountain flows;
With streams austere its winding margin laves,
And pours from vale to vale its dusky waves.
-- As the pale squadrons, bending o’er the brink,
View with a sigh their alter’d forms, and drink;
Slow-ebbing life with refluent crimson breaks
O’er their wan lips, and paints their haggard
cheeks:
Through each fine nerve rekindling transports
dark,
Light the quick eye, and swell the exulting heart.

[82]

-- Thus ISRAEL'S heav'n-taught chief o'er
trackless sands
Led to the sultry rock his murmuring bands.
Bright o'er his brows the forky radiance blazed,
And high in air the rod divine He raised. --
Wide yawns the cliff! -- amid the thirsty throng
Rush the redundant waves, and shine along;
With gourds and shells and helmets press the
bands,
Ope their parch'd lips, and spread their eager
hands,
Snatch their pale infants to the exuberant shower,
Kneel on the shatter'd rock, and bless the
Almighty Power.

Bolster'd with down, amid a thousand wants,
Pale Dropsy rears his bloated form, and pants;
"Quench men, ye cool pellucid rills!" he cries,
Wets his parch'd tongue, and rolls his hollow eyes.
So bends the tormented TANTALUS to drink,
While from his lips the refluent waters shrink;
Again the rising stream his bosom laves,
And Thirst consumes him 'mid circumfluent
waves.

[83]

--Divine HYGEIA, front the bending sky
Descending, listens to his piercing cry;
Assumes bright DIGITALIS' dress and air,
Her ruby cheek, white neck, and raven hair;
Four youths protect her from the circling throng,
And like the Nymph the Goddess steps along. --
O'er Him She waves her serpent-wreathed wand,
Cheers with her voice, and raises with her hand,
Warms with rekindling bloom his visage wan,
And charms the shapeless monster into man.
Digitalis. OF the class TWO POWERS. Four
males, one female, Foxglove. The effect of this
plant in that kind of Dropsy, which is termed
anasarca, where the legs and thighs are much
swelled, attended with great difficulty of
breathing, is truly astonishing. IN the ascites
accompanied with anasarca of people past the
meridian of life it will also sometimes succeed.
The method of administering it requires some
condition, as it is liable, in greater doses, to induce
very violent and debilitating sickness, which
continues one or two days, during which time the
dropsical collection however disappears. One large
spoonful, or half an ounce, of the following
decoction, given twice a day, will generally
succeed in a few days. But in more robust people,
one large spoonful every two hours, till four
spoonfuls are taken, or till sickness occurs, with
evacuate the dropsical swellings with greater
certainty, but is liable to operate more violently.
Boil four ounces of the fresh leaves of purple
Foxglove (which leaves may be had at all seasons
of the year) from two pints of water to twelve
ounces; add to the strained liquour, while yet
warm, three ounces of rectified spirit of wine. A
theory of the effects of this medicine, with many
successful cases, may be seen in a pamphlet called
"Experiments on the Mucilaginous and Purulent
Matter," published by Dr. Darwin, in 1780. Sold
by Cadell, London.

[84]

So when Contagion with mephitic breath
And wither'd Famine urged the work of death;
Marseilles' good Bishop, London's generous
Mayor,
With food and faith, with medicine and with
prayer,
Raise the weak head, and stayed the parting sigh,
Or with new life relumed the swimming eye. –
--And now, PHILANTHROPY! thy rays divine
Dart round the globe from Zembla to the Line;
O'er each dark prison plays the cheering light,
Like northern lusters o'er the vault of night. –
Marseille's good Bishop. In the year 1720 and
1722 the Plague made dreadful havoc at
Marseilles; at which time the Bishop was
indefatigable in the execution of his pastoral
office, visiting, relieving, encouraging, and
absolving the sick with extreme tenderness; and
though perpetually exposed to the infection, like
Sir John Lawrence mentioned above, both are said
to have escaped the disease.

London's generous Mayor. During the great
Plague at London in the year 1665, Sir John
Lawrence, then the Lord Mayor, continued the
whole time in the city; heard complaints and
redressed them; enforced the wisest regulations
then known, and saw them executed. The day after
the disease was known with certainty to be the
Plague, above 40,000 servants were dismissed, and
turned into the streets to perish, for no one would
receive them into their houses; and the villages
near London drove them away with pitch-forks
and fire arms. Sir John Lawrence supported them
all, as well as the needy who were sick, at first by
expending his own fortune, till subscriptions could
be solicited and received from all parts of the
nation. *Journal of the Plague Year. Printed for E.
Nutt, &c. at the R. Exchange. 1722*

[85]

From realm to realm, with cross or crescent
crown'd,
Where'er Mankind and Misery are found,
O'er burning sands, deep waves, or wilds of snow,
Thy HOWARD journeying seeks the house of
woe.
Down many a winding step to dungeon's dank,
Where anguish wails aloud, and fetters clank;
To caves bestrew'd with many a mouldering bone,
And cells, whose echoes only learn to groan;
Where no kind bars a whispering friend disclose,
No sunbeam enters, and no zephyr blows,
HE treads, inemulous of fame or wealth,
Profuse of toil, and prodigal of health,
With soft assuasive eloquence expands
Power's rigid heart, and opes his clenching hands;
Leads stern-ey'd Justice to the dark domains,
IF not to sever, to relax the chains;
Or guides awaken'd Mercy through the gloom,
And shews the prison, sister to the tomb!--

[86]

Gives to her babes the self-devoted wife,
To her fond husband liberty and life! –
--The Spirits of the Good, who bend from high
Wide o'er these earthly scenes their partial eye,
When first, array'd in VIRTUE'S purest robe,
They saw her HOWARD traversing the globe;
Saw round his brows her sun-like Glory blaze
In arrowy circles of unwearied rays;
Mistook a Mortal for an Angel-Guest
And ask'd what Seraph-foot the earth imprest.
--Onward he moves! –Disease and Death retire,
And murmuring Demons hate him, and admire.”

Here paused the Goddess – on HYGEIA's shrine
Obsequious Sylphs relax the trembling strings,
And catch the rain-drops on their shadowy wings.
--And now her vase a modest Naiad fills
With liquid crystal from her pebbly rills;

[87]

Piles the dry cedar round her silver urn,
(Bright climbs the blaze, the crackling faggots
burn),
Culls the green herb of China's envy'd bowers,
In gaudy cups the steamy treasure pours;
And, sweetly-smiling, on her bended knee
Presents the fragrant quintessence of Tea.

INTERLUDE II

--

Bookseller. THE Monsters of your Botanic Garden are a surprising as the bulls with brazen feet, and the fire-breathing dragons, which guarded the Hesperian fruit; yet are they not disgusting, nor mischievous: and in the manner you have chained them together in your exhibition, they succeed each other amusingly enough, like the prints of the London Cries, wrapped upon rollers, with glass before them. In this at least they resemble the monsters in Ovid's *Metamorphoses*; but your similes, I suppose, are Homeric?

Poet. The great Bard well understood how to make use of this kind of ornament in Epic Poetry. He brings his valiant heroes into the field with much parade, and sets them a fighting with great fury; and then, after a few thrusts and parries, he introduces a long string of similes. During this the battle is supposed to continue; and thus the time necessary of the action is gained in our imaginations; and a degree of probability produced, which contributes to the temporary deception or reverie of the reader.

But the similes of Homer have another agreeable characteristic; they do not quadrate, or go upon all fours (as it is called), like the more formal similes of some modern writers; any one resembling feature seems to be with him a sufficient excuse for the introduction of this kind of digression; he then proceeds to deliver some agreeable poetry on this new subject, and thus converts every simile into a kind of short episode.

B. The a simile should not very accurately resemble the subject?

P. No; it would then become a philosophical analogy, it would be ratiocination instead of poetry: it need only so far resemble the

[90]

subject, as poetry itself ought to resemble nature. IT should have so much sublimity, beauty, or novelty, as to interest the reader; and should be expressed in picturesque language, so as to bring the scenery before his eye; and should lastly bear so much verisimilitude as not to awaken him by the violence of improbability or incongruity.

B. May not the reverie of the reader be dissipated or disturbed by disagreeable images being presented to his imagination, as well as by improbably or incongruous ones?

P. Certainly; he will endeavour to rouse himself form a disagreeable reverie, as from the nightmare. And from this may be discovered the line of boundary between the Tragic and the Horrid; he prevailing manners of the age or country, and the peculiar association of ideas, or idiosyncrasy of mind, of individuals. For instance, if an artists should represent the death of an officer in battle, by shewing a little blood on the bosom of his shirt, as if a bullet had there penetrated, the dying figure would affect the beholder with pity; and if fortitude was at the same

time expressed in his countenance, admiration would be added to our pity. On the contrary, if the artist should choose to represent his thigh as shot away by a cannon ball, and should exhibit the bleeding flesh and shattered bone of the stump, the picture would introduce into our minds ideas from a butcher's shop, or a surgeon's operation room, and we should turn from it with disgust. So if characters were brought upon the stage with their limbs disjointed by torturing instruments and the floor covered with clotted blood and scattered brains, our theatric reverie would be destroyed by disgust, and we should leave the play-house with detestation.

The painters have been more guilty in this respect than the Poets; the cruelty of Apollo in flaying Marcias alive is a favourite subject with the ancient artists: and the tortures of expiring martyrs

[91]

Have disgraced the modern ones. It requires little genius to exhibit the muscles in convulsive action either by the pencil or chisel, because the interstices are deep, and the lines strongly defined: but those tender gradations of muscular action, which constitute the graceful attitudes of the body, are difficult to conceive or to execute, except by a master of nice discernment and cultivated taste.

B. By what definition would you distinguish the Horrid from the Tragic?

P. I suppose the latter consist of Distressed attended with Pity, which is said to be allied to Love, the most agreeable of all our passions; and the former in Distress, accompanied with Disgust, which is allied to Hate, and is one of our most disagreeable sensations. Hence, when horrid scenes of cruelty are represented in pictures, we wish to disbelieve their existence, and voluntarily exert ourselves to escape from deception: whereas the butter cup of true Tragedy is mingled with some sweet consolatory drops, which endear our tears, and we continue to contemplate the interesting delusion with a delight, which is not easy to explain.

B. Has not this been explained by Lucretius, where he describes a shipwreck; and says, the Spectators receive pleasure from feeling themselves safe on land? and by Akenside, in his beautiful poem on the Pleasures of Imagination, who ascribes it to our finding objects for the due exertion of our passions?

P. We must not confound our sensations at the contemplation of real misery with those which we experience as the scenical representations of tragedy. The spectators of a shipwreck may be attracted by the dignity and novelty of the object; and from these may be said to receive pleasure; but not from the distress of the sufferers. An ingenious writer who has criticized this dialogue in

[92]

the English Review for August, 1789, adds, that one great source of our pleasure from scenical distress arises from our, at the same time, generally contemplating one of the noblest objects of nature, that of Virtue triumphant over difficulty and oppression, or supporting its votary under every suffering: or, where this does not occur, that our minds are relieved by the justice of some signal punishment awaiting the delinquent. But, besides this, at the exhibition of a good tragedy, we are not only amused by the dignity and novelty, and beauty, of the objects before us; but, if any distressful circumstances occur too forcibly for our sensibility, we can voluntarily exert ourselves, and recollect, that the scenery is not real: and thus not only the pain, which we had received from the apparent distress, is lessened, but a new source of pleasure is opened to us, similar to that which we frequently have felt on awaking from a distressful dream; we are glad that it is not true. We are at the same time unwilling to relinquish the pleasure which we receive from the other interesting circumstances of the drama; and on that account quickly permit ourselves to relapse into the delusion; and thus alternately believe and disbelieve, almost every moment, the existence of the objects represented before us.

B. Have those two sovereigns of poetic land, HOMER and SHAKESPEARE, kept their works entirely free from the Horrid? – or even yourself in your third Canto?

P. The descriptions of the mangled carcasses of the companions of Ulysses, in the cave of Polypheme, is in this respect certainly objectionable, as is well observed by Scaliger. And in the play of Titus Andronicus, if that was written by Shakespeare (which from its internal evidence I think very improbable,) there are many horrid and disgusting circumstances. The following Canto is submitted to the candour of the critical reader, to whose opinion I shall submit in silence.

--
CANTO III

--
And now the Goddess sounds her silver shell,
And shakes with deeper tones the enchanted dell;
Pale, round her grassy throne, bedew'd with tears,
Flit thin forms of Sorrows, and of Fears;
Soft Signs responsive whisper to the chords,
And Indignations half unsheath their swords.

[94]

“Thrice round the grave CIRCÆA prints her tread,
And chants the numbers, which disturb the dead;
Shakes o'er the holy earth her sable plume,
Waves her dread wand, and strikes the echoing tomb!

--Pale shoot the stars across the troubled night,
The tim'rous moon withholds her conscious light;
Shrill scream the famish'd bats, and shivering owls,

And loud and long the dog of midnight howls!—
Circæa. Enchanters Nightshade. Two males, one female. It was much celebrated in the mysteries of witchcraft, and for the purpose of raising the devil, as its name imports. It grows amid the mouldering bones and decayed coffins in the ruinous vaults of Sleaford church in Lincolnshire. The superstitious ceremonies or histories belonging to some vegetables have been truly ridiculous; thus the Druids are said to have cropped the Mistletoe with a golden axe or sickle; and the Bryony, or Mandrake, was said to utter a scream when its root was drawn from the ground; and that the animal which drew it up became diseased and soon died: on which account, when it was wanted for the purpose of medicine, it was usual to loosen and remove the earth about the root, and then to tie it by means of a cord to a dog's tail, who was whipped to pull it up, and was then supposed to suffer for the impiety of the action. And even at this day bits of dried root of Peony are rubbed smooth, and strung, and sold under the name of Anodyne necklaces, and tied round the necks of children, to facilitate the growth of their teeth! add to this, that in Price's History of Cornwall, a book published about ten years ago, the *Virga Divinatoria*, or Divining Rod, has a degree of credit given to it. This rod is of hazel, or other light wood, and held horizontally in the hand, and is said to bow towards the ore whenever the Conjuror walks over a mine. A very few years ago, in France, and even in England, another kind of divining rod has been used to discover springs of water in a similar manner, and gained some credit. And in this very year, there were many in France, and some in England, who underwent an enchantment without any divining rod at all, and believed themselves to be affected by an invisible agent, which the Enchanter called Animal Magnetism!

[95]

--Then yawns the bursting ground!--*two* imps
obscene
Rise on broad wings, and hail the baleful queen;
Each with dire grin salutes the potent wand,
And leads the Sorceress with his sooty hand;
Onward they glide, where sheds the sickly yew
O'er many a mouldering bone its nightly dew;
The ponderous portals of the church unbar,--
Hoarse on their hinge the ponderous portals jar;
As through the colour'd glass the moon-beam
falls,
Huge shapeless spectres quiver on the walls;
Low murmurs creep along the hollow ground,
And to each step the pealing ailes resound,
By glimmering lamps, protecting saints among,
The shrines all trembling as they pass along,
O'er the still choir with hideous laugh they move,
(Fiends yell below, and angels weep above!)
Their impious march to God's high altar bend,
With feet impure the sacred steps ascend;
With wine unblest'd the holy chalice stain,
Assume the mitre, and the cope profane;

[96]

To heaven their eyes in mock devotion throw,
And to the cross with horrid mummerly bow;
Adjure by mimic rites the powers above,
And plight alternate their Satanic love.
Avant, ye Vulgar! from her sacred groves
With manic step the Pythian LAURA moves;
Full of the God her laboring bosom signs,
Foam on her lips, and fury in her eyes,
Strong writhe her limbs, her wild dishrevell'd hair
Starts from her laurel-wreath, and swims in air. --
While *twenty* Priests the gorgeous shrine surround
Cinctur'd with ephods, and with garlands crown'd

Laura. Prunus. Lauro-cerasus. Twenty males, one female. The Pythian priestess is supposed to have been made drunk with infusion of laurel-leaves when she delivered her oracles. The intoxication or inspiration is finely described by Virgil *Æn.* L. vi. The distilled water from laurel-leaves is, perhaps, the most sudden poison we are acquainted with in this country. I have seen about two spoonfuls of it destroy a large point dog in less than ten minutes. In a smaller dose it is said to produce intoxication: on this account there is reason to believe it acts in the same manner as opium and vinous spirit; but that the dose is not so well ascertained. See note on Tremella. It is used in the Ratafie of the Distillers, by which some dram-drinkers have been suddenly killed. One pint of water, distilled from fourteen pounds of black cherry stones probably Apricot-kernels, Peach-leaves, Walnut-leaves, and whatever possesses the kernel-flavour, maybe have similar qualities.

[97]

Contending hosts and trembling nations wait
The firm immutable behest of Fate;
--She speaks in thunder from her golden throne
With words *unwill'd*, and wisdom not her own.

So on his NIGHTMARE through the evening fog
Flits the squab Fiend o'er fen, and lake, and bog;
Seeks some love-wilder'd Maid with sleep
oppress'd
Alights, and grinning sits upon her breast.
--Such as of late amid the murky sky
Was mark'd by FUSELI'S poetic eye;
Whose daring tints, with SHAKESPEAR'S
happiest grace,
Gave to the airy phantom form and place.—
Back o'er her pillow sinks her blushing head,
Her snow-white limbs hang helpless from the bed;
While with quick signs, and suffocative breath,
Her interrupted heart-pulse swims in death.
--Then shrieks of captur'd towns, and windows'
tears,
Pale lovers stretch'd upon their blood-stain'd
biers,

[98]

The headlong precipice that thwarts her flight,
The trackless desert, the cold starless night,
And stern-eye'd Murderer with his knife behind,
IN dread succession agonize her mind.
O'er her fair limbs convulsive tremors fleet,
Start in her hands, and struggle in her feet;
In vain to scream with quivering lips she tries,
And strains in palsy'd lids her tremulous eyes;
In vain she *wills* to run, fly, swim, walk, creep;
The WILL presides not in the bower of SLEEP.
--On her fair bosom sits the Demon-Ape
Erect and balances his bloated shape;
The Will presides not. Sleep consists in the
abolition of all voluntary power, both over our
muscular motions and our ideas; for we neither
walk nor reason in sleep. But at the same time,
many of our muscular motions, and many of our
ideas continue to be excited into action in
consequence of the internal irritations and of
internal sensations; for the heart and arteries
continue to beat, and we experience variety of
passions, and even hunger and thirst in our dreams.
Hence I conclude, that our nerves of sense are not
torpid or inert during sleep; but that they are only
precluded from the perception of external objects,
by their external organs being rendered unfit to
transmit to them the appulses of external bodies,
during the suspension of the power of volition;
thus the eyelids are closed in sleep, and I suppose
the tympanum of the ear is not stretched, because
they are deprived of the voluntary exertions of the
muscles appropriated to these purposes; and it is
probable something similar happens to the external
apparatus of our other organs of sense, which may
render them unfit for their office of perception
during sleep: for milk put into the mouths of
sleeping babes occasions them to swallow and
suck; and, if the eye-lid is a little opened in the
day-light by the exertions of disturbed sleep, the
person dreams of being much dazzled. See first
interlude.

[99]

Rolls in their marble orbs his Gorgon-eyes,
And drinks with leathern ears her tender cries.

Arm'd with her ivory beak, and talon-hands,
Descending FICA dives into the sands;
Chamber'd in search with cold oblivion lies;
Nor heeds, *ye Sutor-train*, your amorous sighs;
Erewhile with renovated beauty blooms,
Mounts into air, and moves her leafy plumes
--Where HAMPS and MANIFOLD, their cliffs
among,

Each in his flinty channel winds along;
With lucid lines the dusky Moor divides,
Hurrying to intermix their sister tides.

When there arises in sleep a painful desire to exert
the voluntary motions, it is called the Nightmare or
Incubus. When the sleep becomes so imperfect
that some muscular motions obey this exertion of
desire, people have walked about, and even
performed some domestic offices in sleep; one of
these sleep-walkers I have frequently seen: once
she smelt of a tube-rose, and sung, and drank a
dish of tea in this state; her awaking was always
attended with prodigious surprise, and even fear;
this disease had daily periods, and seemed to be
one of the epileptic kind.

Ficus indica. Indian Fig-tree. Of the class
Polygamy. This large tree rises with opposite
branches on all sides, with long egged leaves; each
branch emits a slender flexile depending
appendage from its summit like a cord, which
roots in the earth and rises again. Sloan. Hist. Of
Jamaica. Lin. Spec. Plant. See Capri-ficus.

[100]

Where still their silver-bosom'd Nymphs abhor,
The blood-smear'd mansion of gigantic THOR, --
--Erst, fires volcanic in the marble womb
Of cloud-wrapp'd WETTON raised the massy
dome;

Rocks rear'd on rocks in huge disjointed piles
Form the tall turrets, and the lengthen'd ailes;
Broad ponderous piers sustain the roof, and wide
Branch the vast rain-bow ribs from side to side.
Gigantic Thor. Near the village of Wetton, a mile
or two above Dove-Dale, near Ashburn in
Derbyshire, there is a spacious cavern about the
middle of the ascent of the mountain, which still
retains the Name of Thor's house; below it is an
extensive and romantic common, where the river
Hamps and Manifold sink into the earth, and rise
again in Ilam gardens, the seat of John Port, Esq.
about three miles below. Where these rivers rise
again there are impressions resembling the Fish,
which appear to be of Jasper bedded in Limestone.
Calcareous Spars, Shells converted into a kind of
Agate, coral-lines in Marble, ores of Lead, Copper,
and Zinc, and many strata of Flint or Chert, and of
Toadstone, or Lava, abound in this part of the
country. The Druids are said to have offered
human sacrifices enclosed in wicker idols to Thor.
Thursday had its name from this Deity.

The broken appearance of the surface of many
parts of this country; with the Swallows, as they
are called, or basins on some of the mountains,
like volcanic Craters, where the rain-water sinks
into the earth; and the numerous large stones,
which seem to have been thrown over the land by
volcanic explosions; as well as the great masses of
Toadstone or Lava; evince the existence of violent
earthquakes at some early period of the world. At
this time the channels of these subterraneous rivers
seem to have been formed, when a long tract of
rocks were raised by the sea flowing in upon the
central fires, and thus producing an irresistible
explosion of steam; and when these rocks again
subsided, their parts did not exactly correspond,
but left a long cavity arched over in this operation
of nature. The cavities at Castleton and Buxton in
Derbyshire seem to have had a similar origin, as
well as this cavern termed Thor's house. See Mr.
Whitehurst's, and Dr. Huttons' Theories of the
Earth.

[101]

While from above descends in milky streams
One scanty pencil of illusive beams,
Suspended crags and gaping gulfs illumed,
And gilds the horrors of the deepen'd glooms.
--Here oft the Naiads, as they chanced to play
Near the dread Fane on THOR'S returning day,
Saw from red altars streams of guiltless blood
Stain their green reed-beds, and pollute their flood;
Heard dying babes in wicker prisons wail,
And shrieks of matrons thrill the affrighted Gale;
While from dark caves infernal Echoes mock,
And Fiends triumphant shout from every rock!
--So still the Nymphs emerging lift in air
Their snow-white shoulders and their azure hair;
Sail with sweet grace the dimpling streams along,
Listening the Shepherd's or the Miner's song;
But, when afar they view the giant-cave,
On timorous fins they circle on the wave,
With streaming eyes and throbbing hearts recoil,
Plunge their fair forms, and dive beneath the soil.--

[102]

Closed round their heads reluctant eddies sink,
And wider rings successive dash the brink. ---
Three thousand steps in sparry clefts they stray,
Or seek through sullen mines their gloomy way;
On beds of Lava sleep in coral cells,
Or sigh o'er jasper fish, and agate shells.
Till, where famed ILAM leads his boiling floods
Through flowery meadows and impending woods,
Pleased with light spring they leave the drear
night,
And 'mid circumfluent surges rise to light;
Shake their bright locks, the widening vale pursue,
Their sea-green mantles fringed with pearly dew;
In playful groups by towering THORP they move,
Bound o'er the foaming wears, and rush into the
Dove.

With fierce distracted eye IMPATIENS stands,
Swells her pale cheeks, and brandishes her hands,
Impatiens. Touch me not. The seed vessel consists
of one cell with five divisions; each of these, when
the seed is ripe, on being touched, suddenly folds
itself into a spiral form, leaps from the stalk, and
disperse the seed to a great distance by its
elasticity. The capsule of the geranium and the
beard of wild oats are twisted for a

[103]

With rage and hate the astonish'd groves alarms,
And hurls her infants from her frantic arms.
--So when MEDÆA left her native soil
Unaw'd y danger, unsubdued by toil;
Her weeping fire and beckoning friends withstood,
And launch'd enamour'd on the boiling flood;
One ruddy boy her gentle lips caress'd,
And one fair girl was pillowed on her breast;
While high in air the golden treasure burns,
And Love and Glory guide their prow by turns.
similar purpose, and dislodge their seeds on wet
days, when the ground is best fitted to receive
them. Hence one of these, with its adhering
capsule or beard fixed on a stand, serves the
purpose of an hygrometer, twisting itself more or
less according to the moisture of the air.
The awn of barley is furnished with stiff points,
which, like the teeth of a saw, are all turned
towards the point of it; as this long awn lies upon
the ground, it extends itself in the moist air of
night, and pushes forwards the barley corn, which
it adheres to; in the day it shortens as it dries; and
as these points prevent it from receding, it draws
up its pointed end; and thus, creeping like a worm,
will travel many feet from the parent stem. That
very ingenious Mechanic Philosopher, Mr.
Edgeworth, once made on this principle a wooden
automaton; its back consisted of soft Fir-wood,
about an inch square, and four feet long, made of
pieces cut the cross-way in respect to the fibres of
the wood, and glued together: it had two feet
before, and two behind, which supported the back
horizontally; but were placed with their
extremities, which were armed with sharp points
of iron, bending backwards. Hence, in moist
weather the back feet were drawn after, as the
obliquity of the points of the feet prevented it from
receding. And thus, in a month or two, it walked
across the room which it inhabited. Might not this
machine by applied as an Hygrometer to some
meteorological purpose?

[104]

But, when Thessalia's inauspicious plain
Received the matron-heroine from the main;
While horns of triumph sound, and altars burn,
And shouting nations hail their Chief's return;
Aghast, She saw new-deck'd the nuptial bed,
And proud CREUSA to the temple led;
Saw her in JASON'S mercenary arms
Deride her virtues, and insult her charms;
Saw her dead babes from fame and empire torn,
In foreign realms deserted and forlorn;
Her love rejected, and her vengeance braved,
By Him her beauties won, her virtues saved.
With stern regard she eyed the traitor-king,
"Nor Heaven," she cried, "nor Earth, nor Hell can
hold
"A Heart abandon'd to the thirst of Gold!"
Stamp'd with wild foot, and shook her horrent
brow,
And call'd the furies from their dens below.
--Slow out of earth, before the festive crowds,
On wheels of fire, amid a night of clouds,

[105]

Drawn by fierce fiends arose a magic car,
Received the Queen, and hovering flam'd in air.—
As with raised hands the suppliant traitors kneel,
And fear the vengeance they deserve to feel,
Thrice with parch'd lips her guiltless babes she
pres'd,
And thrice she clasp'd them to her tortur'd breast;
Awhile with white uplifted eyes she stood,
Then plung'd her trembling poniards in their
blood.
“Go, kiss your fire! go, share the bridal mirth!”
She cry'd, and hurl'd their quivering limbs on
earth.
Rebelling thunders rock the marble towers,
And red tongued lightnings shoot their arrowy
showers;
Earth yawns! – the crashing ruin sinks! – o'er all
Death with black hands extends his mighty Pall;
Their mingling gore the Fiends of Vengeance
quaff,
And hell receives them with convulsive laugh.

Round the vex'd isles where fierce tornados roar,
Or tropic breezes sooth the sultry shore;

[106]

What time the eve her gauze pellucid spreads
O'er the dim flowers, and veils the misty meads;
Slow, o'er the twilight sands or leafy walks,
With gloomy dignity DICTAMNA stalks;
In sulphurous eddies round the weird dame
Plays the light gas, or kindles into flame.
Dictamnus. Fraxinella. In the still evenings of dry
seasons this plant emits an inflammable air or gas,
and flashes on approach of a candle. There are
instances of human creatures who have taken fire
spontaneously, and been totally consumed. Phil.
Trans.

The odours of many flowers, so delightful to our
sense of smell, as well as the disagreeable scents
of others, are owing to the exhalation of their
essential oils. These essential oils have greater or
less volatility, and are all inflammable; many of
them are poisons to us, as these of Laurel and
Tabaco; others possess a narcotic quality, as is
evinced by the oil of cloves instantly relieving
slight tooth-aches; from oil of cinnamon reliving
the hiccup; and balsam of Peru relieving the pain
of some ulcers. They are all deleterious to certain
insects, and hence their use in the vegetable
economy, being produced in flowers or leaves to
protect them from the depredations of their
voracious enemies. One of the essential oils, that
of turpentine, is recommended, by M. de Thosse,
for the purpose of destroying insects which infect
both vegetables and animals. Having observed that
the trees were attacked by multitudes of small
insects of different colours (pucins ou pucerons)
which injured their young branches, he destroyed
them all entirely in the following manner: he put
into a bowl a few handfuls of earth, on which he
poured a small quantity of oil of turpentine; he
then beat the whole together with a spatula,
pouring on it water till it became of the
consistence of soup; with this mixture he
moistened the ends of the branches, and both the
insects and their eggs were destroyed, and other
insects kept aloof by the scent of the turpentine.
He adds, that he destroyed the fleas of his puppies
by once bathing them in warm water impregnated
with oil of turpentine. Mem. D'Agriculture, An.
1787, Tremest. Printemp. P. 109. I sprinkled some
oil of turpentine, by means of a brush, on some
branches of a nectarine tree, which was covered
with the aphis; but it killed both the insect and the
branches: a solution of arsenic much diluted did
the same. The shops of medicine are supplied with
resins, balsams, and essential oils; and the tar and
pitch, for mechanical purposes, are produced from

these vegetable secretions.

[107]

If rests the traveler his weary head,
Grim MANCINELLA haunts the mossy bed,
Brews her black hebenon, and, stealing near,
Pours the curst venom in his tortured ear. –
Wide o'er the mad'ning throng URTICA flings
Her barbed shafts, and darts her poison'd stings.
Manicnella. Hyppomane. With the milk juice of
this tree the Indians poison their arrows; the dew-
drops, which fall from it, are so caustic as to blister
the skin, and produce dangerous ulcers; whence
many have found their death by sleeping under its
shade. Variety of noxious plants abound in all
countries, in our own the deadly night-shade,
henbane, hounds-tongue, and many others, are
seen in almost every high road untouched by
animals. Some have asked, what is the use of such
abundance of poisons? The nauseous or pungent
juices of some vegetables, like the thorns of others
are given them for their defense from the
depredations of animals; hence the thorny plants
are in general wholesome and agreeable food to
graminivorous animals. See note on *Ilex*. The
flowers or petals of plants are perhaps in general
more acrid than their leaves; hence they are much
seldomer eaten by insects. This seems to have
been the use of the essential oil in the vegetable
economy, as observed above in the notes on
Dictamnus and *Ilex*. The fragrance of plants is thus
a part of their defense. These pungent or nauseous
juices of vegetables have supplied the science of
medicine with its principle materials, such as
purge, vomit, intoxicate., &c.

Urtica. Nettle. The sting has a bag at its base, and
a perforation near its point, exactly like the stings
of wasps and the teeth of adders; Hook, *Microgr.*
P. 142. Is the fluid contained in this bag, and
pressed through the perforation into the wound,
made by the point, a caustic essential oil, or a
concentrated vegetable acid? The vegetable
poisons, like the animal ones, produce more
sudden and dangerous effects, when instilled into a
wound, than when taken into the stomach, whence
the families of Marsi and Psilli, in ancient Rome,
sucked the poison without injury of the wounds
made by vipers, and were supposed to be imbued
with supernatural powers for this purpose. By the
experiment related by Beccaria, it appears that four
or five times the quantity, taken by the mouth, had
about equal effects with that infused into a wound.
The male flowers of the nettle are separate from
the female, and the anthers are seen in fair weather
to burst with force, and to discharge a dust, which

hovers about the plant like a cloud.

[108]

And fell LOBELIA's suffocating breath
Loads the dank pinion of the gale with death.
--With fear and hate they blast the affrighted
grows,
Yet own with tender care their *Kindred Loves!*—

So, where PALMIRA 'mid her wasted plains,
Her shatter'd aqueducts, and prostrate fanes,
(As the bright orb of breezy midnight pours
Long threads of silver through her gaping towers,
O'er moldering tombs, and tottering columns
gleams,
And frosts her deserts with diffusive beams),

Lobelia. Longiflora. Grows in the West Indies, and spreads such deleterious exhalations around it, that an oppression of the breast is felt on approaching it at many feet distance when placed in the corner of a room or hot-house. Ingenhouz, Exper. On Air, p. 146. Jacquini hort. botanic. Vindeb. The exhalations form ripe fruit, or withering leaves are proved much to injure the air in which they are confined; and, it is probable, all those vegetables which emit a strong scent may do this in a greater or less degree, from the Rose to the Lobelia; whence the unwholesomeness in living, perpetually in such an atmosphere of perfume as some people wear about their hair, or carry in their handkerchiefs. Either Boerhave or Dr. Mead have affirmed they were acquainted with a poisonous fluid whose vapour would presently destroy the person who sat near it. And it is well known, that the gas from fermenting liquors, or obtained from limestone, will destroy animals immersed in it, as well as the vapour of the Grotto del Cani near Naples.

So, where Palmira. Among the ruins of Palmira, which are dispersed not only over the plains but even in the deserts, there is one single colonnade above 2600 yards long, the bases of the Corinthian columns of which exceed the height of a man: and yet this row is only a small part of what remains of that one edifice! Volney's Travels.

[109]

Sad o'er the mighty wreck in silence bends,
Lifts her wet eyes, her tremulous hands extends. —
If from lone cliffs a bursting rill expands
Its transient course, and sinks into the sands;
O'er the moist rock the fell Hyæna prowls,
The Leopard hisses, and the Panther growls;
On quivering wing the famish'd Vulture screams,
Dips his dry beak, and sweeps the gushing
streams;
With foaming jaws, beneath, and sanguine tongue,
Laps the lean Wolf, and pants, and runs along;
Stern stalks the Lion, on the rustling brinks
Hears the dread Snake, and trembles as he drinks;
Quick darts the scaly Monster o'er the plain,
Fold after fold, his undulating train;
And, bending o'er the lake his crested brow,
Starts at the Crocodile, that gapes below.

Where seas of glass with gay reflections smile
Round the green coasts of Java's palm isle;

[110]

A spacious plain extends its upland scene,
Rocks rise on rocks, and fountains gush between;
Soft zephyrs blow, eternal summers reign,
And showers prolific bless the soil, --in vain!
--No spice nutmeg scents the vernal gales,
Nor towering plantain shades the mid-day vales;
No grassy mantle hides the sable hills,
No flowery chaplet crowns the trickling rills;
Nor tufted moss, nor leathery lichen creeps
In russet tapestry o'er the crumbling steeps.
--no step retreating, on the sand impres'd,
Invites the visit of a second guest;
No refluent fin the unpeopled stream divides,
No revolant pinion cleaves the airy tides;
Nor handed moles, nor beaked worms return,
That mining pass the irremeable bourn. --
Fierce in dread silence on the blasted heath
Fell UPAS sits, the HYDRA-TREE of death.
Upas. There is a poison-tree in the island of Java,
which is said by its effluvia to have depopulated
the country for 12 to 14 miles round the place of
its growth. It is

[111]

Lo! from one root, the evenenom'd soil below,
A thousand vegetative serpents grow;
In shining rays the scaly monster spreads
O'er ten square leagues his far-diverging heads;
Or in one trunk entwists his tangled form,
Looks o'er the clouds, and hisses in the storm.
Steep'd in fell poison, as his sharp teeth part,
A thousand tongues in quick vibration dart;
Snatch the proud Eagle towering o'er the heath,
Or pounce the Lion, as he stalks beneath;
Or strew, as marshall'd hosts content in vain,
With human skeletons the whiten'd plain.

called, in the Malayan language Bohon-Upas; with the juice of it the most poisonous arrows are prepared; and, to gain this, the condemned criminals are sent to the tree with proper direction both to get the juice and to secure themselves from the malignant exhalations of the tree; and are pardoned if they bring back a certain quantity of the poison. But by the registers there kept, not one in four are said to return. Not only animals of all kinds, both quadrupeds, fish, and birds, but all kinds of vegetables also are destroyed by the effluvia of the noxious tree; so that, in a district of 12 or 14 miles round it, the face of the earth is quite barren and rocky, intermixed only with the skeletons of men and animals; affording a scene of melancholy beyond what poets have described or painters delineated. Two younger trees of its own species are said to grow near it. See London Magazine for 1784, or 1783. Translated from a description of the poison-tree of the island of Java, written in Dutch by N. P. Foersch. For a further account of it, see a note at the end of the work.

[112]

--Chain'd at his root two scion-demons dwell,
Breathe the faint hiss, or try the shriller yell;
Rise, fluttering in the air on callow wings,
And aim at insect-prey their little stings.
So Time's strong arms with sweeping scythe eras
Art's cumberous works, and empires, from their
base:
While each young Hour its sickle fine employs,
And crops the sweet buds of domestic joys!
With blushes bright as morn fair ORCHIS charms,

And lulls her infant in her fondling arms;

Orchis. The Orchis morio in the circumstance of the parent-root shriveling up and dying, as the young one increases, is not only analogous to other tuberous or knobby roots, but also to some bulbous roots, as the tulip. The manner of production of herbaceous plants from their various perennial roots, seems to want further investigation, as their analogy is not yet clearly established. The caudex, or true root in the orchis lies above the knob; and from this part of the fibrous roots and the new knob are produced. In the tulip the caudex lies below the bulb; from whence proceed the fibrous roots and the new bulbs; the root, after it has flowered, dies like the orchis-root; for the stem of the last year's tulip lies on the outside, and not in the centre of the bulb; which I am informed does not happen in the three or four first years when raised from seed, when it only produces a stem, and slender leaves without flowering. In the tulip-root, dissected in the early spring, just before it begins to shoot, a perfect flower is seen in its centre; and between the first and second coat the large next year's bulb is, I believe, produced; between the second and third coat, and between this and the fourth coat, and perhaps further, other less and less bulbs are visible, all adjoining to the caudex at the bottom of the mother bulb; and which, I am told, require as many years before they will flower, as the number of the coats with which they are covered. This annual reproduction

[113]

Soft plays *Affection* round her bosom's throne,
And guards his life, forgetful of her own.
SO wings the wounded Deer her headlong flight,
Pierced by some ambush'd archer of the night,
Shoots to the woodlands with her bounding fawn,
And drops of blood bedew the conscious lawn;
There hid in shades she shuns the cheerful day,
Hangs o'er her young, and weeps her life away.

of the tulip-root induces some florists to believe that tulip-roots never die naturally, as they do lose so few of them; whereas the hyacinth-roots, I am informed, will not last above five or seven years after they have flowered.

The hyacinth-root differs from the tulip-root, as the stem of the last year's flower is always found in the centre of the root, and the new off-sets arises from the caudex below the bulb, but not beneath any of the concentric coats of the root, except the external one: hence MR. Eaton, an ingenious florist of Derby, to whom I am indebted for most of the observations in this note, concludes, that the hyacinth-root does not perish annual after it has flowered like the tulip. Mr. Eaton gave me a tulip-root which had been set too deep in the earth, and the caudex had elongated itself near an inch, and the new bulb was formed above the old one, and detached from it, instead of adhering to its side. See addit. Notes to Vol. 1. No. XIV.

The caudex of the ranunculus, cultivated by the florists, lies above the claw-like root; in this the old root or claws die annually, like the tulip and orchis, and the new claws, which are seen above the old ones, drawn down the caudex lower into the earth. The same is said to happen to Scabiosa, or Devil's bit, and some other plants, as valerian and greater plantain; the new fibrous roots rising round the caudex above the old ones, the inferior end of the root becomes stumped as if cut off, after the old fibres are decayed, and the caudex is drawn down into the earth by these new roots. See Arum and Tulipa.

[114]

So stood Eliza on the wood-crown'd height,
O'er Minden's plain, spectatress of the fight,
Sought with bold eye amid the bloody strife
Her dearer self, the partner of her life;
From hill to hill the rushing host pursued,
And view'd his banner, or believed she view'd.
Pleased with the distant roar, with quicker tread
Fast by his hand one lisp'ing boy she led;
And one fair girl amid the loud alarm
Slept on her kerchief, cradled by her arm;
While round her brows bright beams of Honour
dart,
And Love's warm eddies circle round her heart.
--Near and more near the intrepid Beauty press'd,
Saw through the driving smoke his dancing crest;
Saw on his helm, her virgin-hands inwove,
Bright stars of gold, and mystic knots of love;
Heard the exulting shout, "they run! they run!"
"Great GOD!" she cried, "He's safe! the battle's
won!"
--A ball now hisses through the airy tides,
(Some Fury wing'd it, and some Demon guides!"

[115]

Parts the fine locks, her graceful head that deck,
Wounds her fair ear, and sinks into her neck;
The red stream, issuing from her azure veins,
Dyes her white veil, her ivory bosom stains. --
--"Ah me; she cried, and, sinking on the ground,
Kiss'd her dead babes, regardless of the wound;
"Oh, cease not yet to beat, thou Vital Urn!
"Wait, gushing Life, oh, wait my Love's return!
"Hoarse barks the wolf, the vulture screams from
far! --
"The angle Pity, shuns the walks of war!--
"Oh, spare, ye War-hounds, spare their tender
age!--
"On me, on me," she cried, "exhaust your rage!"--
And sighing hid them in her blood-stain'd vest.

From tent to tent the impatient warrior flies,
Fear in his heart, and frenzy in his eyes;
Eliza's name along the camp he calls,
Eliza echoes through the canvas walls;

[116]

Quick through the murmuring gloom his footsteps tread,
O'er groaning heaps, the dying and the dead,
Vault o'er the plain, and in the tangled wood,
Lo! dead Eliza weltering in her blood! –
--Soon hears his listening son the welcome sounds,
With open arms and sparkling eyes he bounds: --
"Speak low," he cries, and gives his little hand,
"Eliza sleeps upon the dew-cold sand;
"Poor weeping babe with bloody fingers pres'd,
"And tried with pouting lips her milkless breast;
"Alas! we both with cold and hunger quake –
"Why do ye weep? –Mama will soon awake."
--"She'll wake no more!" the hopeless mourner cried,
Upturn'd his eyes, and clasp'd his hands, and sigh'd;
Stretch'd on the ground awhile entranc'd he lay,
And press'd warm kisses on the lifeless clay;
And then upsprung with wild convulsive start,
And all the Father kindled in his heart;
"Oh, Heavens!" he cried, my first rash vow forgive;
"These bind to earth, for these I pray to live!" –

[117]

Round his chill babes he wrapp'd his crimson vest,
And clasp'd them sobbing to his aching breast.
Two Harlot-Nymphs, the fair CUSCUTAS, please
With labour'd negligence, and studied ease;
IN the meek garb of modest worth disguised,
The eye averted, and the smile chastised,
With fly approach they spread their dangerous charms,
And round their victim wind their wiry arms.
Cuscuta. Dodder. Four males, two females. This parasite plant (the seed splitting without cotyledons), protrudes a spiral body, and not endeavoring to root itself in the earth ascends the vegetables in its vicinity, spirally W.S.E. or contrary to the movement of the sun; and absorbs its nourishment by vessels apparently inserted into its supporters. It bears no leaves, except here and there a scale, very small, membranous, and close under the branch. Lin. Spec. Plant. Edit a Reichard. Vol I. p. 352. The Rev. T. Martyn, in his elegant letters on botany, adds, that, not content with support, where it lays hold, there it draws its nourishment; and at length, in gratitude for all this,

strangles its entertainer. Letter XV. A contest for air and light obtains throughout the whole vegetable world; shrubs rise above herbs and, by precluding the air and light from them, injure or destroy them; trees suffocate or incommode shrubs; the parasite climbing plants, as Ivy, Clematis, incommode the taller trees; and other parasites, which exist without having roots on the ground, as Mistletoe, Tillandsia, Epidendrum, and the mosses and funguses, incommode them all. Some of the plants with voluble stems ascend other plants spirally east-south-west, as Humulus, Hop, Lonicera, Honey-suckle, Tamus, black Bryony, Helxine. Others turn their spiral stems west-south-east, as Convolvulus, Corn-bind, Phosealus, Kidney-bean, Basella, Cynanche, Euphorbia, Eupatorium. The proximate or final causes of this difference have not been investigated. Other plants are furnished with the tendrils for the purpose of climbing: if the tendril meets with nothing to lay hold of in its first revolution,

[118]

So by Scamander when LAOCOON stood,
Where Troy's proud turrets glitter'd in the flood,
Raised high his arm, and with prophetic call
To shrinking realms announced her fated fall;
Whirl'd his fierce spear with more than mortal
force,
And pierced the thick ribs of the echoing horse;
Two Serpent-forms incumbent on the main,
Lashing the white waves with redundant train,
Arch'd their blue necks, and shook their towering
crests,
And plough'd their foam way with speckled
breasts;
Then, darting fierce amid the affrighted throng,
Roll'd their red eyes, and shot their forked
tongues. –
--Two daring Youths to guard the hoary fire
Thwart their dread progress, and provoke their ire.
It makes another revolution; and so on till it wraps
itself quite up like a corkscrew; hence to a careless
observer, it appears to move gradually backwards
and forwards, being seen sometimes pointing
eastward and sometimes westward. One of the
Indian grasses, *Panicum arborescens*, whose stem
is no thicker than a goose-quill, rises as high as the
tallest trees in this contest for light and air. *Spec.*
Plant a Rierchard, Vol. I. p. 161. The tops of many
climbing plants are tender from their quick
growth; and, when deprived of their acrimony by
boiling, are an agreeable article of food. The Hop-
tops are in common use. I have eaten the tops of
white Bryony, *Bryonia alba*, and found them
nearly as grateful as Asparagus, and think this
plant might be profitably cultivated as an early
garden-vegetable. The *Tamus* (called black
Bryony), was less agreeable to taste when boiled.
See *Galanthus*.

[119]

Round fire and sons the scaly monsters roll'd,
Ring above ring, in many a tangled fold,
Close and more close their writhing limbs
surround
And fix with foamy teeth the envenom'd wound.
--With brow upturn'd to heaven the holy Sage
In silent agony sustains their rage;
While each fond Youth, in vain, with piercing
cries
Bends on the tortured Sire his dying eyes.

“Drink deep, sweet youths,” seductive VITIS
cries,
The maudlin tear-drop glittering in her eyes;
Green leaves and purple clusters crown her head,
And the tall Thyrsus stays her tottering tread.
Vitis. Vine. Five males, one female. The juice of
the ripe grape is a nutritive and agreeable food,
consisting chiefly of sugar and mucilage. The
chemical process of fermentation converts this
sugar into spirit, converts food into poison! And it
has thus become the curse of the Christian world,
producing more than half of our chronic
diseases; which Mahomet observed, and forbade
the use of it to his disciples. The Arabians invented
distillation; and thus, by obtaining the spirit of
fermented liquors in a less diluted state, added to
its destructive quality. A Theory of the Diabætes
and Dropsy, produced by drinking fermented or
spirituous liquors, is explained in a Treatise on the
inverted motions of the lymphatic system,
published by Dr. Darwin. Cadell.

[120]

--*Five* hapless swains with soft assuasive smiles
The harlot meshes in her deathful toils;
"Drink deep," she carols, as she waves in air
The mantling goblet, "and forget your care."—
O'er the dread feast malignant *Chemia* scowls,
And mingles poison in the nectar'd bowls;
Fell Gout peeps grinning through the flimsy scene,
And bloated *Dropsy* pants behind unseen;
Wrapp'd in his robe white *Lepra* hides his stains,
And silent *Frenzy* writhing bites his chains.

So when *PROMETHEUS* braved the Thunderer's ire,
Stole from his blazing throne ethereal fire,
Prometheus. The ancient story of Prometheus, who concealed in his bosom the fire he had stolen, and afterwards had a vulture perpetually gnawing his liver, affords so apt an allegory for the effects of drinking spirituous liquors, that one should be induced to think the art of distillation, as well as some other chemical processes (such as calcining gold), had been known in times of great antiquity, and lost again. The swallowing drams cannot be better represented in hieroglyphic language than by taking fire into one's bosom; and certain it is, that the general effect of drinking fermented or spirituous liquors is an inflamed, schirrous, or paralytic liver, with its various critical or consequential diseases, as leprous eruptions on the face, gout, dropsy, epilepsy, insanity. It is remarkable, that all the diseases from drinking spirituous or fermented liquors are liable to become hereditary, even to the third generation; gradually increase, if the cause be continued, till the family becomes extinct.

[121]

And, latern'd in his breast, from realms of day
Bore the bright treasure to his Man of clay; --
High on cold *Caucasus* by *VULCAN* bound,
The lean impatient *Vulture* fluttering round,
His writhing limbs in vain he twists and strains
To break loose the adamantine chains.
The gluttonous bird, exulting in his pangs,
Tears his swollen liver with remorseless fangs.

The gently *CYCLAMEN* with dewy eye
Breathes o'er her lifeless babe the parting sigh;
And, bending low to earth, with pious hands
Inhumes her dear Departed in the sands.
Cyclamen. Shew-bread, or Sow-bread. When the seeds are ripe, the stalk of the flower gradually twists itself spirally downwards, till it touches the ground, and forcibly penetrating the earth lodges its seeds; which are thought to receive nourishment from the parent root, as they are said not to be made to grow in any other situation.
The *Trifolium subterraneum*, subterraneous trefoil, is another plant, which buries its seed, the globular head of the seed penetrating the earth; which, however, in this plant may be only an attempt to conceal its seeds from the ravages of birds; for there is another trefoil, the *trifolium globosum*, or globular woolly-headed trefoil, which has a curious manner of concealing its seeds; the lower florets only have corols and are fertile; the upper ones wither into a kind of wool, and forming a head, completely conceal the fertile calyxes. *Lin. Spec. Plant. A Riechard*.

[122]

“Sweet Nursling! withering in thy tender hour,
“Oh, sleep,” She cries, “and rise a fairer flower!”
--So when the Plague o'er London's gasping
crowds
Shook her dank wing, and steer'd her murky
clouds;
When o'er the friendless bier no rites were read,
No dirge slow-chanted, and no pall out-spread;
While Death and Night piled up the naked throng,
And Silence drove their ebon cars along;
Six lovely daughters, and their father, swept
To throng'd grave CLEONE saw, and wept;
Her tender mind, with meek Religion fraught,
Drank all-resigned Affliction's bitter draught;
Alive and listening to the whisper'd groan
Of others' woes, unconscious of her own!—
One smiling boy, her last sweet hope, she warms
Hushed on her bosom, circled in her arms,--
Daughter of woe! ere morn, in vain caress'd,
Clung the cold Babe upon thy milkless breast,
With feeble cries thy last sad aid required,
Stretch'd its stiff limbs, and on thy lap expired!--

[123]

--Long with wide eye-lids on her Child she gazed,
And long to heaven their tearless orbs she raised;
Then with quick foot and throbbing heart she
found
Where Chartreuse open'd deep his holy ground;
Bore her last treasure through the midnight gloom,
And kneeling dropp'd it in the mighty tomb;
“I follow next!” the frantic mourner said,
And living plunged amid the festering dead.

Where vast Ontario rolls his brineless tides,
And seeds the trackless forests on his sides,
Where Chartreuse. During the plague in London,
1665, one pit to receive the dead was dug in the
Charter-house, 40 feet long, 16 feet wide, and
about 20 feet deep; and in two weeks received
1114 bodies. During this dreadful calamity there
were instances of mothers carrying their own
children to those public graves, and of people
delirious, or in in despair from the loss of their
friends, who threw themselves alive into these pits.
Journal of the Plague-year in 1665, printed for E.
Nutt, Royal-Exchange.

Rolls his brineless tide. Some philosophers have
believed that the continent of America was not
raised out of the great ocean at so early a period of
time as the other continents. One reason for this
opinion was, because the great lakes, perhaps
nearly as large as the Mediterranean Sea, consist
of fresh water. And as the sea-salt seems to have
its origin from the destruction of vegetable and
animal bodies, washed down by rains, and carried
by rivers into lakes or seas; it would seem that this
source of sea-salt had not so long existed in that
country. There is, however, a more satisfactory
way of explaining

[124]

Fair CASSIA trembling hears the howling woods,
And trusts her tawny children to the floods. –
this circumstance; which is that the American
lakes lie above the level of the ocean, and are
hence perpetually desalinated by the rivers which run
through them; which is not the case with the
Mediterranean, into which a current from the main
ocean perpetually passes.

Cassia. Ten males, one female. The seeds are
black, the stamens gold-colour. This is one of the
American fruits, which are annually thrown on the
coasts of Norway; and are frequently in so recent a
state as to vegetate, when properly taken care of,
the fruit of the anacardium, cashew-nut; of
cucurbita lagenaria, bottlegourd; of the mimosa

scandens, cocoons; of the *piscidia erythrina*, logwood-tree; and cocoa-nuts are enumerated by Dr. Tønning. (*Amæn. Acad.* 149.) amongst these emigrant seeds. The fact is truly wonderful, and cannot be accounted for but by the existence of under currents in the depths of the ocean; or from vortexes of water passing from one country to another through caverns of the earth.

Sir Hans Sloane has given an account of four kinds of seeds, which are frequently thrown by the sea upon the coasts of the islands of the northern parts of Scotland. *Phil. Trans.* abridged, Vol. III. P.540, which seeds are natives of the West Indies, and seem to be brought thither by the gulf-stream described below. One of these is called, by Sir H. Sloan, *Phaseolus maximus perennis*, which is often also thrown on the coast of Kerry in Ireland; another is called, in Jamaica, Horse-eye-bean; and a third is called *Niker* in Jamaica. He adds, that the *Lenticula marina*, or Sargasso, grows on the rocks about Jamaica, is carried by the winds and current towards the coast of Florida, and thence into the North-American ocean, where it lies very thick on the surface of the sea.

Thus a rapid current passes from the gulf of Florida to the N.E. along the coast of North-America, known to seamen by the name of the GULF-STREAM. A chart of this was published by Dr. Franklin in 1768, from the information principally of Cap. Folges. This was confirmed by the ingenious experiments of Dr. Blagden, published in 1781, who found that the water of the Gulf-stream was from six to eleven degrees warmer than the water of the sea through which it ran; which must have been occasioned by its being brought from a hotter climate. He ascribes the origin of this current to the power of the trade-winds, which, blowing always in the same direction, carry the waters of the Atlantic ocean to the westward, till they are stopped by the opposing continent on the west of the Gulf of Mexico, and are thus accumulated there, and run down: the Gulf of Florida. *Philos. Trans.* V. 71, p.335. Governor Pownall has given

[125]

Cinctured with gold while *ten* fond brothers stand,
And guard the beauty on her native land,
Soft breathes the gale, the current gently moves,
And bears to Norway's coasts her infant-loves
--SO the sad mother at the noon of night
From bloody Memphis stole her silent flight;
Wrapp'd her dear babe beneath her folded vest,
And clasp'd the treasure to her throbbing breast,
With soothing whispers hushed its feeble cry,
Press'd to the soft kiss, and breathed the secret sigh.—

an elegant map of this Gulf-stream, tracing it from the Gulf of Florida north-ward as far as the Cape Sable in Nova Scotia, and then across the Atlantic ocean to the coast of Africa between the Canary-islands and Senegal, increasing in breadth, as it runs, till it occupies five or six degrees of latitude. The Governor likewise ascribes this current to the force of the trade-winds *protruding* the waters westward, till they are opposed by the continent, and accumulated in the Gulf of Mexico. He very ingeniously observes, that a great eddy must be produced in the Atlantic ocean between this Gulf-stream, and some light fields of floating vegetables, called Saragossa weeds, and Gulf-weeds, and some light woods, which circulate in these vast eddies, or are occasionally driven out of them by the winds. *Hydraulic and Nautical Observations* by Governor Pownall, 1787. Other currents are mentioned by the Governor in this ingenious work, as those in the Indian Sea, northward of the line, which are ascribed to the influence of the Monsoons. IT is probable, that in process of time the narrow tract of land on the west of the Gulf of Mexico may be worn away by this elevation of water dashing against it, by which this immense current would cease to exist, and a wonderful change take place in the Gulf of Mexico and West Indian islands, by the subsiding of the sea, which might probably lay all those islands into one, or join them to the continent.

[126]

--With dauntless step she seeks the winding shore,
Hears unappall'd the glimmer torrents roar;
With Paper-flags a floating cradle weaves,
And hides her smiling boy in Lotus-leaves;
Gives her white bosom to his eager lips,
The salt-tears mingling with the milk he sips;
Waits on the reed-crown'd brink with pious guile,
And trusts the scaly monsters of the Nile. --
--Erewhile majestic from his lone abode,
Ambassador of Heaven, the Prophet trod;
Wrench'd the red Scourge from proud
Oppression's hands,
And broke, curst Slavery! thy iron bands.

Hark! Heard ye not that piercing cry,

Which shook the waves and rent the sky!—

E'en now, e'en now, on yonder Western shores
Weeps pale Despair, and writhing Anguish roars;

[127]

E'en now in Afric's groves with hideous yell
Fierce SLAVERY stalks, and slips the dogs of
hell;

From vale to vale the gathering cries rebound,
And sable nations tremble at the sound!—

--YE BANDS OF SEANTORS! Whose suffrage
sways

Britannia's realms, whom either Ind obeys;

Who right the injured, and reward the brave,
Stretch your strong arm, for ye have power to
save!

Throned in the vaulted heart, his dread resort,
inexorable CONSCIENCE holds his court;

With still small voice the plots of Guilt alarms,

Bares his mask'd brow, his lifted hand disarms;

But, wrap'd in night with terrors all his own,

He speaks in thunder, when the deed is done.

Hear him, ye Senates! hear this truth sublime,

“HE, WHO ALLOWS OPPRESSION, SHARES
THE CRIME.”

No radiant pearl, which crested Fortune wears,

No gem, that twinkling hangs from Beauty's ears,

[128]

Not the bright stars, which Nights blue arch adorn,
Nor rising suns that gild the vernal morn,
Shine with such lustre as the tear, that breaks
For other's woe down Virtue's manly cheeks."

Here ceased the MUSE, and dropp'd her tuneful
shell,

Tumultuous woes her painting bosom swell,
O'er her flush'd cheek her gauzy veil she throws,
Folds her white arms, and bends her laurel'd
brows;

For human guilt awhile the Goddess sighs,
And human sorrows dim celestial eyes.

INTERLUDE III

Bookseller. POETRY has been called a sister-art both to Painting and to Music; I wish to know, what are the particulars of their relationship?

Poet. It has been already observed, that the principal part of the language of poetry consists of those words, which are expressive of the ideas, which we originally receive by the organ of sight; and in this it nearly indeed resembles painting; which can express itself in no other way, but by exciting the ideas or sensations belonging to the sense of vision. But besides this essential similitude in the language of the poetic pen and pencil, these two sisters resemble each other, if I may so say, in many of their habits and manners. The painter, to produce a strong effect, makes a few parts of his picture large, distinct, and luminous, and keeps the remainder in shadow, or even beneath its natural size and colour, to give eminence to the principal figure. This is similar to the common manner of poetic composition, where the subordinate characters are kept down, to elevate and give consequence to the hero or heroine of the piece.

In the south aisle of the cathedral church at Lichfield, there is an ancient monument of a recumbent figure; the head and neck of which lie on a roll of matting in a kind of niche or cavern in the wall; and about five feet distant horizontally in another opening or

[130]

cavern in the wall are seen the feet and ankles, with some folds of garment, lying also on a matt; and though the intermediate space is a solid stone-wall, yet the imagination supplies the deficiency, and the whole figure seems to exist before our eyes. Does not this resemble one of the arts both of the painter and the poet? The former often shows the muscular arm amidst a group of figures, or an impassioned face; and, hiding the remainder of the body behind other objects, leaves the imagination to complete it. The latter, describing a single feature or attitude in picturesque words, produces before the mind an image of the whole.

I remember seeing a print, in which was represented a shriveled hand stretched through an iron grate, in the stone floor of a prison-yard, to reach at a mess of porridge, which affected me with more horrid ideas of the distress of the prisoner in the dungeon below, than could have been perhaps produced by an exhibition of the whole person. And in the following beautiful scenery from the *Midsummer-night's dream*, (in which I have taken the liberty to alter the place of the comma), the description of the swimming step and prominent belly brings the whole figure before our eyes with the distinctness of reality.

When we have laugh'd to see the sails conceive
And grow big-bellied with the wanton wind;
Which she with pretty and with swimming gate,
Following her womb (then rich with my young squire),
Would imitate, and sail upon the land.

There is a third sister-feature which belongs both to the pictorial and poetic art; and that is the making sentiments and passions visible, as it were, to the spectator; this is done in both arts by describing or portraying the effects or changes which those sentiments or passions produce upon the body. At the end of the unaltered play of *Lear*, there is a beautiful example of poetic painting; the old King is introduced as dying from grief for the loss of *Cordelia*;

[131]

at this crisis, Shakespeare, conceiving the robe of the King to be held together by a clasp, represents him as only saying to an attendant courtier in a faint voice, "Pray, Sir, undo this button, --thank you, Sir," and dies. Thus by the art of the poet, the oppression at the bosom of the dying King is made visible, not described in words.

B. What are the features, in which these Sister-arts do not resemble each other?

P. The ingenious Bishop Berkeley, in his *Treatise on Vision*, a work of great ability, has evinced, that the colours which we see, are only a language suggesting to our minds the ideas of solidity and extension, which we had before received by the sense of touch. Thus when we view the trunk of a tree, our eye can only acquaint us with the colours or shades; and from the previous experience of the sense of touch, these suggest to us the cylindrical form, with prominent or depressed wrinkles on it. From hence it appears, that there is the strictest analogy between colours and sounds; as they are both but languages, which do not represent their correspond ideas, but only suggest them to the mind from the habits or associations of previous experience. It is therefore reasonable to conclude, that the more artificial arrangements of these two languages by the poet and the painter bear a similar analogy.

But in one circumstance the Pen and the Pencil differ widely from each other, and that is the quantity of Time which they can include in their respective representations. The former can unravel a long series of events, which may constitute the history of days or years; while the latter can exhibit only the actions of a moment. The Poet is happier in describing successive scenes; the Painter in representing stationary ones: both have their advantages.

Where the passions are introduced, as the Poet, on one hand, has the power gradually to prepare the mind of his reader by previous climacteric circumstances; the Painter, on the other hand, can throw strong illumination and distinctness on the principal moment or

[131]

catastrophe of the action; besides the advantage he has in using an universal language, which can be *read* in an instant of time. Thus where a great number of figures are all seen together, supporting or contrasting each other, and contributing to explain or aggrandize the principal effect, we view a picture with agreeable surprize, and contemplate it with unceasing admiration. In the representations of the sacrifice of Jephtha's Daughter, a print done from a painting of Ant. Coytel, at once glance of the eye we read all the interesting passages of the last act of a well-written tragedy; so much poetry is there condensed into a moment in time.

B. Will you now oblige me with an account of the relationship between Poetry, and her other sister, Music?

P. In the poetry of our language I don't think we are to look for any thing analogous to the notes of the gamut; for, except perhaps in a few exclamations or interrogations, we are at liberty to raise or sink our voice an octave or two at pleasure, without altering the sense of the words. Hence, if either poetry or prose can be read in melodious tones of voice, as it done in recitativo, or in chanting, it must depend on the speaker, not on the writer: for though words may be selected which are less harsh than others, that is, which have fewer sudden stops or abrupt consonants amongst the vowels, or with fewer sibilant letters, yet this does not constitute melody, which consists of agreeable successions of notes referable to the gamut; or harmony, which consists of agreeable combinations of them. If the Chinese language has many words of similar articulation, which yet signify different ideas, when spoken in a higher or lower musical note, as some travelers affirm, it must be capable of much finer effect, in respect to the audible part of poetry, than any language we are acquainted with.

There is however another affinity, in which poetry and music more nearly resemble each other than has generally been understood, and that is in their measure or time. There are but two kinds

[131]

of time acknowledge in modern music, which are called *triple time*, and *common time*. The former of these is divided by bars, each bar containing three crotchets, or a proportional number of their subdivisions into quavers and semiquavers. This kind of time is analogous to the measure of our heroic or iambic verse. Thus the two following couplets are each of them divided into five bars of *triple time*, each bar consisting of two crotchets and two quavers; nor can they be divided into bars analogous to *common time* without the bars interfering with some of the crotchets, so as to divide them.

3/4 Soft-warbling beaks | in each bright blos | som
move,
And vo | cal rosebuds thrill | the enchanted grove, |

In these lines there is a quaver and a crotchet alternately in every bar, except in the last, in which *the in* make two semiquavers; the *e* is supposed by Grammarians to be cut off, which any one's ear will readily determine not to be true.

3/4 Life buds or breathes | from Indus to | the
poles,
And the | vast surface kind |les, as it rolls.|

In these lines there is a quaver and a crotchet alternately in the first bar; a quaver, two crotchets, and a quaver, make the second bar. In the third bar there is a quaver, a crotchet, and a rest after the crotchet, that is after the word *poles*, and two quavers begin the next line. The fourth bar consists of quavers and crotchets alternately. In the last bar there is a quaver, and a rest after it viz. after the word *kindles*; and then two quavers and a crotchet. You will clearly perceive the truth of this, if you prick the musical characters above mentioned under the verses.

The *common time* of musicians is divided into bars, each of which contains four crotchets, or a proportional number of their subdivision into quavers and semiquavers. This kind of musical time is analogous to the dactyl verses of our language, the most popular

[134]

instances of which are in Mr. Anstie's Bath-Guide. In this kind of verse the bar does not begin till after the first or second syllable; and where the verse is quite complete, and written by a good ear, these first syllables added to the last complete the bar, exactly in this also corresponding with many pieces of music;

2/4 Yet | if one may guess by the | size of his calf
Sir,
He | weighs about twenty-three | stone and a half,
Sir.

In these lines each bar consists of a crotchet, two quavers, another crotchet, and two more quavers: which are equal to four crotchets, and, like many bars of *common time* in music, may be subdivided into two in beating time without disturbing the measure.

The following verses from Shenstone belong likewise to common time:

2/4 A | river or a sea
Was to him a dish | of tea,
And a king | dom bread and butter.

The first and second bars consist each of a crotchet, a quaver, a crotchet, a quaver, a crotchet. The third bar consists of a quaver, two crotchets, a quaver, a crotchet. The last bar is not complete without adding the latter A, which begins the first line, and then it consists of a quaver, a crotchet, a quaver, a crotchet, two quavers.

It must be observed, that the crotchets in triple time are in general played by musicians slower than those of common time, and hence minuets are generally pricked in triple time, and country dances generally in common time. So the verses above related, which are so analogous to *triple time*; are generally read slower than

[135]

those analogous to *common time*; and are thence generally used for graver compositions. I suppose all the different kinds of verses to be found in our odes, which have any measure at all, might be arranged under one or other of these two musical times; allowing a note or two sometimes to precede the commencement of the bar, and occasional rests, as in musical compositions: if this was attended to be those who set poetry to music, it is probably the sound and sense would oftener coincide. Whether these musical times can be applied to the lyric and heroic verses of the Greek and Latin poets, I do not pretend to determine; certain it is, that the dactyl verse of our language, when it is ended with double rhyme, much resembles the measure of Homer and Virgil, except in the length of the lines.

B. Then there is no relationship between the other two of these sister-ladies, Painting and Music?

P. There is at least a mathematical relationship, so perhaps I ought rather to have said a metaphysical relationship between them. Sir Isaac Newton has observed, that the breadths of the seven primary colours in the Sun's image refracted by a prism are proportional to the seven musical notes of the gamut, or to the intervals of the eight sounds contained in an octave, that is, proportional to the following numbers:

Sol/Red/1/9 La/Orange/1/16 Fa/Yellow/1/10
Sol/Green/1/9 La/Blue/1/16 Mi/Indigo/1/16
Fa/Violet/1/19 Sol

Newton's Optics, Book 1. Part 2. Prop. 3. And 6.
Dr. Smith, in his Harmonics, has an explanatory note upon this happy discovery, as her terms it, of Newton. Sect. 4. Art. 7.

[136]

From this curious coincidence, it has been proposed to produce a luminous music, consisting of succession or combinations of colours analogous to a tune in respect to the proportions above mentioned. This might be performed by a strong light, made by means of Mr. Argand's lamps, passing through coloured glasses, and falling on a defined part of a wall, with moveable blinds before them, which might communicate with the keys of a harpsichord; and thus produce at the same time visible and audible music in unison with each other.

The execution of this idea is said by Mr Guyot to have been attempted by Father Caffel, without much success.

If this should be again attempted, there is another curious coincidence between sounds and colours, discovered by Dr. Darwin of Shrewsbury, and explained in a paper on what he calls *Ocular Spectra* in the Philosophical Transactions, Vol. LXXVI. Which might much facilitate the execution of it. In this treatise the Doctor has demonstrated, that we see certain colours, not only with greater ease and distinctness, but with relief and pleasure, after having for some time contemplated other certain colours; as green after red, or red after green; orange after blue, or blue after orange; yellow after violet, or violet after yellow. This he shews arises from the *ocular spectrum* of the colour last viewed coinciding with the *irritation* of the colour now under contemplation. Now as the pleasure we receive from the sensation of melodious notes, independent of the previous associations of agreeable ideas with them, must arise from our hearing some proportions of sounds after others more easily, distinctly, or agreeably; and as there is a coincidence between the proportions of the primary colours, and the primary sounds, if they may be so called; he argues, that the same laws must govern the sensations of both. IN this circumstance, therefore, consists the sisterhood of Music and Painting; and hence they claim a right to borrow metaphors from each other; musicians to speak of the brilliancy of sounds, and the light and shade of a concerto; and painters of the

[137]

Harmony of colours, and the tone of a picture. Thus it is not quite so absurd, as we imagined, when a blind man asked if the colour scarlet was like the sound of a trumpet. As the coincidence or opposition of these *ocular spectra*, (or *colorus* which remain in the eye after we have for some time contemplated a luminous object) are more easily and more accurately ascertained, now their laws have been investigated by Dr. Darwin, than the *relicts* of evanescent sounds upon the ear; it is to be wished that some ingenious musician would further cultivate this curious field of science: for if visible music can be agreeably produced, it would be more easy to add sentiment to it by representations of groves and Cupids, and sleeping nymphs amid he changing colours, than is commonly done by the words of audible music.

B. You mentioned the greater length of the verses of Homer and Virgil. Had not these poets great advantage in the superiority of their languages compared to our own?

P. It is probable, that the introduction of philosophy into a country must gradually affect the language of it; as philosophy converses in more appropriated and abstracted terms; and thus by degrees eradicates the abundance of metaphor, which is used in the more early ages of society. Otherwise, though the Greek compound words have more vowels in proportion to their consonants than the English ones, yet the modes of compounding them are less general; as may be seen by the variety of instances given in the preface of the Translators, prefixed to the SYSTEM OF VEGETABLES by the Lichfield Society; which happy property of our own language rendered that translation of Linnaeus as expressive and as concise, perhaps, more so than the original.

And in one respect, I believe, the English language serves the purpose of poetry better than the ancient ones, I mean in the greater ease of producing personifications; for as our nouns have in general

[138]

no genders affixed to them in prose-compositions, and in the habits of conversation, they become easily personified only by the addition of masculine or feminine pronoun, as,

Pale Melancholy sits, and round *her* throws
A death-like silence, and a dread repose.

Pope's Abelard

And secondly, as most of our noons have the article *a* or *the* prefixed to them in prose-writing and in conversation, they in general become personified even by the omission of these articles; as in the bold figure of Shipwreck in Miss Seward's Elegy on Capt. Cook:

But round the steep rocks and dangerous strand
Rolls the white surf, and SHIPWRECK guards the land.

Add to this, that if the verses in our heroic poetry be shorter than those of the ancients, our words likewise are shorter; and in respect to their measure of time, which has erroneously been called melody and harmony, I doubt, from what has been said above, whether we are so much inferior as is generally believed; since many passages which have been stolen from ancient poets, have been translated into our language without losing any thing of the beauty of the versification. The following line translated from Juvenal by Dr. Johnson, is much superior to the original:

Slow rises Worth by Poverty depress'd.

The original is as follows:

Difficile emergent, quorum virtutibus obstat,
Res angusta domi.

[139]

B. I am glad to hear you acknowledge the thefts of the modern poets from the ancient ones, whose works I suppose have been reckoned lawful plunder in all ages. But have you not borrowed epithets, phrases, and even half a line occasionally from modern poems?

P. It may be difficult to mark the exact boundary of what should be termed plagiarism: where the sentiment and expression are both borrowed without due acknowledgement, there can be no doubt; -- single words, on the contrary, taken from other authors, cannot convict a writer of plagiarism; they are lawful game, wild by nature, the property of all who can capture them; -- and perhaps a few common flowers of speech may be gathered, as we pass over our neighbor's enclosure, without stigmatizing us with the title of thieves; but we must not therefore plunder his cultivated fruit.

The four lines at the end of the plant *Upas* are imitated from Dr. Young's *Night Thoughts*. The line in the episode adjoined to *Cassia*, "the salt tear mingling with the milk he sips," is from an interesting and humane passage in *Langhorne's Justice of Peace*. There are probably many others, which, if I could recollect them, should here be acknowledged. As it is, like exotic plants, their mixture with native ones, I hope, adds beauty to my *Botanic Garden*: -- and as it is, *Mr. Bookseller*, I now leave it to you to desire the *Ladies and Gentlemen* to walk in; but please to apprise them, that, like the spectators at an unskillful exhibition in some village-barn, I hope they will make *Good-humour* one of their party; and thus themselves supply the defects of the representation.

THE
LOVES OF THE PLANTS.

--

CANTO IV.

--

NOW the broad Sun his golden orb unshrouds,
Flames in the west, and paints the parted clouds;
O'er heaven's wide arch refracted lustres flow,
And bend in air the many-colour'd bow.—
--The tuneful Goddess on the glowing sky
Fix'd in mute ecstasy her glistening eye;

[142]

And then her lute to sweeter tones she strung,
And swell'd with softer chords that Paphian
song;
Long ails the Oaks return'd the silver sound,
And amorous Echoes talk'd along the ground;
Pleas'd Lichfield listen'd from her sacred
bowers,
Bow'd her tall groves, and shook her stately
towers,

“Nymph! not for thee radiant day returns,
Nymph! not for thee the golden solstice burns,
Refulgent CEREA! – at the dusky hour
She seeks with pensive step the mountain-
bower,

Pleased Lichfield. The scenery described at the
beginning of the first part, or economy of
vegetation, is taken from a botanic garden about
a mile from Lichfield.

Cerea. Cactus grandiflorus, or Cereus. Twenty
males, one female. This flower is a native of
Jamaica and Veracruz. It expands a most
exquisitely beautiful corol, and emits a most
fragrant odour for a few hours in the night, and
then closes to open no more. The flower is
nearly a foot in diameter; the inside of the calyx
of a splendid yellow, and the numerous petals of
a pure white: it begins to open about seven or
eight o'clock in the evening, and closes before
sun-rise in the morning. Martyn's Letters, p.
294. The *Cistus labdaniferus* and many other
flowers, lose their petals after having been a few
hours expanded in the day-time; for in these
plants the stigma is soon impregnated by the
numerous anthers: in many flowers of the *Cistus*
labdaniferus I observed two or three of the
stamens were perpetually bent into contact with
the pistil.

The *Nyctanthes*, called Arabian Jasmine, is
another flower, which expands a beautiful corol,
and gives out a most delicate perfume during the
night, and not in the day, in its native country,
whence its name; botanical philosophers have
not yet explained

[143]

Bright as the blush of rising morn, and warms
the dull cold eye of Midnight with her charms.
There to the skies she lifts her pencill'd brows,
Opens her fair lips, and breathes her virgin
vows;

Eyes the white zenith; counts the suns, that roll
Their distant fires, and blaze around the Pole;
Or marks where Jove directs his glittering car
O'er Heaven's blue vault, -- Herself a brighter
star.

--There as soft zephyrs sweep with pausing airs
Thy snowy neck, and part thy shadowy hairs,
Sweet Maid of Night! To Cynthia's sober beams
Glow thy warm cheek, thy polish'd bosom
gleams.

In crowds around thee gaze the admiring
swains,

And guard in silence the enchanted plains;
This wonderful property; perhaps the plant
sleeps during the day as some animals do; and
its odoriferous glands only emit their fragrance
during the expansion of the petals; that is,
during its waking hours: the *Geranium triste* has
the same property of giving up its fragrance
only in the night. The flowers of the *Cucurbita*
lagenaria are said to close when the sun shines
upon them. In our climate many flowers, as
tragopogon, and *hibiscus*, close their flowers
before the hottest part of the day comes on; and
the flowers of some species of *cucubalus*, and
Silene, vicious campion, are closed all day; but
when the sun leaves them they expand, and emit
a very agreeable scent; whence such plants are
termed *noctiflora*.

[144]

Drop the still tear, or breathe the impassion'd sigh,
And drink inebriate rapture from thine eye.
Thus when old Needwood's hoary scenes the Night
Paints with blue shadow, and with milky light;
Where MUNDY pour'd, the listening nymphs among,
Loud to the echoing vales of his parting song;
With measured step the Fairy Sovereign treads,
Shakes her high plume, and glitters o'er the meads;
Round each green holly leads her sportive train,
And little footsteps mark the circled plain;
Each haunted rill with silver voices rings,
And Night's sweet bird in livelier accents sings.

Ere the bright star, which leads the morning sky,
Hangs o'er the blushing east his diamond eye,
The chaste TROPÆO leaves her secret bed;
A saint-like glory trembles round her head;
Where Mundy. Alluding to an unpublished poem by F.N.C. Mundy, Esq. on his leaving Needwood-Forest. See the passage in the notes at the end of this volume.

Tropæolum. Majus. Garden Naturtion, or greater Indian cress. Eight males, one female. Miss. E.C. Linneus first observed the Tropæolum majus to emit sparks

[145]

Eight watchful swains along the lawns of night
With amorous steps pursue the virgin light;
O'er her fair form the electric lustre plays,
And cold she moves amid the lambent blaze.
So shines the glow-fly, when the sun retires,
And gems the night-air with phosphoric fires;

flashes in the mornings before sun-rise, during the months of June or July, and also during the twilight in the evening, but not after total darkness came on; these singular scintillations were shewn to her father and other philosophers; and Mr. Wilcke, a celebrated electrician, believed them to be electric. Lin. Spec. Plantar. P.490. Swedish Acts for the year 1762. Pulteney's View of Linneaus, p. 22. Nor is this more wonderful than that the electric eel and torpedo should give voluntary shocks of electricity; and in this plant perhaps as in those animals, it may be a mode of defence, by which it harasses or destroys the night-flying insects which infest it; and probably it may emit the same sparks during the day, which must be then invisible. This curious subject deserves further investigation. See Dictanus. The ceasing to shine of this plant after twilight might induce one to conceive, that it absorbed and emitted light, like the Bolognian Phosphorus, or calcined oyster-shells, so well explained by Mr. B. Wilson, and by T.B. Beccari. Exper. On Phosphori, by B. Wilson, Dodsley. The light of the evening, at the same distance from noon, is much greater, as I have repeatedly observed, than the light of the morning: this is owing, I suppose, to the phosphorescent quality of almost all bodies, in a greater or less degree, which thus absorb light during the sun-shine, and continue to emit it again for some time afterwards, though not in such quantity as to produce apparent scintillations. The nectary of this plant grows from what is supposed to be the calyx; but this supposed calyx is coloured; and perhaps, from this circumstance of its bearing the nectary, should rather be esteemed a part of the corol. See an additional note at the end of the poem.

So shines the glow-fly. In Jamaica, in some seasons of the year, the fire-flies are seen in the evenings in great abundance. When they settle on the ground, the bull-frog greedily devours

hem; which seems to have given origin to a curious, though cruel, method of destroying these animals: if red-hot pieces of charcoal be thrown towards them in the dusk of the evening, they leap at them, and, hastily swallowing them, are burnt to death.

[146]

Thus o'er the marsh aerial lights betray,
And charm the unwary wanderer from his way.
So when thy King, Assyria, fierce and proud,
Three human victims to his idol vow'd;
Rear'd a vast pyre before the golden shrine
Of sulphurous coal, and pitch-exuding pine;--
--Load roar the flames, the iron nostrils breathe,
And the huge bellows pant and heave beneath;
Bright and more bright the blazing deluge flows,
And white with seven-fold heat the furnace
glows.

And now the Monarch fix'd with dread surprise
Deep in the burning vault his dazzled eyes.

“Lo! Three unbound amid the frightful glare,
“Unscorch'd their sandals, and unsing'd their
hair!

“And now a fourth with seraph-beauty bright
“Descends, accosts them, and outshines the
light!

“Fierce flames innocuous, as they step, retire!
“And slow they move amid a world of fire!”

He spoke, --to Heaven his arms repentant
spread,

And kneeling bow'd his gem-encircled head.

[147]

Two Sister-Nymphs, the fair AVENAS lead
Their fleecy squadrons on the lawns of Tweed;
Pass with light step his wave-worn banks along,
And wake his Echoes with their silver tongue;
Or touch the reed, as gentle Love inspires,
In notes accordant to their chaste desires.

I.

“Sweet ECHO!” sleeps thy vocal shell,
“Where this high arch o’erhangs the dell;
“While Tweed with sun-reflecting streams
“Conquers thy rocks with dancing beans? –

Ovena. Oat. The numerous families of grasses have all three males, and two females, except *Anthoxanthum*, which gives the grateful smell to hay, and has but two males. The herbs of this order of vegetables support the countless tribes of graminivorous animals. The seeds of the smaller kinds of grasses, as of *aira*, *poa*, *briza*, *stipa*, &c. are the sustenance of many sorts of birds. The seeds of the large grasses, as of wheat, barley, rye, oats, supply food to the human species.

It seems to have required more ingenuity to think of feeding nations of mankind with so small a seed, than with the potato of Mexico, or the bread-fruit of the southern islands; hence Ceres in Egypt, which was the birth-place of our European arts, was deservedly celebrated amongst their divinities, as well as Osiris, who invented the Plough.

Mr. Wahlborn observes, that as wheat, rye, and many of the grasses, and plantain, be washed away by the rains, a scarcity of corn is produced by wet summers; hence the necessity of a careful choice of seed-wheat, as that, which had not received the dust of the anthers, will not grow, though it may appear well to the eye. The straw of the oat seems to have been the first musical instrument, invented during the pastoral ages of the world, before the discovery of metals. See note on *Cistus*.

[148]

II.

“Here may no clamours harsh intrude,
“No brawling hound or clarion rude;
“Here no fell beast of midnight prow,
“And teach thy tortured cliffs to howl!

III.

“Be thine to pour these vales along
“Some artless Shepherd’s evening song;
“While Night’s sweet bird, from yon High spray
“Responsive, listens to his lay.

IV.

“And if, like me, some love-lorn Maid
“Should sing her sorrows to thy shade,
“Oh, sooth her breast, ye rocks around!
“With softest sympathy of found.”

From oozier bowers the brooding Halcyons
peep,
The Swans pursuing cleave the glassy deep,

[149]

On hovering wings the wondering Reed-larks
play,
And silent Bitterns listen to the lay. –
Three shepherd-swains beneath the beechen
shades
Twine rival garlands for the tuneful maids;
On each smooth bark the mystic love-knot
frame,
Or on white sands inscribe the favour'd name.
Green swells the beech, the widening knots
improve,
So spread the tender growths of cultured love;
Wave follows wave, the letter'd lines decay,
So Love's soft forms neglected melt away.

From Time's remotest dawn where China brings
In proud succession all her Patriot-Kings;
O'er desert-sands, deep gulfs, and hills sublime
Extends her massy wall from clime to clime;
With bells and dragons crests her Pagod-bowers,
Her silken palaces, and porcelain towers;
With long canals a thousand nations laves;
Plant all her wilds, and peoples all her waves;

[150]

Slow treads fair CANNABIS the breezy strand,
The distaff streams dishevell'd in her hand;
Now to the left her ivory neck inclines,
And leads in Paphian curves its azure lines;
Dark waves the fringed lid, the warm cheek
glows,
And the fair ear the parting locks disclose;
Now to the right with airy sweep she bends,
Quick join the threads, the dancing spool
depends.

--*Five* Swains attracted guard the Nymph, by
turns

Her grace enchants them, and her beauty burns;
To each she bows with sweet assuasive smile,
Hears his soft vows, and turns her spool the
while

Cannabis. Chinese hemp. Two houses. Five
males. A new species of hemp, of which an
account is given by K. Fitzgerald, Esq. in a
letter to Sir Joseph Banks, and which is believed
to be much superior to the hemp of other
countries. A few seeds of this plant were sown
in England on the 4th of June, and grew to
fourteen feet seven inches in height by the
middle of October; they were nearly seven
inches in circumference, and bore many lateral
branches, and produced very white and tough
fibres. At some parts of the time these plants
grew nearly eleven inches in a week. – Philos.
Trans. Vol. LXXII. P.46

Paphian curves. In his ingenious work, entitled,
The Analysis of Beauty, Mr. Hogarth believes
that the triangular glass, which was dedicated to
Venus in her temple at Paphos, contained in it a
line bending spirally round a cone with a certain
degree of curvature; and that this pyramidal
outline and serpentine curve constitute the
principles of Grace and Beauty.

[151]

So when with light and shade, concordant strife!
Stern CLOTHO weaves the chequer'd thread of
life;

Hour after hour the growing line extends,
The cradle and the coffin bounds its ends;
Soft cords of silk the whirling spools reveal,
If smiling Fortune turn the giddy wheel;
But if sweet Love with baby-fingers twines,
And wets with dewy lips the lengthening lines,
Skein after skein celestial tints unfold,
And all the silken tissue shines with gold.

Warm with sweet blushes bright GALANTHA
glows,

And prints with frolic step the melting snows;
Galanthus. Nivalis. Snowdrop. Six males, one
female. The first flower that appears after the
winter solstice. See Stillingfleet's Calendar of
Flora.

Some snowdrop-roots taken up in winter, and
boiled, had the insipid mucilaginous taste of the
Orchis, and, if cured in the same manner, would
probably make as good salep. The roots of
Hyacinth, I am informed, are equally insipid,
and might be used as an article of food. Gmelin,
in his History of Siberia, says the Martigon Lily
makes a part of the food of that country, which
is of the same natural order as the snow-drop.
Some roots of Crocus, which I boiled, had a
disagreeable flavor.

The difficulty of raising the Orchis from seed
has, perhaps, been a principal reason of its not
being cultivated in this country as an article of
food. It is affirmed, by one of the Linnaean
school, in the *Amœnit. Academ.* That the seeds
of Orchis will ripen if

[152]

O'er silent floods, white hills, and glittering
meads

Six rival swains the playful beauty leads,
Chides with her dulcent voice the tard Spring,
Bids slumbering zephyr stretch his folded wing,
Wakes the hoarse Cuckoo in his gloomy cave,
And calls the wondering Dormouse from his
grave,
Bids the mute Redbreast cheer the budding
grove,
And plaintive Ringdove tune her notes to love.

Spring! with thy own sweet smile, and tuneful
tongue,

Delighted BELLIS calls her infant throng.

Each of his reed astride, the Cherub-train
Watch her kind looks, and circle o'er the plain
you destroy the new bulb; and that Lily of the
Valley, *Convallaria*, will produce many more
seeds, and ripend them, if the roots be crowded
in a garden-pot, so as to prevent them from
producing many bulbs. *VOI. Vi. P.120.* It is
proable either of these methods may succeed
with these and other bulbousrooted plants, as
snowdrops, and might render their cultivation
profitable in this climate. The root of the
asphodelus ramosus, branch asphodel, is used to
feed swine in France; the starch is obtained from
the *alstromeria licta*. *Memoires d'Agricult.*
Bellis prolifera. Hen and chicken Daisy; in this
beautiful monster not only the impletion or
doubling of the petals takes place, as described
in the note on *Alcea*; but a numerous circlet of
less flowers on peduncles, or footstalks, rises
from the sides of the calyx, and surround the
proliferous parent. The same occurs in
Calendula, marigold; in *Heracium*, hawk-week;
and in *Scabiosa*, Scabious. *Phil. Botan. p.82.*

[153]

Now with young wonder touch the sliding snail,
Admire his eye-tipp'd horns, and painted mail;
Chase with quick step, and eager arms
outspread,

The pausing Butterfly from mead to mead;
Or twine green oziars with the fragrant gale,
The azure harebell, and the primrose pale,
Join hand in hand, and in procession gay
Adorn with votive wreaths the shrine of May.
--SO moves the Goddess to the Idalian groves,
And leads her gold-hair'd family of Loves.
These, from the flaming furnace, strong and
bold

Pour the red steel in many a sandy mould;
On tinkling anvils (with Vulcanian art),
Turn with ho tongs, and forge the dreadful dart;
The fragrant Gale. The buds of the Myrica Gale
possess and agreeable aromatic fragrance, and
might be worth attending to as an article of the
Materia Medica. Mr. Sparman suspects, that the
green wax like substance, with which at certain
times of the year the berries of the Myrica
cerifera, or candle-berry Myrtle, are covered, are
deposited there by insects. It is used by the
Inhabitants for making candles, which he says
burn rather better than those made of tallow.
Voyage to the Cape. V.I. p.345. Du Halde gives
an account of white-wax made by small insects
round the branches of a tree in China in great
quantity, which is there collected for medical
and economical purposes. The tree is called
Tong-tsin. Descript. Of China. Vol 1. P.230.

[154]

The barbed head on whirling jaspers grind,
And dip the point in poison for the mind;
Each polish'd shaft with snow-white plumage
wing,
Or strain the bow reluctant to its sting.
Those on light pinion twine with busy hands,
Or stretch from bough to bough the flowery
bands;
Scarce the dark beetle, as he wheels on high,
OR catch in silken nets the gilded fly;
Call the young Zephyrs to their fragrant bowers,
And stay with kisses sweet the Vernal Hours.

Where, as proud Masson rises rude and bleak
And with misshapen turrets crests the Peak,
Old Matlock gapes with marble jaws, beneath,
And o'er scar'd Derwent bends his flinty teeth;
Deep in wide caves below the dangerous soil
Blue sulphurs flame, imprison'd waters boil.
Deep in wide caves. The arguments which tend
to shew that the warm springs of this country are
produced from steam raised by deep
subterraneous fires, and afterwards condensed
between the strata of the mountains, appear to
me much more conclusive, than the idea of their
being warmed by chemical combinations near
the surface of

[155]

Impetuous steams in spiral columns rise
Through rifted rocks, impatient for the skies;
Or o'er bright seas of bubbling lavas blow;
As heave and toss the billow fires below;
Condensed on high, in wandering rills they glide
From Masson's dome, and burst his sparry side;
Round his grey towers, and down his fringed
walls,

From cliff to cliff, the liquid treasure falls;
In beds of stalactite, bright ores among,
O'er corals, shells, and crystals, winds along;
the earth: for, 1st, their heat has kept accurately
the same perhaps for many centuries certainly as
long as we have been possessed of good
thermometers; which cannot be well explained,
without supposing that they are first in boiling
state. For as the heat of boiling water is 212, and
that of the internal parts of the earth 48, it is
easy to understand; that the steam raised from
boiling water, after being condensed in some
mountain and passing from thence through a
certain space of the old earth, must be cooled
always to a given degree; and it is probable the
distance from the exit of the spring, to the place
where the steam is condensed, might be guessed
by the degree of its warmth.

2. In the dry summer of 1780, when all other
springs were either dry or much diminished,
those of Buxton and Matlock (as I was well
informed on the spot), had suffering no
diminution; which proves that the sources of
these warm springs are at great depths below the
surface of the earth.

3. There are numerous perpendicular fissures in
the rocks of Derbyshire, in which the ores of
lead and copper are found, and which pass to
unknown depths; and might thence afford a
passage to steam from great subterraneous fires.

4. If these waters were heated by the
decomposition of pyrites, there would be some
chalybeate taste or sulphureous smell in them.
See note in part 1. on the existence of central
fires.

[156]

Crusts the green mosses, and the tangled wood,
And sparkling plunges to its parent flood.
--n'er the warm wave a smiling youth presides,
Attunes its murmurs, its meanders guides,
(The blooming FUCUS), in her sparry coves
To amorous Echo sings his *secret* loves,
Bathes his fair forehead in the misty stream,
And with sweet breath perfumes the rising
steam.

--So, erst, an Angel o'er Bethesda's springs,
Each morn descending, shook his dewy wings;

Fucus. Clandestine marriage. A species of
Fucus, or of *Conserva*, soon appears in all
basins which contain water. Dr. Priestly found
that great quantities of pure dephlogisticated air
were given up in water at the points of this
vegetable, particularly in the sunshine, and that
hence it contributed to preserve the water in
reservoirs from becoming putrid. The minute
divisions of the leaves of subaquatic plants as
mentioned in the note on *Trapa*, and of the gills
of fish, seem to serve another purpose besides
that of increasing their surface, which has not, I
believe, been attended to, and that is to facilitate
the separation of the air, which is mechanically
mixed or chemically dissolved in water by their
points or edges; this appears on immersing a dry
hairy leaf in water fresh from a pump;
innumerable globules like quicksilver appear on
almost every point; for the extremities of these
points attract the particles of water less forcibly
than those particles attract each other; hence the
contained air, whose elasticity was but just
balanced by the attractive power of the
surrounding particles of water to each other,
finds at the point of each fibre a place where the
resistance to its expansion is less; and in
consequence it there expands, and becomes a
bubble of air. IT is easy to foresee that the rays
of the sunshine, by being refracted and in part
reflected by the two surfaces of these minute
air-bubbles, must impart to them much more
heat than to the transparent water; and thus
facilitate their ascent by further expanding them;
that the points of vegetables attract the particles
of water less than they attract each other, is seen
by the spherical form of dew-drops on the points
of grass. See note on Vegetable Respiration in
Part I.

[157]

And as his bright translucent form He laves,
Salubrious powers enrich the troubled waves.
Amphibious Nymph, from Nile's prolific bed
Emerging TRAPA lifts her pearly head;
Trapa. Four males, one female. The lower
leaves of this plant grow under water, and are
divided into minute capillary ramifications;
while the upper leaves are broad and round, and
have air-bladders in their footstalks to support
them above the surface of the water. As the
aerial leaves of vegetables do the office of
lungs, by exposing a large surface of vessels
with their contained fluids to the influence of
the air; so these aquatic leaves answer a similar
purpose like the gills of fish; and perhaps gain
from water or give it to a similar material. As
the material thus necessary to life seems to
abound more in air than in water, the subaquatic
leaves of this plant, and of *sisymbrium*,
cœnanthe, *ranunculus aquatilis*, water crowfoot,
and some others, are cut into fine divisions to
increase the surface; whilst those above water
are undivided. SO the plants on high mountains
have their upper leaves more divided, as
pimpinella, *petroselinum*, and others, because
here the air is thinner, and thence a larger
surface of contact is required. The stream of
water also passes but once along the gills of
fish, as it is sooner deprived of its virtue;
whereas the air is both received and ejected by
the action of the lungs of land-animals. The
whale seems to be an exception to the above, as
he receives water and spouts it out again from
an organ, which I suppose to be a respiratory
one. As spring-water is nearly of the same
degree of heat in all climates, the aquatic plants,
which grow in rills or fountains, are found
equally in the torrid, temperate, and frigid
zones, as water-cress, water parsnip, *ranunculus*,
and many others.

In warmer climates the water grounds are
usefully cultivated, as with rice; and the roots of
some aquatic plants are said to have supplied
food, as the ancient lotus in Egypt, which some
have supposed to be the *Nymphæa*. —In Siberia
the roots of the *Butomus*, or flowering rush, are
eaten, which is well worth further enquiry, as
they grow spontaneously in our ditches and
rivers, which at present produce no esculent
vegetables; and might thence become an article
of useful cultivation. Herodotus affirms, that the

Egyptian Lotus grows in the Nile, and resembles
a Lily. That the natives dry it in the sun, and
take the pulp out of it, which grows like the
head of a poppy, and bake it for bread. *Enterpe*.
Many grit-stones and coals, which I have seen,
seem to bear an impression of the roots of the
Nymphæa, which are often three or four inches
thick, especially the white-flowered one,

[158]

Fair glows her virgin cheek and modest breast,
A panoply of scales deforms the rest;
Her quivering fins and painting gills she hides,
But spreads her silver arms upon the tides;
Slow as she fails, her ivory neck she laves,
And shakes her golden tresses o'er the waves.
Charm'd round the Nymph, in circling gambols
glide
Four Nereid-forms, or shoot along the tide;
Now all as one they rise with frolic spring,
And beat the wondering air on humid wing;
Now all descending plunge beneath the main,
And lash the foam with undulating train;
Above, below, they wheel, retreat, advance,
In air and ocean weave the mazy dance;
Bow their quick heads, and point their diamond
eyes,
And twinkle to the fun with ever-changing dyes.

Where Andes, crested with volcanic beams,
Sheds a long line of light on Plata's streams;

[159]

Opes all his springs, unlocks his golden caves,
And seeds and freights immeasurable waves;
Delighted OCYMA at twilight hours
Calls her light car, and leaves the sultry bowers;
--
Love's rising ray, and Youth's seductive dye,
Bloom'd on her cheek, and brighten'd in her
eye;

Ocymum salinum. Saline Basil. Class TWO
POWERS. The Abbe Molina, in his History of
Chili, translated from the Italian by the Abbe
Grewvel, mentions a species of Basil, which he
calls *Ocymum salinum*: he says as it resembles
the common basil, except that the stalk is round
and jointed; and that though it grows sixty miles
from the sea, yet every morning it is covered
with saline globules, which are hard and
splendid, appearing at a distance like dew; and
that each plant furnishes about half an ounce of
fine salt every day, which the peasants collect,
and use as common salt, but esteem it superior
in flavor.

As an article of diet, salt seems to act simply as
a stimulus, not containing any nourishment, and
is the only fossil substance which the caprice of
mankind has yet taken into their stomachs along
with their food; and, like all other unnatural
stimuli, is not necessary to people in health, and
contributes to weaken our system; though it may
be useful as a medicine. It seems to be the
immediate cause of the sea-scurvy, as those
patients quickly recover by use of fresh
provisions; and is probably a remote cause of
scrophula (which consists in the want of
irritability in the absorbent vessels), and is
therefore weakened by its use. The universality
of the use of salt with our food, and in our
cookery, has rendered it difficult to prove the
truth of these observations. I suspect that flesh-
meat cut into thin slices, either raw or boiled,
might be preserved in coarse sugar or treacle;
and thus a very nourishing and salutary diet
might be presented to our seamen. See note on
Salt-rocks, in Vol. I. Canto II. If a person
unaccustomed to much salt should eat a couple
of red herrings, his insensible perspiration will
be so much increased by the stimulus of the salt,
that he will find it necessary in about two hours

to drink a quart of water; the effects of a continued use of salt in weakening the action of the lymphatic system may hence be deduced.

[160]

Chaste, pure, and white, a zone of silver graced
Her tender breast, as white, as pure, as chaste; --
By *four* fond swains in playful circles drawn,
On glowing wheels she tracks the moon-bright lawn,
Mounts the rude cliff, unveils her blushing charms,
And calls the panting zephyrs to her arms.
Emerged from ocean springs the vaporous air,
Bathes her light limbs, uncurls her amber hair,
Incrusts her beamy form with films saline,
And Beauty blazes through the crystal shrine. --
So with pellucid studs the ice-flower gems
Her rimy foliage and her candied stems.
So from his glassy horns, and pearly eyes,
The diamond-beetle darts a thousand dyes;
Mounts with enamel'd wings the vesper gale,
And wheeling shines in adamantine mail.

Thus when loud thunders o'er Gomorrah burst,
And heaving earthquakes shook his realms accurst,

Ice flower. Mesembryanthemum crystallinum.

[161]

An Angel-guest led forth the trembling Fair
With shadow hand, and warn'd the guiltless pair;
"Haste form these lands of sin, ye Righteous!
fly,
"Speed the quick step, nor turn the lingering eye!" --
--Such the command, as fabling Bards indite,
When Orpheus charm'd the grisly King of Night;
Sooth'd the pale phantoms with his plaintive lay,
And led the fair Assurgent into day.--
Wide yawn'd the earth, the fiery tempest flash'd,
And towns and towers in one vast ruin crash'd;-
-
Onward they move, --loud horror roars behind,
And shrieks of Anguish bellow in the wind.
With many a sob, amid a thousand fears,
The beauteous wanderer pours her gushing tears;
Each soft connection rends her troubled breast,
--She turns, unconscious of the stern behest! --
"I faint! -- I fall! -- ah, me! -- sensations chill
"Shoot through my bones, my shuddering bosom thrill!
"I freeze! I freeze! just Heaven regards my fault,
"Numbs my cold limbs, and hardens into salt! --

[162]

“Not yet, not yet, your dying Love resign!
“This last, last kiss receive! – no longer thine!”

–

She said, and ceased, --her stiffen'd form He
press'd,
And strain'd the briny column to his breast;
Printed with quivering lips the lifeless snow,
And wept, and gazed the monument of woe.
SO when Æneas through the flames of Troy
Bore his pale fire, and led his lovely boy;
With loitering step the fair Creusa stay'd,
And Death involved her in eternal shade. –
--Oft the lone Pilgrim, that his road forsakes,
Marks the wide ruins, and the sulphur'd lakes;
ON moldering piles amid asphaltic mud
Hears the hoarse bittern, where Gomorrah stood;
Recalls the unhappy Pair with lifted eye
Leans on the crystal tomb, and breathes the
silent sigh.

With net-wove sash and glittering gorget dres'd,
And scarlet robe lapell'd upon her breast,

[163]

Stern ARA frowns, the measured march
assumes,
Trails her long lance, and nods her shadowy
plumes;
While Love's soft beams illumine her treacherous
eyes,
And beauty lightens through the thin disguise.
So erst, when HERCULES, untamed by toil,
Own'd the soft power of DEJANIRA'S smile; --
His lion-spoils the laughing Fair demands,
And gives the distaff to his awkward hands;
Arum. Cuckow-pint, of class Gynandria, or
masculine ladies. The pistil or female part of the
flower, rises like a club, is covered above or
clothed, as it were, by the anthers or males; and
some of the species have a large scarlet blotch in
the middle of every leaf.

The singular and wonderful structure of this
flower has occasioned many disputes among
botanists. See Tourniss. Malpig. Dillen. Rivin.
&c. The receptacle admits the germs (a natural
prodigy), and thus do not need the assistance of
elevating filaments: hence the flower may be
said to be inverted. *Families of Plants* translated
from Linneus, p.618.

The spadix of this plant is frequently quite
white, or coloured, and the leaves liable to be
streaked with white, and to have black or scarlet
blotches on them. As the plant has no corol or
blossom, it is probable the coloured juices in
these parts of the sheath or leaves may serve the
same purpose as the coloured juices in the petals
of other flowers; from those tulip-roots which
have a red cuticle produce red flowers. See
Rubia.

When the petals of the tulip become striped with
many colours, the plant loses almost half of its
height; and the method of making them thus
break into colours is by transplanting them into
a meager or sandy soil, *after they have
previously enjoyed a richer soil*: hence it
appears, that the plant is weakened when the
flower becomes variegated. See note on
Anemone. For the acquired habits of vegetables,
see Tulipa, Orchis.

The roots of the *Arum* are scratched up and
eaten by thrushes in severe snow seasons.
White's Hist. of Selbourn, p. 43.

[164]

O'er her white neck the bristly mane she throws,
And binds the gaping whiskers on her brows;
Plaits round her slender waist the saggy vest,
And clasps the velvet paws across her breast.
Next with soft hands the knotted club she rears,
Heaves up from earth, and on her shoulder
bears.

Onward with loftier step the Beauty treads,
And trails the brinded ermine o'er the meads;
Wolves, bears, and bards, forsake the affrighted
groves,
And grinning Satyrs tremble, as she moves.

CARYO'S sweet smile DIANTHUS proud
admires,
And gazing burns with unallow'd desires;

Dianthus. Superbus. Proud Pink. There is a kind of pink called Fairchild's mule, which is here supposed to be produced between a *Dianthus superbus*, and the *Caryophyllus*, Clove. The *Dianthus superbus* emits a most fragrant odour, particularly at night. Vegetable mules supply an irrefragable argument in favour of the sexual system of botany. They are said to be numerous; and, like the mules of the animal kingdom, not always to continue their species of seed. There is an account of a curious mule from the *Antirrhinum linaria*, Toad-flax, in the *Amœnit. Academ. V.I.No.3.* and many hybrid plants described in No. 32. The *Urtica alienata* is an evergreen plant, which appears to be a nettle from the male flowers, and a *Pellitory* (*Psrietaria*) from the female ones and the fruit; and is hence between both. Murray, *Syst. Veg.* Amongst the English indigenous plants, the veronica hybrid mule *Speedwel* is supposed to have originated from the officinal one, and the spiked one. And the *Sibthorpia Europæa* to have

[165]

With sighs and sorrows her compassion moves,
And wins the damsel to illicit loves.
The Monster-offspring heirs the father's pride,
Mask'd in the damask beauties of the bride.
So, when the Nightingale in eastern bowers
On quivering pinion woos the Queen of flowers;
Inhales her fragrance, as he hangs in air,
And melts with melody the blushing fair;
Half-rose, half-bird, a beauteous Monster
springs,
Waves his thin leaves, and claps his glossy
wings;
Long horrent thorns his mossy legs surround,
And tendril-talons root him to the ground;

For its parents the golden saxifrage and marsh pennywort. *Pulteney's View of Linneus*, p.253. Mr. Grabery, Mr. Schreber, and Mr. Ramstrom, seem of opinion, that the internal structure or parts of fructification in mule-plants resemble the female parent; but that the habit or external structure resembles the male parent. See treatise under the above names in V. VI. *Amœnit. Academic.* The mule produced from a horse and the ass resembles the horse externally with his ears, main, and tail; but with the nature or manners of an ass; but the *Hunnus*, or creature produced from a male ass, and a mare resembles the father externally in stature, ash-colour, and the black cross, but with the nature or manners of a horse. The breed from Spanish rams and Swedish ewes resemble the Spanish sheep in wool, stature, and external form; but was as hard as the Swedish sheep; and he contrary of those which were produced from Swedish rams and Spanish ewes. The offspring from the male goat of Angora and the Swedish female goat had long soft camel's hair; but that from the male Swedish goat, and the female one of Angora, had no improvement of their wool. An English ram without horns, and a Swedish horned ewe, produced sheep without horns. *Amœn. Academ. V.VI.p.13.*

[166]

Green films of rind his wrinkled neck
o'erspread,
And crimson petals crest his curled head;
Soft-warbling beaks in each bright blossom
move,
And vocal Rosebuds thrill the enchanted grove!
--
Admiring Evening stays her beamy star,
And still Night listens from his ebon car;
While on white wings descending Houries
throng,
And drink the floods odour and of song.

When from his golden urn the Solstice pours,
O'er Afric's sable sons the sultry hours;
When not a gale flit o'er her tawny hills,
Save where the dry Harmattan breathes and
kills;
When stretch'd in dust her gasping panthers lie,
AND writh'd in foamy folds her serpents die

The dry Harmattan. The Harmattan is a singular wind blowing from interior parts of Africa to the Atlantic ocean, sometimes for a few hours, sometimes for several days without regular periods. It is always attended with a fog or haze, so dense as to render those objects invisible which are at the distance of a quarter of a mile; the sun appears through it only about noon, and then of a dilute red, and very minute particles subside from the misty air so as to make the grass, and skins of negroes appear whitish. The extreme dryness which attends this wind or fog, without dews, withers and quite dries the leaves of vegetables; and is said of Dr. Lind at some seasons to be

[167]

Indignant Atlas mourns his leafless woods,
And Gambia trembles for his sinking floods;
Contagion stalks along the briny sand,
And Ocean rolls his sickening shoals to land

Fatal and malignant to mankind; probably after much preceding wet, when it may become loaded with the exhalations from putrid marshes; at other seasons it is said to check epidemic diseases, to cure fluxes, and to heal ulcers and cutaneous eruptions; which is probably effected by its yielding no moisture to the mouths of the external absorbent vessels, by which the action of the other branches of the absorbent system is increased to supply the deficiency. *Account of the Harmattan. Phil Trans. V. LXXI.*

The Reverend Mr. Sterling gives an account of a darkness for six or eight hours at Detroit in America, on the 19th of October, 1762, in which the sun appeared as red as blood, and thrice its usual size: some rain falling, covered white paper with dark drops, like sulphur or dirt, which burnt like wet gunpowder, and the air had a very sulphureous smell. He supposes this to have been emitted from some distant earthquake or volcano. *Philos. Trans. V. LIII. P.63.*

In many circumstances this wind seems much to resemble the dry fog which covered most parts of Europe for many weeks in the summer of 1780, which has been supposed to have had a volcanic origin, as it succeeded the violent eruption of Mount Hecla, and its neighbourhood. From the subsidence of a white powder, it seems probably that the Harmattan has a similar origin, from the unexplored mountains of Africa. Nor is it improbable, that the epidemic coughs, which occasionally traverse immense tracts of country, may be the products of volcanic eruptions; nor impossible, that at some future time, contagious miasmata may be thus emitted from subterraneous furnaces, in such abundance as to contaminate the whole atmosphere, and depopulate the earth! *His sickening shoals.* Mr. Marsden relates, that in the island of Sumatra, during the November of 1775, the dry monsoons, or S.E. winds, continued so much longer than usual, that the large rivers became dry; and prodigious quantities of sea-fish, dead and dying, were seen

floating for leagues on the sea, and driven on the beach by the tides. This was supposed to have been caused by the great evaporation, and the deficiency of fresh water rivers having rendered the sea too salty for its inhabitants. The season then became so sickly as to destroy great numbers of people, both foreigners and natives. Phil. Trans. V.LXXI. p.384

[168]

--Fair CHUNDA smiles amid the burning waste,
Her brow unturban'd, and her zone unbrac'd
Ten brother-youths with light umbrellas shade;
Or fan with busy hands the panting maid;
Loose wave her locks, disclosing, as they break,
The rising bosom and averted cheek;
Clasp'd round her ivory neck with studs of gold
Flows her thin vest in many a gauzy fold;
O'er her light limbs the dim transparence plays,
And the fair form, it seems to hide, betrays.

Chunda. Chundali Borrum is the name which the natives give to this plant; it is the *Hedysarum gyrans*, or moving plant; its class is two brotherhoods, ten males. Its leaves are continually in spontaneous motion; some rising and others falling; and others whirling circularly by twisting their stems; this spontaneous movement of the leaves, when the air is quite still and very warm, seems to be necessary to the plant, as perpetual respiration is to animal life. A more particular account with a good print of the *Hedysarum gyrans* is given by M. Broussonet in a paper on vegetable motions in the *History de l'Academie des Sciences*. Ann. 1784. P. 609.

There are many other instances of spontaneous movements of the parts of vegetables. IN the *Marchantia polymorpha* some yellow wool proceeds from the flower-bearing anthers, which moves spontaneously in the anther, while it drops its dust like atoms. Murray, *Syst. Of Veg.* See note on *Collinsonia* for other instances of vegetable spontaneity. Add to this, that as the sleep of animals consist in a suspension of voluntary motion, and as vegetables are likewise subject to sleep, there is reason to conclude, that the various actions of opening and closing their petals and foliage may be justly ascribed to a voluntary power: for without the faculty of volition, sleep would not have been necessary to them.

Cold from a thousand rocks, where Ganges leads
The gushing waters to his sultry meads;
By moon-crown'd mosques with gay reflections glides,
And vast pagodas trembling on his sides;
With sweet loquacity NELUMBO sails,
Shouts to his shores, and parleys with his gales;
Invokes his echoes, as she moves along,
And thrills his rippling surges with her song.
-As round the Nymph her listening lovers play,
And guard the Beauty on her watery way;
Nelumbo. *Nymphae Nelumbo*. A beautiful rose-red flower on a receptacle as large as an artichoke. The capsule is perforated with holes at the top, and the seeds rattle in it. Perfect leaves are seen in the seeds before they germinate. Linneus, who has enlisted all our senses into the service of botany, has observed this rattling of the *Nelumbo*; and mentions what he calls an electric murmur, like distant thunder in hope-yards when the wind blows, and asks the cause of it. We have one kind of pedicularis in our meadows which has obtained the name of rattle-grass, from the rattling of its dry seed vessels under our feet.

[169]

Where leads the northern Star his lucid train
High o'er the snow-clad earth, and icy main,
With milk light the white horizon streams,
And to the moon each sparkling mountain
gleams. –
Slow o'er the printed snow with silent walk
Huge shaggy forms across the twilight stalk;
And ever and anon with hideous sound
Burst the thick ribs of ice, and thunder round. –
There, as old Winter flaps his hoary wing,
And lingering leaves his empire to the Spring,
Pierced with quick shafts of silver-shooting light
Fly in dark troops the dazzled imps of night.—
“Awake, my Love!” enamour'd MUSCHUS
cries,
“Stretch thy fair limbs, refulgent Maid! arise;

Burst the thick ribs of ice. The violent cracks of ice heard from the Glaciers seem to be caused by some of the snow being melted in the middle of the day; and the water thus produced running down into valleys of ice, and congealing again in a few hours, forces off by its expansion large precipices from the ice-mountains.

Muschus. Corallinus, or lichen rangferinus. Coral-moss. Clandestine-marriage. This moss vegetates beneath the snow, where the degree of heat is always about 40; that is, in the middle between the freezing point, and the common heat of the earth; and is for many months of the winter the sole food of the rein-deer, who digs

[170]

“Ope thy sweet eye-lids o the rising ray,
“And hail with ruby lips returning day.
“Down the white hills dissolving torrents pour,
“Green springs the turf, and purple blows the
flower;
“His torpid wing the Rail exulting tries,
“Mounts the soft gale, and wantons in the skies;
“Rise, let us mark how bloom the awaken’d
groves,
“And ’mid the banks of roses *hide* our loves.”

Night’s tinsel beams on smooth Lock-lomond
dance,
Impatient *Æga* views the bright expanse; --

furrows in the snow to find it; and as the milk
and flesh of this animal is almost the only
sustenance which can be procured during the
long winters of the higher latitudes, this moss
may be said to support some millions of
mankind.

The quick vegetation that occurs on the solution
of the snows in high latitudes appears very
astonishing; it seems to arise from two causes, 1.
the long continuance of the approaching sun
above the horizon; 2. The increased irritability
of plants which have been exposed to the cold.
See note on *Anemone*.

All the water fowl on the lakes of Siberia are
said by Professor Gmelin to retreat southwards
on the commencement of the frost, except the
Rail, which sleeps buried in the snow. Account
of Siberia.

Æga. *Conserva ægagropila*. IT is found loose in
many lakes in a globular form, from the size of a
walnut to that of a melon, much resembling the
balls of hair found in the stomachs of cows; it
adheres to nothing, but rolls from one part of the

[171]

In vain her eyes the passing floods explore,
Wave after wave rolls freightless to the shore.
--Now dim amid the distant foam he spies
A rising speck, --“ ’tis! ’tis he!” she cries;
As with firm arms he beats the streams aside,
And cleaves with rising chest the tossing tide,
With bended knee she prints the humid sands,
Up-turns her glistening eyes, and spreads her
hands;
--“ ’Tis he, ’tis he! – My Lord, my life, my love!
“Slumber, ye winds; ye billows, cease to move!
“Beneath his arms your buoyant plumage
spread,
“Ye Swans! ye Halycons! Hover round his
head!”—
--With eager step the boiling surf she braves,
And meets her refluent lover in the waves;
Loose o’er the flood her azure mantle swims,
And the clear stream betrays her snow limbs.

lake to another. The *Conserva vagabunda* dwells
on the European seas, travelling along the midst
of the waves; (*Spec. Plant.*) these may not
improperly be called itinerant vegetables. In a
similar manner the *Fucus natans* (*Swimming*)
strikes no roots into the earth, but floats on the
sea in very extensive masses, and may be said to
be a plant of passage, as it is wafted by the
winds from one shore to another.

[172]

So on her sea-grit tower fair HERO stood
At parting day, and mark'd the dashing flood;
While high in air, the glimmering rocks above,
Shone the bright lamp, the pilot-star of Love.
--With robe outspread the wavering flame
behind
She kneels, and guards it from the shifting wind;
Breathes to her Goddess all her vows, and
guides
Her bold LEANDER o'er the dusky tide;
Wrings his wet hair, his briny bosom warms,
And clasps her panting lover in her arms.

Deep, in wide caverns and their shadowy aisles,
Daughter of Earth the chaste TRUFFELIA
smiles;
On silvery beds, of soft asbestos wove,
Meets her Gnome-husband, and avows her love.
--*High* o'er her couch impending diamonds
blaze,
And branching gold the crystal roof inlays;

Truffelia. (*Lycoperdom* Tuber). Truffle.
Clandestine marriage. This fungus never
appears above ground, requiring little air, and
perhaps no light. It is found by dogs or swine,
who hunt it by the smell. Other plants, which
have no buds or branches on their stems, as the
grasses, shoot out numerous stoles or scions
under ground; and this the more, as their tops or
herbs are eaten by cattle, and thus preserve
themselves.

[173]

With verdant light the modest emeralds glow,
Blue sapphires glare, and rubies blush, *below*;
Light pierces the lazuli the dome surround
And pictured mochoes tessellate the ground;
In glittering threads along reflective walls
The warm rill murmuring twinkles, as it falls;
Now sink the Eolian strings, and now they
swell,
And Echoes woo in every vaulted cell;
While on white wings delighted Cupids play,
Shake their bright lamps, and shed celestial day.

Closed in an azure fig by fairy spells,
Bosom'd in down, fair CAPRI-FICA dwells; --

Caprificus. Wild fig. The fruit of the fig is not a
seed vessel, but a receptacle inclosing the flower
within it. As these trees bear some male and
others female flowers, immured on all sides by
the fruit, the manner of their fecundation was
very unintelligible, till Tournesfort and
Pontedera discovered, that a kind of gnat
produced in the male figs carried the
fecundating dust on its wings, (*Cynips Psenes*
Syst. Nat. 919), and penetrating the female fig,
thus impregnated the flowers; for the evidence
of this wonderful fact, see the word
Caprification, in Milne's Botanical Dictionary.
The figs of this country are all female, and their
seeds not prolific; and therefore they can only
be propagated by layers and suckers.

[174]

So sleeps in silence the Curculia, shut
In the dark chambers of the cavern'd nut,
Erodes with ivory beak the vaulted shell,
And quits on filmy wings its narrow cell.
So the pleased Linnet in the moss-wove nest,
Waked into life beneath its parent's breast,

Monsieur de la Hire has shewn in the Memoir. De l'Academ. De Science, that the summer figs of Paris, in Provence, Italy, and Malta, have all perfect stamina, and ripen not only their fruits, but their seed; from which see other fig-trees are raised; but that the stamina of the autumnal figs are abortive, perhaps owing to the want of due warmth. Mr. Milne, in his Botanical Dictionary (art. Caprification), says, that the cultivated fig-trees have a few male flowers placed above the female within the same covering or receptacle; which in warmer climates perform their proper office, but in colder ones become abortive. And Linnaeus observes, that some figs have the navel of the receptacle open; which was one reason that induced him to remove this plant from the class Clandestine Marriage to the class Polygamy. Lin. Spec. Plant.

From all these circumstances I should conjecture, that those female fig flowers, which are closed on all sides in the fruit or receptacle without any male one, are monsters, which have been propagated for their fruit, like barberries, and grapes without seeds in them; and that the Caprification is either an ancient process of imaginary use, and blindly followed in some countries, or that it may contribute to ripen the fig by decreasing its vigour, like cutting off a circle of the bark from the branch of a pear-tree. Tournesort seems inclined to this opinion; who says, that the figs in Provence and at Paris ripen sooner, if their buds be pricked with a straw dipped in olive-oil. Plumbs and pears punctured by some insects ripen sooner, and the part round the puncture is sweeter. Is not the honey-dew produced by the puncture of insects? will not wounding the branch of a pear-tree, which is too vigorous, prevent the blossoms from falling off; as from some fig-trees the fruit is said to fall off unless they are wounded by caprification? I had last spring six young trees on the Ischai fig with fruit on them in pots in a stove; on removing

them into larger boxes, they protruded very vigorous shoots, and the figs all fell off; which I ascribed to the increased vigour of the plants.

[175]

Chirps in the gaping shell, burst forth erelong,
Shakes its new plumes, and tries its tender song.

—

--And now the talisman she strikes, that charms
Her husband-Sylph, --and calls him to her arms.

—

Quick, the light Gnat her airy Lord bestrides,
With cobweb reins the flying courser guides,
From crystal steeps of viewless ether springs,
Cleaves the soft air on still expanded wings;
Darts like a sunbeam o'er the boundless wave,
And seeks the beauty in her *secret* cave.

So with quick impulse through all nature's
frame

Shoots the electric air its subtle flame.
SO turns the impatient needle to the pole,
Tho' mountains rise between, and oceans roll.

Where round the Orcades white torrents roar,
Scooping with ceaseless rage the incumbent
shore,

Wide o'er the deep a dusky cavern bends
Its marble arms, and high in air impends;

[176]

Basaltic piers the ponderous roof sustain,
And steep their mass sandals in the main;
Round the dim walls, and through the
whispering ailes

Hoarse breathes the wind, the glittering water
boils

Here the charm'd BYSSUS with his blooming
bride

Spreads his green fails, and braves the foaming
tide;

The star of Venus gilds the twilight wave,
And lights her votaries to the *secret* cave;
Light cupids flutter round the nuptial bed,
And each coy Sea-maid hides her blushing head.

Where cool'd by rills, and curtain'd round by
woods,

Slopes the green dell to meet the briny floods,

Basaltic piers. This description alludes to the cave of Fingal in the island of Staffa. The basaltic columns, which compose of the Giants Causeway on the coast of Ireland, as well as those which support the cave of Fingal, are evidently of volcanic origin, as is well illustrated in an ingenious paper of Mr. Keir, in the Philos. Trans. Who observed in the glass, which had been long in a fusing heat at the bottom of the pots in the glass-houses at Stourbridge, that crystals were produced of a form similar to the parts of the basaltic columns of the Giants Causeway.

Byssus. Clandestine Marriage. It floats on the sea in the day, and sinks a little during the night; it is found in caverns on the northern shores, of a pale green colour, and as thin as paper.

[177]

The sparkling noon-beams trembling on the tide,
The PROTEUS-LOVER woos his playful bride,
To win the fair he tries a thousand forms,
Basks on the sands, or gambols in the storms.
A Dolphin now, his scaly sides he laves,
And bears the sportive damsel on the waves;
She strikes the cymbal as he moves along,
And wondering Ocean listens to the song.
--And now a spotted Pard the lover stalks,
Plays round her steps, and guards her favour'd
walks;

AS with white teeth he prints her hand, caress'd,
And lays his velvet paw upon her breast,
The Proteus-love. *Conserva polymorpha*. This
vegetable is put amongst the cryptogamia, or
clandestine marriages, by Linnaeus; but,
according to Mr. Ellis, the males and females
are on different plants. *Philos. Trans. Vol. LVII*.
It twice changes its colour, from red to brown,
and then to black; and changes its form by
losing its lower leaves, and elongating some of
the upper ones, so as to be mistaken by the
unskillful for different plants. It grows on the
shores of this country.

There is another plant, *Medicago polymorpha*,
which may be said to assume a great variety of
shapes; as the seed-vessels resemble sometimes
snail-horns, at other times caterpillars with or
without long hair upon them; by which means it
is probably they sometimes elude the
depredations of those insects. The seeds of
Calendula, *Marygold*, bend up like hair
caterpillar, with their prickles bristling
outwards, and may thus deter some birds or
insects from preying upon them. *Salicornia* also
assumes an animal similitude. *Phil. Bot. p. 87*.
See note on *Iris* in additional notes; and
Cypripedia in Vol. I.

[178]

O'er his round face her snowy fingers strain
The silken knots, and fit the ribbon-rein.
--And now a Swan, he spreads his plummy sails,
And proudly glides before the fanning gales;
Pleas'd on the flowery brink with graceful hand
She waves her floating lover to the land;
Bright shines his sinuous neck, with crimson
beak
He prints fond kisses on her glowing cheek,
Spreads his broad wings, elates his ebon crest,
And clasps the beauty to his downy breast.

A hundred virgins join a hundred swains,
And fond ADONIS leads the sprightly trains;
Adonis. Many males and many females live
together in the same flower. It may seem a
solecism in language, to call a flower, which
contains many of both sexes, an individual; and
the more so to call a tree or shrub and
individual, which consists of so many flowers.
Every tree, indeed, ought to be considered as a
family or swarm of its respective buds; but the
buds themselves seem to be individual plants;
because each has leaves or lungs appropriated to
it; and the bark of the tree is only a congeries of
the roots of all these individual buds. Thus
hollow oak-trees and willows are often seen
with the whole wood decayed and gone; and yet
the few remaining branches flourish with
vigour; but in respect to the male and female
parts of a flower, they do not destroy its
individuality any more than the number of paps
of a sow, or the number of her cotyledons, each
of which includes one of her young.
The society, called the Areoi, in the island of
Otaheite, consists of about 100 males and 100
females who form one promiscuous marriage.

[179]

Pair after pair, along his scared groves
To Hymen's fane the bright procession moves;
Each smiling youth a myrtle garland shades,
And wreaths of roses eil the blushing maids;
Light Joys on twinkling feet attend the throng,
Weave the gay dance, or raise the frolic song;
--Thick, as they pass, exulting Cupids fling
Promiscuous arrows from the sounding string;
On wings of gossamer soft Whispers fly,
And the fly Glance steals side-long from the
eye.
--As round his shrine the gaudy circles bow,
And seal with muttering lips the faithless vow,
Licentious Hymen joins their mingled hands,
And loosely twines the meretricious bands. –
Thus where pleased VENUS, in the southern
main,
Sheds all her smiles on Otaheite's plain,
Wide o'er the isle her silken net she draws,
And the Loves laugh at all but Nature's laws."

[180]

Here ceased the Goddess, -- o'er the silent
strings
Applauding Zephyrs swept their fluttering
wings;
Entraptur'd Sylphs arose in murmuring crowds
To air-wove canopies and pillowy clouds;
Each Gnome reluctant sought his earthy cell,
And each bright Floret clos'd her velvet bell.
Then, on soft tiptoe, NIGHT approaching near
Hung o'er the tuneless lyre his sable ear;
Gem'd with bright stars the still ethereal plain,
And bad his Nightingales repeat the strain.

Annotations from Digital Edition

Front Materials:

Darwin always intended *The Botanic Garden* to be a two poem collection of which "The Loves of the Plants" was the second poem. Despite this, *Loves* was published first, in 1789. It was not until 1791, with "Loves" in its second edition, that the first half "The Economy of Vegetation" was published. Though the copy text for this edition was a third edition version of "Loves", also published in 1791, it was published as a stand-alone copy of "Loves" and did not contain "Economy"

2.

This frontispiece by Emma Crewe, a designer for the Wedgewood family with whom Darwin was close, depicts Flora, Roman goddess of flowers, and Cupid, the classical figure associated with love

3.

Lines 5-69 from *Epithalamium for Emperor Honorius*, a wedding poem by 4th century Latin poet Claudian. 'The leaves live for love; in every deep grove, the happy tree is in love: the palms bend down to mate with each other, poplar sighs for passion for poplar, and plane tree whispers to plane, and alder sighs for alder'

4.

An eminent publisher in the late 18th century, Joseph Johnson (1738-1809) is primarily known for his publishing of and support for radical writers like Thomas Paine and Mary Wollstonecraft. He also worked for over two decades with William Blake, the early Romantic poet and engraver who supplied Johnson with many engravings. Although not responsible for "The Loves of the Plants" illustrations, Blake provided illustrations for the other volume of *The Botanic Garden*, "The Economy of Vegetation."

5.

Given a royal charter to operate in 1571, the Stationers' Company controlled printing and copyright in the English book trade until 1911. The right of printers and publishers to print specific works were recorded in the Stationers' Registry.

6.

In the initial 1789 publication of *The Botanic Garden*, the advertisement immediately preceded the Preface to "The Loves of the Plants." In this stand-alone third edition of "Loves" the advertisement is not included. Given that the advertisement is an oft-cited component of the poem, it has been borrowed from the 1790 second edition to include in this edition.

7.

Botany in the late 18th century was becoming a fashionable topic of study, a trend spurred in part by King George III's mother Princess Augusta developing a botanical garden at Kew, and by would-be Royal Society president Joseph Banks' discovery of 1300 new species while on a exploration voyage with Captain James Cook.

8.

Carl Linnaeus (1707-1778) is remembered for pioneering the system of binomial nomenclature still used to classify life, though he also travelled Europe collecting natural specimens and taught botany at Uppsala University in Sweden.

9.

Although it was not published until 1791, two years after the first two editions of "The Loves of the Plants", Darwin always intended *The Botanic Garden* to be a two poem collection of which "Loves" was the second poem. Like "Loves", "Economy" uses heroic couplets and lengthy footnotes; its themes differ in its increased focus on natural philosophers and industrialists.

10.

A reference to Roman poet Horace's (65-8 BC) *Ars Poetica* in which Horace advises authors to wait until the 9th year after composition of a text before publishing.

11.

In *Systema Naturae*(1735), his earliest work of classification, Linnaeus first catalogued life forms, fitting them into twenty-four categories. The categories were refined in subsequent works; *Genera Plantarum* (1771) in particular finalizes this categorization process for plant life.

12.

Grafts or Layers: removing a cut section of a plant and using it to engender new plant growth through attaching the cutting to another plant.

13.

Stamen: stalk that protrudes from the flower's center; it bears the flower's pollen. Following Linnaeus' system, Darwin also gendered his representations of plant organs. This is an arbitrary imposition of human gender onto plant life: although the stamen and pistils are reproductive organs of plants, their functions are not entirely analogous to those of human male and female reproductive organs.

14.

Jean Bulliard (1742-1793) was a French botanist who, along with fellow botanist Louis-Claude Richard (1727-1791), compiled botanical terms into a single volume which identified and defined the terms which, in their opinions, "[constituted] a grammar of botany" (Bulliard and Richard "Grammar of Botany").

15.

Analogizing between plant stamen and human male, Linnaeus' labels for stamen number combine Greek numerical prefixes – "mon" for one, "di" for two etc. – with "andria", a derivation from Greek word for man: "andros".

16.

From Latin, meaning "namely".

17.

Calyx: a cup-shaped collection of leaves at the top of the stem. It surrounds the base of the flower and protects it, especially at the bud stage.

18.

Literally "two" from the Greek "di" and "power" from the Greek "dynamis". Here, Linnaeus equated height of plant stamens with different levels of power. Because there are two heights of stamens, there are two levels of power represented. The same logic applies to the tetradynamia class, where four heights and thus four powers are represented.

19.

Anther: pollen-bearing portion of the stamen; they are situated on top of the filaments.

20.

Filament: stalk portion of the stamen which holds the anther.

21.

Pistil: central part of the flower with a swollen base (ovary) which contains seeds, a stalk (style) which rises out of the ovary, and a tip to receive pollen (stigma).

22.

Literally "one" from the Greek "mon" and "brotherhood" from the Greek "adelfia". Linnaeus saw the stamens in this category of plants as united brothers clustered together by the filaments into single tubes or rings.

23.

From the Greek "syn" meaning "together" and "genesis" meaning "birth", Linnaeus identified this class of plants by the fact that their filaments cluster together around joined anthers.

24.

Because the stamens connect to what Linnaeus called the female part of the flower, the pistil, this class derives its name from "gyna" or "woman" in Greek and "andros", or "man".

25.

The stamen and pistils of plants usually occupy one flower, but in this class they are separated onto different flowers. This separation may have influenced Linnaeus' use of Greek the root word for injury - "aikia".

26.

Literally "many" from the Greek "poly" and "marriages" from the Greek "gamos", Linnaeus identified this class of plants by the fact that they contain both flowers with stamens and pistils and flowers with either one or the other part.

27.

From the Greek "kryptos", meaning "hidden" and "gamos", meaning "marriage", Linnaeus could not discern the reproductive processes of these plants (such as ferns and fungi which reproduce by spores instead of pollen exchange). Thus, he labelled the class "hidden marriages", suggesting that they kept their reproductive process secret from human observers.

28.

The female equivalent to the monandria label, the Greek "gyna" meaning women. Linnaeus uses the number of pistils on a plant to determine its order. Stamens were his indication for distinctions at the class level, while number of pistils distinguished between the lower level of categorization: the order.

29.

Silique: a dry, elongated fruit.

30.

Disk flowers: flowers situated on the circular area in the center of a flower

31.

Ray flowers: Flowers surrounding the circular area in the center of the flower

32.

Flags: A type of plant whose stem grows based on internal deposits, new wood inside itself instead of outside, typically found in moist places

33.

Linnaeus

34.

Founded by Darwin in 1778, the Botanical Society of Lichfield had only three members, Darwin included, and existed for the express purpose of translating Linnaeus' botanical works. The society translated two of Linnaeus' works from Latin to English. The first was a translation of *Systema Vegetabilium*, a later edition of Linnaeus' *Systema Naturae* (translated by the Society as *A System of Vegetables* and published 1740-1791). The second was a more complicated project which combined Linnaeus' *Genera Plantarum* and his *Mantissae Plantarum* with a supplementary work, *Supplementarum Plantarum*, by Linnaeus' son. The result was *The Families of Plants*, published 1787.

35.

This is an English rendition of the 13th edition of *Systema Naturae*, a work first published by Linnaeus in 1735. This 13th edition was retitled *Systema Vegetabilium* by its editor Johan Murray (1740-1791), the Swedish pupil of Linnaeus. It includes an introduction by Murray entitled *Regnum Vegetabile* in which Murray elaborates on Linnaeus' classification system.

36.

Johannes Elmgren wrote a thesis under the supervision of Linnaeus. The thesis was called *Termini Botanici*; it defined botanical terms and had been translated by Darwin in 1781.

37.

Published in 1751, this work was the culmination of Linnaeus' theorizing about botany; in it, he conveys the binomial system still in use today.

38.

In this 1737 work, Linnaeus organizes all known genera of plants using his system. *Families of Plants* is the English translation of this work, translated by Darwin and the Botanical Society of Lichfield.

39.

A prevalent printing house that still exists today as the largest and oldest auctioning firm in the world.
40.

An eminent printer in the late 18th century, Joseph Johnson (1738-1809) is primarily known for his publishing of and support for radical writers like Thomas Paine and Mary Wollstonecraft. He also worked for over two decades with William Blake, the early Romantic poet and engraver who supplied Johnson with many engravings, including ones for the other volume of *The Botanic Garden*, "The Economy of Vegetation."
41.

A box with a small hole through which light enters, reflects off the inside, and is projected outwards again. The result is a 2-D image of the box's surroundings that is then cast on the wall. Though the image does appear upsidedown, due to the reflective mirrors within the camera, the projected image does maintain both colour and perspective.
42.

The full name of Ovid, a Roman poet who wrote in the court of Gaius Octavius Augustus.
43.

Darwin is referring to Ovid's *Metamorphoses*, a 15 book epic poem that recounted hundreds of classical myths. In many of these, Ovid described the transformation of people into plants, a common motif in classical myth; Darwin saw *The Loves of the Plants* as reversing this transformation through his personification of plant life as human.
44.

This small engraved sigil is by Thomas Holloway (1748-1827), a London-born engraver. Holloway's work varied in scale from small seals like this one to larger projects like his contribution of approximately 300 plate illustrations to an English Edition of J.C. Lavater's *Essays on Physiognomy*. 800 illustrations were required for this project. The contributing artists, including Holloway, worked under the management of artist Henry Fuseli, an acquaintance of Darwin's who is directly cited by the poet in both the first Interlude and third Canto of *The Loves of the Plants*.

Canto I

1.

Oaten: Describing a musical pipe made of straw or the stem of a plant; often a symbol associated with rustic or pastoral poetry.

2.

Imitating the classical invocation to the muses, Darwin addresses an invented muse who governs over gardens, suggesting that she was responsible for inspiring Linnaeus, the Swedish Sage named here.

3.

Shot: A pellet used for ammunition in a weapon

4.

Darwin uses italics to indicate either the class (number of stamens) or order (number of pistils) of the plant. In this case, *Callitriche* possesses two pistils, so Darwin personifies these parts as "two virgins".

5.

A theologian and naturalist who flourished in the late 17th century, John Ray (1627-1705) published several works on botany and plant classification.

6.

Keel-leaf: In translating Linnaeus, Darwin coined many English botanical terms still used. The term keel-leaf, however, was not widely adopted. Darwin uses it to identify an overhanging petal on the flower, one that initially envelops the bud and is later pushed open by the growing pistils or stamens.

7.

An interpretation based on the Greek root words for "dodecatheon", "dodeca" meaning "twelve" and "theo" meaning "god". Refers to the twelve major Olympian gods of the Greeks.

8.

English physician and book collector Richard Mead (1673-1754) also funded the studies of naturalists George Edwards and Mark Catesby. Catesby demonstrated his gratitude by naming the American cowslip *Meadia*, after Mead.

9.

Storgé: Feelings of affection, typically those from parent to offspring.

10.

Lacking the anther means that the stamens of the turmeric plant do not carry pollen. Without pollen, Linnaeus did not understand how turmeric could reproduce – hence the term eunuch. Today, turmeric is classified as a rhizome, a type of plant that reproduces by underground stems spreading roots which develop into new plants.

11.

Frustraneous Polygamy: An order within the class of syngensia, plants in this category have neither stamen or pistil on ray florets but have both on the disk florets.

12.

Unprolific: failure to promote production and fertilization

13.

Darwin frequently draws parallels across kingdoms – from plant life, to animal life, to human life. He seems to have believed that many traits and abilities - such as locomotion, thought and, in this case, reproductive strategy - are in fact similarly demonstrated across all 3 kingdoms.

14.

Amoenitates Academicæ is the title of a series of scientific volumes, most published by Linnaeus, that included doctoral dissertations from Scandinavian natural philosophers. Included in Volume VII was Andreas Johannes Bladh's 1767 essay on insects, *Fundamenta Entomologiae* or the Foundations of Entomology.

15.

Darwin's 1803 poem *The Temple of Nature* was published post-humously and presents a more robust theory of evolution than the snippets of evolutionary thought found in *Loves*. Because evolutionary theory was often coupled with atheism, the subject was doubly contentious, and writing about it in *Temple* offended acquaintances of Darwin such as Samuel Taylor Coleridge and Joseph Priestly.

16.

Terraqueous: formed of both land and water

17.

While Darwin uses all capital letters to emphasize flower names, he also uses them when inserting external references either fictional or actual. Here, 'ELOISA' refers to the doomed romance of Eloise, a noble, and Abelard, her hired tutor. Upon learning of their tryst, Eloise's uncle had Abelard castrated. She was sent to a convent, he to a monastery. Their ill-fated love captured the imagination of many 18th century writers.

18.

Refers to *Philosophia Botanica* (1751), a botanical treatise which amalgamated all of Linnaeus' theorizing about botany; in it, he conveys the binomial nomenclature system still in use today.

19.

Nectary: A nectar-secreting gland in a plant

20.

Perianth: a structure surrounding or forming the outer part of a flower

21.

Calyx: a cup-shaped collection of leaves at the top of the stem. It surrounds the base of the flower and protects it, especially at the bud stage.

22.

Published in 1751, the *Philosophia Botanica* culminated Linnaeus' theorizing about botany; in it, he conveys the binomial system still in use today.

23.

Cone-bearing plants: plants that reproduce via cone, such as most conifers.

24.

Turpentine has many uses from creating paints and varnishes to acting as topical medicine. Venice turpentine, in particular, is formed from larch and is often used to harden horse hooves.

25.

Sandarach: A soft red arsenic-containing mineral used as a pigment in medicine

26.

An Anglican preacher and hobbyist botanist, Colin Milne (c.1743–1815) authored both a 1770 botanical dictionary of terms, cited here, and a 1771-2 translation of Linnaeus' *Genera Plantarum*, a work that would inform Darwin's later translations of Linnaeus.

27.

Approximately 300-1450 CE.

28.

An Ancient Greek historian, Thucydides (460-395) is known for his anecdotal retelling - and sometimes inventing - of historical events and cultural practices, particularly of those surrounding the Peloponnesian War between Athens and Sparta.

29.

We hope to make poems fit/ to be smeared with cedar oil and stored in preserving cypress (*Ars Poetica*, 331-2).

30.

A reference to Act 1 Scene 3 of Shakespeare's *Othello*, in which Othello recounts the tales with which he regaled Desdemona, winning her love. Darwin likens Othello's charm to that of the plantago's many stamens, lulling the pistil into co-operation.

31.

Bract: A scale or leaf growing directly under the flower-cup

32.

Chaffy: resembling chaff, the thin dry leaves surrounding flowers on grass plants

33.

Glume: a dry, thin and small leaf that surrounds the central flower cup of a plant

34.

The plants Darwin lists here all possess bracts, chaffy scales, or glumes: outer shell leaves that add a sort of second skin around the central flowers. To Darwin and Linnaeus, such deviation from the more typical flower arrangement (i.e., without bracts, chaffy scales, or glumes) resulted in a more 'monstrous' appearance.

35.

Nectary: A nectar-secreting gland in a plant

36.

Bistort: A species of plant bearing a cylindrical spike of small flesh-coloured flowers

37.

Viviparous: bringing forth young in a live state

38.

Oviparous: producing young which are hatched outside the body of the parent

39.

Amoenitates Academicae is the title of a series of scientific volumes, most published by Linnaeus, that included doctoral dissertations from Scandinavian natural philosophers. Included in Volume VII was Andreas Johannes Bladh's 1767 essay on insects, *Fundamenta Entomologiae*, or the Foundations of Entomology.

40.

Darwin uses this word to indicate plants of the Linnaean class cryptogamia – plants which reproduce not by seed but a method Linnaeus could not discern (often by spore or root).

41.

Eolian Lyre: Also known as an Aeolian harp; a stringed instrument that produces musical sounds when currents of air pass over the strings

42.

Zephyr: classical god of the winds

43.

Floret: a small flower

44.

A Discourse Concerning the Irritability of Some Flowers, by Italian Giovambatista dal Colvolo, relates Colvolo's experiments on the centaurea calcitrapoides, focusing particularly on the plant's responses to external stimuli. The version Darwin read was most likely British botanist Benjamin Stillingfleet's (1702-1771) translation, published 1767.

45.

James Dodsley (1724-97) was the English bookseller who sold the English translation of the Italian work on the irritability of plants.

46.

Corol: The whorl of leaves or petals that form the inner envelope of the flower

47.

A personified reference to the month in which some flowers of the lychnis family come to bloom. Missouri Botanical Garden

48.

Ninon de l'Enclos (1620-1705) was a French writer, courtesan and neo-Epicurean philosopher. She was renowned as a lover of many high society Frenchmen, and, upon her retirement as a courtesan, she opened a school to educate noble sons in the art of love. It was there that she was alleged to unintentionally win the love of her son, Chevalier de Gersay. L'Enclos had given up Gersay as an infant, and thus he was unaware that she was his mother. Hoping to discourage further pursuit from Gersay, L'Enclos revealed to him his parentage. Tragically, Gersay was so distraught from the knowledge that he killed himself. This is the incident that Darwin recounts here.

49.

Depredation: The action of making prey of; in this case, the *Dionaea Muscipula* has defense mechanisms against insects that prey on it

50.

Supplementum Plantarum: A work written by Linnaeus' son to supplement the *Genera Plantarum*, the *Supplementum Plantarum* added notes to Carl Linnaeus senior text. __It was also translated into English by Darwin and was published in Lichfield in 1783.

51.

Sirens: Mythological monsters, part women, part bird, who lured sailors to destruction by their enchanted singing

52.

Limed: Caught in birdlime, a glutinous substance used to catch birds

53.

The formation and condensation of clouds was a process Darwin was intimately familiar with. In 1788, his article on cloud formation was published in the *Philosophical Transactions*, the world's longest running international scientific journal.

54.

Pendant: downward hanging

55.

The kind of flower that lifts its head perpendicular to the horizon, after fertilization.

56.

Corol: The whorl of leaves or petals that form the inner envelope of the flower

57.

Fane: a weathercock used to determine wind direction

58.

Vane: Part of a weathercock; the metal plate that points in the direction of the wind. Though a weathercock or weathervane may seem an unusual analogy, Darwin was a hobbyist meteorologist. His good friend and fellow natural scientist, John Whitehurst, invented and installed dozens of specialty weathervanes which had spindles that extended downward into the house, allowing for indoor weather forecasting. This allowed Darwin to observe wind direction from the comfort of his living-room armchair.

59.

In 1783, Darwin himself witnessed a meteor passing over his then-hometown of Derby. He made calculations about the trajectory of the meteor, sending them to the Royal Society.

60.

As these italics do not correspond to Linnaean classes or orders, Darwin is likely using them for literary emphasis here.

61.

Needwood Forest was a small forest near the town of Lichfield where Darwin lived from 1756-1781. The forest was memorialized in a poem by friend and witness at Darwin's second wedding, Francis Mundy. Parts of the poem are cited in the Additional Notes section that follows "Loves of the Plants", Canto IV.

62.

Aculeus: a sharply pointed projection on a plant, such as a thorn or spine

63.

Bird-Lime: a glutinous substance used to catch birds

64.

Elastic Bitumen: a flexible mineral substance found, in particular, in the mines at Matlock about twenty miles north of Derby, Darwin's home from 1783-1802

65.

Matlock is a town in Derbyshire, a county in England's eastern midlands.

66.

This is an English rendition of the 13th edition of *Systema Naturae*, a work first published by Linnaeus in 1735. This 13th edition was retitled *Systema Vegetabilium* by its editor Johan Murray (1740-1791), the Swedish pupil of Linnaeus. It includes an introduction by Murray entitled *Regnum Vegetabile* in which he elaborates on Linnaeus' classification system.

68.

Joseph Wright, painter and friend of Darwin's. Here, Darwin is making explicit reference to Wright's largest and most expensive painting (£420), the *View of Gibraltar*. Now lost, the painting depicted the destruction of the Spanish fleet.

69.

A volcano in Italy, famous for its 79 AD eruption that demolished the city of Pompeii. Darwin is likening the violence of Wright's painting, the *View of Gibraltar*, to a volcanic eruption.

70.

The Latin name for the Rock of Gibraltar, a coastal promontory overlooking the sea where the Spanish and English battled in 1588.

71.

Orixa: A genus within the rutaceae family, the family in which most citrus plants are found

72.

Named for the natural scientist, Michael Adanson (1727-1806), who first catalogued the tree for an English audience.

73.

A correspondent of the Royal Society, French-born Michael Adanson (1727-1806) was an explorer from a young age. The preface to his *Voyage to Senegal* travel text holds "that if a young man is ambitious to raise a reputation in the world or to improve in knowledge and wisdom, he should travel into foreign countries" (i-ii). Though Darwin never travelled out of England, he made use of travel texts such as Adanson's to research exotic plants.

74.

Fully titled *A Voyage to Senegal, the Isle of Goree, and the River Gambia*, Adanson's travel account compiles five years worth of observations on "the various curiosities, natural and artificial, of Negroland" (iv). Adanson is thorough in this intent, documenting plant, human and animal life, climate, geography and more within a clear, chronological and categorical framework.

75.

Thalestris: Mythological Amazonian Queen who supposedly spent thirteen nights with Alexander the Great, hoping to conceive a child from the successful military leader.

76.

Bellona's car: Bellona is Roman goddess of war, described here to be riding a wheeled, horse-drawn wagon.

77.

John James Ferber published a paper entitled "Prolepsis Plantarum" in the *Amoenitates Academicæ* (Vol. VI, 1764). *Amoenitates Academicæ* is the title of a series of scientific volumes, most published by Linnaeus, that included doctoral dissertations from Scandinavian natural philosophers.

78.

Dominus Mariotte is cited in chapter 10 of Ferber's article.

79.

Dormouse: a small rodent

80.

Eider: soft feather

81.

Kernel'd: To contain kernels, bodies of seeds within plant husks

82.

In this 1737 work, Linnaeus organizes all known genera of plants using his system. *Families of Plants* is the English translation of this work, translated by Darwin and the Botanical Society of Lichfield.

83.

Miller's Dictionary of Gardening, Botany, and Agriculture; including Planting, Landscape, Gardening, and Rural Architecture with the Management of Domestic Animals, English horticulturalist Philip Miller (1691-1771) compiled and defined botanical terms in a detailed and illustrated compendium for would-be botanists.

84.

Published in 1751, the *Philosophia Botannica* culminated Linnaeus' theorizing about botany; in it, he conveys the binomial system still in use today.

85.

Lin. Spec: Linnaeus' 1753 text *Species Plantarum* listed all plant species then known in the world - about 8000.

86.

Miller's Dict.: English horticulturalist Philip Miller (1691-1771) compiled and defined botanical terms in *Miller's Dictionary*, a detailed and illustrated compendium for would-be botanists.

87.

Astronomer William Herschel discovered the planet Uranus; he named it after his king, calling it the Georgian planet, while continental astronomers resisted the name, and referred to it as Uranus instead.

88.

Car: a wheeled, usually horse drawn carriage, cart or wagon

89.

Dervise: a Muslim religious figure who has taken vows of poverty and austere life; also spelt Dervish. Darwin personifies each sunflower stamen as a dervish, moving together in a train or line.

90.

Nutation: the oscillation on the axis of a rotating object; in this case, the head of the sunflower oscillates to follow the sun as it moves through the sky

91.

British natural philosopher Stephen Hales (1677-1761) was a fellow of the Royal Society. His 1727 work *Vegetable Staticks* shares the results of experiments which examined the role of the sun's rays on plant sap.

92.

Gluten: a glue-like animal or plant secretion; sometimes used by birds for the construction of nests

93.

Elastic seed-vessel: structures containing seeds of a flowering plant that can open to release the seeds but then return to their previous form

94.

Pellucid drop of mucilage: transparent drop of a sticky material naturally present in seeds, roots, or other parts of plants

95.

Ducal Coronet: a small crown that serves as a heraldic symbol of rank. Darwin suggests that the viscous drops on the tips of the drosera fringe cause the fringes to resemble a crown.

96.

Pierre Broussonet was a professor and botanical garden director at Montpellier medical school in France.

97.

Broussonet's work was published in the Memoirs of the French Academy of Sciences. The memoirs were a widely cited source in Britain's equivalent publication, the Royal Society's *Philosophical Transactions*. Although nominally focusing on mathematics and physics, the French scholarly journal published articles from all fields of natural science. Scholarly Societies Project, Academie des Sciences.

98.

Vermil: bright scarlet or red

99.

Nectary: A nectar-secreting gland in a plant

100.

Pansied: abounding in pansies

101.

The largest of the Canary Islands. Although under the control of Spain, the island was considered exotic to English readers as it was often a stopover for voyages to and from the Americas.

102.

Antiscorbutic: can be used against scurvy

103.

The *Philosophical Transactions of the Royal Society of London* is the world's longest running international scientific journal. Its first issue was published in 1665.

104.

Watkin Tench (1759-1833) was a British marine officer and author who fought for Britain in their attempts to suppress both the American and French Revolutions. His 1789 book *Expedition to Botany Bay* describes his 1788 voyage to New South Wales on the south-east coast of Australia.

105.

Congelations: crystallizations, frozen objects

106.

Hoar-frost: frozen dew or vapour

107.

The *Philosophical Transactions of the Royal Society of London* is the world's longest running international scientific journal. Its first issue was published in 1665.

108.

Cider countries: those countries that make cider, a fermented apple juice beverage, from the apples of trees.

109.

English naturalist James Barbut's *Genera Vermium* explores the order of mollusca, described by the author as the "inhabitants of shells, whose usual abode is in the depths of the Ocean" (iv). The Scylla cited here is described as a creature with a "compressed and fluted" body," a mouth which "consists of a hole without teeth", and "three pair of tentacula or arms" (68).

110.

Priest and natural scientist, John Tuberville Needham (1713-1781) was the first English Catholic to be elected to the Royal Society of London. His works were published in the *Philosophical Transactions* and focused in particular on studies conducted with a microscope.

111.

Eolopile: an early form of steam technology: a container filled with steam/heated vapours which escape through apertures with sufficient force to cause the container to rotate.

112.

Italian biologist Lazzaro Spallanzani (1729-1799) conducted experiments in a variety of fields. His *Dissertations on the Nature of Animals and Vegetables* (1780) reported results of these various experiments and ranged in subject from the use of gastric juice in digestion to artificial insemination. His artificial insemination of a dog is one of the earliest records of this process.

113.

Darwin uses the word 'secret' to reflect the class cryptogamia – i.e., those plants which do not have apparent pistils or stamens and thus reproduce in a method that Linnaeus could not perceive.

114.

Flexile: bends easily

115.

Lin. Spec: Linnaeus' 1753 text *Species Plantarum* listed all plant species then known in the world - about 8000.

116.

Eminent English physician and curio collector, Hans Sloane (1660-1753) travelled much and acquired many natural history artifacts through deliberate search or the good will of his many acquaintances. Famously, Sloane bequeathed his possessions to the king and the Royal Society, leaving behind a vast collection that would serve as the beginnings of the British Museum.

117.

The *Philosophical Transactions of the Royal Society of London* is the world's longest running international scientific journal. Its first issue was published in 1665.

118.

Alexander Hunter (1729?-1809) was a Scottish physician best known for his illustrated editions with notes of John Evelyn's (1620-1706) works. Writer and hobbyist botanist, Evelyn published extensively on the topic of gardening. *Terra: A Philosophical Discourse* was first published in 1676 and focuses on soil. Hunter's edition was released in 1778.

119.

Camphor: A translucent crystalline substance that is chemically similar to vegetable oils; Darwin suggests it for this experiment because it is highly flammable.

120.

Capillary attraction: the process by which liquids are drawn upwards through small tube-like spaces. Here, the water is drawn up through miniscule spaces in the snow.

121.

Gambol: an energetic leap

122.

Pellucid: transparent

123.

Seraglios were an increasingly common fixture of 18th century western literature about the east, inspired by writers such as Lady Mary Wortley Montagu (*bap.* 1689-1762), wife to Britain's Turkish ambassador. Montagu's *Turkish Embassy Letters* (published posthumously in 1763) document her experiences in Turkey; one letter discusses Turkish female bathhouses. Though Montagu was writing from personal experience, many writers were not and hyperbolized depictions of the east. The seraglio, seen by English readers as the apartments reserved for wives and concubines, became a highly salacious image that represented not actual cultural practices but rather a western fantasy about the east.

124.

Libration: the action of being carefully balanced

125.

Roman author Pliny the Elder (23-79) discusses the anemone in his *Naturalis Historia*, an encyclopedia of natural history (389).

126.

Calyx: a cup-shaped collection of leaves at the top of the stem - it surrounds the base of the flower and protects it, especially at the bud stage

127.

Melliferous: producing honey

128.

Claw: in botany, the narrow base of the petal which attaches to the plant

129.

Benjamin Stillingfleet (1702-1771) was an English botanist and writer, well-known for his 1759 translation of Linnaeus, entitled *Miscellaneous Tracts* – a work which both communicated Linnaeus' classification system while advocating increased study of the natural sciences.

130.

Letter XXXI of Lady Mary Wortley Montagu's *Turkish Embassy Letters* included a loose retelling of the Persian legend of the nightingale and rose. The motif was taken up and popularized by later writers such as judge and eastern-enthusiast William Jones (1746-94) in his 1771 work *Grammar of the Persian Language*. "The nightingale now wanders in the vines/Her passion is to seek roses," Montagu writes. (Montagu Let. XXXI).

131.

Scottish-born physician George Fordyce (1736-1802) was an active Fellow of the Royal Society and author of many papers. His *Elements of Agriculture and Vegetation* (1789) analyzes the chemical compounds that drive plant growth.

132.

Swedish botanist Pehr Kalm (1716-1779) was a student of Linnaeus who travelled in England and North America collecting plant specimens. He shared his experiences via his 1771 account *Travels into North America*.

133.

Fully titled the *Treatise upon Planting, Gardening and the Management of the Hot-House*, this 1776 publication was a handbook by John Kennedy, gardener to Sir Thomas Gascoigne, the eighth baronet of Parlington, Yorkshire. The book describes, among many subjects, the growth of exotic plants and experimentations in fodder crops.

134.

John Walker (1731-1803) was a minister of the Church of Scotland and professor of natural history at the University of Edinburgh. An extensive collector of natural specimens, he was also in correspondence with

Linnaeus. He was a leading figure in the planning and establishment of the Royal Society of Edinburgh and contributed seven papers to their scholarly journal, *The Transactions of the Royal Society of Edinburgh*.

135.

Zephyr: classical god of the winds

136.

Calash: A hood of silk

137.

Landau: A four wheeled carriage, the top of which may be closed or opened

138.

The highest mountain in Wales.

139.

A river in north Wales that flows by Snowdon mountain.

140.

O'er her head/beneath: As these italics do not correspond to Linnaean classes or orders, Darwin is likely using them for literary emphasis here, expressing wonder at Lichen's resilience in growing in such remote locations.

141.

Hymen: Greek god of marriage, represented as a young man carrying a torch and veil.

142.

Darwin uses the word 'secret' to reflect the class cryptogamia – i.e., those plants which do not have apparent pistils or stamens and thus reproduce in a method that Linnaeus could not perceive.

143.

Sirius: A fixed star in the constellation Canis Major; the brightest star in the sky

144.

William Dampier (1651-1715), buccaneer and explorer, describes in his published journals his experiences on a merchant ship sailing for the Bay of Campechy, Mexico. The 1675 work discusses the region's wildlife and unruly inhabitants.

145.

Eminent English physician and curio collector, Hans Sloane (1660-1753) travelled much and acquired many natural history artifacts through deliberate search or the good will of his many acquaintances. Famously, Sloane bequeathed his possessions to the king and Royal Society, leaving behind a vast collection that would serve as the beginnings of the British Museum.

146.

Reference to the *Thesaurus Zeylanicus* by Johannes Burman (1707-1780), Dutch botanist and teacher of Linnaeus, which provided a catalogue of plants found in Burman's travels throughout Africa (Gunn and Codd, 266).

147.

Woof: in weaving, the threads that cross horizontally from side to side, perpendicular to the vertically oriented threads called the warp.

148.

John Belchier was an English surgeon who was elected to the Royal Society in 1736.

149.

Gall: A secretion of the liver

150.

Commentarii de rebus in scientia naturali et medicina gestis. Volvminis I. Pars I., or Commentaries about Achievements in Natural Science and Medicine was a Latin scientific journal compiled by Johannes Friedrich Gleditsch in Leipzig. Though rubia tinctorum is discussed in multiple volumes of the journal, Darwin is likely referring to Volume 33, published 1791, which cites Dutch natural philosopher Levinus Lemnius' work using madder to dye animal bones (Vol 38 pg 272).

151.

Daughter of the King of Colchis (modern day Georgia), Medea fell in love with Jason, defied her family, and helped him steal the golden fleece, fleeing to Corinth, Greece, with him.

152.

Medea performs magic on Aeson, Jason's old father, to extend his life. Though Darwin uses the point to argue for the benefits of regular bathing, Ovid's original rendition of the story in the *Metamorphosis* describes Medea slitting Aeson's throat and replacing his blood with a magical concoction she had brewed.

183.

This page has been added from the 1799 printing of the 4th edition. Although still entitled the 4th edition, this passage is an addition to the earlier 1794 4th edition. Because it is from a different edition, no facsimile image is included.

184.

Johann Reichard (1742-1782) was a German botanist and editor of Linnaeus' works, including *Systema Vegetabilium*.

153.

Lin. Spec: Linnaeus' 1753 text *Species Plantarum* listed all plant species then known in the world - about 8000.

154.

A river that runs through Switzerland and France.

155.

Farina: pollen (Darwin uses dust to represent the same item)

156.

In this 1737 work, Linnaeus organizes all known genera of plants using his system. *Families of Plants* is the English translation of this work, translated by Darwin and the Botanical Society of Lichfield.

157.

Duplicatures: folds

158.

Spec: Linnaeus' 1753 text *Species Plantarum* listed all plant species then known in the world - about 8000.

159.

Primarily known for the discovery of oxygen by isolating it in its gaseous state, Joseph Priestley (1733-1804) was a natural philosopher and dissenting clergyman acquainted with Darwin via the Lunar Society of Birmingham, a group of inventors, natural philosophers and manufacturers who held regular meetings between c.1765-c.1800.

160.

Scottish-born anatomist, Alexander Monro's (1733-1817) *The structure and physiology of fishes explained, and compared with those of man and other animals* (1785) provides an illustrated examination of fish anatomy, drawing comparisons from fish anatomy to other forms of life.

161.

Phlogisticated: to contain phlogiston, a hypothetical substance, supposed to exist in all combustible bodies, that is released upon combustion

162.

Umbelliferous: plants with multiple stalks leading to multiple flower heads

163.

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164.

John Day, an English millwright, had his accidental death immortalized in the 1775 work *A philosophical dissertation on the diving vessel projected by Mr Day and sunk in Plymouth sound*. The tract was written by Nikolai Detlef Flack, the author of several works on medicine and technology.

165.

Refers to Aphrodite, Greek goddess of love, who is mythologically associated with the island of Cyprus.

166.

Halcyon: birds fabled to calm the seas

167.

Galatea: A sea nymph courted by the Cyclops Polyphemus.

168.

Rill: a brook

169.

Naiad: a nymph that lives in fresh water

170.

Triton: a creature with a human head and fish tail

171.

Car: a wheeled, horse-drawn carriage

172.

Pinions: wings

173.

Dove: A river that runs through the English midlands, not far from Lichfield and Derby, the two principle hometowns of Darwin.

174.

Mucilage: a sticky material naturally present in seeds, roots, or other parts of plants

175.

Ostiacks: an indigenous people of western Siberia

176.

Russia: or, a compleat Historical Account of All the Nations which Compose that Empire (1780) was printed for J. Nichols and authored by Johann Georgi. It provides European readers with a “general account of Siberia and of the Mongouls” (Georgi v).

177.

Esculent: suitable to be eaten

178.

Girt: to secure around

179.

Eurus: a god of the east winds

180.

Hesper: an evening star

181.

Effulgence: the quality of being splendidly radiant

182.

Pellucid: transparent

183.

Dove: A river that runs through the English midlands, not far from Lichfield and Derby, the two principle hometowns of Darwin.

Interlude I

1.

From Shakespeare's *Henry VI Part 3*, Act V, Scene II. Somerset and Warwick, traitors to Henry VI, lament their defeat as Warwick lies dying on the field of battle. The lines are as follows: Somerset: Ah, could'st thou fly! Warwick: Why, then I would not fly.

2.

English playwright William Shakespeare (1564-1616). After the Restoration and into the 18th century his original works were frequently staged, as were revised versions of his major plays (Davenant's *MacBeth*. Tate's *King Lear*, abridged versions of *Othello*).

3.

English poet, essayist, and satirist Alexander Pope's (1688-1744) *Windsor Forest* (1714) is an optimistic Georgic poem that both describes the English countryside where Pope lived and acts as a panegyric praising 17th and 18th century historical events. The couplet from which this line is drawn: "The *Kennet* swift, for silver eels renown'd; The *Loddonslow*, with verdant alders crown'd" (339-40) contrasts tributaries of the River Thames: the Kennet and the Loddon.

4.

In Chapter 9 of his six-volume historical work, *The History of the Decline and Fall of the Roman Empire*, historian Edward Gibbon (1737-1794) wrote "In the time of Caesar, the reindeer, as well as the elk and the wild bull, was a native of the Hercynian forest, which then overshadowed a great part of Germany and Poland" ("Climate"). It is likely this passage that Darwin is paraphrasing.

5.

Irish-born politician and author Edmund Burke (1729-1797) was renowned for his oratorical ability; he employed ornaments of all kinds - vivid imagery, metaphor, puns - in both his speech and writing. Largely conservative in his views, Burke's works ranged from the political - the pro-monarchy book *Reflections on the Revolution in France* - to topics as varied as aesthetic treatises (*A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful*) and historical accounts (*The Abridgement of the History of England*).

6.

Georgics are didactic poems giving instruction on or praising rural life; Roman writer Virgil's (70-19 BCE) series of georgic poems (29 BCE) were organized in four books: the first discussed crops, the second trees and shrubs, the third livestock and husbandry, and the fourth bee-keeping. English poets of the 18th century often imitated Virgil's form (John Dyer's "The Fleece", 1757; James Grainger's "The Sugar-cane", 1759); like classical georgics, these poems differ from the pastoral in that they emphasize necessary labour instead of harmonious idleness in nature.

7.

William Mason (1725-1797) was an English poet, church deacon, and garden designer. He wrote in diverse modes as a poet, creating odes, elegies, and epic blank verse while also using an alter-ego writing identity named Malcolm MacGreggor to pen subversive satirical works. *The English Garden* (1772-81) is a four-book poem in blank verse based on Virgil's *Georgics*. It is didactic, concerning art, landscape, and gardening.

8.

English poet and biographer, William Hayley (1745-1820) wrote several epistles - poems in the form of letters - and essays addressed to other English poets, artists, and writers, such as Joseph Wright, Darwin's acquaintance and a painter from Derby, and Edward Gibbon, historian.

9.

From *Twelfth Night*, Act 2, Scene 4.

10.

Darwin quotes a popular folk song attributed to Lord Cantalupe and set to music by theatre composer Thomas Arne (1710-1778).

11.

Greek goddess of youth, daughter of Zeus and Hera.

12.

Sir Peter Paul Rubens (1577-1640), Flemish Baroque painter. Darwin is likely referring here to Ruben's series of 25 enormous paintings (painted 1622-5) commissioned by Queen Marie de Medicis of France. These epic pieces depict Marie throughout her life and often feature celestial beings. They were initially

housed in the Luxembourg Palace in Paris. Rubens was so eminent a painter that the wing which held the paintings was entitled the *Galerie de Rubens*.

13.

Angelica Kauffman (1741-1807), Austrian portrait painter, largely painted within distinct genres, either completing portraits of her acquaintances or commissions or painting either historical, classical or pastoral scenes.

14.

Louis Francois Roubiliac (1702-1762) was a French sculptor known for his statues, busts and monuments. The monument to Field Marshall George Wade was installed at Wade's grave in Westminster Abbey; it depicts a medallion portrait of Wade's head between an angel, Fame, pushing away another angel, Time. Roubiliac said this monument was his favourite work.

15.

Joshua Reynolds (1732-1792) was an eminent English portrait and history painter. As president of the Royal Academy of Arts, Reynolds gave regular public addresses like the one Darwin discusses below. Entitled "Discourses", Reynold's reflections on aesthetic issues were always published after the public delivery; he gave fifteen discourses between 1769 and 1790.

16.

The Royal Academy of Arts was founded in 1768 by a group of thirty-six artists nominated by the king. Joshua Reynolds was the Academy's inaugural president and was re-elected to the role multiple times, holding it until his death in 1792.

17.

Referring to contemporary artists and actors in his time, Reynold's says that "Raffaelle is praised for naturalness and deception, which he certainly has not accomplished... and our late great actor, Garrick, has been as ignorantly praised by his friend Fielding; who doubtless imagined he had hit upon an ingenious device, by introducing, in one of his novels... an ignorant man mistaking Garrick's representation of a scene in "Hamlet" for reality. A very little reflection will convince us, that there is not one circumstance in the whole scene that is of the nature of deception. The merit and excellence of Shakespeare, and of Garrick, when they were engaged in such scenes, is of a different and much higher kind. But what adds to the falsity of this intended compliment is, that the best stage-representation appears even more unnatural to a person of such a character, who is supposed never to have seen a play before, than it does to those who have had a habit of allowing for those necessary deviations from nature which the Art requires" (Discourse XIII, 223).

18.

Darwin invokes a conception of human mental processes prevalent in the 18th century. In 1699, a new edition of English philosopher John Locke's (1632-1704) *Essay Concerning Human Understanding* was published, containing a chapter on the association of ideas in which he asserts that "as far as we can comprehend thinking, thus ideas seem to be produced in our minds; or, if they are not, this may serve to explain their following one another in an habitual train" (6). Physician and philosopher David Hartley's (1705-1757) 1749 work *Observations on Man* uses Locke's term "association" to discuss both visible and audible "trains" of ideas (147). Darwin reiterates Hartley's writing that the "trains of ideas that are presented in dreams... are taken to be real" (241).

19.

Appulse: a driving or energetic motion toward or against a place

20.

In his 1762 treatise *Elements of Criticism*, Scottish judge and writer Henry Home, Lord Kames' (1696-1782) advocated a aesthetic theory of criticism drawn primarily from human nature. Homes distinguishes between "real" and "ideal" presence, indicating that the ideal occurs "when I recall any thing in the distinctest manner, so as to form an idea or image of it as present; I have not the words to describe this act, other than that I perceive the thing as a spectator, and as existing in my presence. This means not that

I am really a spectator; but only that I conceive myself to be a spectator, and have a consciousness of presence similar to what a real spectator hath" (107-8).

21.

Eighteenth century aesthetic treatises often concerned these three topics, questioning how humans identify and respond to the beautiful, the awe-striking, or the unusual. Notable participants in this discussion were philosopher and writer Francis Hutcheson (1694-1746) and the publisher of a popular periodical, *The Spectator*, Joseph Addison (1672-1719). Addison's 1712 essay 'Pleasures of the Imagination' elevates aesthetics to an empirical study akin to the natural sciences. Later, Edmund Burke examines human responses to viewed stimuli with this kind of empirical lens. In *A Philosophical Inquiry into the Origin of Our Ideas of the Sublime and the Beautiful* (1757), he assess human responses to objects viewed, distinguishing between the sublime – darkness, vastness, infinity, terror – and the beautiful – smallness, smoothness, brightness. Burke also dedicates a chapter to novelty, examining it as a product of curiosity and identifying the pleasure of beholding the new.

22.

English playwright William Shakespeare (1564-1616). After the Restoration and into the 18th century his original works were frequently staged, as were revised versions of his major plays (Davendant's *MacBeth*. Tate's *King Lear*, abridged versions of *Othello*).

23.

Joshua Reynolds (1732-1792) was an eminent English portrait and history painter.

24.

Angelica Kauffman (1741-1807), Austrian portrait painter, largely painted within distinct genres, either completing portraits of her acquaintances or commissions or painting either historical, classical or pastoral scenes.

25.

Swiss painter and writer Henry Fuseli (1741-1825) whose paintings are known for their sensational, demoniac or strange subject matter and dramatic representation. In 1781, Darwin met Fuseli in London and it was in this year that Fuseli's most successful and renowned painting, *The Nightmare*, was first exhibited (King-Hele 171). *The Nightmare* typifies the type of sensationalism Darwin discusses here. He refers directly to it in Canto III of *Loves of the Plants* and would later do so in an extended verse passage in *The Economy of Vegetation*. Darwin and Fuseli both worked with radical publisher Joseph Johnson, and Fuseli would later engrave the frontispiece for the compiled *Botanic Garden*.

26.

English playwright William Shakespeare (1564-1616). After the Restoration and into the 18th century his original works were frequently staged, as were revised versions of his major plays (Davendant's *MacBeth*. Tate's *King Lear*, abridged versions of *Othello*).

27.

Probably written in 1611, Shakespeare's *The Tempest* is a fantastical play about Prospero, former duke and magician ruler of a remote island, and his attempts to restore his family's status through both his own magic and assistance from the island's fairy and demon inhabitants.

28.

In summer of 1770, Scottish author Patrick Brydone (1736-1818) travelled from Naples to Sicily and Malta, locations that were unfamiliar to the British at the time. Thus, Brydone published in 1773. His work met with critical acclaim and his reflections on volcanoes and electricity had him elected to the Royal Society. In Volume 2 of his travel narrative, Brydone recounts the terrible statues Darwin discusses here: outside a Prince's house, he witnessed an "amazing crowd of statues" stating that "of all of that immense group, there is not one made to represent any object in nature"(95). The artist responsible has "put the heads of men to the bodies of every sort of animal" and "sometimes he makes a compound of five or six animals that have no sort of resemblance in nature".

29.

Henry Swinburne (1743-1803) was an Englishman whose travels took him over much of continental Europe, including an extended stay in the Kingdom of the Two Sicilies, the largest Italian state before Italian unification. From 1783-5, he published *Travels in the Two Sicilies, 1777-1780*.