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ACCLIMATISING THE USEFUL ANIMAL IN THE IBERIAN WORLD AND BEYOND

Glamorous Feathers for the Metropolis. Promises and Failures in the Acclimatisation of the Ostrich in colonised Algeria (1854–1914)

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Abstract: Since the mid-nineteenth century until World War I, France attempted to acclimatise the ostrich in Algeria and other French colonies in Africa. The goal was to establish a feather production centre that could compete with the British in the global market for feathers. But for more than half a century the French failed to raise ostriches on a large scale and thus to truly position themselves as a world feather producer. This paper analyses the Algerian initiative as an occasion for understanding the nature of acclimatisation in action, and the limitations that this form of colonialism through animals actually had. Its *failed* nature allows us to examine the various factors involved in the acclimatisation of the ostrich, which did not depend only on having the appropriate knowledge and technology.

Keywords: ostriches; acclimatisation; Algeria; France; colonialism; feather trade.

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In 1867 two stuffed ostriches displayed at the Algerian section of the *Exposition Universelle* in Paris showed the French ambitions for the colony by means of animal production. The acclimatisation and domestication of the African bird promised France a leading position in the world's feather market, while playing a role in the control of the lands and peoples of colonised territories. Yet France would never see the promise of Algeria becoming a centre of ostrich feather production fulfilled. In contrast, the ostrich initiative proved successful in the British colony of Cape Town, ensuring British domination of the feather market until World War I. Why were ostriches in Algeria so reluctant to be acclimatised? The success of the British colony may have suggested that success was a given, provided one simply had the appropriate knowledge and technology. The Algerian case shows instead that acclimatising ostriches was not so straightforward, and rather depended on multiple factors that did not always come together. Before looking at them, we must say some general words on the idea of animal acclimatisation.

Ostriches were by no means the only exotic animal that the French and other European empires wanted to introduce into the climates of their national and colonial territories. Yaks, llamas and many other “useful” animals were also prized for the products or service they could provide (food, raw materials, workforce).¹ Acclimatisation has been called the paradigmatic colonial science.² It was an ambitious programme that sought to apply science to satisfy humanity's needs.³ Among other features, it provided a scientific theoretical framework that aligned with the economic interests of imperialism, as it stimulated the European appropriation of exotic animals, and of plants to a greater extent.⁴ Based on Isidore Geoffroy Saint-Hilaire's concept of limited variability of type, it theorised that a certain malleability existed among animals and plants, which under the influence of a new environment would

¹ Michael Osborne, “Acclimatizing the World: A History of the Paradigmatic Colonial Science,” *Osiris* 15, *Nature and Empire: Science and the Colonial Enterprise* (2000): 135–51. On the acclimatisation of the llama, see: Helen Cowie, *Llama* (London: Reaktion Books, 2017).

² Michael Osborne, *Nature, the Exotic and the Science of French Colonialism* (Bloomington: Indiana University Press, 1994) and Warwick Anderson, “Climates of Opinion. Acclimatization in Nineteenth-Century France and England,” *Victorian Studies* 35, no. 2 (1992): 135–57.

³ Rémi Luglia, *Des savants pour protéger la nature* (Rennes: Presses universitaires de Rennes, 2015), 39–59.

⁴ Christophe Bonneuil and Kleiche, Mina, *Du jardin d'essais colonial à la station expérimentale 1880–1930. Éléments pour une histoire du CIRAD* (Paris: CIRAD, 1993), 13–66.

undergo physiological transformations that could be fixed and transmitted to subsequent generations. These modifications could engender new breeds, but not new species. This malleability could be provoked and exploited—an important aspect for European powers, since they were spreading their influence throughout the globe.⁵ In turn, the colonised territories would favour the development of the scientific bases of acclimatisation through the *jardins d’essais*, which acted as its main laboratories. This was the basic scheme that prompted the French to try to acclimatise all kind of animals, from fish to silk worms, from kangaroos to cassowaries. In Britain, the transformist implications of the French theory found strong opposition and the acclimatisation of species was based mainly on similarities of climate.⁶

Ostriches were integrated in this transnational movement because, as Buffon had suggested, they “offered humans too many benefits for them to remain safe in the desert.”⁷ Although, in theory, their acclimatisation in Algeria was intended as an intermediate stage prior to their introduction in France, in reality it became the focus and ultimate goal of most of the efforts.⁸ The tenacious attempts to acclimatise ostriches there were the outcome of a firm alliance between natural history and fashion industry to secure a highly profitable animal resource. The economic importance of the bird is reinforced when looking at the British case, the only European power to raise them on a large scale for several decades. By presenting a detailed account on the advances and obstacles encountered in the pursuit of this ambitious objective in Algerian territory, this case study contributes to the understanding of how acclimatisation was put into practice. The fact that it ended in failure now re-

⁵ See for instance: David Francisco de Moura Penteado, “Brazilian Dromedaries: A History of Acclimatization, Agricultural Modernization and Camelids, 1857–1867,” *Isis* 115, no. 2 (2024): 241–66; Minard, Peter, *All things harmless, useful and ornamental. Environmental transformation through species acclimatisation from colonial Australia to the world* (Chapel Hill: University of North Carolina Press, 2019); Santiago Aragón, “Le rayonnement international de la Société zoologique d’acclimatation: Participation de l’Espagne entre 1854 et 1861,” *Revue d’histoire des sciences* 58, no. 1 (2005): 169–206.

⁶ Anderson, “Climates of Opinion,” 147.

⁷ Buffon, *Histoire naturelle des oiseaux*, volume 2, 212–89 (Paris: Imprimerie royale, 1776), on 272.

⁸ Experiments carried out in France and other European countries were largely of an anecdotal nature until the early decades of the twentieth century, when the farms in Nice and in Stellingen (Hamburg) attracted some attention. See: A. Monjaret “Plume et mode à la Belle Époque. Les plumassiers parisiens face à la question animale,” *Techniques & Culture* 50 (2008): 228–55; J. E. Duerden “Experiments with ostriches,” *Agricultural Journal of the Cape of Good Hope* 35, no. 5 (1909): 601–603. https://hdl.handle.net/10520/AJA0000018_919

sorts the complexity inherent in any specific initiative. Or rather, it is the perception of failure by historical actors that makes the diverse aspects on which acclimatisation depended to come more easily to the fore, as this article intends to show.

The article is divided in four sections following a chronological sequence. The first section pays attention to the life of the bird in the wild and human-ostrich relations in the time just before the launch of the French acclimatisation programme. The second section presents early experiences with ostrich breeding, which became public promises at the international exhibitions, hence the paper's emphasis on them as "places for acclimatisation." The third section describes attempts to domesticate ostriches on a large scale and analyses the acclimatisers' own interpretations of failure. The last section concludes with some remarks on the colonial nature of ostrich acclimatisation.

The Virtues of Wild Ostriches

In 1859 domesticating ostriches in Algeria was "not only possible, but probably easy" because "the question of their acclimatisation is scientifically solved."⁹ The climate of the northern African territory—then considered almost southern France—, seemed ideal as a first stage of a project that aimed to acclimatise these birds in the metropolis. Animals were the *raison d'être* of the acclimatisation agenda. We can take this animal centrality to decentralise our analysis from the context in which this agenda originated.¹⁰ To understand why the large desert bird became the focus of a rational breeding programme, it is worth knowing some features of the animal and the goods it offered to humans before it became the object of French colonial ambitions. Presenting the ostrich in the wild and then the usual human-animal encounters can offer a glimpse of the (non-human and non-European) context in which acclimatisation was put into practice.¹¹ This reconstruction results in

⁹ Armand de Quatrefages, "Notice sur l'acclimatation de quelques espèces d'oiseaux," *Bulletin Société impériale d'acclimatation* 6 (1859), 101–102.

¹⁰ Geoffroy Saint Hilaire and the Société zoologique d'acclimatation have been well studied: Claude Blanckaert, "Les animaux 'utiles' chez Isidore Geoffroy Saint-Hilaire: La mission sociale de la zootechnie," *Revue de synthèse* 113 (1992): 347–82; Luglia, *Des savants*; Osborne, *Nature, the Exotic*.

¹¹ For an approach including the animal perspective, see: Helen Cowie, *Victims of the Fashion. Animal Commodities in Victorian Britain* (Cambridge-New York: Cambridge University Press,

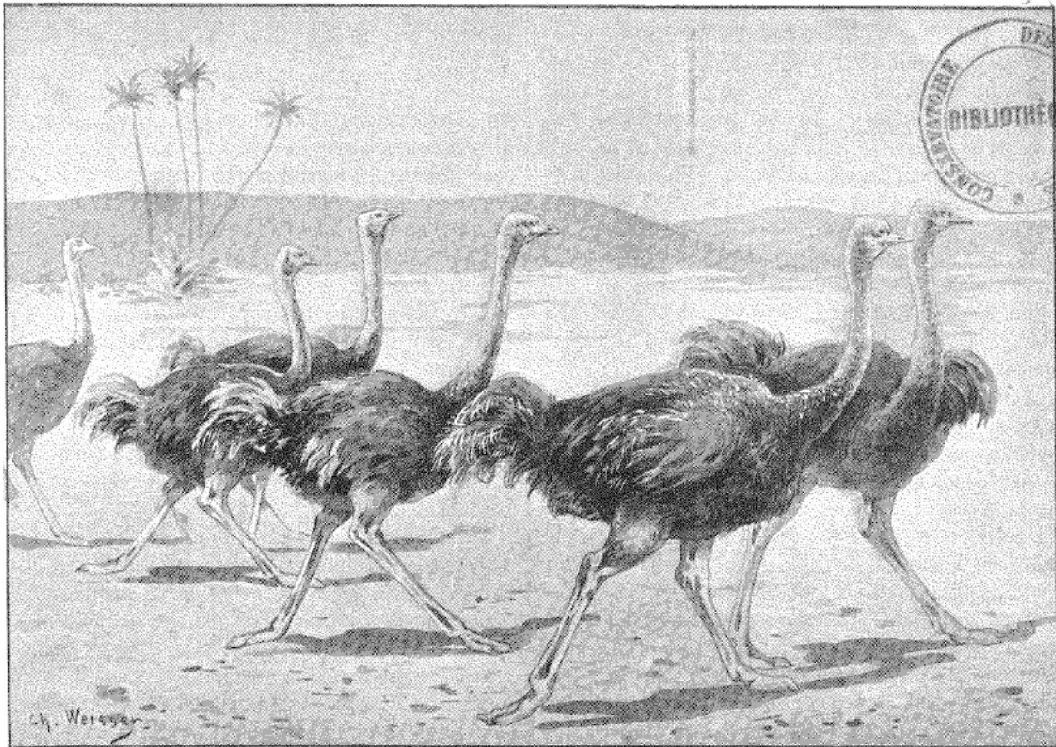
part from the same sources used to document the acclimatisation advances. Most writings on the subject recorded the lives of *wild* ostriches, while promoting their conversion as *tamed* ostriches. It was there that the wild-civilised dichotomy was progressively construed as a hinge that would articulate the discourses of acclimatisation and colonisation, not only with respect to birds but also to people.

As dwellers of the deserts in Africa and Arabia, ostriches enjoyed a nomad life in the Algerian Sahara. *Naam meta el Dahara* (the northern ostrich) grazed in herds of tens or even of a few hundred in the northern region of the *hauts plateaux* during the warm season and migrated to the *chotts* (lakes), or to the warmer and sandier regions of the south and south-west during the cold season.¹² They never approached the littoral, remaining at least at 250–300 km from the coast. Ostriches living in southern latitudes, *naam mata el Sahara*, followed similar migration patterns. During the warm season, they camped near the basins of the Saharan Atlas, which offered the necessary grass and water. As soon as the cold season was felt, they took shelter behind the mountains and the gorges of numerous tributaries to the Zeggeur and Zeugoum rivers (regions of Laghouat, Ksel and Oulad Sidi Chikh), and to the south-west in the regions surrounding the Garhi and El Namour rivers.¹³ During the rainy season, ostriches took refuge in the Saharan steppes, from the Chebka of Mezel to the oases of Ouargla, Mittili and El Golea; migration was stopped in the south by the Erq, the immense sand dunes before the great Sahara.

2022). On the local feather trading networks, see: Sarah A. Stein, *Plumes. Ostrich feathers, Jews and a Lost World of Global Commerce* (New Haven: Yale University Press, 2010).

¹² L. A. Gosse, *Des avantages que présenterait en Algérie la domestication de l'autruche d'Afrique* (Paris: Imprimerie L. Martinet, 1857), 110.

¹³ *Ibid.*, 110.



Confins du Sahara, habitat de l'autruche barbaresque.

Figure 1: Barbary ostriches in their habitat. Source: L. Songy, "L'autruche. Son élevage en Algérie au point de vue commercial," *La Nature* (1 Octobre 1898), Cnum - Conservatoire numérique des Arts et Métiers, <https://cnum.cnam.fr>.

Ostriches were said to be anatomically adapted to the arid and semi-arid habitats they inhabited. Their very recognisable figure consists of a relatively small head with two prominent eyes, followed by a long neck, which leads to a massive feathered body that is supported by two long and powerful legs, ending in feet with three toes each. Formidable in size, they can cover long distances in a short time thanks to their robust legs and aided by their wings, which make them one of the fastest running animals on earth. The run is aided by an extraordinary sense of vision, a quality that gave ostriches a precious advantage against predators. They tolerate a short period without eating or drinking. Apart from grass, their diet includes insects and small vertebrates. They ingest sand and stones to aid digestion. This morphology, which it was said to resemble a camel's, reflects adaptation to similar habitats, and gave the African bird its scientific name, *Struthio camelus*. The soft and malleable feathers with which the body and the wings are covered regu-

late their corporeal temperature, a crucial aspect in those climates. In males, feathers are dominantly black, with some white lines in the wings and the tail; in females, they show degrees of brown.

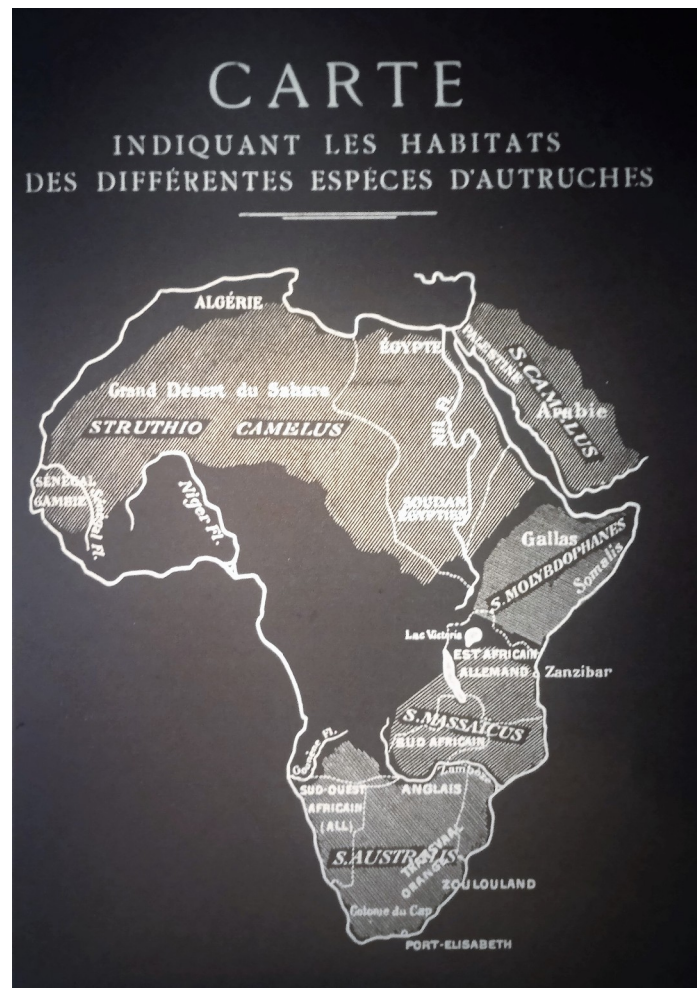


Figure 2: Map showing the range of different ostrich species (now subspecies) in 1914.

Source: Édouard Lefevre, *Le commerce et l'industrie de la plume pour parure* (Paris: 1914).

During the mating season, the herds were dispersed in pairs or small groups of individuals, often composed of one male and three or four females.¹⁴ Egg laying was influenced by feeding conditions and both male and female took

¹⁴ Gosse, *Des avantages*, 112.

care of the incubation.¹⁵ Six months after hatching, the young ostriches could measure near one meter in height; at one year, they are the same size as an adult. At this age, females were already able to lay eggs, but were not fertile until they reached two years of age. Males could reproduce when they were two-to-three years old.¹⁶ The lifespan of the wild ostrich was then a matter of discussion, with 25–35 years considered a “rational” average.¹⁷

Ostriches were not alone in many of the territories in which they lived, and they had cohabited for millennia with human communities, which hunted them, traded with their skins and appreciated their feathers as ornaments. In the nineteenth century, however, as ostrich feathers became a fashionable ornament among bourgeois women in Europe and North America, the demand for them greatly increased and encouraged an already existing trade, as well as their hunting. The regions of North Africa supplied the most prized feathers in the European and American markets, the *Aleph* and the *Barbary*. The Aleph feathers were by far the most valued of all, and they came from Syria via Cairo and Alexandria. The Barbary ones were considered high quality feathers, especially compared to those exported from the Cape. They came primarily from wild ostriches hunted by settled and nomadic peasants in southern Sahara and semiarid Sahel, from Timbuktu to the Darfur region.¹⁸ Skinned ostriches were then purchased by different communities of merchants—the Ghadamasi, the Sanusiya and the Jewish merchants—, and followed four principal routes to the Mediterranean: one from Timbuktu to Essaouira (Mogador); another one from Kano to Tripoli; a third from Bornu to Tripoli; and yet another from Wadai to Benghazi. Each of these merchant communities relied on representatives in the villages along the trans-Saharan routes who bought the ostrich skins directly from hunters or the village head.¹⁹ The Jewish were the only community that operated along all the caravan routes and that were involved at different stages of the feather commodity chain.²⁰ Once ostrich feathers were conveyed to North

¹⁵ Ibid., 113.

¹⁶ Ibid., 116.

¹⁷ Ibid., 111.

¹⁸ Sarah A. Stein, “Mediterranean Jewries and Global Commerce in the Modern Period: On the Trail of the Jewish Feather Trade,” *Jewish Social Studies* 13, no. 2 (2007): 1–39, on 6.

¹⁹ Ibid., 7.

²⁰ Ibid., 9.

Africa's port cities, poor Jewish residents participated in preparing the feathers for sale overseas: plucking, washing, sorting, and packing them.²¹ Jewish merchants also played a role on the other shore of the Mediterranean, in the port cities of Venice, Livorno, and Marseille.

The increase in demand led to a rise in feather prices that by the mid-1850s worried French businessmen, scientists and administrators, because “formerly, France supplied them [the feathers] to the foreign nations; now it has become dependent on these nations, in particular England and Tuscany.”²² According to Gosse, a member of the Société Zoologique d'Acclimatation whom we will discuss later, “the *plumassiers* (feather merchants) of Paris do not only depend on England for feathers from the Cape and a disastrous monopoly for those from the Mediterranean [probably the Jewish], they must also fear that the sources of their raw materials will dry up; because Aleph feathers are becoming increasingly scarce.”²³ The idea of acclimatising ostriches in Algeria emerged from this unfavourable context, in which ostriches saw their populations diminished and the French were losing their economic dominance. Breeding ostriches in captivity was conceived as a way of ensuring the provision of raw material on a regular basis, of becoming independent of third parties, and of recovering the prominent role of France in the world's feather trade. Other strategies were also considered to this end, such as redirecting the trans-Saharan caravan trade towards Algiers or the conquest of crucial trading entrepôts like Timbuktu, which the French acquired in 1894.²⁴ However, the attempts to dominate an indigenous regional trading network in North and West Africa ultimately proved unsuccessful.²⁵ While Barbary feathers provided a small part of world's feathers, their sales remained quite vigorous until the early twentieth century, implying that wild ostriches in the Mediterranean still fueled this trade. In the mid-1850s local communities' hunting of ostriches was presented in neutral terms.²⁶ As accli-

²¹ Ibid., 11.

²² L. A. Gosse, “Des plumes d'autruche. Extrait d'un mémoire sur l'autruche d'Afrique, lû à la Société dans les séances des 1^{er} et 15 février et 14 mars 1856,” *Bulletin de la Société impériale zoologique d'acclimatation* (1856): 525–35 and 565–74, on 572.

²³ Ibid., 572.

²⁴ Stein, “Mediterranean Jewries,” 6.

²⁵ Ibid., 4.

²⁶ *Catalogue explicatif raisonné de l'Exposition permanente des produits de l'Algérie, suivi du catalogue méthodique des produits algériens à l'Exposition Universelle de 1855* (Paris: Librairie de

matisation developed, the references to these hunting practices took a pejorative connotation in contrast to French domestication which was presented as a more civilised way of obtaining feathers, as will be discussed later.

The French Acclimatisation of the Ostrich: Promising Experiments in Algeria

After the publication in 1849 of the *Rapport général sur les questions relatives à la Domestication et la Naturalisation des Animaux Utiles* by Isidore Geoffroy Saint-Hilaire, the idea of domesticating animals with an economic interest enjoyed great success.²⁷ The Société Zoologique d'Acclimatation (hereafter referred to as Société) was founded a few years later in 1854, and the attempts at acclimatising exotic and domesticating autochthonous species in France and the colonies multiplied. Some members soon proposed the idea of acclimatising the African bird in France, Algeria and other colonies. The 1867 ostrich specimens presented at the beginning of the paper synthesised the efforts done in one decade to develop a rational breeding of the ostrich in Algeria. To demonstrate this, I first examine the early stages in the acclimatisation of the ostrich, which consisted of amassing a great deal of data on the birds and conducting successful breeding experiments at the Jardin d'essai du Hamma. Then, I consider international exhibitions as “places for acclimatisation” that, along with the *jardins d'acclimatation*, publicised the acclimatisation agenda as an integral part of colonisation.

For the Société, “acclimatising the ostrich” meant the acclimatisation of both the African ostrich and the rhea (“American ostrich”) in France, as well as the domestication of the former in the French colonies in Africa. For the purpose of ease of writing and reading, I am using “acclimatisation” and “domestication” almost as synonyms, acknowledging that the term “acclimatisation” implied dealing with exotic species, and “domestication” with autochthonous ones, in relation to a specific territory.²⁸ In Algeria, the proper term in principle would be “domestication.” But, as already seen, the bird inhabited some regions of the country, not all. In fact, the first breeding experiments

Firmin Didot Frères, 1855), 7.

²⁷ Ostrich's initial omission from the report was likely due to Buffon, who considered its acclimatisation in France to be very difficult.

²⁸ Regarding the range of uses of the term, see Osborne, “Acclimatizing the World,” 136–37.

occurred near the sea coast, a habitat that was alien to the ostrich and to which it actually had to acclimatise.

In 1856, the Société proposed the idea of acclimatising ostriches in Algeria, as an intermediate stage before their introduction in France. L. A. Gosse, delegate of the Société in Geneva, read a series of papers on the advantages of domesticating the “African Ostrich” there, which were published in the *Bulletin de la Société Impériale Zoologique d’Acclimatation* (hereafter, *Bulletin*).²⁹ In an article on the quality and the trade routes of ostrich feathers, he concluded that the only solution to reverse the state of affairs was to tame the ostrich: “this endeavour should not seem too difficult or too expensive, once the habits of these animals have been studied.”³⁰ To this end, Gosse developed a questionnaire aimed at obtaining comprehensive information about the many aspects of ostrich life, such as migratory patterns, physical features, food preferences, sexual behavior, etc.³¹ The survey had two versions, one for the African ostrich, with sixty-one questions; the other for the rhea, with forty-nine. The length and diversity of aspects treated show that knowing the living conditions of birds in the wild was mandatory for any attempt to breed them: What were the regions where ostriches lived in the summer? What were the plants, insects and reptiles that ostriches ate in each region? Were ostriches monogamous or polygamous? Did the sexes share egg incubation? The survey also requested information on ostriches raised in captivity by local populations: What authentic documents could prove that the inhabitants of the interior of Africa managed to domesticate ostriches? What use did local people make of the different ostrich products (fat, meat, eggs, skin and feathers)? What was the method used to obtain feathers?³² The very wording of the questions is indicative that local communities did not only know where to find ostriches and how to hunt them, but that they were good sources on ostrich farming methods and on preparing ostrich products. Some answers were obtained from administration officers and heads of Arab offices

²⁹ L. A. Gosse, “Des plumes d’autruche,” *Bulletin de la Société impériale zoologique d’acclimatation* (1856): 525–35 and 565–74.

³⁰ *Ibid.*, 572.

³¹ L. A. Gosse, “Questionnaire relatif à l’autruche et au nandou ou autruche d’Amérique,” *Bulletin de la Société impériale zoologique d’acclimatation* (1856): 290–97.

³² *Ibid.*, 290–97.

(*bureaux arabes*) based on indigenous informants.³³ It appears that there were varying degrees of captivity. For instance, “among the Abiades (Oulad Sidi Chikh) flocks of 20 to 30 ostriches can be seen following the livestock to the pastures [...] and return with them every evening.”³⁴ Feather plucking was practiced in places such as Sebdou, Tlemcen and Laghouat, and it was recommended “not to pluck all the feathers at once, but one by one (Laghouat).” The examples support the idea of a probable existence of ostrich domestication in different regions of Africa, arising from a long cohabitation with local communities, and show the importance of local knowledge for the Société’s project.

Besides the information on animals’ needs, the breeding of ostriches in captivity required factual knowledge provided by experiments. In parallel to the survey, Auguste Hardy, the director of the Jardin d’essai du Hamma, located near Algiers, made some progress in that direction. There had been previous experiences of breeding ostriches in captivity. Buffon mentioned some experiments of artificial incubation of ostrich eggs at the Ménagerie royal of Versailles, which proved always unsuccessful.³⁵ The laying of eggs by ostriches was also common at the menagerie of the Muséum national d’Histoire naturelle, but eggs were mostly unfertilised. Ostriches had been common diplomatic gifts on the part of the North African rulers during the first third of the century, reflecting the geopolitical situation prior to French colonial expansion in Algeria.³⁶

In 1857, things turned out differently. In a letter sent to the Société, Hardy explained: “I managed to hatch these birds. After some sixty days, a chick was born that began to run around the nest [...] He is vigorous and promises

³³ A first report by Baron Aucapitaine was presented to the Société in June 1856. Aucapitaine, “Note sur l’autruche d’Afrique en réponse au questionnaire rédigé par le docteur Gosse,” *Bulletin de la Société impériale zoologique d’acclimatation* (1856): 379–85. Eight more reports were subsequently received, four from Oran, two from Algiers and one from Constantine. Lieutenant Burin’s report (Oran) mentioned the ostrich hunter Mohammed Ben Khaled, of the Oulad Sidi Cheikh tribe, as one of the informants. L. A. Gosse, “Rapport sur les documents adressés d’Algérie en réponse au questionnaire sur l’autruche,” *Bulletin de la Société impériale zoologique d’acclimatation* (1857): 331–43, 391–94, 482–86.

³⁴ Gosse, “Rapport questionnaire sur l’autruche,” 482–83.

³⁵ Buffon, *Histoire naturelle*, 251.

³⁶ Richard W. Burkhardt, *The Leopard in the Garden. Animal and Human Lives in Paris at the First Public Zoo of the Modern Era* (Chicago and London: University of Chicago Press, 2026), 480–81.

to come to fruition.”³⁷ After examining the remaining eight eggs of the clutch, Hardy found out that three were at an advanced state of incubation, which convinced him that, in addition to being able to be born in captivity, ostriches could multiply and be domesticated. One year later, Hardy obtained a generation of nine ostrich chicks from one pair, and three more from another one.³⁸ Hardy meticulously described the practical aspects of the experiment, including the enclosure’s design, the materials provided for the bird’s construction of its nest and the food brought to the young ostriches. In 1860, Hardy obtained new young from the same pairs, and six from a female from the first cohort, thus a second generation.³⁹ Hardy took measurements of the eggs and estimated that one ostrich egg had the same weight as twenty-four Spanish chicken eggs or thirty-three Bedouin chicken eggs,⁴⁰ in line with Geoffroy Saint-Hilaire’s conviction that one day ostriches would be excellent for both food and industrial uses.⁴¹ Another member of the Société, interested in these latter industrial uses, promoted their acclimatisation by other means. As a feather merchant, Chagot “wished to avoid the destruction of the bird [...] and took the generous resolution to fund a prize of two thousand francs for the multiplication of the ostrich in domesticity.”⁴² It would be awarded to the person or institution that achieved two generations of successful breeding in captivity. Unsurprisingly, Hardy won it. These experiments and awards are precisely what was visible in 1867 at the Algerian section of the *Exposition universelle* of Paris. The two ostrich specimens on display were directly linked to the early acclimatisation attempts: one was “a young stuffed ostrich” from the Jardin d’acclimatation d’Alger, provided by Hardy; the other one was “an ostrich mounted” as part of a showcase displaying ostrich feathers, belonging to Chagot.⁴³ Both specimens presented the bird that provided the glamorous feathers of so many fashion items. But, more than that, they

³⁷ Auguste Hardy, “Sur un fait d’incubation de l’autruche à Alger,” *Bulletin de la Société Impériale Zoologique d’Acclimatation* 4 (1857): 524–25.

³⁸ Auguste Hardy, “Note sur l’incubation des autruches à la pépinière centrale du gouvernement à Alger,” *Bulletin de la Société zoologique d’acclimatation*, (1858): 306–12.

³⁹ Isidore Geoffroy Saint-Hilaire, *L’acclimatation et domestication des animaux utiles* (Paris: Librairie agricole de la maison rustique, 1861), 413.

⁴⁰ Hardy, “Note sur l’incubation,” 312.

⁴¹ Geoffroy Saint-Hilaire, *L’acclimatation*, 415.

⁴² *Ibid.*, 410.

⁴³ Exposition universelle de 1867 à Paris, *Catalogue général publié par la Commission impériale* (Paris: E. Dentu, Éditeur, 1867), 753.

showed the wealth that ostriches promised to the metropolis: the acclimatising efforts made over the last decade offered a bright horizon for France to become a feather producer capable of competing with the British market.



Figure 3: Two stuffed ostriches in the Algerian section at the 1867 Exposition universelle, Paris. On the left, the specimen that was probably sent by the Jardin d'acclimatation d'Alger; on the right, the ostrich that probably belonged to Chagot. Source: Archives nationales de France, 1867

The stuffed ostriches lead us to consider the “places for acclimatisation” and the role international exhibitions played in making this agenda visible. The Jardin zoologique d'acclimatation of Paris, opening its doors at the Bois de Boulogne in 1860, was the place par excellence for research and exhibition of the acclimatisation movement. But the experiments carried out with potentially useful animal species were usually exhibited in displays at the world's fairs (i.e., huge aquaria and fish-farming displays and the regular livestock competitions, including already acclimatised breeds such as the merino sheep and new species that might become so in the near future). In fact, zoos and exhibitions were part of a network of research and exhibition spaces through which ostriches—both alive and dead—, experiments, texts and actors circulated between the colony and the metropolis, and across nations. In 1855, ostrich breeding was just an idea. The only ostrich products exhibited at the *Exposition universelle* of Paris that year came from local Algerian exhibitors: sculpted ostrich eggs (Gantard-Boero, near Algiers; Raïtou, in Mustapha, Hamian, from the Zebdou tribe and Abd-el-Kader-Ben-Hamed, Tlemcen),

fans made of ostrich feathers (Abd-el-Kader-Ben-Hamed) or ostrich skins (Hamian and Quaddour-ben-Marrir, Batna).⁴⁴ Here can be a new example of the adoption of an African fashion by Europeans.⁴⁵ Once closed, they were transferred to the new Permanent exhibition of Algerian productions created by the Ministry of War with the aim of making visible “the consecration of a forever glorious conquest through colonisation, in a country where our domination is no longer contested.”⁴⁶ Another permanent exhibition was created in Algiers, thought as “a warehouse for objects of the colony that had to travel to the museum [...] in Paris.”⁴⁷ A big part of the natural products exhibited came from the Jardin d’essai du Hamma. Before Hardy conducted his ostrich experiments, the Jardin had kept a herd of ostriches, which was reduced because of gifts made to zoos in Paris, Antwerp and Marseille.⁴⁸ Therefore, ostriches travelled from zoo to zoo between Algiers and Paris or other European cities, from zoo to exhibition within Algeria, and from exhibition to exhibition between Algiers and Paris and within Paris. They also reached southern Africa, as “the English came to buy pairs of ostriches from the Jardin d’acclimatation d’Alger, and imported them to the Cape.”⁴⁹ This colonial exhibitionary complex made ostrich acclimatisation publicly known as a scientific project, which, along with other channels such as travel literature or the action of geographical societies and colonial committees, contributed to spreading the colonial idea within French society.⁵⁰ At the third *Exposition universelle*, in 1878, some ostrich products in the Algerian pavilion came from a farm in Kouba, near Algiers.⁵¹ A new phase in the acclimatisation programme was on display which enlarged the “places for acclimatisation” from public to private spaces.

⁴⁴ *Catalogue explicatif... 1855*, 205–206.

⁴⁵ John Mackenzie, *The Empire of Nature. Hunting, Conservation and British Imperialism* (Manchester and New York: Manchester University press, 1988), 67.

⁴⁶ *Catalogue explicatif... 1855*, 7.

⁴⁷ *Ibid.*, 6.

⁴⁸ Hardy, “Note sur l’incubation,” 306.

⁴⁹ L. Songy, “L’autruche. Son élevage en Algérie au point de vue commercial,” *La Nature* 1322 (1 October 1898): 273–75, on 273.

⁵⁰ Pascal Blanchard, Sandrine Lemaire, and Nicolas Bancel, eds. *Culture coloniale en France. De la Révolution à nos jours* (Paris: CNRS Éditions Autrement, 2006), 15.

⁵¹ Exposition universelle internationale de 1878 à Paris, *Catalogue officiel publié par le Commissariat générale* (Paris: Imprimerie nationale, 1878), volume 3, 264.



Figure 4: A view of the Permanent exhibition of Algerian products when it was relocated to the *Palais de l'Industrie* in 1868. Source: *Le Monde illustré* (19 September 1868), Bibliothèque nationale de France, gallica.fr.

Stunted Ostriches on Farms: Troubles with Domestication

Despite Hardy's promising experiments, ostrich breeding in Algeria turned out to be far more difficult than expected. This contrasted with the flourishing domestication of the ostrich in the British colony of Cape Town, South Africa, which since the 1860s multiplied the numbers of farm-raised ostriches. If the large African bird could be domesticated on a large scale, as the case of Cape Town demonstrated, why did the attempts in Algeria not succeed? French acclimatisers meticulously examined the causes of successive failures and their interpretations will help to answer this question. First, I briefly present several initiatives from the last third of the century. They met with different fortunes, and in most cases, a short life. Then, the problems these initiatives encountered are discussed. They never abandoned the desire to position France as a leader in the global feather market, and looking for the reasons for previous failures was a way to justify persevering.

The ostrich experiments at the Jardin d'essai du Hamma developed on a small scale. They were a feasibility study for those interested in pursuing this activity on a larger scale. A governmental initiative was attempted in 1868, as

Napoleon III founded a model ostrich farm in Boukandoura under Hardy's direction, but soon disappeared.⁵² Then the foundation of *parcs à autruches* in Algeria was left to private initiative, to which the Jardin contributed by providing knowledge, skills and specimens.⁵³ In the early 1870s Captain Créput created a farm in Misserghin.⁵⁴ It was the first to emulate Hamma's experiences, as in 1873 it tried to breed ostriches by natural incubation.⁵⁵ However, Créput's duties might have not allowed him to sufficiently supervise the entreprise because he sought the assistance of a feather merchant in Paris, Jules Forest (who we will mention later).⁵⁶ By 1884–1885, they were raising forty-five young ostriches and Créput believed that breeding could be successfully achieved at low cost.⁵⁷ At the same time, another farm was established by Ms. Carrière in Kouba, near Algiers, to which in 1876 the Jardin provided twenty-one (of thirty) specimens. It was said that the owner, a woman of English origins, had organised a fancy installation, more for curiosity than for production, "as [it] never produced anything."⁵⁸ In 1880 this farm was acquired by the explorer Louis Say, who planned to change its location, but it probably did not last long.⁵⁹ In 1878, a more ambitious initiative was endeavoured in Aïn Marmora by a group of Parisian feather businessmen.⁶⁰ By the names of Gouverneur, Brion, Laloue, Lebrun, Nebours, Duflot and Adolphe and Arsène Viol, they established an ostrich farm on an area of 200 hectares, on the outskirts of Algiers, near the mouth of the Mazafran river.⁶¹ In 1880 this farm had twenty ostriches, which had been sold by the Jardin.⁶² In this decade other farms were founded, one of them in Zéralda, by the

⁵² Auguste Ménégaux, *L'élevage de l'autruche, récolte et commerce des plumes* (Paris: Augustin Challamel, Éditeur, 1913), 113.

⁵³ L. Magaud d'Aubusson, "L'industrie de l'autruche," *Bulletin de la Société nationale d'acclimatation* 15 (1889): 1–9, on 6–7.

⁵⁴ Créput had previously attempted breeding in Zemmorah (Oran), but due to disagreement with the military administration, he resigned and established a new farm in Misserghin. Ménégaux, *L'élevage de l'autruche*, 116.

⁵⁵ Jules Oudot, *Le fermage d'autruches en Algérie, incubation artificielle* (Paris: Challamel aîné, Libraire-éditeur, 1880), 103.

⁵⁶ Ménégaux, *L'élevage de l'autruche*, 116.

⁵⁷ Créput, "Notes sur l'élevage de l'Autruche en Algérie," *Bulletin de la Société nationale d'acclimatation* (1886): 497–501, on 498.

⁵⁸ Oudot, *Le fermage d'autruches*, 103.

⁵⁹ *Ibid.*, 103.

⁶⁰ Aubusson, "L'industrie de l'autruche," 6–7.

⁶¹ Oudot, *Le fermage d'autruches*, 101.

⁶² *Ibid.*, 101.

aforementioned feather businessman Laloue. Another farm by Marchal was set up in Planteur, in the forest of Saint-Ferdinant, between Algiers and Sidi Fredj, which, between 1883 and 1885, managed to keep around thirty ostriches in perfect health.⁶³ In 1888, observers waxed poetic about the farm, but since no profits were made, the state administration expelled him, “the animals sold at a miserable price.”⁶⁴ By that time, the *parcs* contained 108 adult ostriches, while they would have been expected to number in thousands.⁶⁵ In 1889 only Aïn Marmora was still in full swing. Their products were exhibited in the Algerian pavilion at the 1889 *Exposition universelle* in Paris.⁶⁶ But this was to last only a few years.⁶⁷ Expensive and unsuccessful trials took their toll on their promoters, as they were aggravated by a severe crisis that affected feather trade,⁶⁸ leaving ostrich breeding in Algeria hanging by a thread. Yet new initiatives followed in the 1890s, such as the one by G. Rolland, director of the Agricultural and Industrial Society of Southern Algeria, who established three or four pairs on a farm intended for the cultivation of date palms, in El Ayata, 150 km south of Biskra, in the Oued Rir valley. But breeding did not prosper there;⁶⁹ or not so as to “constitute a core for ostrich farming (*noyau d’autrucherie*), the only means for repopulation.”⁷⁰ In 1891, Jules Forest, formerly in charge of the Misserghin farm,⁷¹ unsuccessfully requested from the military authority the concession of El Outaya communal land or *smala*, located between Batna and Biskra, to create a central ostrich farm for repopulating the northern edge of the

⁶³ A. Berthoule, “Fermes à autruches,” *Bulletin de la Société nationale d’acclimatation* (1886): 365–68, on 367.

⁶⁴ Ménégaux, *L’élevage de l’autruche*, 117.

⁶⁵ Édouard Lefevre, *Le commerce et l’industrie de la plume pour parure* (Paris, chez l’Auteur, 1914), 55.

⁶⁶ Aubusson, “L’industrie de l’autruche,” 6–7.

⁶⁷ In 1894 Forest stated that “farming has not been practiced there for several years.” Jules Forest, “L’autruche. Son importance économique depuis l’antiquité jusqu’au XIXe siècle. Son avenir en Algérie au point de vue français,” *Revue des sciences naturelles appliquées* 4 and 7 (1895): 1–31, on 24.

⁶⁸ Berthoule, “Fermes à autruches,” 366–67.

⁶⁹ Ménégaux, *L’élevage de l’autruche*, 117.

⁷⁰ Songy, “L’autruche. Son élevage,” 274.

⁷¹ Forest donated six ostrich skins to the Muséum national d’Histoire naturelle in 1889 (MNHN_ZO_MO_1889 467–72), from which three (468, 471 and 472) remain in the collection and may well constitute the only physical evidence of this history. I thank the museum curators for the information, which unfortunately is not currently available online.

Sahara.⁷² Now the idea was breeding ostriches in semi-liberty. In the early twentieth century, an experiment was carried out by the Algerian government in the Oran plateau, but it appears that the ostriches did not cooperate, as they destroyed their eggs and even their young.⁷³ The causes of these successive failures were studied and discussed by the promoters as soon as the problems arose. It never took long.

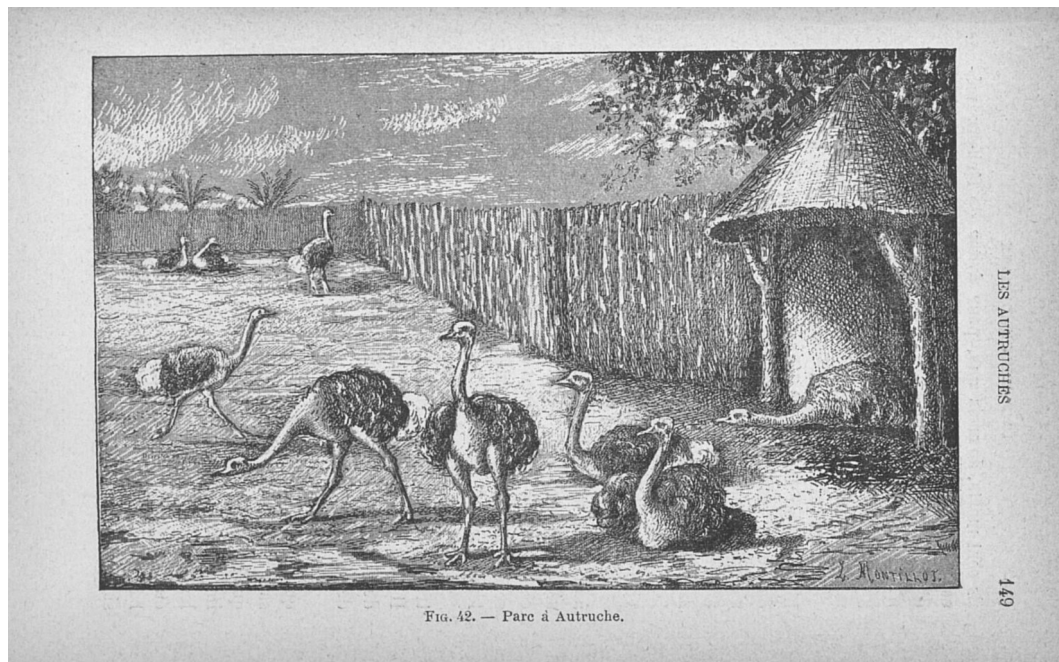


Figure 5: Illustration of an ostrich farm. Source: J. M. Lacroix-Danliard, *La plume des oiseaux. Histoire naturelle et industrie* (Paris: 1891), Bibliothèque nationale de France, gallica.fr.

A common threat in many *parcs à autruches* was illness among young ostriches. In Aïn Marmora and Zéralda young birds suffered from rickets and died from leg injuries. Those in charge of the farms put their efforts into studying the problem and they discussed their findings in the *Bulletin*. In 1885, Lucien Merlato, the manager of Aïn Marmora's farm, stated that the main pitfall was the breeding of young ostriches born viable. After a preliminary study, he realised that "there were two afflictions:"⁷⁴ the first appearing

⁷² Ménégau, *L'élevage de l'autruche*, 117.

⁷³ Lefevre, *Le commerce*, 56.

⁷⁴ Lucien Merlato, "M. Merlato écrit d'Aïn Marmora (Algérie), à la date du 4 décembre 1884," *Bulletin de la Société nationale d'acclimatation* (1885), 63–66, on 65.

during the first two months of life; the second one, from that moment to the sixth month. He introduced measures that seemed positive to prevent the first affliction, but, at that stage of research, he was not able to remedy the symptoms of the second one. He could just put six of the youngest ostriches on a diet, hoping that this would “bring the chicks to fruition.”⁷⁵ The same year, Laloue announced a first satisfactory result in the Zéralda farm, in terms of successful hatching: “two of our couples were incubating, one, twelve eggs; the other, fifteen. From these 27 eggs, 25 little ostriches hatched; one of them was crushed by the parents and the other 24 are all well.” Laloue was cautious about this success, because “we always fear losses that result from the climate, the soil or our inexperience” and rightly so, as he recalled, “last year we still lost all our young.”⁷⁶ Although being quite vigorous, “from the sixth month, our birds began to experience their usual illness, and they all, one after the other, broke their legs.”⁷⁷ Laloue sent the bones to Professor Le Valtat for analysis, who established a probable deficiency in limestone salts. Merlato and Laloue disagreed on the cause of rickets. Laloue considered that if a deficiency existed while he had supplemented the diet with calcium, “we must look elsewhere for the causes of our failure.” He was more inclined to think that nutrition and lack of space were the probable causes. Merlato had another opinion. He sustained that “the lack of great spaces has nothing to do with limestone problems; adults and chicks live very well in limited spaces.” He also dismissed that problems were due to the food or the temperature. For him, the only credible cause was “the constant state of humidity of the air in Algeria.”⁷⁸ On this point it is worth noting that the locations of most *parcs à autruches* were on the coast, a region alien to wild ostriches. This was not due to a lack of knowledge. As we have seen, French acclimatisers had gathered exhaustive information on the birds. Merlato supposed that “the error [...] was to consider it acclimatised,” while in fact “the ostrich in Algeria [...] is not entirely in its own environment.”⁷⁹ Créput added that it was a mis-

⁷⁵ Ibid., 65.

⁷⁶ A. Laloue, “Ferme d’autruches de Zéralda (Algérie),” *Bulletin de la Société nationale d’acclimatation* (1885): 665–67, on 665.

⁷⁷ Ibid., 665.

⁷⁸ Lucien Merlato, “Un mot sur l’élevage des autruchons en Algérie,” *Bulletin de la Société nationale d’acclimatation* (1887): 1–8, on 7.

⁷⁹ Merlato, “Merlato écrit,” 64.

take not to have “carried out the tests exclusively with the native ostrich.”⁸⁰ Two varieties were indeed used in the trials: the “Barbary breed, inhabiting southern Algeria [...] along with the Sudanese breed.”⁸¹ He considered that while the first one was fully acclimatised, “the Sudanese ostrich, [...] by moving it 5 to 6 degrees further north, we have subjected it to a genuine acclimatisation process.”⁸² However, as Merlato indicated, it is likely that not even the Algerian ostrich was properly in its own habitat. In any case, climate was not the only reason for choosing a location.



Figure 6: Location of ostrich farms on a map of Algeria by the mid-nineteenth century: 1) Jardin d'essai du Hamma; 2) Misserghin; 3) Kouba; 4) Aïn Marmora; 5) Zéralda; 6) Saint Ferdinand (Algiers-Sidi Fredj); 7) El Ayata (out of the map); 8) El Outaya and 9) Plateau d'Oran, probably Murdjadjo. Elaborated by the author. Source: *Algérie, colonie française*, Victor Levasseur (Paris: 1854), Bibliothèque nationale de France, gallica.fr.

Forest provides other motivations that influenced the choice. After studies that predicted the Saharan oases as the most favorable locations, he went to the field “in 1879 with the aim of creating an ostrich farm in Biskra,” but the project “was interrupted by the Aurès insurrection, which prevented me [...]

⁸⁰ Créput, “Notes sur l'élevage,” 497.

⁸¹ Songy, L. “L'autruche. Son élevage,” 274.

⁸² Créput, “Notes sur l'élevage,” 497.

from penetrating the South, and made me try the experience in Misserghin.”⁸³ For Forest, Misserghin was not a first-choice location. It was conditioned by the state of colonisation, in which local populations continued to resist French occupation. In fact, Biskra had been identified as a suitable location from the beginning. In 1856 General Eugène Daumas had recommended to Gosse the area around that city as the most appropriate for establishing ostrich farms. Daumas was director of Algerian affairs at the Ministry of War and like many other military men, member of the Société, highlighting how closely tied the acclimatisation programme and the politics of Algerian colonisation were.⁸⁴ But “the 1863 Senatus-Consulate prevented the appropriation of communal lands and [...] this is an obstacle for colonisation.”⁸⁵ In 1879, when Forest envisaged Biskra as the location to start an ostrich farm, following Daumas’s advice, most communal lands or *smalas* had already disappeared, being confiscated after insurrection. But, again, an insurrection scuppered the idea. The glimpses of land conflict show the common practice of dispossession of land, labor and life by colonialism, in which livestock is often involved.⁸⁶ They also evidence that the French colonisation of Algeria had not been completed, as it was often officially presented, but it progressed through struggle in many regions. In fact, we may consider that local resistance conditioned in part the geography of ostrich acclimatisation, driving farms to concentrate on the coast, where there was more security, but also the humidity that harmed ostriches. Comfort and easier communication and logistics with the metropolis were other aspects that led French colonists to prefer coastal placements. Yet the ostriches were ignorant of material and political reasons and, probably just felt the climate in their bodies and the limited freedom of movement the enclosures offered to them.

The design of spaces and the technological equipment were other aspects analysed in addressing the failures. Forest thought that the reduced space was among the main causes: “Ostriches love solitude and wide-open spaces [...] it is essential to have huge tracts of land [...] to breed these birds; [...] the

⁸³ Forest, “L’austruche,” 25.

⁸⁴ Osborne, “Acclimatizing the World,” 144.

⁸⁵ Forest, “L’austruche,” 25.

⁸⁶ Marcy Norton, *The Tame and the Wild. People and Animals after 1492* (Cambridge-London: Harvard University Press, 2024), 102–104.

reason for the success of settlements founded in the Cape.”⁸⁷ Créput was even convinced that lack of space was the cause of rickets: “ostriches in the wild are forced to exert constant activity in search of food.”⁸⁸ Likewise, Marchal stated that “raising ostriches requires space – plenty of space – without which it is impossible to succeed.”⁸⁹ Not all the authors agreed with this view. We have already seen Merlato saying that ostriches lived well in limited spaces. Jules Oudot opined the same: “Most English farmers in the Cape claim that the success of ostrich farming [...] depends on the more or less considerable space allocated to them.”⁹⁰ There the area per ostrich ranged between one and five hectares. In Algeria, the system was completely different: “it consists of keeping the ostriches in pairs in a relatively narrow enclosure covering an area of 500 to 1000 square metres at most, with 10 to 20 pairs per enclosure.”⁹¹ For Oudot the use of vast extensions for keeping ostriches in semi-liberty was a great mistake. He considered that the Algerian system was “unquestionably superior to that of the Cape” because it was the most rational and the best aligned with domestication: “the ostrich by nature is apt for domestication, like poultry” and in a “narrow captivity” more regular egg-laying was expected, and “feather products will be more considerable and of greater value.”⁹² Keeping ostriches in small spaces was not a lesser evil, but the most rational option. Laloue followed this approach, although in some instances he sought to expand the spaces to “almost one hectare.”⁹³ However, the benefits of this system did not come and the subsequent promoters proposed new approaches. Forest envisaged not just using larger enclosures, but “the reconstitution of the Ostrich in southern Algeria,” in the thousands of unproductive hectares of that region.⁹⁴ This view was widely held at the turn of the century: “Ostriches must be introduced into their natural habitat, or we should not attempt it at all.”⁹⁵ By that time those lands were regarded with greater interest because of “the security currently en-

⁸⁷ Forest, “L’autruche,” 24.

⁸⁸ Space allocated to ostriches was discussed on 2 April 1886. *Bulletin de la Société nationale d’acclimatation* (1886): 280–82.

⁸⁹ Berthoule, “Fermes à autruches,” 367.

⁹⁰ Oudot, *Le fermage d’autruches*, 105.

⁹¹ *Ibid.*, 106.

⁹² *Ibid.*, 106–108.

⁹³ *Ibid.*, 280–81.

⁹⁴ Forest, “L’autruche,” 27.

⁹⁵ Songy, “L’autruche. Son élevage,” 274.

joyed in the Algerian Sahara; transport risks being reduced to the usual risks of shipping live animals by rail.”⁹⁶ Colonisation and acclimatisation merged in Forest’s plan: “the conquest of Insalah will allow the creation of ostrich farms that will form a connecting line between French northern Africa and Sudan.”⁹⁷ This is the most explicit example of acclimatisation in the service of colonisation, seeking a total control of the ostrich feather trade. However, the fact that the military and administrative agents did not support it may be an indication that the fruitful links between colonisation and acclimatisation were not evident to everyone.

To be a feather producer did not just require that ostriches be able to reproduce, but that they reproduce a lot. This need had to be met through technology. In many British accounts, the technological aspect was presented as a key to success, specially thanks to the ostrich egg incubator, which ensured a controlled reproduction of birds. Apparently, the first hatching at Beaufort and Onedsboud in Cape Town draw inspiration from the French methods.⁹⁸ In 1867 the French consul in the colony, Heritte, explained that “the few people in the Cape who are involved in ostrich breeding” were, like the French, novices still at the stage of trials.⁹⁹ In 1873, however, they succeeded in incubating ostrich eggs artificially.¹⁰⁰ The incubator, built by W. M. Thick from London and then perfected by A. Douglas, was exhibited at the World’s Fair in Philadelphia in 1876.¹⁰¹ In a few years the ostrich populations grew amazingly, as the 80 ostriches that Cape Town had in 1865 multiplied to around 50,000 in 1880. Feather exports grew accordingly, rising from £300,000 in 1875 to £1,000,000 (25,000,000 francs) in 1880.¹⁰² By 1888, a census counted 152,445 individuals.¹⁰³ And export figures remained high: “between 1879 and 1889, the Cape Colony exported one million kilograms of feathers, worth nearly 200 million francs, or 20 million a year!”¹⁰⁴ Despite the volume of

⁹⁶ Forest, “L’autruche,” 26.

⁹⁷ Ibid., 30.

⁹⁸ Lefevre, *Le commerce*, 55.

⁹⁹ Heritte, “Etude sur la domestication des autruches du Cap,” *Bulletin de la Société impériale zoologique d’acclimatation* 4 (1867): 122–24, 319–22, on 319–20.

¹⁰⁰ Oudot, *Le fermage d’autruches*, 182.

¹⁰¹ Ibid., 184.

¹⁰² Berthoule, “Fermes à autruches,” 366.

¹⁰³ Forest, “L’autruche,” 25.

¹⁰⁴ Songy, “L’autruche. Son élevage,” 274.

trade, feathers from the Cape were considered to be of inferior quality and this made French acclimatisers “to regret all the more that our colony ranks last in terms of production.”¹⁰⁵ By importing Barbary ostriches, farmers of the Cape had attempted to obtain a superior breed, but no crossbreeding succeeded in improving plumage imperfection.¹⁰⁶ A mongrel breed delivered quantity but not quality. This was the basis of the French hope “of one day regaining the monopoly we have lost;”¹⁰⁷ as if Algeria succeeded in artificial incubation, they believed they would be unquestionably superior, as they would add the quantity to the quality.

Artificial incubation was attempted in Algeria in many of the existing *parcs à autruches*, like in the “Jardin d’essai in Algiers; Créput, in the province of Oran; Mrs Viol, Gouverneur et Cie, at Aïn Marmora [...]; and Mme Carrière, at Kouba; but all these experiments [...] have so far produced no results.”¹⁰⁸ According to Oudot, the failure was due to imperfect equipment in some cases and lack of technical knowledge in others.¹⁰⁹ This was soon to change thanks to “the device I’ve invented,” stated Oudot optimistically.¹¹⁰ Based on Douglas model, he designed a new machine in 1869, which was marked by “the ease of construction, the low cost of installation and the simplicity and ease of operation.”¹¹¹ In 1879 Oudot patented an improved version of this incubator, with a capacity for twenty ostrich eggs and two hundred poultry eggs. Oudot thought that artificial incubation opened a new stage in ostrich farming in Algeria and that the government and the colonists had the responsibility of giving “this new and impressive exploitation a big boost.”¹¹² The optimistic statement on the expected results can be read partly as promotional. Yet it appears that having the right technology was a necessary but not sufficient reason for success. At least, it was not able to overcome the many difficulties found by those who undertook ostrich farming, one of which was precisely their lack of experience. Laloue mentioned in 1885 his inexperience among the plausible causes contributing to his failure. Chagot’s

¹⁰⁵ Aubusson, “L’industrie de l’autruche,” 9.

¹⁰⁶ Forest, “L’autruche,” 23.

¹⁰⁷ Songy, “L’autruche. Son élevage”, 273.

¹⁰⁸ Oudot, *Le fermage d’autruches*, 171.

¹⁰⁹ *Ibid.*, 171.

¹¹⁰ *Ibid.*, 172.

¹¹¹ *Ibid.*, 172.

¹¹² *Ibid.*, 181.

APPAREIL INCUBATEUR POUR ŒUFS D'AUTRUCHES
ET AUTRES ŒUFS D'OISEAUX DE BASSE-COUR

(Déposé à Alger, le 9 juin 1869.)

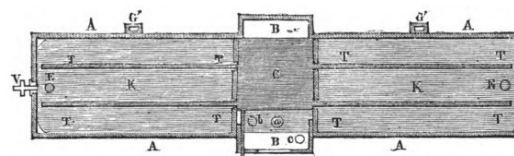


FIG. 1.

Plan horizontal de l'Incubateur.

A. Coffres de l'appareil. — B. Boîte à fumée. — C. Chambre à air sec. — K. Cuve. — T. Conduits de l'air sec. — E. Échappement de vapeur. — V. Robinet de vidange. — a. Introduction de l'eau. — b. Refoulement de l'eau et de la vapeur. — c. Niveau d'eau. — d. Introduction de l'air froid dans la chambre à air sec.

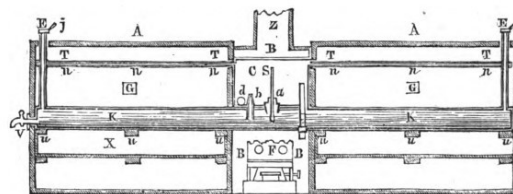


FIG. 2.

Coupe longitudinale de l'appareil incubateur.

A. Coffres de l'appareil. — B. Boîte à fumée. — C. Chambre à air sec. — K. Cuve. — T. Conduits de l'air sec dans l'intérieur de l'appareil. — E. Échappement de vapeur. — V. Robinet de vidange. — a. Introduction de l'eau dans la cuve. — b. Refoulement de l'eau et de la vapeur. — c. Niveau d'eau. — d. Introduction de l'air froid dans la chambre à air sec. — F. Foyer. — G. Échappement modérateur de l'air chaud et purgureur. — H. Échappement de l'air sec au-dessus des œufs. — I. Thermomètre plongeur. — Z. Cheminée d'appel de fumée. — J. Valve de l'échappement de vapeur. — u, u. Tasseaux de soutien de la cuve. — X. Tiroirs pour œufs d'oiseaux de basse-cour.

Figure 7: Ostrich egg incubator designed in 1869 by Jules Oudot. Source: Jules Oudot, *Le fermage d'autruches en Algérie, incubation artificielle* (Paris: 1880).

decision to fund the award for the breeding of ostriches may be the result of an awareness of the need to improve methods and skills, as he had previously attempted his own trials and maintained ostrich farms in Laghouat and in Saint-Louis in Senegal.¹¹³ In fact, most owners of the *parcs à autruches* were, as seen, Parisian feather businessmen who engaged in ostrich farming. This is a significant feature of the French case; in England, breeders had been predominantly farmers since the outset, as only gentlemen animal breeders sup-

¹¹³ Ménégaux, *L'élevage de l'autruche*, 80; Lefevre, *Le commerce*, 54.

ported agricultural experimentation.¹¹⁴ Men such as Chagot, Laloue and Forest were surely the most interested in obtaining the plumes in more favourable conditions. But given the economic importance of the feather industry in France, it is not clear why the government did not energetically sustain acclimatisation as a strategy to secure the raw materials for such a national lucrative activity. Being associated with colonial politics of the Second Empire, the Société lost its reputation in the time of the Third Republic. Moreover, by the end of the century, “heredity” rather than “adaptation” became the central scientific problem and it is likely that acclimatisation appeared in scientific circles a bit outdated.¹¹⁵ However, in 1913, Auguste Ménégaux, from the Muséum national d’Histoire naturelle, still regretted that “the largest ostrich feather house in Paris buys them [the feathers] every year from the Cape for more than 8 million francs.”¹¹⁶ He considered that while private initiative required support, “we must not forget that only the government has sufficient means to carry out long-term tests.”¹¹⁷ It was only during the Second Empire of Napoleon III that the domestication of the ostrich received explicit governmental support. After the promising results obtained at the Jardin d’essai, most efforts were left to private initiative, which lacked the expertise in managing this kind of business, which included the skills for keeping live animals, for manipulating technological equipment, etc. The Algerian case has helped to highlight the many aspects that influenced the outcome of ostrich domestication, which in the Cape may have been overshadowed by spectacular results.

Final Remarks: Domesticating Ostriches and the Nature of Colonialism

In 1913, the naturalist Auguste Ménégaux said that the domestication of the ostrich in South Africa was “the most marvellous instrument of colonisation one could dream of, since in fifty years it has brought more than 900 million francs to the Cape Colony.”¹¹⁸ The domestication not only reported high eco-

¹¹⁴ Anderson, “Climates of Opinion,” 147.

¹¹⁵ Ibid., 152.

¹¹⁶ Ménégaux, *L’élevage de l’autruche*, 80.

¹¹⁷ Ibid., 80.

¹¹⁸ Ibid., 5.

conomic profits “without experiencing overproduction,”¹¹⁹ but “saved the ostrich from complete disappearance.”¹²⁰ The British case bitterly exemplified what the French acclimatisers had wished for France since the late 1850s. And Ménégau still advocated for a new attempt that would definitely “provide the government with a means of colonising and making productive the vast semi-desert steppes south of the Atlas, while freeing French trade from the enormous contribution paid each year abroad.”¹²¹ This claim was probably the last one, as in a few months a huge financial crisis would end the golden age of the feather trade.¹²² Two aspects stand out in considering the ostrich domestication a “marvellous instrument of colonisation:” first, it resulted in a lucrative business; second, it saved the bird from extinction. Both were supposed to be clear signs of the beneficial impact of the colonial mission. However, after close examination, incongruousness in legitimising discourse emerge.

Comparing the maps of ostrich range in Africa in 1914 (figure 2) and today, one finds out that in the north wild ostriches reduced their range and have not recovered it since.¹²³ One might wonder whether, had domestication been successful there, the species would have retained a wider distribution area. During the period under study, the argument that, in northern Africa, wild ostrich suffered from excessive hunting gained acceptance: “as the people engaged in this hunt were all nomadic, they could never have thought of breeding the ostrich and, consequently, the disappearance of this bird was only a matter of time.”¹²⁴ Domesticating ostriches avoided the need to kill birds and in this respect the proponents presented it as a more respectful means of obtaining feathers, and thus more civilised.¹²⁵ Therein lay the legitimising force of the project: the assumption that domesticating animals was an advanced stage of civilisation. It was inherited from the Enlightenment tradition, which interpreted human progress based on a historical account of

¹¹⁹ Ibid., 5.

¹²⁰ Ibid., 7.

¹²¹ Ménégau, *L'élevage de l'autruche*, 121.

¹²² Stein, “Falling into Feathers,” 807.

¹²³ A map showing the current distribution of the ostrich is available on BirdLife DataZone: <https://datazone.birdlife.org/species/factsheet/common-ostrich-struthio-camelus> (June 2, 2026).

¹²⁴ Lefevre, *Le commerce*, 39.

¹²⁵ On the debate regarding whether plucking caused pain to ostriches, see: Cowie, *Victims of the fashion*, 40–42.

its material conditions, including animal exploits.¹²⁶ A society that domesticated animals was considered more civilised, in the same way as domesticated animals were considered more civilised than the wild ones.¹²⁷ Isidore Geoffroy Saint-Hilaire was influenced by Buffon: both agreed that humans had the right to subjugate animals. However, the latter thought that this right turned domestic animals into slaves; whereas the former saw subjugation as a desired condition for the animals, which were conceived of as partners.¹²⁸ Domestication was also desirable for human societies that did not practise it. This led them along the path of civilisation. The acclimatisation movement aspired to implement these ideas to their full extent. But this ideology legitimising colonialism had of course many contradictions.

The argument that nomadic peoples were less civilised than the Europeans because they hunted ostriches (they could not even think about breeding them) and, moreover, they did so with such an intensity that they brought the bird to the brink of extinction is fallacious in many respects. Firstly, local hunters no longer hunted to survive, but were responding to the demands of trade, which came mainly from Europe, with France at the forefront.¹²⁹ This would make them at least equally responsible for the bird's disappearance. In fact, local people had hunted ostriches for centuries, without seemingly any significant impact on ostrich populations. Secondly, among local communities there were hunters, traders, labourers of feathers and skins, etc., that is, a multiplicity of groups, not only hunters, that took part in the feather trade over the route from inland to coastal areas. French acclimatisers relied on this diversity of knowledges to put into practice their programme: hunters provided information on the habits of wild ostriches and other groups gave examples of breeding them in captivity and the products they obtained. By contrast, the French colonists hunted ostriches for sport in a non-negligible way: it was reported that "General Margueritte, in eight races, in his first

¹²⁶ Nathaniel Wolloch, *The Enlightenment's Animals. Changing conceptions of Animals in the Long Eighteenth Century* (Amsterdam: Amsterdam University Press, 2019), 16. The idea can be traced back even further to the early modern period, as Europeans invaded the Americas. Norton, *The Tame and the Wild*, 9.

¹²⁷ On the link between colonised humans and animals as "uncivilised," see: Erica Fudge, *Brutal Reasoning. Animals, Rationality and Humanity in Early Modern England* (Ithaca-London: Cornell University Press, 2006), 50–52.

¹²⁸ Blanckaert, "Les animaux 'utiles'," 357–59.

¹²⁹ Mackenzie, *The Empire of Nature*, 100–101.

year of hunting, destroyed 72 ostriches [...] this active pursuit continued for seven years, from 1850 to 1858.”¹³⁰ The fact that these practices were neither questioned nor considered a blatant contradiction with the civilising process makes clear the double standard that governed the discourse. It was typical of European modernity to consider hunting for necessity a feature of “less civilised” societies or social groups, while hunting for sport was a distinctive mark of the upper classes of modern nations, the “civilised ones.” But perhaps it is more important to note that the retreat of the ostrich into the Sahara occurred with French colonisation: “before the conquest of Algeria, the oases not far from the Tell [the coast] were home to numerous herds of ostriches.”¹³¹ Indeed, in 1855 encountering herds of hundreds of ostriches was still quite common, but the situation was already changing: “the existence of this magnificent species was seriously threatened by 1858” as “they had almost disappeared from the colonised regions or hunting grounds.”¹³² The expressions “before the conquest” or “in the colonised regions” were used in a descriptive way and this makes them more revealing of the likely impact of colonialism in the decline of ostrich populations. A similar process occurred in South Africa where the wild ostrich frontier retreated into the continent while the tame ostrich located in the settled areas.¹³³ In 1870, when ostrich breeding was starting in the Cape Town, the government passed a rule to abolish the hunting of ostriches.¹³⁴ Both measures were a response to the realisation that wild sources began to be exhausted (both the responses and the cause were colonial in nature), and it was probably their joint action that preserved ostriches in the wild; at least to a greater extent than in Algeria, where an international law was not passed until the turn of the century and large-scale domestication did not materialise, so ostriches only found refuge in the southern solitudes.¹³⁵ The unsuccessful attempts to domesticate them seem to prove that ostriches did not really *appreciate* the conditions that were offered to them, probably because these did not suit their physiological needs. This was in part due to local resistance, because it conditioned the

¹³⁰ Ménégaux, *L'élevage de l'autruche*, 79.

¹³¹ *Ibid.*, 79.

¹³² *Ibid.*, 79–80.

¹³³ Mackenzie, *The Empire of Nature*, 89–90.

¹³⁴ Ménégaux, *L'élevage de l'autruche*, 82.

¹³⁵ *Ibid.*, 79.

geography of ostrich farms, driving them to locate on the coast, where climate proved fatal. In this regard, the acclimatisation agenda not only shaped, but was shaped by the lands, peoples and animals it sought to domesticate, civilise and colonise. The fact that colonised peoples and animals contributed in a way to the *failure* to make ostrich domestication into a profitable business evidences that the beneficial effects of colonisation were actually challenged. Nevertheless, if the initiative did not succeed, it was also due to reasons contingent to French science and colonialism, as the scientific, technical, economic and colonialist interests that motivated it were often not aligned in practice. Despite the considerable obstacles that demonstrated its limitations as a “marvellous instrument of colonisation,” the acclimatisation of the ostrich in Algeria always retained its strength, which was precisely the conviction in that promise.

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