

## ADDITIONAL NOTES.<sup>1</sup>

P. 7. *Additional note to Curcuma*. These anther-less filaments seem to be an endeavour of the plant to produce more stamens, as would appear from some experiments of M. Reynier,<sup>2</sup> instituted for another purpose: he cut away the stamens of many flowers, with design to prevent their fecundity, and in many instances the flower threw out new filaments from the wounded part of different lengths; but did not produce new anthers. The experiments were made on the geum rivale, different kinds of mallows, and the æchinops ritro. Critical Review for March, 1788.

P. 8. *Addition to the note on Iris*. In the Persian Iris the end of the lower petal is purple, with white edges and orange streaks, creeping, as it were, into the mouth of the flower like an insect; by which deception in its native climate it probably prevents a similar insect from plundering it of its honey: the edges of the lower petal lap over those of the upper one, which prevents it from opening too wide on fine days, and facilitates its return at night; whence the rain is excluded, and the air admitted. See Polymorpha, Rubia, and Cyripedia in Vol. I.<sup>3</sup>

P. 12. *Additional note on Chondrilla*. In the natural state of the expanded flower of the barberry, the stamens lie on the petals; under the concave summits of which the anthers shelter themselves, and in this situation remain perfectly rigid; but on touching the inside of the filament near its base with a fine bristle, or blunt needle, the stamen instantly bends upwards, and the anther, embracing the stigma, sheds its dust. Observations on the Irritation of Vegetables, by T. E. Smith, M. D.<sup>4</sup>

P. 15. *Addition to the note on Silene*. I saw a plant of the Dionæa Muscipula, Flytrap of Venus, this day, in the collection of Mr. Boothby<sup>5</sup> at Ashbourn-Hall, Derbyshire, Aug. 20th, 1788; and on drawing a straw along the middle of the rib of the leaves as they lay upon the ground round the stem, each of them, in about a second of time, closed and doubled itself up, crossing the thorns over the opposite edge of the leaf, like the teeth of a spring ra[t]-trap:<sup>6</sup> of this plant I was favoured with an elegant coloured drawing, by Miss Maria Jackson<sup>7</sup> of Taporly, in Cheshire, a Lady who adds much botanical knowledge to many other elegant acquirements.

In the *Apocynum Androsæmifolium*, one kind of Dog's-bane, the anthers converge over the nectaries, which consist of five glandular oval corpuscles<sup>8</sup> surrounding the germ; and at the same time admit air to the nectaries at the interstice between each anther. But when a fly inserts its proboscis between these anthers to plunder the honey, they converge closer, and with such violence as to detain the fly, which thus generally perishes. This account was related to me by R. W. Darwin, Esq;<sup>9</sup> of Elston, in Nottinghamshire, who showed me the plant in flower, July 2d, 1788, with a fly thus held fast by the end of its proboscis, and was well seen by a magnifying lens, and which in vain repeatedly struggled to disengage itself, till the converging anthers were separated by means of a pin: on some days he had observed that almost every flower of this elegant plant had a fly in it thus entangled; and a few weeks afterwards favoured me with his further observations on this subject.

“My *Apocynum* is not yet out of flower. I have often visited it, and have frequently found four or five flies, some alive, and some dead, in its flowers; they are generally caught by the trunk or proboscis, sometimes by the trunk and a leg; there is one at present only caught by a leg: I don't know that this plant sleeps, as the flowers remain open in the night; yet the flies frequently make their escape. In a plant of Mr. Ordino's,<sup>10</sup> an ingenious gardener at Newark, who is possessed of a great collection of plants, I saw many flowers of an *Apocynum* with three dead flies in each; they are a thin-bodied fly, and rather less than the common house-fly; but I have seen two or three other sorts of flies thus arrested by the plant. Aug. 12, 1788.”

P. 18. *Additional note on Ilex*. The efficient cause which renders the hollies prickly in Needwood Forest<sup>11</sup> only as high as the animals can reach them, may arise from the lower branches being constantly cropped by them, and thus shoot forth more luxuriant foliage: it is probable the shears in garden-hollies may produce the same effect, which is equally curious, as prickles are not thus produced on other plants.

P. 41. *Additional note on Ulva*. M. Hubert made some observations on the air contained in the cavities of the bambou. The stems of these canes were from 40 to 50 feet in height, and 4 or 5 inches in diameter, and might contain about 30 pints of elastic air.<sup>12</sup> He cut a bambou, and introduced a lighted candle into the cavity, which was extinguished immediately on its entrance. He tried this about 60 times in a cavity of the bambou, containing about two pints. He introduced mice at different times into these cavities, which seemed to be somewhat affected, but soon recovered their agility. The stem of the bambou is not hollow till it rises more than one foot from the earth; the divisions between the cavities are convex downwards. *Observ. sur la Physique par M. Rozier*, I. 33. p. 130.<sup>13</sup>

( 187 )

P. 65. *Additional note on Gossypium*.<sup>14</sup>

— — — — — emerging Naiads cull  
From leathery pods the vegetable wool.  
— — — — — *eam circum Milesia vellera nymphae*  
*Carpebant, hyali saturo fucata colore.*

Virg. Georg. IV. 334.<sup>15</sup>

P. 119. *Addition to Orchis*.<sup>16</sup> The two following lines were by mistake omitted; they were to have been inserted after l. 282, p. 119.

Saw on his helm, her virgin hands inwove,  
Bright stars of gold, and mystic knots of love;

P. 136. *Addition to the note on Tropæolum*. In Sweden a very curious phenomenon has been observed on certain flowers, by M. Haggren,<sup>17</sup> Lecturer in Natural History. One evening he perceived a faint flash of light repeatedly dart from a Marigold; surprized at such an uncommon appearance, he resolved to examine it with attention; and, to be assured that it was no deception of the eye, he placed a man near him, with orders to make a signal at the moment when he observed the light. They both saw it constantly at the same moment.

The light was most brilliant on Marigolds, of an orange or flame colour; but scarcely visible on pale ones.

The flash was frequently seen on the same flower two or three times in quick succession, but more commonly at intervals of several minutes; and when several flowers in the same place emitted their light together, it could be observed at a considerable distance.

This phænomenon was remarked in the months of July and August, at sun-set, and for half an hour after, when the atmosphere was clear; but after a rainy day, or when the air was loaded with vapours, nothing of it was seen.

The following flowers emitted flashes, more or less vivid, in this order:

1. The Marigold, (*Calendula Officinalis*).
2. Garden Nasturtion, (*Tropæolum majus*).
3. Orange Lily, (*Lilium bu[l]biferum*).
4. The Indian Pink,<sup>18</sup> (*Tagetes patula et erecta*).

Sometimes it was also observed on the Sun-flowers, (*H[e]lianthus annuus*). But bright yellow, or flame colour, seemed in general necessary for the production of this light; for it was never seen on the flowers of any other colour.

To discover whether some little insects, or phosphoric worms, might not be the cause of it, the flowers were carefully examined even with a microscope, without any such being found.

From the rapidity of the flash, and other circumstances, it might be conjectured, that there is something of electricity in this phænomenon. It is well known, that when the

*pistil* of a flower is impregnated, the  *pollen* bursts away by its elasticity, with which electricity may be combined. But M. Haggren, after having observed the flash from the Orange-lily, the  *anthers* of which are a considerable space distant from the  *petals*, found that the light proceeded from the  *petals* only; whence he concludes, that this electric light is caused by the  *pollen*, which in flying off is scattered upon the  *petals*.  *Obser. Physique par M. Rozier, Vol. XXXIII. p. 111.*<sup>19</sup>

P. 153.  *Addition to Avena.*<sup>20</sup> The following lines were by mistake omitted; they were designed to have been inserted after l. 102, p. 153.

Green swells the beech, the widening knots improve,  
So spread the tender growths of culture'd love;  
Wave follows wave, the letter'd lines decay,  
So Love's soft forms neglected melt away.

P. 157.  *Additional note to Bellis.* Du Halde gives an account of a white wax made by small insects round the branches of a tree in China in great quantity, which is there collected for economical and medical purposes: the tree is called Tong-tsin.  *Description of China, Vol. I. p. 230.*<sup>21</sup>

*Description of the Poison-Tree in the Island of JAVA.*<sup>22</sup>  *Translated from the original Dutch*<sup>23</sup>  *of N. P. Foersch.*<sup>24</sup>

THIS destructive tree is called in the Malayan<sup>25</sup> language  *Bohon- Upas*, and has been described by naturalists; but their accounts have been so tinctured with the  *marvellous*, that the whole narration has been supposed to be an ingenious fiction by the generality of readers. Nor is this in the least degree surprising, when the circumstances which we shall faithfully relate in this description are considered.

I must acknowledge, that I long doubted the existence of this tree, until a stricter enquiry convinced me of my error. I shall now only relate simple unadorned facts, of which I have been an eye-witness. My readers may depend upon the fidelity of this account. In the year 1774 I was stationed at Batavia,<sup>26</sup> as a surgeon, in the service of the Dutch East-India Company.<sup>27</sup> During my residence there I received several different accounts of the Bohon Upas, and the violent effects of its poison. They all then seemed incredible to me, but raised my curiosity in so high a degree, that I resolved to investigate this subject thoroughly, and to trust only to  *my own observations*. In consequence of this resolution, I applied to the Governor-General, Mr. Petrus Albertus van der Parra,<sup>28</sup> for a pass to travel through the country: my request was granted; and, having procured

every information, I set out on my expedition. I had procured a recommendation from an old Malayan priest to another priest, who lives on the nearest inhabitable spot to the tree, which is about fifteen or sixteen miles distant. The letter proved of great service to me in my undertaking, as that priest is appointed by the Emperor to reside there, in order to prepare for eternity the souls of those who for different crimes are sentenced to approach the tree, and to procure the poison.

The *Bohon-Upas* is situated in the island of *Java*, about twenty-seven leagues from *Batavia*, fourteen from *Soura Charta*,<sup>29</sup> the seat of the Emperor, and between eighteen and twenty leagues from *Tinkjoe*,<sup>30</sup> the present residence of the Sultan of Java.<sup>31</sup> It is surrounded on all sides by a circle of high hills and mountains; and the country round it, to the distance of ten or twelve miles from the tree, is entirely barren. Not a tree, nor a shrub, nor even the least plant or grass is to be seen. I have made the tour all around this dangerous spot, at about eighteen miles distant from the centre, and I found the aspect of the country on all sides equally dreary. The easiest ascent of the hills is from that part where the old ecclesiastick dwells. From his house the criminals are sent for the poison, into which the points of all warlike instruments are dipped. It is of high value, and produces a considerable revenue to the Emperor.

*Account of the manner in which the Poison is procured.*

The poison which is procured from this tree is a gum that issues out between the bark and the tree itself, like the *camphor*. Malefactors, who for their crimes are sentenced to die, are the only persons who fetch the poison; and this is the only chance they have of saving their lives. After sentence is pronounced upon them by the judge, they are asked in court, whether they will die by the hands of the executioner, or whether they will go to the *Upas* tree for a box of poison? They commonly prefer the latter proposal, as there is not only some chance of preserving their lives, but also a certainty, in case of their safe return, that a provision will be made for them in future by the Emperor. They are also permitted to ask a favour of the Emperor, which is generally of a trifling nature, and commonly granted. They are then provided with a silver or tortoiseshell box, in which they are to put the poisonous gum, and are properly instructed how to proceed while they are upon their dangerous expedition. Among other particulars, they are always told to attend to the direction of the winds; as they are to go towards the tree before the wind, so that the effluvia<sup>32</sup> from the tree are always blown from them. They are told, likewise, to travel with the utmost dispatch, as that is the only method of insuring a safe return. They are afterwards sent to the house of the old priest, to which place they are commonly attended by their friends and relations. Here they generally remain some days, in expectation of a favourable breeze. During that time the ecclesiastic prepares them for their future fate by prayers and admonitions.

( 190 )

When the hour of their departure arrives, the priest puts them on a long leather-cap, with two glasses before their eyes, which comes down as far as their breast; and also provides them with a pair of leather-gloves. They are then conducted by the priest, and their friends and relations, about two miles on their journey. Here the priest repeats his instructions, and tells them where they are to look for the tree. He shews them a hill, which they are told to ascend, and that on the other side they will find a rivulet, which they are to follow, and which will conduct them directly to the Upas. They now take leave of each other; and, amidst prayers for their success, the delinquents hasten away.

The worthy old ecclesiastic has assured me, that during his residence there, for upwards of thirty years, he had dismissed above seven hundred criminals in the manner which I have described; and that scarcely two out of twenty have returned. He shewed me a catalogue of all the unhappy sufferers, with the date of their departure from his house annexed; and a list of the offences for which they had been condemned: to which was added, a list of those who had returned in safety. I afterwards saw another list of these culprits, at the jail-keeper's at *Soura-Charta*, and found that they perfectly corresponded with each other, and with the different informations which I afterwards obtained.

I was present at some of these melancholy ceremonies, and desired different delinquents to bring with them some pieces of the wood, or a small branch, or some leaves of this wonderful tree. I have also given them silk cords, desiring them to measure its thickness. I never could procure more than two dry leaves that were picked up by one of them on his return; and all I could learn from him, concerning the tree itself, was, that it stood on the border of a rivulet, as described by the old priest; that it was of middling size; that five or six young trees of the same kind stood close by it; but that no other shrub or plant could be seen near it; and that the ground was of a brownish sand, full of stones, almost impracticable for travelling, and covered with dead bodies. After many conversations with the old Malayan priest, I questioned him about the first discovery, and asked his opinion of this dangerous tree; upon which he gave me the following answer:

“We are told in our new Alcoran,<sup>33</sup> that, above an hundred years ago, the country around the tree was inhabited by a people strongly addicted to the sins of Sodom and Gomorrha;<sup>34</sup> when the great prophet Mahomet determined not to suffer them to lead such detestable lives any longer, he applied to God to punish them: upon which God caused this tree to grow out of the earth, which destroyed them all, and rendered the country for ever uninhabitable.”

Such was the Malayan opinion. I shall not attempt a comment; but must observe, that all the Malayans consider this tree as an holy instrument of the great prophet to punish the sins of mankind; and, therefore, to die of the poison of the Upas is generally

considered among them as an honourable death. For that reason I also observed, that the delinquents, who were going to the tree, were generally dressed in their best apparel.

This however is certain, though it may appear incredible, that from fifteen to eighteen miles round this tree, not only no human creature can exist, but that, in that space of ground, no living animal of any kind has ever been discovered. I have also been assured by several persons of veracity, that there are no fish in the waters, nor has any rat, mouse, or any other vermin, been seen there; and when any birds fly so near this tree that the effluvia reaches them, they fall a sacrifice to the effects of the poison. This circumstance has been ascertained by different delinquents, who, in their return, have seen the birds drop down, and have picked them up *dead*, and brought them to the old ecclesiastick.

I will here mention an instance, which proves them a fact beyond all doubt, and which happened during my stay at Java.

In the year 1775 a rebellion broke out among the subjects of the Massay,<sup>35</sup> a sovereign prince, whose dignity is nearly equal to that of the Emperor. They refused to pay a duty imposed upon them by their sovereign, whom they openly opposed. The Massay sent a body of a thousand troops to disperse the rebels, and to drive them, with their families, out of his dominions. Thus four hundred families, consisting of above sixteen hundred souls, were obliged to leave their native country. Neither the Emperor nor the Sultan would give them protection, not only because they were rebels, but also through fear of displeasing their neighbour, the Massay. In this distressful situation, they had no other resource than to repair to the uncultivated parts round the Upas, and requested permission of the Emperor to settle there. Their request was granted, on condition of their fixing their abode no more than twelve or fourteen miles from the tree, in order not to deprive the inhabitants already settled there at a greater distance of their cultivated lands. With this they were obliged to comply; but the consequence was, that in less than two months their number was reduced to about three hundred. The chiefs of those who remained returned to the Massay, informed him of their losses, and intreated his pardon, which induced him to receive them again as subjects, thinking them sufficiently punished for their misconduct. I have seen and conversed with several of those who survived soon after their return. They all had the appearance of persons tainted with an infectious disorder; they looked pale and weak, and from the account which they gave of the loss of their comrades, of the symptoms and circumstances which attended their dissolution, such as convulsions, and other signs of a violent death, I was fully convinced that they fell victims to the poison.

This violent effect of the poison at so great a distance from the tree, certainly appears surprising, and almost incredible; and especially when we consider that it is possible for delinquents who approach the tree to return alive. My wonder, however, in a great measure, ceased, after I had made the following observations:

I have said before, that malefactors are instructed to go to the tree with the wind, and to return against the wind. When the wind continues to blow from the same quarter while the delinquent travels thirty, or six and thirty miles, if he be of a good constitution, he certainly survives. But what proves the most destructive is, that there is no dependence on the wind in that part of the world for any length of time.—There are no regular land-winds; and the sea-wind is not perceived there at all, the situation of the tree being at too great a distance, and surrounded by high mountains and uncultivated forests. Besides, the wind there never blows a fresh regular gale, but is commonly merely a current of light, soft breezes, which pass through the different openings of the adjoining mountains. It is also frequently difficult to determine from what part of the globe the wind really comes, as it is divided by various obstructions in its passage, which easily change the direction of the wind, and often totally destroy its effects.

I, therefore, impute the distant effects of the poison, in a great measure, to the constant gentle winds in those parts, which have not power enough to disperse the poisonous particles. If high winds are more frequent and durable there, they would certainly weaken very much, and even destroy the obnoxious effluvia of the poison; but without them, the air remains infected and pregnant with these poisonous vapours.

I am the more convinced of this, as the worthy ecclesiastick assured me, that a dead calm is always attended with the greatest danger, as there is a continual perspiration issuing from the tree, which is seen to rise and spread in the air, like the putrid steam of a marshy cavern.

*Experiments made with the Gum of the UPAS-TREE.*

IN the year 1776, in the month of February, I was present at the execution of thirteen of the Emperor's concubines, at *Soura-Charta*, who were convicted of infidelity to the Emperor's bed.<sup>36</sup> It was in the forenoon, about eleven o'clock, when the fair criminals were led into an open space within the walls of the Emperor's palace. There the judge passed sentence upon them, by which they are doomed to suffer death by a lancet poisoned with Upas. After this the Alcoran was presented to them, and they were, according to the law of their great prophet Mahomet, to acknowledge and to affirm by oath, that the charges brought against them, together with the sentence and their punishment, were fair and equitable. This they did, by laying their right hand upon the Alcoran, their left hands upon their breast, and their eyes lifted towards heaven; the judge then held the Alcoran to their lips, and they kissed it.

These ceremonies over, the executioner proceeded on his business in the following manner:—Thirteen posts, each about five feet high, had been previously erected. To these the delinquents were fastened, and their breasts stripped naked. In this situation they remained a short time in continual prayers, attended by several priests, until a signal



( 193 )

was given by the judge to the executioner; on which the latter produced an instrument, much the like the spring lancet used by farriers for bleeding horses. With this instrument, it being poisoned with the gum of the Upas, the unhappy wretches were lanced in the middle of their breasts, and the operation was performed upon them all in less than two minutes.

My astonishment was raised to the highest degree, when I beheld the sudden effects of that poison, for in about five minutes after they were lanced, they were taken with a *tremor*, attended with a *subsultus tendinum*,<sup>37</sup> after which they died in the greatest agonies, crying out to God and Mahomet for mercy. In sixteen minutes by my watch, which I held in my hand, all the criminals were no more. Some hours after their death, I observed their bodies full of livid spots, much like those of the *Petechiæ*,<sup>38</sup> their faces swelled, their colour changed to a kind of blue, their eyes looked yellow, &c. &c.

About a fortnight after this, I had an opportunity of seeing such another execution at Samarang.<sup>39</sup> Seven Malayans were executed there with the same instrument, and in the same manner; and I found the operation of the poison, and the spots in their bodies exactly the same.

These circumstances made me desirous to try an experiment with some animals, in order to be convinced of the real effects of this poison; and as I had then two young puppies, I thought them the fittest objects for my purpose. I accordingly procured with great difficulty some grains of Upas. I dissolved half a grain of that gum in a small quantity of arrack,<sup>40</sup> and dipped a lancet into it. With this poisoned instrument I made an incision in the lower muscular part of the belly in one of the puppies. Three minutes after it received the wound the animal began to cry out most piteously, and ran as fast as possible from one corner of the room to the other. So it continued during six minutes, when all its strength being exhausted, it fell upon the ground, was taken with convulsions, and died in the eleventh minute. I repeated this experiment with two other puppies, with a cat, and a fowl, and found the operation of the poison in all of them the same: none of these animals survived above thirteen minutes.

I thought it necessary to try also the effect of the poison given inwardly, which I did in the following manner. I dissolved a quarter of a grain of the gum in half an ounce of arrack, and made a dog of seven months old drink it. In seven minutes a retching ensued, and I observed, at the same time, that the animal was delirious, as it ran up and down the room, fell on the ground, and tumbled about; then it rose again, cried out very loud, and in about half an hour after was seized with convulsions, and died. I opened the body, and found the stomach very much inflamed, as the intestines were in some parts, but not so much as the stomach. There was a small quantity of coagulated blood in the stomach; but I could discover no orifice from which it could have issued; and therefore supposed it to have been squeezed out of the lungs, by the animal's straining while it was vomiting.

From these experiments I have been convinced that the gum of the Upas is the most dangerous and most violent of all vegetable poisons; and I am apt to believe that it greatly contributes to the unhealthiness of that island. Nor is this the only evil attending it: hundreds of natives of Java, as well as Europeans, are yearly destroyed and treacherously murdered by that poison, either internally or externally. Every man of quality or fashion has his dagger or other arms poisoned with it; and in times of war the Malayans poison the springs and other waters with it; by this treacherous practice the Dutch suffered greatly during the last war, as it occasioned the loss of half their army. For this reason, they have ever since kept fish in the springs of which they drink the water; and sentinels are placed near them, who inspect the waters every hour, to see whether the fish are alive. If they march with an army or body of troops into an enemy's country, they always carry live fish with them, which they throw into the water some hours before they venture to drink it; by which means they have been able to prevent their total destruction.

This account, I flatter myself, will satisfy the curiosity of my readers, and the few facts which I have related will be considered as a certain proof of the existence of this pernicious tree, and its penetrating effects.

If it be asked why we have not yet any more satisfactory accounts of this tree, I can only answer, that the object to most travellers to that part of the world consists more in commercial pursuits than in the study of Natural History and the advancement of Sciences. Besides, Java is so universally reputed an unhealthy island, that rich travellers seldom make any long stay in it; and others want money, and generally are too ignorant of the language to travel, in order to make enquiries. In future, those who visit this island will probably now be induced to make it an object of their researches, and will furnish us with a fuller description of this tree.

I will therefore only add, that there exists also a sort of Cajoe-Upas<sup>41</sup> on the coast of Macassar, the poison of which operates nearly in the same manner, but is not half so violent or malignant as that of Java, and of which I shall likewise give a more circumstantial account in a description of that island.—*London Magazine*.

{*Another Account of the Boa Upas, or Poison-Tree of Macasser,*<sup>42</sup> *from an inaugural Dissertation published by Christ. Aejmelæus, and approved by Professor Thunberg,*<sup>43</sup> *at Upsal.*

Doctor Aejmelæus first speaks of poisons in general, enumerating many virulent ones from the mineral and animal, as well as from the vegetable kingdoms of Nature. Of the first he mentions arsenical, mercurial, and antimonial preparations; amongst the second he mentions the poisons of several serpents, fishes, and insects; and amongst the last the Curara<sup>44</sup> on the bank of the Oronoko,<sup>45</sup> and the Woorara<sup>46</sup> on the banks of the Amazonas,<sup>47</sup> and many others. But he thinks the strongest is that of a tree hitherto undescribed, known by the name of Boa Upas, which grows in many of the warmer parts of India, principally in the islands of Java,<sup>48</sup> Sumatra,<sup>49</sup> Borneo,<sup>50</sup> Bali,<sup>51</sup> Macasser,<sup>52</sup> and Celebes.<sup>53</sup>

Rumphius<sup>54</sup> testifies concerning this Indian poison, that it was more terrible to the Dutch than any warlike instrument; it is by him styled *Arbor toxicaria*, and mentions two species of it, which he terms male and female; and describes the tree as having a thick trunk, with spreading branches, covered with a rough dark bark. The wood, he

adds, is very solid, of a pale yellow, and variegated with black spots, but the fructification is yet unknown.

Professor Thunberg supposes the Boa Upas to be a *Cestrum*,<sup>55</sup> or a tree of the same natural family; and describes a *Cestrum* of the Cape of Good Hope,<sup>56</sup> the juice of which the Hottentots<sup>57</sup> mix with the venom of a certain serpent, which is said to increase the deleterious quality of them both.

The Boa Upas tree is easily recognised at a distance, being always solitary, the soil around it being barren, and as it were burnt up; the dried juice is dark brown, liquifying by heat, like other resins. It is collected with the greatest caution, the person having his head, hands, and feet carefully covered with linen, that his whole body may be protected from the vapour as well as from the droppings of the tree. No one can approach so near as to gather the juice, hence they supply bamboos, pointed like a spear, which they thrust obliquely, with great force, into the trunk; the juice oozing out gradually fills the upper joint; and the nearer the root the wound is made, the more virulent the poison is supposed to be. Sometimes upwards of twenty reeds are left fixed in the tree for three or four days, that the juice may collect and harden in the cavities; the upper joint of the reed is then cut off from the remaining part, the concreted juice is formed into globules or sticks, and is kept in hollow reeds, carefully closed, and wrapped in tenfold linen.<sup>58</sup> It is every week taken out to prevent its becoming mouldy, which spoils it. The deleterious quality appears to be volatile, since it loses much of its power in the time of one year, and in a few years becomes totally effete.

The vapour of the tree produces numbness and spasms of the limbs, and if any one stands under it bare-headed, he loses his hair; and if a drop falls on him, violent inflammation ensues. Birds which sit on the branches a short time, drop down dead, and can even with difficulty fly over it; and not only no vegetables grow under it, but the ground is barren a stone cast around it.

A person wounded by a dart poisoned with this juice feels immediately a sense of heat over his whole body, with great vertigo, to which death soon succeeds. A person wounded with the Java poison<sup>59</sup> was affected with tremor of the limbs, and starting of the tendons in five minutes, and died in less than sixteen minutes, with marks of great anxiety; the corpse, in a few hours, was covered with petechial<sup>60</sup> spots, the face became tumid and lead-coloured, and the white part of the eye became yellow.

The natives try the strength of their poison by a singular test; some of the expressed juice of the root of *Amomum Zerumbet* is mixed with a little water, and a bit of the poisonous gum or resin is dropped into it; an effervescence instantly takes place, by the violence of which they judge of the strength of the poison.—What air can be extricated during this effervescence?—This experiment is said to be dangerous to the operator.<sup>61</sup>

As the juice is capable of being dissolved in arrack,<sup>62</sup> and is thence supposed to be principally of a resinous nature, the Professor does not credit that fountains have been poisoned with it.

This poison has been employed as a punishment for capital crimes in Macasser and other islands;<sup>63</sup> in those cases some experiments have been made, and when a finger only has been wounded with a dart, the immediate amputation of it did not save the criminal from death.

The poison from what has been termed the female tree, is less deleterious than the other, and has been used chiefly in hunting; the carcasses of animals thus destroyed are eaten with impunity. The

poison-juice is said to be used externally as a remedy against other poisons, in the form of a plaster; also to be used internally for the same purpose; and is believed to alleviate the pain, and extract the poison of venomous insects sooner than any other application.

The author concludes that these accounts have been exaggerated by Mahomedan priests, who have persuaded their followers that the Prophet Mahomet planted this noxious tree as a punishment for the sins of mankind.<sup>64</sup>

An abstract of this Dissertation of C. Aejmelæus is given in Dr. Duncan's Medical Commentaries for the Year 1790, Decad. 2d. Vol. V.}<sup>65</sup>

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{*Fairy-scene from Mr. Mundy's Needwood Forest.*<sup>66</sup> Referred to in  
*Canto IV. l. 35.*

HERE, seen of old, the *elfin* race  
With sprightly vigils mark'd the place;  
Their gay processions charm'd the sight,  
Gilding the lucid noon of night;  
Or, when obscure the midnight hour,  
With glow-worm lanterns hung the bower,  
—Hark!—the soft lute!—along the green  
Moves with majestic step the QUEEN!  
Attendant Fays around her throng,  
And trace the dance or raise the song;  
Or touch the shrill reed, as they trip,  
With finger light and ruby lip.

High, on her brow sublime, is borne  
One scarlet woodbine's tremulous horn;  
A gaudy Bee-bird's\* triple plume  
Sheds on her neck its waving gloom;

\* The *humming-bird*.

With silvery gossamer entwin'd  
Stream the luxuriant locks behind.  
Thin folds of tangled network break  
In airy waves adown her neck;—  
Warp'd in his loom, the spider spread  
The far-diverging rays of thread,  
Then round and round with shuttle fine  
Inwrought the undulating line;—  
Scarce hides the woof her bosom's snow,  
One pearly nipple peeps below.  
One rose-leaf forms her crimson vest,  
The loose edge crosses o'er her breast;  
And one translucent fold, that fell  
From the tall lily's ample bell,  
Forms with sweet grace her snow-white train,  
Flows, as she steps, and sweeps the plain.  
Silence and Night enchanted gaze,  
And Hesper<sup>67</sup> hides his vanquish'd rays!—

Now the waked reed-finch swells his throat,

And night-larks trill their mingled note:  
Yet hush'd in moss with writhed neck  
The blackbird hides his golden beak;  
Charm'd from his dream of love, he wakes,  
Opes his gay eye, his plumage shakes,  
And, stretching wide each ebon wing,  
First in low whispers tries to sing;  
Then sounds his clarion loud, and thrills  
The moon-bright lawns, and shadowy hills.  
Silent the choral Fays attend,  
And then their silver voices blend,  
Each shining thread of sound prolong,  
And weave the magic woof of song.  
Pleased Philomela<sup>68</sup> takes her stand  
On high, and leads the Fairy band,  
Pours sweet at intervals her strain,  
And guides with beating wing the train.  
Whilst interrupted Zephyrs bear  
Hoarse murmurs from the distant wear;<sup>69</sup>  
And at each pause is heard the swell  
Of Echo's soft symphonious shell.<sup>70</sup>

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<sup>1</sup> In 1789, the Additional Notes consist of four notes that in subsequent editions are placed with their verse passages (see notes to *LOTP* I:161, I:387, III:411, and IV:52), and Foersch's "Description of the Poison-Tree," including "Experiments made with the Gum of the Upas-Tree." The notes on *Silene* and *Tropæolum* are found in 1789 in a Supplement placed after the indexes.

<sup>2</sup> Jean Louis Antoine Reynier (1762–1824), Swiss naturalist. ED's reference is to p. 221 in the "Foreign Literary Intelligence" section in *The Critical Review* 65 (March 1788): pp. 217–24.

<sup>3</sup> "Vol. I" (referring to Part I of *The Botanic Garden, The Economy of Vegetation*) applies to *Cypripedia* only. In *The Economy of Vegetation* IV:505 and note, the flower of *Cypripedium* mimics a spider to protect its nectar from hummingbirds; an illustration of the flower is included. In the note, there is a cross-reference to the note on *Lonicera* in *LOTP* I:143n. The notes in *LOTP* on *Polymorpha* (IV:446) and *Rubia* (I:375) refer to the kind of camouflage discussed here.

<sup>4</sup> James Edward Smith (1759–1828), botanist. He purchased the library, manuscripts, herbarium, and natural history collections made by Linnaeus and his son when Carl Linnaeus Jr. died. He was a founder and the first president of the Linnaean Society established in 1788. Among his best-known works is *English Botany* (1790–1814), illustrated by James Sowerby (1757–1822), natural history artist, publisher, and collector. ED refers to his article, "Some Observations on the

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Irritability of Vegetables," *Philosophical Transactions of the Royal Society of London* 78 (1788): pp. 158–65.

<sup>5</sup> 1791, 1794, 1799: "Sir B. Boothby" Boothby succeeded to the baronetcy when his father died in April 1789. Brooke Boothby (1744–1824), author, traveller, and exotic plant collector, was part of ED's circle of literary friends in Lichfield, and a member of the Botanical Society at Lichfield, participating in the translations of Linnaeus spearheaded by ED, *A System of Vegetables* (1783) and *The Families of Plants* (1787). See *LOTP* Preface vii–viii and editor's notes.

<sup>6</sup> 1789, 1791, 1794, 1799: "rat-trap:"

<sup>7</sup> Maria Elizabetha Jacson (1755–1829), writer on botany. Brooke Boothby was her cousin. She is the author of *Botanical Dialogues, between Hortensia and her Four Children* (1797), which includes a commendatory letter from Boothby and ED, and *Botanical Lectures* (1804) which she addressed to readers as "an easy introduction to the use of the Translated System of Vegetables, the only English work from which the pupil can become a Linnean, or universal Botanist" (iv), referring to the Botanical Society of Lichfield's *A System of Vegetables* (1783) (see *LOTP* Preface vii–viii and editor's notes). Her *Sketches of the Physiology of Vegetable Life* (1811) is illustrated with her own drawings. She also wrote on horticulture and garden design in *Florist's Manual* (1816).

<sup>8</sup> A minute body, forming a distinct part of the organism.

<sup>9</sup> This is ED's eldest brother Robert Waring Darwin (1724–1816) who also wrote poetry and studied botany. He published *Principia Botanica*, an introduction to the Linnean system, in 1787. He dedicated the third edition (1810) to his nephew and namesake, ED's son Robert Waring Darwin (1766–1848) who would be the father of Charles Darwin (1809–1882). Elston was the Darwin family home where ED spent his early years.

<sup>10</sup> Corrected in 1791, 1794 and 1799 to Ordoyno. Garrett Ordoyno (c. 1723–1795) and his brother Jacob Ordoyno (c. 1734–1812) had a nursery in Newark on Trent in Nottinghamshire, about six miles from Elston. Their nephew Thomas Ordoyno (fl. 1790s–1810s) was also involved in the nursery.

<sup>11</sup> Needwood Forest was located in East Staffordshire, not far from Lichfield where ED lived from 1756 to 1781. It was the subject of a poem, *Needwood Forest* (1776), by his friend Francis Noel Clarke Mundy (1739–1815) which opposed the felling of its trees. See *LOTP* I:161–74, IV:33–6, and Additional Notes below, and editor's notes.

<sup>12</sup> Hubert writes that the gas in the bamboo "jouit de son élasticité: je le crois un air fixe, foiblement méphitisé, ou air phlogistique" [enjoys its elasticity; I believe it a fixed air, weakly mephitic, or phlogisticated air]. Fixed air is carbon dioxide. Mephitic means noxious; mephitic air is unable to support life or combustion and could refer to carbon dioxide or nitrogen. Phlogisticated air is nitrogen; phlogiston was a

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hypothetical substance believed to exist in flammable substances, released on combustion.

<sup>13</sup> “Lettre de M. Hubert, Major d’Infanterie, &c à M. L’Abbé Rozier, Sur l’Air contenu dans les cavités du Bambou” [Letter from Monsieur Hubert, Major of Infantry, etc., to Monsieur l’Abbé Rozier, on the air contained in the cavities of the Bamboo] *Observations sur la physique, sur l’histoire naturelle et sur les arts* [Observations on physics, natural history and the arts], Vol. 33 Part 2 (July 1788), pp. 130–32. François Rozier (1734–1793), French botanist, was one of three editors of the periodical, the others being Jean-André Mongez (1750–1788?) and Jean-Claude de la Métherie (1743–1817).

<sup>14</sup> In 1791, 1794 and 1799, this note does not appear, and the lines are inserted in the note to *Gossypium*.

<sup>15</sup> These lines from Virgil’s *Georgics*, 4:334–35, more literally translate, “About her [Cyrene] the nymphs were spinning fleeces of Miletus, dyed with rich glassy hue” (trans. H. Rushton Fairclough; Loeb Classical Library). The context of the lines is that Aristaeus has cried to his mother, Cyrene, in grief over the sickness and death of his colonies of bees; she hears him and asks one of her nymphs to bring Aristaeus to her in the realm of waters. Miletus, on the coast of Asia Minor, was the leading city for the wool industry.

<sup>16</sup> In 1791, 1794 and 1799, this note does not appear because the lines are not omitted.

<sup>17</sup> Lars Christian Haggren, “Om Blommors blickande”, *Kongliga Vetenskaps Academiens nya Handlingar* [Royal Academy of Sciences’ New Documents] Series 2, Vol. 9 (1788), pp. 62–4.

<sup>18</sup> 1791, 1794, 1799: “4. African Marigold.” ED’s source, Gevalin’s French translation of Haggren, has “les œilletts d’Inde.” “œillet” in English is “pink” or “carnation,” but “œillet d’Inde” is “African marigold.”

<sup>19</sup> In 1789 (where this note appears in a Supplement placed after the indexes) this reference is not given, and “[*Gen. Evening Post.*]” is printed on the line below. That reference is to *The General Evening Post*. (London.) From Saturday, November 29, to Tuesday, December 2, 1788, p. 2. ED’s note is a verbatim transcription of the full article; the only substantive differences are that in the article the common name for *Tropæolum majus* is given as “Monk’s-hood”, and the article concludes with the sentence, “Whatever be the cause, the effect is singular, and highly curious.” The article is a direct translation of the piece ED refers to here: “Mémoire sur des fleurs donnant des éclairs; Traduction du Suedois de M. Haggren, Lecteur d’Histoire-Naturelle, par M. Gevalin” [Report on flowers giving flashes; Translation from the Swedish of [Lars Christian] Haggren, Lecturer in Natural History, by [Johan Erik] Gevalin], *Observations sur la physique, sur l’histoire naturelle et sur les arts* [Observations on physics, natural history and the arts] Vol. 33 Part 2 (July 1788): p. 111. The original article in Swedish is “Om Indianska

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krassens blickande. Af Elisabet Christina Linnæa. Med tillägg af Carl Linnæus. (Herr Lector Wilckes anmärkning vid föregående Rön.)" [On the twinkling of the Indian cress, by Elisabeth Christine Linnaeus, with supplement by Carl Linnaeus. (Lecturer Wilckes' remarks about the preceding findings.)], *Kongliga Vetenskaps Akademiens Handlingar* [Documents of the Royal Academy of Sciences] Series 1, Vol. 23 (1762), pp. 284–87. (For a translation of E. C. Linnaeus's article and supplement, see Fred Blick, "Flashing Flowers and Wordsworth's 'Daffodils,'" *Wordsworth Circle* 48.2 (2017): pp. 110–15.)

<sup>20</sup> In 1791, 1794 and 1799, this note does not appear because the lines are not omitted.

<sup>21</sup> The French Jesuit Jean-Baptiste Du Halde (1674–1743) drew on the records of Jesuit missionaries in China to compile *Description géographique, historique, chronologique, politique et physique de l'Empire de la chine et de la Tartarie chinoise*, first published in French in 1735. The first English edition, *The general history of China. Containing a geographical, historical, chronological, political and physical description of the empire of China, Chinese-Tartary, Corea, and Thibet*, was published in 1736. In Vol. 1 of the English translation, insects producing white wax are mentioned (primarily on pp. 11 and 208), but the name ED uses for the tree (given variably as *Tong tçin* or *Tong çin*) and the medical purposes of the wax are found in a section that only appears in the original French text, "De la cire blanche, faite par des insectes, et nommée Tcang pe la, c'est-à-dire, Cire blanche d'Insectes" [Of the white wax, made by insects, and called Tcan pe la, that is, White wax of Insects] (Vol. 3, pp. 495–96).

<sup>22</sup> The island of Java is in Indonesia, between the Java Sea and the Indian Ocean, southeast of Sumatra. In the eighteenth century (including ED's time) it was mainly under Dutch control.

<sup>23</sup> The *London Magazine* names the translator as Mr. Heydinger, "formerly a *German bookseller* near Temple-Bar"; Charles Heydinger was a French and German bookseller who lived in London from 1771 to 1778, or later, considering his involvement in this translation. However, William Marsden (1754–1836), author of *History of Sumatra* (1783), would later (in an 1812 letter) suggest that Foersch's "romance" was not translated from Dutch but written in English in London. (See John Bastin, "New Light on J. N. Foersch and the Celebrated Poison Tree of Java," *Journal of the Malaysian Branch of the Royal Asiatic Society* 58.2 (1985): pp. 25–44.)

<sup>24</sup> This article, "Description of the Poison-Tree, in the Island of Java," was published in the *London Magazine*, New Series Vol. 1 (December 1783): pp. 512–17. The *London Magazine* lists the author incorrectly as "N. P. Foersch" after the title, and correctly as "J. N. Foersch" at the end of the article. John Nichols Foersch travelled in Java but never visited Surakarta, as the article claims, and he was not a surgeon at Batavia



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(now Jakarta) in 1774, but a Surgeon Third Class for the Dutch East India Company, stationed at Semarang (a port on the north coast of Java) in 1775–1776, and then became Senior Surgeon. Later he was a surgeon's mate on an English ship (the *Powerful*) and was in London in 1783. (See John Bastin, "New Light on J. N. Foersch and the Celebrated Poison Tree of Java," *Journal of the Malaysian Branch of the Royal Asiatic Society* 58.2 (1985): pp. 37–8.) A preface to the article in the *London Magazine* allows that Foersch's account "appears so marvellous, that even the Credulous might be staggered." It insists that "this narrative certainly merits attention and belief" but does recognize that it is probably a mix of fact and fiction: "With regard to the principal parts of the relation, there can be no doubt. The existence of the tree, and the noxious powers of its gums and vapours, are certain. For the story of the *thirteen* concubines, however, we should not choose to be responsible" (p. 512). The Batavian Society of Experimental Philosophy investigated Foersch's claims and published a refutation, written in Dutch, in 1789 ("Aenmerkingen over de beschryving van den vergifboom, in het Maleitsch genoemd *Pohoon Upas*, die, volgens het verhael van N. P. Foersch, op het eiland Java te vinden zoude zyn", *Nieuwe algemeene Vaderlandsche letter-oefeningen, waarin de boeken schriften, die dagelyks in ons Vaderland en elders uitkomen* Vol. 4, No. 2 (1789): pp. 104–9, 153–59). In 1793, George Staunton (1737–1801), secretary to Lord Macartney's embassy to China, made enquiries about the Upas when the embassy visited Java in 1793, and obtained a Latin translation of the Batavian Society's report, which he sent to Joseph Banks. In his reply to Staunton, Banks wrote, "I am glad the dutch have had the Sense to Contradict Foersch's Foolish account of the Cayu upas for the Sake of weak minds I have it in Contemplation to give the Paper to Nichols for publication in the Gent Mag in order that truth may be restord to the Public" (*The Indian and Pacific Correspondence of Sir Joseph Banks, 1768–1820, Volume 4, Letters 1792–1798*, ed. Neil Chambers (Pickering & Chatto 2011), p. 198). The *Gentleman's Magazine* published a summary in English in May 1794 ("Observations concerning the poisonous tree called by the Malays *Pohoon Upas*, and said by N. P. Foersch, to grow in the Island of Java," *Gentleman's Magazine* Vol. 64, No. 1 (1794): pp. 433–35). However, the Batavian Society's report mainly refutes the surrounding details without providing more accurate botanical information; indeed, it goes to the opposite extreme of claiming that "the island of Java produces no such tree" (p. 435). Accurate botanical information about the Upas would only be published after ED's lifetime, most notably by Jean-Baptiste Leschenault de la Tour in 1810 (who officially named it *Antiaris toxicaria*), and Thomas Horsfield in 1816. (Leschenault de la Tour, "Mémoire Sur le Strychnos tieute et l'*Antiaris toxicaria*, plantes vénéneuses de l'île de Java, avec le suc desquelles les

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indigènes empoisonnent leurs flèches; et Sur l'Andira harsfieldii, plante médicinale du même pays" *Annales du muséum d'histoire naturelle* Tome 16 (1810), pp. 459–82; Horsfield, "An Essay on the Oopas, or Poison-Tree of Java," *Asiatic Journal and Monthly Register for British India and its Dependencies*, Vol. 1 (January–June 1816): pp. 542–47; continued in Vol. 2 (June–December 1816): pp. 17–27).

<sup>25</sup> Malayan refers to the people and the language of Malaysia, Brunei, and parts of Indonesia.

<sup>26</sup> Former name of Jakarta, now capital of Indonesia, on the northwest coast of Java. It was founded c. 1619 by the Dutch as a fort and trading post.

<sup>27</sup> A chartered company set up to coordinate Dutch trade in the regions east of Africa. It was founded in 1602 and dissolved in 1799. France and Britain each had a comparable East India Company.

<sup>28</sup> Petrus Albertus van der Parra (1714–1775) was born in Ceylon (Sri Lanka) where his father was government secretary. He rose through various positions in colonial government and was Governor-General of the Dutch East Indies from 1761 until his death.

<sup>29</sup> Surakarta, a city in central Java, Indonesia.

<sup>30</sup> Probably Tjukjoe, or Djokjokarta, the Dutch name for Yogyakarta, southwest of Surakarta in central Java, Indonesia.

<sup>31</sup> Hamengkubuwono I was the Sultan of Yogyakarta 1749–1792. Under a 1755 treaty with the Dutch, the Mataram kingdom was divided between two sultanates, one in Surakarta and one in Yogyakarta. Susuhunan Pakubuwono III was the ruler of Surakarta 1749–1788.

<sup>32</sup> An outflow of particles too subtle to be perceived.

<sup>33</sup> The Quran, the sacred book of Islam.

<sup>34</sup> In Islamic, Jewish, and Christian tradition, the cities of Sodom and Gomorrah are associated with extreme and incorrigible wickedness. Their main sin, among many, is traditionally considered to be sodomy. In both the Quran (11:77–83) and the Bible (Genesis 19:1–26), the cities are destroyed by God for the people's sinfulness, but not because Muhammad, or anyone, has asked God to punish them. On the contrary, Abraham pleads to God to have mercy on the people (Quran 11:74–6; Genesis 18:23–32). In the Quran, the cities are not named; they are understood to be Sodom and Gomorrah because of their association with Lut (the biblical Lot). In neither source does the destruction involve a poison tree. In the Quran (37:62–8, 44:43–6), there is Zaqqum, a tree in hell, but its effects are different (its fruits boil in the bellies of sinners) and it is not specifically connected to Sodom and Gomorrah.

<sup>35</sup> Probably Mas Said, nephew of the ruler of Surakarta from 1727–1749, Pakubuwono II. Mas Said was involved in political upheavals in central Java in the mid-eighteenth century. These troubles led to the division of the sultanate between Surakarta and Yogyakarta in 1755 which brought an end to

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the conflicts. Mas Said, as Mankunegara I, was granted territory in 1757. John Bastin remarks that 1775 “was a particularly peaceful [year] in central Java” (“New Light on J. N. Foersch and the Celebrated Poison Tree of Java,” *Journal of the Malaysian Branch of the Royal Asiatic Society* 58.2 (1985): pp. 25–44; p. 41.)

<sup>36</sup> The 1789 report on the enquiry into the Upas by the Batavian Society of Arts and Sciences includes letters from 1785 in which the ruler of Surakarta 1749–1788, Pakubuwono III, denies any knowledge of Foersch and the Upas tree. (See John Bastin, “New Light on J. N. Foersch and the Celebrated Poison Tree of Java,” *Journal of the Malaysian Branch of the Royal Asiatic Society* 58.2 (1985): pp. 25–44; p. 32.)

<sup>37</sup> Twitching of muscles and their tendons, especially as seen in the late stages of typhoid and typhus fevers.

<sup>38</sup> A small, flat red spot caused by bleeding into the skin or other organ.

<sup>39</sup> Semarang, a port on the northern coast of central Java, Indonesia.

<sup>40</sup> A name for any alcoholic liquor made in Eastern countries, particularly those made from fermented coconut palm sap, or from rice and sugar fermented with coconut juice.

<sup>41</sup> German-born botanist and Dutch East India Company employee Georg Eberhard Rumph, known as Rumphius (1627–1702). His *Herbarium Amboinense* (1741–1750), has a substantial chapter on Arbor Toxicaria [poison tree] including an illustration (Book 3, Chapter 45, Tab. 87, Vol. 2, pp. 263–68). In the chapter, he mentions Cajoe Upas as the Malay name for a variety of Arbor Toxicaria found in Macassar (p. 265). Makassar, also known as Ujung Pandang, is a port city in the southern part of the island of Sulawesi in Indonesia.

<sup>42</sup> As cited at the end of the passage, ED takes this account from a summary by Andrew Duncan (1744–1828), professor of medicine at Edinburgh, who began publishing *Medical and Philosophical Commentaries* in 1773; in 1780 it was renamed *Medical Commentaries*. ED’s rendering selectively paraphrases Duncan’s article, occasionally re-ordering the points, and with some differences as noted below.

<sup>43</sup> The dissertation, “Arbor Toxicaria Macassariensis,” proposed by Christen Æjmelæus and presided over by Carl Peter Thunberg, was published in 1788; most of the dissertations Thunberg presided over would have been written primarily by him, with the student acting as an assistant. Carl Peter Thunberg (1743–1828) was a student of Linnaeus who succeeded him in 1784 as Professor of Botany at Uppsala University. Thunberg travelled extensively, spending 1772–1775 in South Africa and 1775–1776 in Japan, and then visiting Java, Colombo (in Ceylon, now Sri Lanka), and London on his return trip to Sweden. He is best known for his *Flora Japonica* (1784), which catalogs hundreds of Japanese plants and earned him the name of “the Japanese Linnaeus.”

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<sup>44</sup> Curare, an extract from South American trees (the bark of *Strychnos toxifera* and the root of *Chondrodendron tormentosum*), used to poison arrows, and as a muscle relaxant.

<sup>45</sup> River that rises in the Sierra Parima in southern Venezuela, flowing northwest to Colombia, then north along part of the Venezuela-Colombia border, and east into the Atlantic Ocean.

<sup>46</sup> Another name for curare.

<sup>47</sup> River that drains the rainforest basin of the northern part of South America.

<sup>48</sup> The island of Java is in Indonesia, between the Java Sea and the Indian Ocean, southeast of Sumatra. In the eighteenth century (including ED's time) it was mainly under Dutch control.

<sup>49</sup> Island in west Indonesia.

<sup>50</sup> Island in the Malay Archipelago, east of Singapore.

<sup>51</sup> Island off the eastern tip of Java, in Indonesia.

<sup>52</sup> Makassar is the former name of Ujung Pandang, the main port of the island of Sulawesi in Indonesia.

<sup>53</sup> Former name of Sulawesi, an island in eastern Indonesia.

<sup>54</sup> German-born botanist and Dutch East India Company employee Georg Eberhard Rumph, known as Rumphius (1627–1702). His *Herbarium Amoinense* (1741–1750) has a substantial chapter on Arbor Toxicaria [poison tree], including an illustration (Book 3, Chapter 45, Tab. 87, Vol. 2, pp. 263–68).

<sup>55</sup> *Cestrum*, jessamine, is a genus of the Solanaceae (nightshade or potato) family; all *Cestrum* species are toxic. The points in this paragraph are not made in Duncan's article; ED inserts the information from Carl Peter Thunberg, *Travels in Europe, Africa, and Asia, made between the years 1770 and 1779*, Vol. 2 (1793), p. 162.

<sup>56</sup> Peninsula south of Cape Town, South Africa, near the southern extremity of Africa.

<sup>57</sup> Archaic name for the Khoekhoe and San peoples of southern Africa.

<sup>58</sup> According to Duncan's article, "seven or eight folds of linen" (p. 40).

<sup>59</sup> The details that constitute the rest of this paragraph are not found in Duncan's article.

<sup>60</sup> Small, flat red spots caused by bleeding into the skin or other organ.

<sup>61</sup> Duncan's article reads, "This operation is said not to be dangerous, as the experimenter feels only a sudden increase of heat" (p. 42).

<sup>62</sup> A name for any alcoholic liquor made in Eastern countries, particularly those made from fermented coconut palm sap, or from rice and sugar fermented with coconut juice.

<sup>63</sup> According to Duncan's article, it is "Among the natives of India" that the poison is "employed for the punishment of criminals condemned to death" (p. 43).

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<sup>64</sup> According to Duncan's article, among "various superstitious opinions propagated [...] particularly by some of the artful Mahomedan priests" was that the tree "was produced by the advice of the prophet Mahomet, as a punishment for the sins of mankind" (pp. 44–5).

<sup>65</sup> Inserted 1794 and 1799

<sup>66</sup> *Needwood Forest* (1776) by ED's friend Francis Noel Clarke Mundy (1739–1815). The poem protested the felling of the trees of Needwood Forest in East Staffordshire, near Lichfield where ED lived from 1756 to 1781. Part 2, pp. 15–8, is reproduced here. Mundy's poem was privately printed in Lichfield along with verses written in response, which by the initials given seem to be by ED ("Address to Swilcar Oak"), his friends Anna Seward (1742–1809) ("A Rural Coronation") and Brooke Boothby (1744–1824) ("Sonnet"), and ED's son Erasmus Darwin, Jr. (1759–1799) ("On Mr. Mundy's Needwood Forest"). However, according to Seward, they were all written by ED (see Appendix 4.2). In a 1777 letter, Seward claims that *Needwood Forest* itself was a collaborative composition: "I dress'd the Furies, [ED] gave them their music [...] The description of the witches, all but the last couplet, and that of *Murder, are mine,*" and she also wrote the description of Lichfield as seen from the forest (qtd. in Teresa Barnard, *Anna Seward: A Constructed Life* (2009), p. 110).

<sup>67</sup> Hesperus, the evening star.

<sup>68</sup> The nightingale. In Greco-Roman mythology, Philomela was raped by her sister Procne's husband, Tereus, who then cut out her tongue. Philomela sent her sister a tapestry that revealed the crime. Procne stabbed her son to death, served his flesh to his father, then presented the boy's severed head. When Tereus drew his sword to slay the sisters, he was turned into a hoopoe, Procne into a swallow, and Philomela into a nightingale (though in some versions Philomela is the swallow and Procne the nightingale). The story is most famously told in Ovid, *Metamorphoses* (6:401–674).

<sup>69</sup> Weir, a barrier across a river to raise the water and regulate its flow.

<sup>70</sup> Inserted in 1791, 1794 and 1799