Studies in History and Philosophy of Biological and Biomedical Sciences 40 (2009) 168–178

Contents lists available at ScienceDirect

Studies in History and Philosophy of Biological and Biomedical Sciences

journal homepage: www.elsevier.com/locate/shpsc

'The vagaries of a Rafinesque': imagining and classifying American nature

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ARTICLE INFO

Article history:
Received 27 January 2009
Received in revised form 25 February 2009

Keywords:
Constantine Samuel Rafinesque
Early nineteenth-century American botanists
History of classification
American identity
Joseph Dalton Hooker

ABSTRACT

Some early nineteenth-century American naturalists condemned their contemporary, Constantine Samuel Rafinesque (1783–1840), as 'eccentric', or worse. Both during his life and long after his death, his botanical work in particular was criticised, even ridiculed. However, in recent years, attempts have been made to restore his reputation and the term 'genius' has even been used to describe him. This paper examines this continuing fascination with this strange, disturbing figure and argues that in the competing interpretations of his life and work, Rafinesque has generally been used to typify bad classification; he is perhaps better understood in a broader, literary context as embodying a particular kind of American national identity.

1. Introduction

In 1855 the British botanist, Joseph Dalton Hooker devoted part of the introduction to his *Flora Indica* to one of his favourite topics, attacking bad classification and its perpetrators. He condemned 'the recklessness with which genera, orders, and even so-called natural systems, have been instituted by tyros without the smallest practical acquaintance with structure and affinities', adding 'we do not refer merely to the vagaries of a Rafinesque'.[1] At the time this was published, Constantine Samuel Rafinesque (1783–1840) (see Fig. 1) had been dead for fifteen years and the modest fame he had enjoyed in his adopted America had largely ebbed away. There was certainly no 'Rafinesquian' school of classification that Hooker might have felt he needed to combat. So, how had this obscure, early American figure become such a byword for bad classification that one of Britain's most influential botanists felt it necessary to speak ill of the dead?

Hooker's friend Asa Gray, professor of botany at Harvard University, wrote a 'Notice of the Botanical Writings of the late C. S. Rafinesque' in 1841, which described Rafinesque as 'eccentric', his work as 'absurd' and 'a curious mass of nonsense', and included such observations as: 'A gradual deterioration will be observed in Rafinesque's botanical writings from 1819 to about 1830, when his passion for establishing new genera and species, appears to have become a complete *monomania.* This is the most charitable supposition we can entertain, and is confirmed by the opinions of those who knew him best'.[2] Unusual language for what was effectively an obituary.

However, as Gray implied, he was merely reflecting the private opinions of 'those who knew him best'—Rafinesque's botanical contemporaries.[3] William Baldwin, a Delaware botanist, was pleased to see two of Rafinesque's publications rejected at a meeting of Philadelphia's Academy of Natural Sciences: 'I am truly glad,' he told a friend, 'that they have sufficient independence to reject the wild effusions of a *literary madman*'.[4] Baldwin's choice of 'literary' as an adjective is, I think, telling and I will return to it later; 'madman' was rather more common. The Kentucky botanist Charles Wilkins Short asked the naturalist John Torrey the rhetorical question,

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[1] Hooker & Thomson (1855), pp. 9–10. Turrill notes that, despite the use of the plural pronoun throughout, both the internal evidence of style and Hooker's correspondence at the time of writing make it clear that he was almost solely responsible for the essay (Turrill, 1963, p. 47).

[2] Gray (1841), pp. 221, 230–231, 237. All emphasis in quotes is as given in the original, unless otherwise stated.

[3] Porter (1986), pp. 147–148.

[4] W. Baldwin to W. Darlington, 4 February 1819. Quoted in Stuckey (2003), pp. 157–158.

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doi:10.1016/j.shpsc.2009.06.009

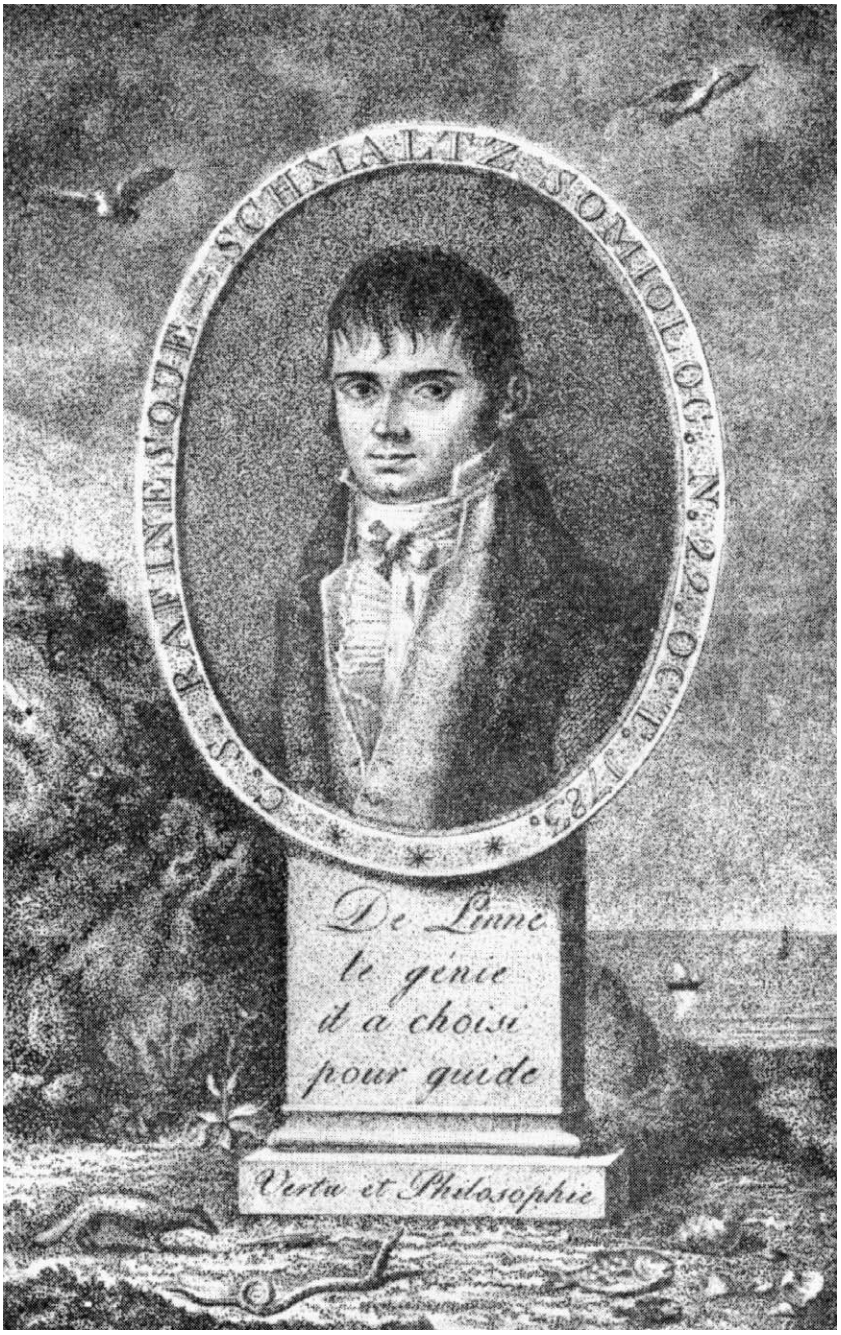

Fig. 1. Frontispiece from Rafinesque's *Life of travels* (1836).

'Is not Rafinesque a madman!' Short continued, 'Can we not manage to silence this endless discoverer of new things, by raising among the botanical corps of the country an annuity for life?', so as to keep Rafinesque from publishing:

> new genera & species without number in all the departments of nature—If I could lend a helping hand to effect this, and toward suppressing all this published nonsense I should be sure of having render'd a greater service to Science than I shall ever do in any other way.[5]

However, if Gray was reflecting the prevailing wisdom—and Hooker was mainly reflecting Gray—one would have expected the attacks on Rafinesque to have ended in the mid-nineteenth century. But eighty years after Hooker's attack, in 1935, Charles Alfred Weatherby, an American botanist, attacked Rafinesque's work as representing 'a kind of pseudo-scientific work, the nomenclatural results of which may well be legislated out of existence'.[6] This suggestion was followed up by Leon Croizat, formerly of Harvard University, who published an article called 'Rafinesque: a con-

[5] C. W. Short to J. Torrey, 11 August 1835. Quoted in Stuckey (2003), pp. 166–167.
[6] Weatherby (1935), p. 409.

crete case'.[7] Croizat argued that 'In the present writer's matured judgment, *Rafinesque was an arrant lunatic*, and his output cannot be viewed in any other light'. He therefore proposed the suppression of a 'flood of polluted nomenclature contributed by a lunatic, who wrote botany because he was of unsound mind'.[8] Two years later, at the Seventh International Botanical Congress in Stockholm, Croizat was apparently involved in an attempt to permanently expunge Rafinesque's names from the botanical literature.[9] If there was such an attempt, it failed and the International code of botanical nomenclature's priority rules have ensured that many of Rafinesque's names survive (the zoological situation is more complex). Nevertheless, attacks on Rafinesque's classifications continued: in 1989, Peter Taylor described Rafinesque's work on *Utricularia* (bladderworts) as 'largely nonsense' and criticised one of his twentieth-century predecessors for 'apparently rediscovering the work of Rafinesque'.[10]

Back in 1950, the immediate cause of Croizat and Weatherby's campaign was the work of Elmer Drew Merrill, of Harvard, who had originally hired Croizat and who chaired the Nomenclature session of the Seventh Congress.[11] Merrill spent several years compiling a complete catalogue of Rafinesque's publications and claimed he had 'been mildly amused' by criticisms of his 'contemplated excursions into the Rafinesque field'. He suspected that his critics felt guilty for having 'slighted their own bibliographic obligations by ignoring [Rafinesque's] work', yet acknowledged that few would thank him for having published 740 previously overlooked generic names alone.[12]

Merrill arranged private financing to reprint some of Rafinesque's works and donated them to international botanical libraries.[13] One might therefore assume that Merrill was an admirer of Rafinesque's work, but in fact he wrote that:

> After several years of effort devoted in part to a consideration of the unending series of problems in botany alone, raised by Rafinesque's work, my frank conclusion is that in taxonomy and nomenclature we would have been infinitely better off today had Rafinesque never written or published anything appertaining to the subject.[14]

Merrill believed that the rules of priority should nevertheless be observed, but it is unusual for anyone to devote so many years to recovering work they regard as worthless. Rafinesque has aroused, and continues to arouse, many emotions in those who know of his work—but indifference is not among them.

2. A life of travels

To better understand the Rafinesque controversies, it is necessary to know a little about his life. He was born in 1783, in Constantinople, where his French father was a merchant. In 1802, the nineteen-year-old Rafinesque was sent to Philadelphia to be apprenticed to his father's business partners. During the next two years he became interested in natural history, and began travelling, collecting and corresponding. Three years later he returned to Europe, this time to Sicily, where he was secretary to the United States consul and traded in *materia medica*. In his autobiography, Rafinesque explained that it was while in Sicily, that he briefly added his mother's maiden name, Schmaltz, to his own, in order 'to pass for an American'.[15] Rafinesque's rather idiosyncratic sense of what was needed not merely to pass for but to become an American dominated his later career, as I will argue below. He returned to the US in 1815 and despite being shipwrecked and losing all his collections and unpublished manuscripts, he lived there for the rest of his life, becoming a US citizen in 1832.

It was while he was in Sicily that Rafinesque produced his first publications, including a new journal, the *Mirror of the Sciences*.[16] This was to be an exhaustive account of all scientific knowledge and began, in characteristic Rafinesque style, with an entirely new classification of all the sciences, followed by a comprehensive revision of biological classification. He explained that:

> I dare to flatter myself that [I can] demonstrate its superiority, my purpose at present does not go beyond giving notice of my discovery, which perhaps will cause some useful change in the study of Zoology and Botany. It is already five years since I invented it, all this time I have been employed in perfecting it and making it worthy to rival with advantage the . . . celebrated classifications of illustrious authors.[17]

If Rafinesque had indeed invented his new classification five years earlier, he would have been just twenty-six at the time; a remarkable age at which to have surpassed (as he claimed) everyone from Linnaeus to Cuvier. The world would have to wait for his new system—no further parts of the journal appeared—but in a book, privately printed in the same year, he gave more details of 'the reform which I have undertaken, the happy result of which will be directed to fix invariably the Nomenclature, the Classification and the Definitions of organised Bodies'.[18]

It is typical of Rafinesque that the volume was preceded by a dedicatory letter, addressed to the South-African born naturalist Christian Hendrik Persoon (evidently without the latter's knowledge, much less permission). This letter included the observation that Persoon could have reformed classification himself, had he not 'preferred to follow the tracks of your predecessors and to walk somewhat slavishly in the steps of the great Linnaeus'. By contrast, Rafinesque felt he had:

> had the boldness to undertake it and the good fortune to carry it out in a few years of assiduous work and profound meditation, not without having groped about for a long time and often failed in my first efforts. The idea that Linnaeus had had no more means than I, apart from his genius, when he succeeded in wholly reforming Botany and Zoology, had encouraged me and sustained my zeal: I said to myself why doubt of success?

[7] [Croizat] (2003). Croizat's attack was originally published under the pseudonym, 'Henricus Quatre': Boewe speculates that he had in mind Henry IV of England, famous for burning heretics, which is more or less how Croizat proposed to dispose of Rafinesque (Boewe, 2003, p. 41). Croizat himself was often accused of eccentricity (or worse).

[8] [Croizat] (2003), p. 183.

[9] Boewe (2003), p. 41. There is no published record of an attempt to suppress Rafinesque, but Boewe says 'the story was told to me orally by the late Joseph Ewan, who did attend the 1950 Stockholm Congress'. Adding that 'Like other "good stories", this one may have grown in its retelling, but I never doubted its essential truth' (C. Boewe, personal communication via email, 6 October 2004). See also Camp, Rickett, & Weatherby (1949), p. 22; Lanjouw (1950), pp. 17–19; Osvald & Åberg (1950), pp. 472–473.

[10] Taylor (1989), pp. 3, 4.

[11] Croizat was dismissed from Harvard shortly after Merrill left in 1947, and appears to have felt some personal animosity towards Merrill (see Craw, 1984). Weatherby was not present at the Stockholm congress, but resolutions he had written or sponsored were put forward and discussed.

[12] Merrill (1949), pp. 1–2.

[13] Information from the New York Botanic Gardens LuEsther T. Mertz Library website: http://www.nybg.org/bsci/libr/Merpap.htm (accessed September 2004).

[14] Merrill (1949), p. 52.

[15] Rafinesque (1944), p. 309.

[16] Rafinesque (1990b).

[17] Ibid., p. 34.

[18] Rafinesque (1990a), p. 33.

> why may I not imitate this great man while my ardour is alike and my means similar?[19]

However, the new system failed to excite the interest Rafinesque had anticipated and he decided America would offer a wider scope for his talents.

Rafinesque began collecting and corresponding immediately. In March 1817, he wrote to the Philadelphia-based Quaker naturalist, Zaccheus Collins, beginning, characteristically, with a complaint that the University of Pennsylvania (of which Collins was a trustee) had decided not to appoint Rafinesque their new professor of natural history, but had decided instead to give the post 'to a person without any claim to the name of a Naturalist'.[20] Rafinesque went on to ask Collins to submit descriptions of some of his collections to in another new journal he was planning, the *Annals of Nature*. A few months later he was still urging Collins to publish details of 'the treasures laying unknown in your herbarium', adding 'You could so well afford to give us a fine specimen of your labours, that I shall always urge you to do it, you want neither, leisure, taste nor money, what could then prevent you? Modesty and indolence! if I could be your Secretary, I hope that both could be obviated'.[21] This combination of flattery and insult combined with a thinly veiled request for a job is fairly representative of Rafinesque's correspondence; tactfulness was not one of its features.

Disappointed by Collins's 'indolence' and the University of Pennsylvania's hiring decision, Rafinesque decided to remain in New York for the winter. He described to Collins his previous summer's travels in New York state, along the Hudson River. Despite this being relatively well-explored territory, Rafinesque was able to report that:

> the result of my researches was an herbarium of 600 Species, and the Discovery of about 80 New Species, say 20 New plants, 12 New fishes, 18 New shells—and 30 New Reptiles, Insects, Worms. I have read to the L[iterary]. & Philos[ophical]. Soc. of N.Y. the Description of some of them, particularly of a remarkable new genus of Turtle very small, with a soft shell, without scales, and 5 claws to all the feet, I called *Aplaxia nasica*: the remainder will be published in my Annals of Nature.[22]

Eighty new species in a summer, whose new names were to appear in the journal he edited and published, was typical of both Rafinesque's manic productivity and methods. When he next wrote to Collins, four months later, the journal's first issue had still not appeared because, as Rafinesque explained:

> None of our Booksellers being willing as yet to print Annals of Nature on joint account with me, and being advised by no means to print on my sole account, I shall after all be under the necessity of altering my plans in some shape or other. Pray could you propose to some of your booksellers whether they would undertake it, I ~~have~~ reckon on ab^{t}. 100 subscribers, ~~my terms are~~ I will agree to any terms, provided I shall have no trouble about Printing, binding, forwarding, selling &c.?[23]

As Rafinesque's deletions show, he was finding it increasingly difficult to get published, but despite these set-backs, he had not been idle, telling Collins that between May and June he had 'discovered about 50 new species and even several new genera'.

Rafinesque closed this letter by saying that, 'One of the principal Tracts completed for my Annals of Nature, is the *Flora of Louisiana* made up from Robin's Materials and containing 404 Species of which 196 are new! besides 30 New genera!'[24] Impatient to share his new discoveries, Rafinesque published this flora later in the same year as the *Florula Ludoviciana: Or, flora of the State of Louisiana* (1817). In his preamble, he noted that the book was a translation of one by the French naturalist Charles-César Robin, who visited the southern United States between 1802–1806 and whose flora appeared as an appendix to his *Voyages dans l'intérieur de la Louisiane* (1807). However, Rafinesque had found in necessary to 'improve' the original. A task that had 'proved an arduous one':

> owing to the numerous misnames and errors of the author, who does not appear to have been a professed Botanist, but a mere observer and collector; his observations and descriptions are, however, generally accurate, which is proved by his descriptions of well known plants.[25]

Despite not having set foot in Louisiana, Rafinesque wanted to entirely reclassify all Robin's plants, but pressure of time forced him to keep the original classification, so he confined himself to adding amendments in order, as he put it, 'to show at once many of Robin's mistakes'.

The *Louisiana flora* was attacked by Gray in his obituary of Rafinesque. Gray noted that Robin's work was a popular one, riddled with elementary errors, yet, 'On the sole authority of the descriptions and determinations of such a botanist, Rafinesque has established thirty new genera and one hundred and ninety-six new species'.[26] Even worse, in Gray's view, was the fact that almost every time Rafinesque had been unable to recognise the plant Robin described, he 'has considered it a new genus or species'. As a result, there was no way of knowing how many errors Robin actually made, but Gray was nonetheless sure that:

> The *Flore Louisiane*, in the state Robin left it, could do no harm, and whatever information it contained was quite as available as at present. As *improved* by a botanist who had never been within a thousand miles of Louisiana, and at that period, could scarcely have seen a dozen Louisianan plants, the only result has been to burthen our botany with a list of nearly two hundred *species semper incognit* æ [species forever unknown]. There can, we think, be but one opinion as to the consideration which is due to these new genera and species: they must be regarded as fictitious, and unworthy of the slightest notice.[27]

This opinion was shared by many of Rafinesque's contemporaries, one of whom described the flora as 'The most curious medley I ever saw. The author without ever being in the country whose plants he describes, has discovered 50 or 60 new species . . . I expect he will soon issue proposals for publishing the botany of the moon with figures of all the new species!'[28]

In addition to those announced in the *Louisiana flora*, the two letters to Collins quoted above refer to over 300 new species and

[19] Ibid., pp. 42–43.
[20] C. S. Rafinesque (CSR) to Z. Collins (ZC), 15 March 1817 (American Philosophical Society, Philadelphia, *C. S. Rafinesque Papers*, B R124. Hereafter APS: CSR).
[21] CSR to ZC, 21 July 1817 (APS: CSR).
[22] CSR to ZC, 15 March 1817 (APS: CSR).
[23] CSR to ZC, 21 July 1817 (APS: CSR). Deletions in original.
[24] Ibid.
[25] Rafinesque (1967), p. 8.
[26] Gray (1841), p. 232.
[27] Ibid., p. 233.
[28] Amos Eaton to J. Torrey, 21 March 1818. Quoted in Stuckey (2003), p. 163.

more than thirty genera—in less than twelve months. Publishing so many names soon became one of Rafinesque's major problems. By October 1817, he was still unable to find a publisher for the *Annals of Nature* and Collins might perhaps have been alarmed to read that, despite this setback, Rafinesque claimed, 'My zeal increases every day instead of abating, and I hope to do great things yet, notwithstanding all the disappointments, obstructions, and difficulties in my way'.[29]

An undaunted Rafinesque set off on his first major American collecting trip in 1818, down the Ohio River as far as Shawneetown, Illinois, close to the Kentucky border. While on his way back to Philadelphia, he visited his former employer, the merchant John D. Clifford, who was a trustee of Kentucky's Transylvania University. Clifford helped Rafinesque become professor of botany and natural science there, where he spent seven productive years (1819–1826).

Rafinesque's interests extended well beyond botany and zoology, to identifying and excavating prehistoric Indian sites, but his publication problems continued. Rafinesque was initially mystified and eventually angered by Benjamin Silliman's refusal to print his work in the influential *American Journal of Science*. He told Collins that:

> I have been surprised to find that Prof. Silliman has not published any of my essays ..., he has had 12 memoirs of mine, some for 2 or 3 years! Is not this strange? Why am I used so? is it through jealousy, neglect, ignorance or wilful intent? It is well that my zeal is above this paltry & sorry usage.[30]

Silliman would later claim he had become 'alarmed by a flood of communications, announcing new discoveries by C. S. Rafinesque, and being warned, both at home and abroad, against his claims, I returned him a large bundle of memoirs ... The step was painful, but necessary; for, if there had been no other difficulty, he alone would have filled the Journal, had he been permitted to proceed'.[31]

As Charles Boewe has shown, Silliman's reference to having 'being warned, both at home and abroad, against [Rafinesque's] claims' refers not merely to the general hostility of Rafinesque's contemporaries, but in particular to a dispute with Caleb Atwater, an Ohio-based pioneer of American pre-historic archaeology. Rafinesque had excavated and mapped over 148 pre-historic Amerindian sites in Kentucky alone and shared his information freely with Atwater.[32] When Atwater's book appeared, Rafinesque was not mentioned, much less thanked and when a rather critical, anonymous review of the book appeared, which Atwater correctly surmised had been written by Rafinesque, Atwater decided that Rafinesque had libelled him and started to systematically blacken his name in a series of letters to influential people, including Silliman.[33]

Rafinesque returned to Philadelphia in the spring of 1826, accompanied by forty crates of specimens whose description, classification and publication were to absorb the rest of his life. He supported himself by trading in specimens and books, giving public lectures and organising a 'Six per cent Savings Bank'. The latter was to be based on Rafinesque's 'Divitial invention', the idea of making bank stock and deposit certificates divisible and circulating them like currency.[34] In an effort to gain support for this idea, Rafinesque wrote to the US ambassador to Mexico (among others), requesting assistance in obtaining a patent for his idea. As an enticement, Rafinesque mentioned that 'I have made a dreadful Discovery in the Art of Defensive War. Or invented a *New Kind of Artillery*, a single discharge of which will destroy *One thousand Men in Arms*, one mile off, or sink a large Ship of War'. He proposed to divulge the details of this weapon to every government that would grant him a patent on his divitial invention.[35] Rafinesque's inventiveness also extended to medical matters and having, as he believed, cured himself of tuberculosis he marketed his cure as Pulmel and wrote a book describing its use.[36] He also published a two-volume *Medical flora* (Rafinesque, 1828–1830), which collected traditional, folk, and native-American plant cures and remedies and was one of his few commercially successful publications.[37]

As Silliman's journal would no longer publish Rafinesque's taxonomic papers, he resorted to the practice he had begun in Sicily and published his own books and journals. With the help of a wealthy patron, Charles Wetherill, a Philadelphia paint manufacturer, Rafinesque published everything from conventional natural history to poetry and linguistics. He estimated that he had published over 220 works, pamphlets, essays, and tracts, yet the great bulk of his work remained in manuscript, and most of his papers were sold as junk after he died in Philadelphia in 1840.[38]

3. An American Adam?

Thanks to his publishing methods, his enthusiasm for coining new names and his indefatigable energy, Rafinesque published more Latin plant names than anyone else in botanical history, including Linnaeus himself. However, while almost all of Linnaeus's names are still in use, it is widely assumed that—even if they were to be fully researched (which they have not been)—fewer than five percent of Rafinesque's names would prove valid and that the actual number in use is much lower.[39] The claim that most of Rafinesque's names were invalid originated with Merrill and it is often erroneously claimed that most of Rafinesque's 6,700 names have been expunged from the botanical literature.[40]

Rafinesque therefore holds the (not entirely deserved) reputation of being the most prolific—but least successful—taxonomist in history. One obvious reason for this is the hostility of both his contemporaries and successors: the number of names he published and the often weak evidence upon which he based them would be enough to irritate any taxonomist. The priority rules mean that Rafinesque's names have remained a problem for taxonomists, who must search existing literature before naming new species. Their difficulties are exacerbated by limited print-runs or short lifetimes of many of the books or journals Rafinesque published in; several of Rafinesque's works are only known from citations in his own manuscripts and may never have been printed at all.[41]

[29] CSR to ZC, 18 October 1817 (APS: CSR).
[30] CSR to ZC, 25 June 1820 (APS: CSR).
[31] Silliman, editorial comment appended to Gray (1841), p. 237.
[32] Sayre (1998).
[33] As Boewe showed, Rafinesque was almost certainly the review's co-author, but Atwater (1820) was convinced that the most hostile parts of the review were Rafinesque's work (Boewe, 2003, pp. 211–212).
[34] Rafinesque (1944), pp. 351–352.
[35] Quoted in Pennell (2003), pp. 22–24.
[36] Rafinesque (1829); Boewe (1982), p. 47.
[37] Pennell (2003), pp. 29–30.
[38] Ibid., pp. 42–43, 52–54.
[39] Merrill (1943), pp.110–113).
[40] A search of the International Plant Names Index (www.ipni.org) reveals numerous valid Rafinesque names.
[41] Boewe (2003c), pp. 204–205.

Rafinesque undoubtedly over-estimated his ability to reform classification, but as A. J. Cain has pointed out, he lived in an age when classification was in a state of considerable turmoil, with numerous rival systems aiming to replace the old Linnean one.[42] The Linnaean system of botanical classification was an artificial one, in that it only used a plant's reproductive organs as the basis of its classification. Its simplicity made it easy to use, but produced groupings that were clearly unnatural; Linnaeus himself acknowledged that it must eventually be replaced by a truly natural system, one that used all a plant's characteristics to reveal the true patterns of affinity.[43] This observation inspired Rafinesque, who always described Linnaeus as his master and believed that he would be the one to complete the great Swede's work by reforming classification on a natural as opposed to an artificial basis.[44]

Rafinesque argued in 1820 (which was early for such views to be expressed in the English-speaking world), that the Linnaean System 'has many anomalies and irregularities, on which account the natural method or classification is now preferred by the best botanists'.[45] By the best botanists, Rafinesque meant the European ones, especially Antoine-Laurent de Jussieu and A.-P. de Candolle, whose natural system formed the basis of Rafinesque's.[46] His promotion of such ideas irritated some American naturalists: Amos Eaton, senior professor of botany at the Rensselaer School, Troy, NY, wrote to his former pupil John Torrey asking why Rafinesque 'can not give up that foolish European foolery, which leads him to treat Americans like half-taught school boys? He may be assured, he will never succeed in this way'.[47] Rafinesque certainly believed that his commitment to natural classification was behind the rejection of his papers to the Philadelphia Academy of Natural Sciences (see above); he told Collins they had been considered '*too bold*', in that he had 'described *at once* 10 New Genera, and ... endeavoured to show their *natural affinities*! and to class them naturally!'[48]

Merrill argued that, despite its failure to be widely adopted, Rafinesque's new system of classification was nonetheless significant because 'Rafinesque's insistence on accepting a natural system of classification at a time when most of his American associates were pronounced Linnaeists was one of the reefs which wrecked his reputation among his contemporaries'.[49] Rafinesque certainly evinced a rather European attitude to his American contemporaries who rejected his classifications:

> our botanists are not yet quite ripe, to relish these true doctrines, they will rather follow easy errors, than plain truth. The usual foolish objection once made to Linnaeus is always repeated, that they have not time to learn new principles. But we shall conquer sometime hence, and we shall live to see it.[50]

Given Rafinesque's promotion of European classification, it seems paradoxical that he was also prone to a wilful neglect of contemporary European works. When he berated Collins for failing to publish details of some of the plants in his collection (see above), Collins had replied that 'I waited to be correct, and to know whether the Europeans had got them'.[51] Rafinesque was unimpressed with this excuse, and responded that he 'was acquainted with the fact' that several of the plants in question had already been described in Europe, but added, 'the Americans while they ought to endeavour to acquire all the european knowledge, need not keep back their discoveries in order to be forestalled by them!' His concern that Americans publish the natural history of their country shaped his work, as he explained:

> I don't know if the Science suffers more from hurry than delay; if two names are given nearly at the same time, we have the choice of the best, if none are given, our knowledge lays buried like the gold of a miser.
>
> I have enlarged on this subject, because I feel greatly interested in it, and wish that we should soon do for ourselves in Science as well as anything else.[52]

This desire that Americans should 'do for ourselves in Science' reflects his pride in his adopted country during the first decades of its independence. Rafinesque's *Louisiana flora* appeared in 1817, just fourteen years after Louisiana had been purchased from the French. Rafinesque's flora was a translation of a French one, but as we've seen, he revised the original completely. In the same letter to Collins, Rafinesque commented:

> I never would have undertaken the tedious revival of the *Flora Ludoviciana* if I had not been able to extend the limits of the Science by that labour; but the glory of founding, naming and describing 30 or 40 new genera and 200 new species, was well worth the trouble.[53]

He was clearly annexing Louisiana's botany, integrating into that of the English-speaking Union, to complete the territorial acquisition.

Rafinesque's letter listed numerous American naturalists who had lost their claims to priority, offering them as a warning against delay. 'You will deem me an enthusiast', he admitted to Collins, 'or too zealous, but without zeal what can be done, witness those that have more modesty than zeal'.[54] His dedication to ensuring American natural history was published by Americans, for Americans, in America helps explain the hostility of Europeans like Hooker, who felt that only the imperial metropolis was qualified to classify. Rafinesque's example was not one Hooker wanted his own collectors to follow.[55]

Rafinesque became a passionate citizen of his adopted country, convinced that he and his fellow naturalists should not defer to European naturalists. So, despite his commitment to some European scientific ideas, he was happy to ignore European opinion when it suited him. Moreover, he was convinced that America's natural history was entirely distinct from Europe's, so nothing but confusion would result from imposing European categories on it. In his autobiography, *A life of travels*, he records that the very first plant he found when he arrived in America was a new species, which he named *Draba Americana*. Finding a new species so rapidly confirmed his preconception that America and Europe had no spe-

[42] Cain (1990), p. 9; see also Endersby (2008).
[43] Freer (2005); Koerner (1996).
[44] Cain (1990), p. 16.
[45] Rafinesque (1983), pp. 13–14.
[46] Porter (1986), pp. 76–77.
[47] A. Eaton to J. Torrey, 5 October 1817. Quoted in Stuckey (2003), p. 160.
[48] CSR to ZC, 27 November 1817 (APS: CSR).
[49] Merrill (1949), p. 9. One of the few exceptions to Merrill's observation about the dominance of Linnaean classification was José Correia da Serra, a US resident, who published a flora based on de Jussieu's system in 1815 (Chaplin, 2003, p. 78).
[50] CSR to ZC, 27 November 1817 (APS: CSR).
[51] ZC to CSR, 10 November 1817 (APS: CSR).
[52] CSR to ZC, 27 November 1817 (APS: CSR). NB: Rafinesque's handwriting and English are noticeably worse in this letter than others and get increasingly so in passages of high passion.
[53] Ibid.
[54] Ibid.
[55] Endersby (2001).

cies in common. Although American botanists were convinced it was the common European weed, *Draba verna*, Rafinesque never accepted their view and devoted the rest of his life to cataloguing the New World's novelties. As he wrote *Draba Americana* 'is the emblem of many discoveries of mine, of which ignorance had doubted, till science has proved that I was right'.[56]

This idea of America as a new land had gripped the European imagination for centuries.[57] As Stephen Fender has commented, 'First America was imagined—only then was it discovered, and then "invented"'.[58] This imagined America, rich with novelties, retained its fascination well into the nineteenth century, and Rafinesque was particularly susceptible to its power. William Baldwin's description of Rafinesque as a '*literary madman*' (above) strikes me as peculiarly appropriate, because Rafinesque's copious, unending catalogues are perhaps best understood within what Fender has identified as a distinctive American literary genre of cataloguing.[59] For example, Captain John Smith, in his *A description of New England* (1616) was clearly so overwhelmed by the richness of American nature, that he resorted to simply listing the species, new and old, that the new colony held:

> The herbs and fruits are of many sorts and kinds, as alkermes, currants, or a fruit like currants, mulberries, vines raspberries, gooseberries, plums, walnuts, chestnuts, small nuts, &c, pumpkins, gourds, strawberries, beans, peas, and maize; a kind or two of flax, wherewith they make nets, lines, and ropes, both small and great.

The lists continue, of trees, birds, fish and animals ('Moose, a beast bigger than a stag, deer, red and fallow; beavers ...'), on and on, without order or organisation.[60] These lists often end with phrases such as 'and many other sorts' and 'and divers others, &c', which were a common feature of such accounts, whether they appeared in private letters or printed pamphlets promoting colonisation. The inability to complete the list is also characteristic of Rafinesque's catalogues (Short described him as an '*endless* discoverer of new things'), and Fender identifies it as an essential feature of the genre: 'etcetera' conveys a sense of limitless natural bounty that exceeds all descriptive languages and categories.[61]

Such catalogues listed America's natural wealth, but also made a virtue of its uncivilised state by listing all the unwelcome institutions that the country lacked, such as tithes, taxes and excisemen. What Fender calls the negative and positive beneficent catalogues combine to create an image of America as an unspoilt Eden, where—before the Fall—Adam didn't need to work or sweat to persuade the earth to feed him; everything was just naturally bountiful.[62] Yet, despite not having to labour to earn his bread, Adam did have a task in the Garden of Eden: 'God formed every beast of the field, and every fowl of the air; and brought them unto Adam to see what he would call them: and whatsoever Adam called every living creature, that was the name thereof'.[63]

In America, colonists were surrounded by nameless unfamiliar plants and animals; as Smith wrote in one of his lists, there were also 'many other sorts whose names I know not'.[64] In the late eighteenth and early nineteenth centuries, both native-born and émigré naturalists struggled to impose order on the lists by naming and classifying America's unique species.[65] In the early decades of independence, Americans often made a virtue of their country's relatively undeveloped state, offering their closeness to nature and proximity to the wilderness as virtues and defining the new nation's distinctiveness in terms of its distinctive natural productions. Exploring, collecting, classifying and naming were often seen as ways of asserting the new nation's intellectual independence from European learning.[66]

America's natural wealth required a new Adam to name it and many naturalists took up the challenge, but none more enthusiastically than Rafinesque.[67] The alarming 'flood of communications' to which Silliman referred were primarily concerned with Rafinesque's classification of the plants and animals he had accumulated on his Ohio River trip, where he had literally had a new field all to himself. The river's fauna, especially its fish and freshwater molluscs, were incredibly rich and diverse: practically every shell he picked up seemed to be a new species.[68] One explicit aspect of America's Edenic state, frequently referred to (and satirised) by list makers was that one could supposedly catch fish without skill: they were so common and so innocent of human wiles that they practically jumped into the nets.[69] New aquatic species certainly seemed to jump into Rafinesque's nets, confirming his view that the whole American flora and fauna were unique.

These assumptions shed some light on a celebrated hoax, perpetrated by the naturalist John James Audubon, who presented Rafinesque with a series of drawings of interesting new fish. Rafinesque duly published descriptions of these new species, unaware that they were all creatures of Audubon's imagination.[70] Audubon may simply have felt Rafinesque's pretensions needed correcting, but the hoax supposedly had its origins in a visit Rafinesque paid to Audubon. Audubon recounted how in the middle of the night:

> I heard a great uproar in the naturalist's room. I got up, reached the place in a few moments, and opened the door, when to my astonishment, I saw my guest running about the room naked, holding the handle of my favourite violin, the body of which he had battered to pieces against the walls in attempting to kill the bats which had entered by the open window ... I stood amazed, but he continued jumping and running round and round, until he was fairly exhausted, when he begged me to procure one of the animals for him, as he felt convinced they belonged to 'a new species.' Although I was convinced to the contrary, I took up the bow of my demolished Cremona, and administering a sharp tap to each of the bats as it came up, soon got specimens enough.[71]

[56] Pennell (2003), p. 6; Rafinesque (1836), p. 301; Warren (2004), p. 13.
[57] See, for example, Wilson (1991); Cronon (2003); Barringer (2003).
[58] Fender (1983), p. 3.
[59] Fender (1992), pp. 50–54.
[60] Smith (1616), quoted in Fender (1983), p. 16.
[61] Fender (1992), pp. 51–54.
[62] Ibid., pp. 58–60.
[63] Genesis, 2:19.
[64] Smith (1616), quoted in Fender (1992), p. 54.
[65] Of course, the native Americans had already named them, but such 'savage' knowledge was often ignored. There is an extensive literature on this topic, but space prohibits even a cursory discussion of it here.
[66] Chaplin (2003), pp. 75–76.
[67] Ibid., p. 84; Prince (2003), pp. 5–6.
[68] Cain (1990), p. 23; Porter (1986), p. 35.
[69] Fender (1992), pp. 58–60.
[70] Markle (1997).
[71] Audubon (2003), p. 369.

Although the tone of Audubon's portrait is humorous, at the time he was apparently so infuriated by the violin's destruction that he perpetrated the hoax in revenge.

As in the case of the much-criticised *Louisiana flora*, Rafinesque could have avoided being hoaxed by Audubon if he had confined himself to describing only what he had seen with his own eyes. Indeed, this is the policy one would have expected him to have pursued, since he saw himself as primarily a field naturalist, proud of the distances he had travelled and the hard-won, first-hand knowledge they had brought him. He was dismissive of cabinet naturalists, who worked only from specimens collected by others—and he maintained this despite his own reliance on published sources and his willingness to publish floras of places he had never visited.[72]

Rafinesque was nothing if not contradictory, but his contradictions make a little more sense in the context of his convictions about the nature of America. Since he was certain that the country was rich in novelties, he was inclined to believe reports of fresh ones: hence his decision to assume that the unidentifiable plants in Robin's original *Flore Louisiane* were new species. Rafinesque generally privileged reports from America, assuming that naturalists who had travelled the country and knew its plants and animals at first hand were better-equipped to describe than those in Europe. One might therefore have expected someone like Asa Gray to be an ally in this project, but he wished to see Harvard University established as the centre of American botany, and wanted nothing but specimens and compliance from men like Rafinesque. In addition, Charlotte Porter has argued that Gray saw himself as the pioneer of natural classification in America, and was thus jealous of Rafinesque's work, and Leonard Warren has argued that men like Gray wanted to protect American science's reputation among European savants from the potential injury Rafinesque's publications might cause.[73]

4. Instability

Rafinesque's acquired American-ness also illuminates the other reason why Hooker in particular was anxious to condemn 'the vagaries of a Rafinesque'. Rafinesque was a transmutationist, a believer in the evolution of species. In 1833, he had written:

> The truth is that *Species and perhaps Genera also, are forming in organized beings* by gradual deviations of shapes, forms and organs, taking place in the lapse of time. . . . This is part of the great universal law of PERPETUAL MUTABILITY in everything . . . every variety is a deviation which becomes a Sp. as soon as it is permanent by reproduction.[74]

Rafinesque explicitly cited the transmutation of species as a justification for his classificatory practice. For example, in his 1837 *New flora of North America (II)* he noted of the Kentucky lopseed plant (*Phryma leptostachya*) that while other naturalists classified it as a single species with three 'mere varieties', he named three species because 'they afford a fine illustration of incipient species forming under our eyes in our woods'.[75] His contention, in effect was that while they may not be species now, they will be one day, so he might as well name them now.

Although Hooker was to become a committed supporter of Darwin's theory of evolution by natural selection, he chose to minimise its impact on classification. According to Hooker, 'the descriptive naturalist who believes all species to be derivative and mutable, only differs *in practice* from him who asserts the contrary, in expecting that the posterity of the organisms he describes as species may, at some indefinitely distant period of time, require redescription'. The slow, gradual nature of Darwinian change ensured that species changed too slowly to upset the conservative world of the systematist.[76] Rafinesque was, of course, pre-Darwinian, and claimed to derive his transmutationism from the rather limited kind admitted by the French naturalist Michel Adanson. Nevertheless, Rafinesque epitomised the problems that evolution could potentially create for men like Hooker.[77] Far from assuming that species might require reclassification at 'some indefinitely distant period of time', Rafinesque believed in rapid transformation arguing that 'we may assume as an average 30 to 100 years for the deviating or splitting range of specific deviation, and 500 to 1000 years for the Generic deviation'.[78]

Rafinesque's conviction that the organic world was in a state of ceaseless flux was reflected in a book-length poem he wrote, *The world or instability* (1836):

> In endless shapes, mutations quick and slow,
> The world revolves, and all above, below,
> In various molds and frames all things were cast,
> But none forever can endure nor last.
> Whatever took a form, must change or mend;Whatever once began, must have an end.[79]

His aim in writing the poem, as he explained, had been that 'the constant gradual progress of mutations and changes all over the world, has been long surmised; but never explained nor sung, nor deemed a general perpetual law, which it is the aim of this poem to do and prove the fact'.[80] He also included a footnote that clearly set out his views on species: '[species] are abstract terms of our own; Nature only acknowledges individuals, and varies them constantly; so as to produce new species now and then, particularly among plants'.[81]

Rafinesque's commitment not merely to transmutation but to *rapidly* evolving species is another reason for the hostility of taxonomists, who generally love nothing more than stability. Hooker and Gray tried to categorise Rafinesque as the type specimen of the bad classifier: the disruptive spectre at the taxonomic feast, a phantom of ceaseless, unmanageable change.

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[72] Porter (1986), p. 81; Warren (2004), pp. 28–29.
[73] Porter (1986), p. 82; Warren (2004), p. 204.
[74] Rafinesque, quoted in Warren (2004), p. 31.
[75] Rafinesque, quoted in Boewe (1988), p. 54.
[76] Hooker (1860), p. iv; my emphasis. The question of precisely where Hooker stood on the question of transmutation in 1855, when he wrote the *Flora indica*, is too complex to go into here, but in his pre-1859 published comments he remained committed to stable species. See Endersby (2008).
[77] In a letter to the British botanist, John Lindley, Rafinesque claimed to 'have been a disciple of Jussieu, Adanson &c since 1800', CSR to J. Lindley, May 1840 (APS: CSR). Rafinesque cited Adanson as the originator of his views, in *Flora telluriana* (1836); cited in Merril (1949), pp. 47–48. Charles Boewe has argued that Rafinesque's views were closer to Erasmus Darwin's than to Adanson's (Boewe, 1988, p. 55). On Adanson, see Ratcliff (2002); Lamy (2007). Although Ernst Mayr and Richard Burkhardt have both argued that Adanson's views were not genuinely transmutationist, since he only admitted slight deviations from the original type, Adanson's views were certainly regarded as being more radical by Rafinesque (Mayr, 1982, p. 260; Burkhardt, 1995).
[78] Rafinesque (2005), p. 247, quoted in Pennell (2003), pp. 43–45; Porter (1986), pp. 78–79.
[79] Rafinesque (1836), p. 13.
[80] Ibid., p. 11.
[81] Ibid., p. 229, quoted in Boewe (1988), p. 55. Boewe notes that Rafinesque expressed similar sentiments as early as his 1814 *Principes Fondamentaux de Somiologie 13*, suggesting that 'Nature creates only individuals or at the most Species, all the other Designations being only ideal notions invented by our imagination, to facilitate our knowledge of objects' (Boewe, 1988, p. 55).

However, while Rafinesque's commitment to taxonomic splitting and his transmutationist rationale for it helps explain the hostility of lumpers like Hooker and Gray, we are still left wondering why Rafinesque believed so firmly in 'Instability' as a principle. It may perhaps be best understood as an aspect of the way in which his idea of America shaped his sense of himself as an American. As he wrote in his autobiography that:

> Versatility of talents and of professions, is not uncommon in America; but those which I have exhibited in these few pages, may appear to exceed belief: and yet it is a positive fact that in knowledge I have been a Botanist, Naturalist, Geologist, Geographer, Historian, Poet, Philosopher, Philologist, Economist, Philanthropist ... By profession a Traveller, Merchant, Manufacturer, Collector, Improver, Professor, Teacher, Surveyor, Draftsman, Architect, Engineer, Pulmist, Author, Editor, Bookseller, Librarian, Secretary ... and I hardly know myself what I may not become as yet: since whenever I apply myself to any thing, *which I like*, I never fail to succeed if depending on me alone, unless impeded and prevented by lack of means, or the hostility of the foes of mankind.[82]

Rafinesque saw America's flora and fauna as new, different and constant changing; perhaps he saw himself as a new species of human—an American—one who constantly changed profession and career, adapted to new circumstances and was able to transform himself as circumstances demanded.

Once again, Rafinesque's idea of Americans seems rooted in a literary genre, epitomised by J. Hector St. John Crevecoeur's celebrated *Letters from an American farmer* (1782). Letter III asks 'What then is the American, this new man?' He may be someone like Rafinesque, 'either an European, or the descendant of an European', but birth is not decisive: 'He is an American, who leaving behind him all his ancient prejudices and manners, receives new ones from the new mode of life he has embraced'. As a result of breaking these ties, in America 'individuals of all nations are melted into a new race of men, whose labours and posterity will one day cause great changes in the world'.[83] This vision inspired many Americans and seem entirely consistent with Rafinesque's sense of himself. His financial, medical and military inventions were not eccentricities, but aspects of 'the new mode of life' that America made possible, a life whose possibilities were exemplified by another largely self-made Philadelphian genius, Benjamin Franklin, whose interests and achievements were every bit as diverse as Rafinesque's.[84] Although the supposed quality of Rafinesque's classifications was and continues to be the ostensible reason for his poor reputation, it seems that some of the hostility he engendered was aroused by his refusal to accept the roles into which others wanted to classify him. Rafinesque thought of himself as kin to the Kentucky lopseed plant, always ready to evolve into something new. His views may perhaps have been shaped by those of Alexander von Humboldt, who had written of South America that 'Nature in these climates appears more active, more fruitful, we may even say more prodigal, of life'.[85]

5. Conclusion

Rafinesque's sense of himself as a quintessentially American figure may help explain why his reputation is currently on the rise again. The American historian Charles Boewe has spent many years researching Rafinesque's life and work, clearing away myths and misconceptions, and arguing that Rafinesque's strange personality has led to his scientific work being unfairly neglected or attacked. In recent years, several books and articles have appeared that have attempted to rehabilitate him.[86]

Some sense of how Rafinesque's reputation is shifting can be gleaned from the way his name crops up on Taxacom, an internet discussion list dedicated to classification and systematics.[87] As recently as 1996, Rafinesque was still being cited as the exemplary bad classifier: 'look at some early 19th-Century literature and see what chaos can be caused when biologists feel free to change any name they find disagreeable (for example, pick up any book by Rafinesque)'. In similar vein, another correspondent referred to him as 'the all-time king of mess-makers'. However, in February 2004, a casual description of Rafinesque as 'that idiot', led to protests and several of the list's participants waded in to defend or criticise him. As one commented, it is 'Funny how certain events of long ago still can make hairs bristle', adding that 'Rafinesque has been maligned for years for no good reason other than because he was energetic and went to great pains to contribute his knowledge to science'. The writer concluded that 'He was eccentric, I would admit, but who in our field is not?' Adding that classification would be 'terribly boring and sterile' without 'people like C. S. Rafinesque-Schmaltz'. More than 160 years after his death, Rafinesque continues to inspire passions, both positive and negative.

One measure of Rafinesque's shifting reputation is the way certain standard stories about him—that have been shown by Boewe to be either entirely untrue or largely without foundation—are still repeated both by supporters and detractors. I will mention just three: the species of lightning; Audubon's violin; and, Rafinesque's impoverished death.

The claim that Rafinesque classified lightning into species first appeared in Asa Gray's 'Notice' of 1841. Gray commented that, one of Rafinesque's papers characterised '*twelve new species of thunder and lightning!*'[88] Gray's exclamation mark suggests that he thought this classification distinctly eccentric and the story still circulates, despite Merrill having described it as 'definitely untrue' in his *Index Rafinesquianus* (1949), noting that Thomas Jefferson Fitzpatrick had already shown it to be false in 1911.[89] Audubon's account of Rafinesque's 'eccentricity', is even more canonical, and forms the basis of many accounts of his temperament—despite the fish hoax being clear evidence of Audubon's hostility to Rafinesque. One might therefore reasonably suspect Audubon of—at the very least—exaggerating his guest's behaviour, especially since Rafinesque's contemporary account of the visit makes no mention of the incident and differs from Audubon's in several aspects.[90] Yet this story is repeated by both Rafinesque's critics and defenders: the former see it as further evidence of insanity, while the latter cite Audubon's hoax as evi-

[82] Rafinesque (1944), p. 351.
[83] Crevecoeur (1904), pp. 54–55.
[84] Chaplin (2006).
[85] Humboldt & Bonpland (1852), p. 157.
[86] For example Gilbert (1999); Audubon (2003); Stuessy (2003); Warren (2004). Leonard Warren describes Rafinesque as a genius (ibid., p. 1).
[87] Given the informal nature of such lists, I have felt it inappropriate to publish the names of correspondents in print, however the archives of the list are publicly available online at http://mailman.nhm.ku.edu/pipermail/taxacom/ (accessed January 2009).
[88] Gray (1841), p. 241.
[89] Fitzpatrick (1911), pp. 101–102; Merrill (1949), p. 52.
[90] Boewe (2003), p. xxxix.

dence of the way Rafinesque's reputation has been systematically blackened, when he was nothing more than over-zealous in his pursuit of specimens.[91]

Finally, there is the story of Rafinesque's death, alone and impoverished in a Philadelphia garret; his debts supposedly so severe that his friends had to steal his body to prevent the landlord selling it to the medical school for dissection, to recover some of the back rent he was owed. As Boewe has shown, none of this is true: Rafinesque died in a comfortable rented house, attended by a friend and two of Philadelphia's more prominent physicians.[92] Nevertheless, Rafinesque's death in supposedly abject poverty has become part of his myth, maintained in part by his defenders, one of whom recently wrote on Taxacom that 'Rafinesque was ruined and died penniless in a Philadelphia attic because he had trusted Audubon'.

This mythologizing of Rafinesque, whether positive and negative, highlights some of uses to which his reputation has been put. To some he serves as a unjustly neglected pioneer of American natural history, 'a voice in the American wilderness', in Warren's phrase.[93] While for others, he remains a systematic bogeyman, a useful example of how not to do classification. However, I believe he is better understood in the broader, literary context of early American writing about the nature of America and Americans. Rafinesque's distinctively American ability to reinvent himself has allowed him to serve so many contradictory purposes; as he said himself 'I hardly know myself what I may not become'. This was his implicit answer to the question 'What is an American?' and it explains the vagaries of Rafinesque's posthumous reputation more fully than examining him in a narrowly scientific context can hope to do.

Acknowledgements

Most of the research for this paper was made possible by an Isaac Comly Martindale Fund library resident research fellowship at the American Philosophical Society (APS), Philadelphia. I am grateful to the APS and to the Master and Fellows of Darwin College, Cambridge, for their financial support. My thanks also to Charles Boewe, Robert Cox, John Flanagan, Charlotte Porter, Keir Sterlink, Pamela Thurschwell, the late Max Walters and Leonard Warren. Also for comments and suggestions from members of the audience at Cambridge University's Cabinet of Natural History discussion group, and at the History of Science Society/British Society for the History of Science/Canadian Society for the History and Philosophy of Science Joint Meeting.

References

Audubon, J. J. (2003). The eccentric naturalist. In C. Boewe (Ed.), *Profiles of Rafinesque* (pp. 367–372). Knoxville: University of Tennessee Press. (First published 1831–1839)

Barringer, T. (2003). The course of empires: Landscape and identity in America and Britain, 1820–1880. In A. Wilton, & T. Barringer (Eds.), *American sublime: Landscape painting in the United States 1820–1880* (pp. 38–65). Princeton, NJ: Princeton University Press.

Boewe, C. (1982). *Fitzpatrick's Rafinesque: A sketch of his life with bibliography*. Weston, MA: M & S Press.

Boewe, C. (1988). Rafinesque among the field naturalists. *Bartonia (Journal of the Philadelphia Botanical Club), 54*, 48–58.

Boewe, C. (Ed.). (2003a). *Profiles of Rafinesque*. Knoxville: University of Tennessee Press.

Boewe, C. (2003b). The last days of Rafinesque. In C. Boewe (Ed.), *Profiles of Rafinesque* (pp. 80–98). Knoxville: University of Tennessee Press.

Boewe, C. (2003c). The fall from grace of that 'base wretch' Rafinesque. In C. Boewe (Ed.), *Profiles of Rafinesque* (pp. 203–216). Knoxville: University of Tennessee Press. (First published 1987)

Burkhardt, R. W. (1995). *The spirit of system: Lamarck and evolutionary biology*. Cambridge, MA: Harvard University Press.

Cain, A. J. (Ed.). (1990). *Constantine Samuel Rafinesque Schmaltz on classification: A translation of early works by Rafinesque with introduction and notes*. Philadelphia: Academy of Natural Sciences.

Camp, W. H., Rickett, H. W., & Weatherby, C. A. (1949). Proposed changes in the international rules of botanical nomenclature. *Brittonia, 7*(1), 1–51.

Chaplin, J. E. (2003). Nature and nation: Natural history in context. In S. A. Prince (Ed.), *Stuffing birds, pressing plants, shaping knowledge* (pp. 75–95). Philadelphia: American Philosophical Society.

Chaplin, J. E. (2006). *The first scientific American: Benjamin Franklin and the pursuit of genius*. New York: Basic Books.

Craw, R. C. (1984). Never a serious scientist: The life of Leon Croizat. *Tuatara, 27*(1), 5–7.

Crevecoeur, J. H. S. J. (1904). *Letters from an American farmer*. New York: Fox, Duffield. (First published 1782)

[Croizat, L.] (2003). Rafinesque: A concrete case. In C. Boewe (Ed.), *Profiles of Rafinesque* (pp. 179–193). Knoxville: University of Tennessee Press. (First published 1948)

Cronon, W. (2003). *Changes in the land: Indians, colonists, and the ecology of New England*. New York: Hill & Wang.

Endersby, J. (2001). 'From having no Herbarium': Local knowledge vs. metropolitan expertise: Joseph Hooker's Australasian correspondence with William Colenso and Ronald Gunn. *Pacific Science, 55*(4), 343–358.

Endersby, J. (2008). *Imperial nature: Joseph Hooker and the practices of Victorian science*. Chicago: University of Chicago Press.

Fender, S. (1983). *American literature in context I: 1620–1830*. London: Methuen.

Fender, S. (1992). *Sea changes: British emigration & American literature*. Cambridge: Cambridge University Press.

Fitzpatrick, T. J. (1911). *Rafinesque: A sketch of his life and bibliography*. Des Moines: The Historical Department of Iowa.

Freer, S. (Ed.). (2005). *Linnaeus' Philosophia botanica*. Oxford: Oxford University Press. (First published 1751)

Gilbert, B. (1999). An 'odd fish' who swam against the tide. *Smithsonian, 29*(10), 112.

Gray, A. (1841). Notice of the botanical writings of the late C. S. Rafinesque. *American Journal of Science and Arts, XL*(2), 221–241.

Hooker, J. D. (1860). *On the flora of Australia: Its origin, affinities and distribution: Being an introductory essay to the flora of Tasmania*. London: Lovell Reeve.

Hooker, J. D., & Thomson, T. (1855). *Introductory essay to the Flora Indica*. London: W. Pamplin.

Humboldt, A. v., & Bonpland, A. (1852). *Personal narrative of travels to the equinoctial regions of America, during the years 1799–1804*. Berlin: H. G. Bohn.

Koerner, L. (1996). Carl Linnaeus in his time and place. In N. Jardine, J. A. Secord, & E. Spary (Eds.), *Cultures of natural history* (pp. 145–62). Cambridge: Cambridge University Press.

Lamy, D. (2007). Michel Adanson: A universal method of classification. In R. Huxley (Ed.), *The great naturalists* (pp. 153–158). London: Thames & Hudson.

Lanjouw, J. (1950). *Synopsis of proposals: Concerning the international rules of botanical nomenclature*. Utrecht: The International Commission of Taxonomy of the I.U.B.S.

Markle, D. F. (1997). Audubon's hoax: Ohio river fishes described by Rafinesque. *Archives of Natural History, 24*(3), 439–447.

Mayr, E. (1982). *The growth of biological thought: Diversity, evolution, and inheritance*. Cambridge, MA: Harvard University Press.

Merrill, E. D. (1943). Rafinesque's publications from the standpoint of world botany. *Proceedings of the American Philosophical Society, 87*(1), 110–119.

Merrill, E. D. (1949). *Index Rafinesquianus: The plant names published by C. S. Rafinesque with reductions, and a consideration of his methods, objectives, and attainments*. Jamaica Plain, MA: Arnold Arboretum of Harvard University.

Osvald, H., & Åberg, E. (1950). *Proceedings of the seventh international botanical congress*. Stockholm: Almqvist & Wiksell.

Pennell, F. W. (2003). The life and work of Rafinesque. In C. Boewe (Ed.), *Profiles of Rafinesque* (pp. 3–66). Knoxville: University of Tennessee Press.

Porter, C. M. (1986). *The eagle's nest: Natural history and American ideas, 1812–1842*. Tuscaloosa: University of Alabama Press.

Prince, S. A. (Ed.). (2003). *Stuffing birds, pressing plants, shaping knowledge*. Philadelphia: American Philosophical Society.

Rafinesque, C. S. C. J. [pseud.] (1836). *The world or instability: A poem, with notes and illustrations*. London: O. Rich.

Rafinesque, C. S. (1829). *The pulmist; or, introduction to the art of curing and preventing the consumption or chronic phthisis: A medical essay*. Philadelphia: Printed for the author.

Rafinesque, C. S. (1944). A life of travels and researches in North America and South Europe, or outlines of the life, travels and researches of C. S. Rafinesque. *Chronica Botanica, 8*(2), 291–360. (First published 1836)

Rafinesque, C. S. (1967). *Florula Ludoviciana; or, a flora of the state of Louisiana. Tr., rev., and improved from the French of C. C. Robin, by C. S. Rafinesque*. New York: C. Wiley & Co. (First published 1817)

Rafinesque, C. S. (1983). *On botany*. Frankfort, KY: The Whippoorwill Press. (First published 1820)

[91] Recent contributors to Taxacom (see previous note) make precisely these points.

[92] Boewe (2003).

[93] Warren (2004).

Rafinesque, C. S. (1990a). Epitome of somiological or zoological and botanical discoveries of C. S. Rafinesque. In A. J. Cain (Ed.), *Constantine Samuel Rafinesque Schmaltz on classification: A translation of early works by Rafinesque with introduction and notes* (pp. 42–72). Philadelphia: Academy of Natural Sciences. (First published 1814)

Rafinesque, C. S. (1990b). Mirror of the sciences, or encyclopaedic journal of Sicily, literary repository of modern knowledge, discoveries and observations on the sciences and arts. In A. J. Cain (Ed.), *Constantine Samuel Rafinesque Schmaltz on classification: A translation of early works by Rafinesque with introduction and notes* (pp. 33–41). Philadelphia: Academy of Natural Sciences. (First published 1814)

Rafinesque, C. S. (2005). Flora telluriana. In C. Boewe (Ed.), *A C. S. Rafinesque anthology* (pp. 246–248). Jefferson, NC: McFarland & Company Inc. (First published 1836)

Ratcliff, M. J. (2002). Duchesne's strawberries: Between grower's practices and academic knowledge. In H.-J. Rheinberger, P. McLaughlin, & S. Müller-Wille (Eds.), *A cultural history of heredity I: 17th and 18th centuries* (pp. 43–65). Preprint, 222. Berlin: Max Planck Institute for the History of Science.

Sayre, G. M. (1998). The mound builders and the imagination of American antiquity in Jefferson, Bartram, and Chateaubriand. *Early American Literature, 33*(3), 225–249.

Stuckey, R. L. (2003). Opinions of Rafinesque expressed by his American botanical contemporaries. In C. Boewe (Ed.), *Profiles of Rafinesque* (pp. 154–178). Knoxville: University of Tennessee Press.

Stuessy, T. (2003). Review of Charles Boewe *Profiles of Rafinesque*. *Taxon*, *52*(4), 881–882.

Taylor, P. (1989). The genus *utricularia*—a taxonomic monograph. *Kew Bulletin Additional Series*, *XIV*.

Turrill, W. B. (1963). *Joseph Dalton Hooker: Botanist, explorer and administrator*. London: Scientific Book Club.

Warren, L. (2004). *Constantine Samuel Rafinesque: A voice in the American wilderness*. Lexington: The University Press of Kentucky.

Weatherby, C. A. (1935). The genus *Claderia*. *Kew Bulletin of Miscellaneous Information*, *6–9*, 409. (In 'Conservation of later generic homonyms')

Wilson, R. (1991). *American sublime: The genealogy of a poetic genre*. Madison: University of Wisconsin Press.