The Naming of Names

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Extract

From the Introduction

Hidden in the viscous, puddled gloom of Guyana's tropical rainforest are two monster waterfalls, Kaiteur on the Potaro river and Orinduik on the Ireng. No maps show the faint, foot-narrow trails that connect them. They are known only to the Patamona Indians who live here, and a few miners — Portuguese in origin — who set up solitary camps deep in the bush to pan for gold and dig for diamonds. Kaiteur, almost five times higher than Niagara, I'd first seen from the co-pilot's seat of a twin-engined Islander plane, flying with a prospector up to his camp on the Venezuelan border. We'd been following the Potaro river, which from the air cuts a series of wide, lazy, muddy loops through the dense canopy of trees. The green stretches from horizon to wild horizon, broken only occasionally by shocking red where a vast tree explodes into bloom. On a whim, the pilot had brought the plane down low over the great arc of the Kaiteur fall, and landed it on a makeshift strip that he sometimes used, cleared from the bush. Beating our way through scrub, the noise of the fall dumbing any possibility of thought, we'd emerged by the wide, flat river at the very point where it throws itself off the edge of the world to land 820 feet below in a narrow, rocky chasm of aweful savagery. Rainbows made and remade themselves in the spray that hung in the valley below the lip of the fall. Swifts darted behind the pounding curtains of water to the nests they had built on the rock face behind. Bromeliads and orchids shivered in the turbulence created as the torpid bulk of the river suddenly broke on the rim of the escarpment. Free of its bulk, it became air and prisms. Liberated, it flew. Here I learned of Guyana's second great waterfall, Orinduik, and of the trail that was said to connect it with Kaiteur. The pilot did not know of anybody who had walked it, but a week, he thought, would do it, if we could find Amerindian guides to take us.

So that is why, six months later, I am stumbling, disorientated, through the filtered gloom under the canopy of this same forest. In front of me, a snake in a perfect camouflage jacket stretches out over the trail, motionless, disregarding. Without the warning from our Patamona guides, I would not have seen it. What sort of snake is it? I don't know, but they are indicating I need to treat it with the same careful respect that they have shown. I know nothing here. I depend on the guides entirely. There are no roads, no signposts, no indicators. I don't know where we are, which way we are facing, how far we have travelled, how much further we will be going before our two companions decide to set up camp for the night. To 'How far?' or 'How long?' questions, they give the same elegant, liquid wave of the arm. That way. In time. So we continue to slither, and climb, and slip, and creep, and wade, and swim, and trip, and fall, and curse, and swing, and jump our way through this outlandish territory. Though so evidently familiar to our Amerindian guides, it is a world as strange as Mars to me.

Our route seems to be following the Potaro river upstream, perhaps to a point where it meets the Kopinang. The river is usually hidden by impenetrable curtains of growth, but I can sometimes hear it, crashing over rapids or surging through a narrow chasm of rock. If it was navigable, we'd be navigating it, in the narrow dug-out canoes that the Patamonas excel in making. Water is easier to travel over than land. When there is no river noise, the forest is oddly quiet; few birds, the two guides moving in absolute silence through this world of theirs. Only

once do they shout, when a group of jaguars cross the track in front of us with the self-contained, intent look of hunters on a mission. Early one morning though, a strange sound passes through the forest, high, as though caught in the web of the treetops. The noise swells and falls away, swells and falls away like some great animal gasping for breath. It is pitched low and in a minor key, and it wraps all around us, ghostly and insubstantial, ebbing and flowing. But what can be making such an unearthly sound? Howler monkeys? Baboons? I can't see them moving through the canopy. If I could, at least one question would be answered and I would feel less adrift in this world that I can't interpret or understand.

Occasionally we meet a hunter in the forest with bow and quiver of poison-tipped arrows. Sometimes an entire family passes by: babies, cooking pots, hunting dogs, bags of farine. I watch a child, three years old at most, running barefoot over a river on a fallen tree, the only bridges that exist here. It is set high over a boiling torrent of water, impossible to swim across and the damp, mossy log has no rope sides to it, no handholds. It is like a tightrope. These log crossings terrify me more than anything ever has in the whole of my life. We do perhaps a dozen a day. I have nightmares about them; I wake up kicking and screaming. I do not have the physical skills I need to survive here, but I'm disorientated in a mental sense too. Born and brought up in a temperate country, I'm lost here in the tropics where no living thing in this complex, interwoven understorey has a name that I know.

I reach out to pick a leaf, which is about the size of a hazel leaf, though more leathery and tough. I think it is the one that soothes the bite of a cabouri fly. But is it though? Or is it the leaf that I was warned never to touch, even fleetingly, for fear that my heart would stop, right there on the track, because of the poison it contains? What are the distinguishing, the essential, differences between the two plants? Someone, somewhere has worked these out, set them down, commissioned drawings, published descriptions, assigned each plant a place in a particular family, christened them with a two-part name that shows its botanical genus and its species. The taxonomist, the namer of names, will have described the plant's characteristics, explained its kinship with other plants in the same family, shown how, through some minute distinction, perhaps veining on the leaf, hairs on the stem, habit of growth, it is not the useful, medicinal leaf I thought it might have been, but the powerful drug. This work has transmuted local knowledge of plants, critical to the survival of indigenous people anywhere, into a comprehensive system of naming, of ordering and classifying, which now embraces every known plant in the world. But I am here without access to this knowledge, able only to define plants as they were defined in the Middle Ages in Europe — by their usefulness, their potential for food, medicine or magic. If I lived here, I too would learn to pick out the particular saplings that the Amerindians use to make their overnight shelters. I would also recognise the tree that produces the invaluable gum which our companions use as firelighters. In the pouring rain, as darkness falls, with a pile of wet sticks for a cooking fire, a small ball of this gum provides an infallible flame. Salvation. But nobody else, not even the Macushi or the Wai Wai, Amerindian neighbours, would recognise the name

that the Patamona people use to describe it.

We do the final leg of the journey to Orinduik by boat, down the Ireng river. The canoe shoots through the rapids, while with wild cries the two oarsmen stem the current either side and the bowman, with a long pole like a quant tries to keep the bow of the boat pointing in the right direction. Sometimes he loses it and the boat spins round and round like a leaf in the current, until the river spits us out of the rapids into calmer water. At Orinduick, the river fractures into different branches, pouring over steps of jasper and pure crystal. That night there is a storm somewhere over the mountains. We had arrived with a full moon and now sit with the waterfall thundering in our ears, watching that great glimmering disc haul itself up over the mountains into a hemisphere thick with stars. Opposite the vast moon, sheets of lightning throw into relief the jagged rims of the Pakaraima mountains.

In a tiny chartered plane, we leave the great Orinduik and fly out again over the canopy of trees. Sitting in the co-pilot's seat, looking down on this mass of green, I finally regain some sense of my relationship to the natural world. Following a ravine and the river as it tumbles over the rocks, we fly towards the sun, drifting over a landscape of huge flat-topped mountains that loom like islands from the sea of the forest. We have spun a thread between the two waterfalls. Gazing out from the Piper as it winds its way through this Conan Doyle *Lost World* landscape, I am as happy as I have ever been in my life.

A small selection of the beautiful pictures featured in the book.

***From left to right*: Waterlilies from the Bourdichon Hours, French, early sixteenth century (Add ms. 35214, fol. 95, British Library, London); The fabled mandrake, (Mandragora officinarum) from Leonhart Fuch's unpublished encyclopaedia of plants. (Vienna, Austrian National Library, Codex II, 12).; *Botracion satiche*, a patient covered in boils waits to be treated by a doctor preparing medicine which includes pig's dung as a vital ingredient.(Codex Vindobonensis 93, early thirteenth century, Vienna, Austrian National Library).**

From CHAPTER 1: In the Beginning

Theophrastos is the first in the long list of men who fought to find the order they believed must exist in the dizzying variety of the natural world. He lays out the puzzle, nudges together a few pieces that he thinks might fit. Fitfully, over the next 2,000 years, the puzzle is taken up by a series of philosophers, doctors, apothecaries, each of whom adds to the picture, links a few more pieces together, until finally by the end of the seventeenth century, the whole picture begins to make sense. We now have written descriptions of 422,000 different plant species. Theophrastos knew about 500, half of which had already appeared in Greek poetry, plays, essays (Homer mentions sixty). But Theophrastos was the first person to devote serious attention to the business of naming plant names. He was the first person to gather information about plants, and to ask the big questions: 'What have we got?' 'How do we differentiate between these things?' He was the first person to discuss plants in relationship to each other,

not just in terms of their usefulness to man. Magic and medicine both provided powerful practical incentives to know more about plants, but Theophrastos wanted to know them in a different way, just for the sake of knowing. From that knowledge, connections between plants gradually emerged which helped to make sense of the natural world and its terrors. The Greeks believed passionately in order.

On the north side of Syntagma Square in Athens, there is a boundary stone, of old unpolished marble, incised with the remnants of an inscription. It's only about two feet tall, but it's set on a much newer swagged column, which makes it almost as tall as the kiosk close by that sells fizzy drinks and ice creams. The stone marks the boundary of the Lyceum, the school where Theophrastos taught in 350 bc. Forget the traffic hurtling with suicidal speed round the dusty circuit of Syntagma. Forget the hoardings, the looming presence of the Hotel Grand Bretagne, the Greek guards in their crazy bobble shoes. See instead Theophrastos, pacing up and down in front of his audience (the historian Diogenes Laertes says that sometimes more than 2,000 people came to hear his morning lectures the Lyceum. In one hand, he has a leaf from the plane tree that shadows the stream running through the Lyceum grounds, in the other, a vine leaf. The leaves are roughly the same size, roughly the same three-cornered shape. Can this mean that there is some kinship between them? But the vine produces an edible fruit. The plane tree does not. Does this rule out the possibility of any relationship between the two plants? And the plane grows tall, in our measurements, 30 feet or more. The vine is a shrubby kind of plant, never attaining the stature of a tree.

Is the difference in height, in general habit of growth, a useful, valid way of distinguishing between things, of grouping them? Theophrastos thought it was and explained to his pupils why he favoured separating plants into four different categories: trees, shrubs, sub-shrubs and herbs. That does not sound much of a breakthrough to us. But we have to unknow such a vast amount of knowledge to get back to Theophrastos and the world he was trying to understand. There had been no Darwin. No Origin of Species. No conception of evolution. The early Greeks saw cultivated types of grape, plum, peach, apple as gifts from the Gods, in benign mood after a particularly good day on Mount Olympus. The Ionian philosopher Hippon had already suggested that cultivated plants may perhaps derive from wild ones, but it was a wildly radical thought to absorb. Theophrastos noted it as an interesting proposition, but still suggested a division between wild plants and cultivated ones as a primary mode of classification. He knew nothing about the mechanics of pollination and yet, in writing about date palms, noted that 'it is helpful to bring the male to the female; for it is the male which causes the fruit to persist and ripen, and this process some call, by analogy "the use of the wild fruit". The process is thus performed: when the male palm is in

flower, they at once cut off the spathe on which the flower is, just as it is, and shake the bloom with the flower and the dust over the fruit of the female, and, if this is done to it, it retains the fruit and does not shed it.' This is where the biggest chasm looms between our mind-set and his. How could he so accurately describe the process of pollination without going on to ask himself why this particular trick worked? He understood the concept of a male and a female plant. He understood that a good fruit set depended on the female flowers being visited by the males, but he never puzzled out the concept of pollination. Seeds and fruits came, but the how of it was a mystery.

He tells us what other authorities have to say on the matter: the Greek philosopher Anaxagoras (?500—428bc) believed that all things were made from minute particles arranged by a supernatural intelligence. To him, the air contained seeds of all things, and these, washed down by rain, produced all the plants on earth. The Athenian historian Kleidemos believed that plants were made of the same elements as animals, but that they fell short of being animals because their composition is less pure and they was colder. The Greek poet Hesiod said that the oak produced not only acorns, but also honey and bees. So instruments of pollination, such as the catkins of the hazel tree, seemed to him to have absolutely no purpose. Theocrastus described them minutely:

In autumn after the nuts have fallen, there appear in bunches of several certain things that look like worms, inserted on a short, thick stalk. These are called juli. Each is made up of countless scales arranged somewhat after the manner of those of the nut pine, the whole longer in proportion to its thickness than that, and also of equal thickness throughout. Before the end of winter it begins to grow. In early spring the scales separate and stand apart, and are then become yellow, the whole then sometimes as much as three inches long. When the leaves begin to put forth, these things shrivel and fall. Then the cups that enclose the nuts develop; one cup for each flower, and one nut in a cup.

He described only what he could see with his own eyes. Spectacles had not yet been invented. Nor had the magnifying glass or the microscope. He could see the veins in a leaf, but not the stomata, the tiny pores that control the passage of oxygen and carbon dioxide in and out of the plant. But he did not know anything about oxygen or carbon dioxide or the way leaves breathe.

His mentor and master, Aristotle, led the way with animals. In his treatment of plants, Theophrastos started with a concept of the plant as an animal with its feet in the air and its mouth in the ground. In some ways, he could make the analogy work: like animals, plants could be described in terms of their veins, nerves and flesh. And he worked most often by analogy: this leaf is bigger, smaller, hairier, lighter in colour than that one, a method which relied on his audience (or readers) having a clear image of the 'that'. So, looking out at the *Trachelospermum jasminoides* twining round the supports of the loggia outside, I could describe it as like bay in that its leaves are elliptical and evergreen but smaller. The flowers come later than the bay's and are sweetly scented. Theophrastos observed that the leaf is very varied in form, but reasonably constant within a species, so therefore provided a good basis for

making distinctions. In his lectures, he could hold the one and the other in front of his students. He could make his analogies immediate. Most lanceolate leaves he described as being like laurel. Oblong leaves were compared to the foliage of the olive. For rounded leaves, almost as broad as they were long, the standard was the pear. Hornbeam he described as having leaves 'in shape like a pear's, except that they are much longer, come to a sharp point, are larger, and have many fibres, which branch out like ribs from a large straight one in the middle, and are thick; also the leaves are wrinkled along the fibres and have a finely serrated edge.' It is a brilliantly vivid description. Was the leaf lying on his desk in front of him as he was writing it? But leaves could not always be depended on as indicators because they were not always the same on the same plant. Ivy confounded him. So did the castor oil plant.

His work, like a series of lecture notes prepared for his classes at the Lyceum, survive in two collected volumes, the *Historia plantarum* and the *De causis plantarum*. They set down how it was in 300 bc. This is what was known. The quest for order starts here. But unfortunately for Theophrastos, his work was shamelessly plagiarised and regurgitated by the later Roman writer Pliny and it was Pliny's work Historia naturalis that was handed down, quoted and requoted, bowdlerised, Theophrastos forgotten. Knowledge can only be built up from what is known and tricks of fate — wars, deaths, fires, shifts of power and language, prevented Theophrastos's pre-eminence from being appreciated until Teodoro of Gaza (c.1398—c.1478) finally turned into Latin the great body of knowledge that Theophrastos had so painstakingly amassed at the Peripatetic School in the Lyceum.

...In a life that lasted for eighty-five years, Theophrastos's great work on plants represents only 5 per cent of his output. At the end, in a sentence perhaps too neatly epigrammatic to be real, he said 'we die just when we are beginning to live.' Think of him when you look at the bronze, thrusting shoots of paeony breaking through the ground in spring. His name *paionia* is the one we still use. He is with you too as you bend to catch the spicy scent of narcissus, or *narkissos* as he wrote it. *Aspharagos, elleboros, skilla, anemone, iris, krokos* are all in his book. Remember him.

CAST LIST: the men who devised the naming of names...

ARISTOTLE 384 bc—322 bc
Greek philosopher who studied under Plato at the Academy. In 342 bc summoned to Macedonia

to act as tutor to Alexander, later the Great. After Plato's death, founded his own school in Athens, the Lyceum. Wrote the book on animals (Historia animalium) that inspired Theophrastos, his pupil, to produce a similar work on plants.

BRUNFELS, OTTO 1488—1534
Carthusian monk who converted to the Lutheran cause. Studied at University of Basel and practiced as a doctor in Strasbourg. Author of Herbarum vivae eicones published 1530—36, but outshone by his illustrator, Hans Weiditz.

CESALPINO, ANDREA 1519—1603
Brilliant Italian plantsman who studied under Luca Ghini at Bologna and later succeeded him as curator of the botanic garden at Pisa. Made a fine herbarium (1563) in which plants are laid out according to similarities in fruit and seed. His book De plantis libri xvi (1583) is the first serious attempt since Theophrastos to find a system of sorting and ordering plants in meaningful groups.

DIOSCORIDES, PEDANIOS AD 40—??
Greek physician and author, who studied in Alexandria before joining the Roman army as a doctor. Travelled widely in the Eastern Mediterranean and compiled medical treatise De materia medica (c.AD 77) which drew widely on local knowledge and traditions. For the next 1,500 years, widely regarded (with Pliny) as the ultimate authority on medicinal plants.

DÜRER, ALBRECHT 1471—1528
Painter and master engraver of the German Renaissance. 'Be guided by nature,' he wrote. 'Do not depart from it, thinking that you can do better yourself.' His famous piece of turf painted c.1503, came to be seen as the most extraordinary mirror of the natural world that any artist had ever produced.

FUCHS, LEONHART 1501—1566
Professor of medicine at the newly established Protestant University at Tubingen, Germany. Author of De historia stirpium (1542) better written, but not quite so brilliantly illustrated as Brunfels Herbarum vivae eicones which was published twelve years earlier. Splenetic, opinionated, disinclined to travel, he died before publishing the mammoth encyclopaedia that occupied the last twenty-four years of his life.

GERARD, JOHN 1545—1612
Describes himself as 'master of Chirurgerie'; Warden of Company of Barber-Surgeons (1597) becoming Master in 1607. Garden in Holborn, London 'the little plot of myne own especiall care and husbandry'. Supervised Lord Burghley's gardens in The Strand and was curator of the College of Physicians' own garden. Author of the famous, but flawed Herball (1597).

GESNER, CONRAD 1516—1565
Brilliant young Swiss scholar and encyclopaedist who travelled widely in Germany, France and Italy as well as in his homeland. Died before he could publish the monumental Historia plantarum which occupied the last ten years of his life. Amassed a collection of c.1,500 illustrations of plants, some executed by himself, all heavily annotated with habitats, synonyms and detailed description. The greatest might-have-been of The Naming of Names.

GHINI, LUCA 1490—1556
Inspirational teacher who inspired an entire generation of plantsmen. In 1544, moved from the University at Bologna to Pisa where he set up a botanic garden, a new resource centre for the medical students of the Medici's new university. Pioneered the preparation and use of the hortus siccus or herbarium as a tool for the better study of plants. Universally admired — a rare trait.

JOHNSON, THOMAS c.1600—1644
Pioneering apothecary with a shop on Snow Hill in the City of London. Arranged the earliest plant-hunting excursions ever made in England, a first step towards compiling a complete list of British flora. Edited a new edition of John Gerard's flawed Herball. Died in the Civil War, fighting for the king.

LOBELIUS (Matthias de l'Obel) 1538—1616
Flemish scholar and plantsman who, after studying under Rondelet at Montpellier, travelled widely with his friend Pierre Pena. Finally settled permanently in England, dedicating his Stirpium adversaria nova (1570) to Elizabeth I. Appointed superintendent of Edward Zouche's garden in Hackney, then (1607) herbalist to James I.

MATTIOLI, PIERANDREA ?1501—1577
Unlike most other Italian scholars of the age, he never taught, but made the most of his prestigious position as personal physician to Emperor Ferdinand I. By nature a compiler, a recorder, not an original thinker. Nevertheless, his famous book, Commentarii in VI Libros Pedacii Dioscoridis was a wildly successful bestseller, appearing in sixty-one different editions.

PLINY THE ELDER AD 23—79
Roman soldier, cavalry commander and author (c. AD 77) of a Historia naturalis, an encyclopaedic ragbag of information about science, art, plants, animals with digressions on human inventions and institutions. Throughout the Middle Ages, it remained an important, over-valued source. Pliny died investigating the eruption of Vesuvius at Pompeii.

RAY, JOHN 1627—1705

Catalogus plantarum Angliae. Studies in the field encouraged by Royal Society. Made several long trips to Europe (in parallel with Tournefort in France) to create a watertight system of nomenclature for plants. His Synopsis methodica of 1690 was the distillation of a lifetime's search for order in the natural world.

TEODORO OF GAZA c.1398—c.1478
A native of Thessalonica who opened a school in Constantinople c.1422. Fled to Italy as Sultan Murad II laid seige to the city. Called to Rome to assist in the translation of ancient texts in the Vatican library. Spent five years working on Aristotle's treatise on animals and Theophrastos's on plants. The translation was finally published in Treviso in 1483.

THEOPHRASTOS c.372 bc—287 bc
Greek philosopher, who studied under Aristotle. After Aristotle's death he took over as head of the Peripatetic School at the Lyceum in Athens. The first person to write down descriptions of plants in terms of their similarities and differences. His Historia plantarum and Causae plantarum were translated in 1916 by Sir Arthur Hort as Enquiry into Plants.

TURNER, WILLIAM c.1508—1568
Cleric and plantsman, called 'the father of English botany' because he was the first Englishman to write (in English) a decent book on plants. His Names of Herbes (1548) was followed by a New Herball (1551—64). Fiercely Protestant and forced twice to flee England because of his religious views, always trenchantly expressed.

WEIDITZ, HANS before 1500—c.1536
Draughtsman and engraver. Studied under Albrecht Dürer and, with his illustrations for Otto Brunfels's Herbarum vivae eicones, produced the first life-like portraits of plants to appear in a printed book.