On Antoine Risso and his Histoire Naturelle des Principales Productions de l'Europe Méridionale et Particulièrement Celles des Environs de Nice Des Alpes Maritimes

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ABSTRACT. Antoine Risso (1777-1844) was a native and lifelong resident of Nice (France). He was a pharmacist by training and occupation, but became one of the foremost naturalists of his time. Risso published extensively on the flora, and particularly the marine fauna, of his native region. His 'magnum opus' is an 1826 five volume work on the natural history of Nice and its region, treating geology, botany and zoology: *Histoire Naturelle des Principales Productions de l'Europe Méridionale et Particulièrement de Celles des Environs de Nice et des Alpes Maritimes*. The volumes included beautiful color plates, nearly all the work of Jean Gabriel Prêtre, one of the most reputable naturalist-painters of the first half of the 19th century. Risso's *Histoire Naturelle* was greeted with considerable criticism when it appeared. However, today it can be said that it has passed the test of time. Of works published in 1826, Risso's *Histoire Naturelle* appears among the top five in terms of total number of citations in academic journals, along with the classic works by D'Orbigny on cepalopods and Malthus on population growth. Nonetheless, Risso's major work is unknown to most of us other than perhaps fish taxonomists, and specialists in scientific illustration. Here an attempt is made to introduce to a broad audience Antoine Risso's interesting life and his major work, as well as the work of Jean Gabriel Prêtre.

KEYWORDS. History of ichthyology, History of natural history, Scientific illustration, Scientific tourism

Introduction

Antoine Risso (1777-1844) is a celebrated figure in his native Nice. He has a school and a boulevard named for him. He is acknowledged as the pioneering naturalist who first brought attention to the diverse marine fauna of the "Sea of Nice". Risso is also recognized for his practical work as a botanist as he was responsible for the re-planting of the city's Castle Hill when the once derelict site was made into the premiere city park of Nice (Pace 2018), and for publishing works on the citrus trees of the region. Outside of his native city, Risso is likely known only in a few specialized fields. Among antiquarians, a copy of one of his books on citrus trees, *Histoire Naturelle des Orangers* (Risso & Poiteau 1818-1820), co-authored and illustrated by Antoine Poiteau, is today valued at over €25,000. Among specialists of crustaceans and fish, Risso is known for his *Ichthyologie de Nice* (Risso 1810), *Histoire Naturelle des Crustacées des Environs de Nice* (Risso 1816), and especially his multivolume *Histoire Naturelle des Principales Productions de l'Europe Méridionale et Particulièrement de Celles des Environs de Nice et des Alpes* Maritimes (Risso 1826). This latter work (from hereon simply *Histoire Naturelle*) can be considered a gem, hidden to most of us, and is the focus of this essay.

Admittedly, Risso's *Histoire Naturelle* is not light reading. It is rather an ambitious reference work, composed of 5 volumes totaling over 2200 pages. The first volume is mainly on the geology of the region of Nice, the second on the plants, both native and cultivated, the third mostly concerns fish and, the fourth the mollusks and worms, and the fifth and final volume deals with various invertebrates: crustaceans, spiders, insects, echinoderms, etc. *Histoire Naturelle* was published in two different versions: one priced at 67 Francs, printed on ordinary paper with figures in black and white, and a deluxe version on velum paper with color plates, priced at 135 Francs (Quérard 1859-1864). Here the version considered is the version with color plates as all but two were the work of Jean Gabriel Prêtre, a "painter naturalist" of considerable renown in his time.

The five volume treatise, considered as a single work, actually ranks among the five most cited works published in 1826. In descending order (according to Web of Science data), these are: Von Thunen's study on the role of the state in agricultural economies (Von Thunen 1826), D'Orbigny's treatise on cephalopods (D'Orbigny 1826), Risso's *Histoire Naturelle* (Risso 1826), Godfuss's volume on fossils (Goldfuss 1826), and the sixth edition of Malthaus's famous essay on population growth (Malthaus 1826). It should be noted that Web of Science data concern only citations in academic journals; books, magazine articles, etc., are not tabulated, explaining in large part why Malthus's essay is in fifth place rather than first. The *Histoire Naturelle* of Risso has been cited through the years mostly as records of species occurrences. However, it is much, much, more than a

catalogue of species and their descriptions. He also describes agriculture, fishing and collecting methods, habits, edibility, and occasionally even manners of cooking of the organism. His texts, along with Prêtre's illustrations provide a charming glimpse into life, science, and art of 19th century natural history.

Here first will be presented a biographical sketch of Antoine Risso, to place him and his work in context. This will be followed by a review of what little is known about the illustrator Jean Gabriel Prête, with some examples of his work that preceded his contribution to Risso's treatise. Then I will describe Risso's *Histoire Naturelle* including its unusual aspects, the reception it received in Risso's time, and provide examples of Prête's artwork that formed an integral and likely the most attractive part of the work. The account of Risso's life is based on the biographies (occasionally conflicting) of Toselli (1860), Quérard (1859-1864), Vayrolati (1911), and Gasiglia (1970). Sadly, little information is available concerning the life and career of Prêtre other than a brief entry in the *Dictionnaire des Artistes* of Gabet (1834) and occasional mentions in the text of the works he illustrated.

Antoine Risso, the Premier Naturalist of Nice

Antoine Risso was born April 9th 1777 into a modest family. At age 11, he and his 4 siblings were orphaned and taken in by his maternal uncle. At age 12 Risso was apprenticed to an established pharmacist and botanist, Augustin Balmossiere-Chartroux. In 1802, Risso received his training certificate as a pharmacist and opened his own pharmacy in 1803, at 26 years of age. That same year he was named as assistant curator of the Departmental Botanical Garden, under his pharmacist mentor, Balmossiere-Chartroux. Risso soon became known as the pharmacist-botanist, expert in plants, friendly and helpful to visiting foreigners such as English women wintering in Nice who sought advice as to plant identification and collecting (Carlotti-Davier 2017). Risso's interests went beyond botany that commonly occupied pharmacists of his time, and his main focus became marine fauna. It is unclear when he started his investigations of fish, crustaceans, and mollusks. However, by 1809 when François Péron and Charles-Alexander Lesueur (renown explorers of Australia), visited Nice, Risso was already known as the local expert on marine life. Risso introduced them to the local fisherman and showed them the value of examining the baskets of the fisherman to obtain interesting specimens (Walton 2018). He also worked with them when they measured temperatures of seawater from various depths (Risso 1826, vol. 1) and collected planktonic organisms (Risso 1826, vol. 4).

Risso's first publication appeared in 1810, shortly after the visit of Péron and Lesueur. It was entitled "*Ichthyologie de Nice ou Histoire Naturelle des Poisson du Departement des Alpes Maritimes*", a major work of 388 pages with 11 plates.

George Cuvier is said to have declared it to be the most important work on the fish of the Mediterranean Sea since the 1558 appearance of Salviani's landmark monograph (Gudger 1934). It was likely Risso's book that earned him the honor of becoming a Corresponding Member of the *Société Philomatique de Paris*, considered as the 'waiting room' for entry into the *Académie des Sciences* (Chappey 2009). Risso's first book also showed that he had apparently become a close friend of Lesueur. The last plate was part of an addendum that contained the text description and illustration of a species Risso named for Lesueur, *Gobius suerii* (Fig. 1). Lesueur returned the honor, naming a new species of fish for Risso in 1812, *Callionymus risso* (Lesueur 1814). Not long after, in 1813, Risso visited Paris for the first time, making direct contact with the naturalists of the *Muséum Nationale de Histoire Naturelle*, all well known to Lesueur, and he also introduced Risso to opera. They would correspond throughout the many years that Lesueur spent in the United States (see Dolan 2020) and through Lesueur, Risso would be one of the first foreign members of the Philadelphia Academy of Natural Sciences. In 1815, Georges Cuvier sent his assistant Charles-Léopold Laurillard to Risso to learn from him and collect specimens for the Paris *Muséum National d'Histoire Naturelle* (Bauchot et al. 1990). Risso continued to aid and befriend naturalists visiting Nice through the years, for example, the geologist Thomas Allen (Allen 1818), and the biologist William Leach (Leach 1825). Risso was then one of the first stops for scientific tourists visiting the area, often serving as a guide to the back-country of Nice (Barale 2020).

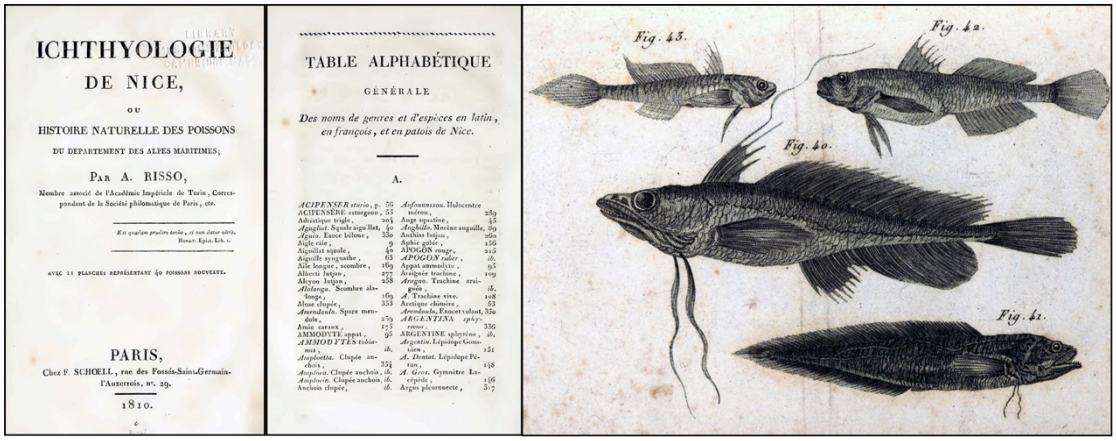


Figure 1. The title page of Risso's 1810 book on the fish of Nice (left panel), the index of the fishes described by binomial Latin name, name in French, and name in the *Niçois* (center panel), and the last plate of the book (right panel), showing the species that Risso named for Lesueur, *Gobius suerii* now known as *Lesueurigobius suerii*, as fig. 43, in the top left corner.

Risso's two 1813 publications provide clear evidence that his interests ranged widely as one concerned the geology of the peninsula of Cap Ferrat and the other the natural history of citrus trees. In his study of Cap Ferrat geological deposits, Risso documented the occurrence of the remains of marine invertebrates far

above the present altitude of the sea, leading him to conclude that major changes in sea level had occurred in the Mediterranean Sea (Risso 1813a). The other work, his first monograph on citrus trees (Risso 1813b), concerned the various types and varieties grown in the region of Nice, their origins, descriptions, uses, and diseases. It was a relatively modest monograph of 74 pages of text and two black and white plates. Risso as a pharmacist, and charged with the departmental botanical garden, could be expected to have a considerable expertise in botany. However, geology and natural history of the fauna of the region were outside of his professional knowledge and experience.

Risso returned to studies of marine fauna with his 1816 book on the crustaceans of the region of Nice: "*Histoire Naturelle des Crustacés des Environs de Nice*". It was a substantial work of 175 pages but sparsely illustrated with only 3 plates of line drawings. The major value of the work was the details given with regard to each species: habitats in terms of substrates and depths where it lived, the period when females are found with eggs; odd remarks such as that fisherman are convinced that the more flesh is found inside the shell when fished during a full moon, commonly eaten fried, etc. Such details were remarked upon in a review of the book (Audoin 1823). Risso soon returned to citrus trees with a very large work of 280 pages of text and 109 color plates. Titled simply "*Histoire Naturelle des Orangers*", it was authored by Risso and Antoine Poiteau, a botanist and talented painter who had worked at the *Muséum Nationale d'Histoire Naturelle*; Poiteau did the plates. Published in installments between 1818 and 1820 (Risso & Poiteau 1818-1820), the work is now a very high-priced, sought-after, collector's item. Between 1818 and 1825, Risso published articles on gastropod mollusks (Risso 1818), fish (Risso 1820a,b,c; Risso 1825) and geology (Risso 1824). And it was in 1825, at age 48, that Risso sold his pharmacy to his former pharmacy student to become a full-time naturalist. Risso's main work, the five volume *Histoire Naturelle* appeared in 1826.

In the years following the appearance of his *Histoire Naturelle*, Risso continued to publish on a variety of topics. He wrote on 'new crustaceans' (Risso 1827), 'new mollusks' (Risso 1831). In 1832 Risso was charged with landscaping the Castle Hill of the city of Nice. It was to become the Castle Park, a work designed to be a considerable asset to tourism (Pace 2018). Risso later returned to his natural history work, describing new species of fish (Risso 1840a,b). Risso's last publications appeared in 1844, the year of his death. One was a guide to Nice for foreign visitors, especially naturalists as it included a listing of the flora and fauna (Risso 1844a), and the other was large work of 586 pages and 24 black and white plates, "*Flore de Nice des Principales Plantes Exotiques Naturalisées dans ses Environs*" (Risso 1844b). At the end of the book appeared a page filled with a long list of works in progress or proposed. Risso clearly had plans for the future

when he died on August 27th rather suddenly of an unknown illness. He is buried the cemetery of the Castle Hill, the site he landscaped years earlier.

Jean Gabriel Prêtre the Artist of Risso's *Histoire Naturelle*

Little information on the life of Jean Gabriel Prêtre is available. He was born in Geneva (Switzerland) in 1778, eleven years before Risso. The earliest work I found containing a mention of Prêtre is in Palisot-Beauvois's 1804 botanical monograph "*Flore d'Oware et de Benin, en Afrique*" (Palisot-Beauvois 1804). In the preface, it is stated that M. Mirabel, and Sophie Luigné, were responsible for the illustrations. However, in the corrections to the first volume appears "*after the last words of the preface, add - M. Prêtre, talented artist, and having become today among the best, has succeeded M. Mirbel and Miss Luigné; he alone is in charge of the illustrations*. (my translation)" Thus, by 1804 at age 26, Prêtre was already acknowledged as a talented illustrator. Although apparently unplanned, he was the major artist of the work, signing 35 of the 59 plates. The last plate is rightfully considered remarkable (see fig. 2) and was reproduced in Lack's "*A Garden of Eden: Masterpieces of Botanical Illustration*" (Lack 2001).

Figure 2. Examples of Prêtre's early works. The left panel is from Palisot-Beauvois's 1804 botanical monograph "*Flore d'Oware et de Benin, en Afrique*". It is featured in Lack's 2001 "*A Garden of Eden: Masterpieces of Botanical Illustration*". The right panel is an illustration from Viellot's 1805 volume on songbirds. Prêtre would go to be a prolific illustrator of birds.

The second mention I found of Prêtre is by Vieillot in the preface to his 1805 monograph on songbirds of the tropics stating that Prêtre, one of the most talented naturalist painters, had been charged with the color illustrations (Vieillot 1805). The illustrations, numbering 72, are striking (see fig. 2). The 1805 plates appear to be the first of many illustrations of birds by Prêtre who today is considered as one of the most important illustrators of birds (Roncil 1957).

The next mention found of Prêtre is in a prospectus by George Cuvier (1816) for his *Dictionnaire des Sciences Naturelles*, stating that plates for the Parisian Flora will be done by Turpin and by Prêtre *'dessinateur de zoologie'* (zoological illustrator). In reality, Prêtre would be responsible, not for the Parisian Flora, but for hundreds of plates depicting a wide range of animals in the volumes of illustrations published between 1816 and 1830. For La Cépède's 1819 "*Histoire Naturelle des Quadrupèdes-ovipares*" which was largely on fish, Prêtre did 115 plates. Prêtre, the illustrator, was next mentioned in an 1820 prospectus for another large multi-volume work reference work "*Faune Française*" (Anon. 1820). It was published in installments from 1821 to 1828. Prêtre illustrated invertebrates, reptiles, birds, fish and crustaceans in 220 plates of the *Faune Française*.

The Prêtre plates of the *Faune Française* are of special interest here for two reasons. First, because nine of the plates were signed by Prêtre as "*ad. nat. viv*." indicating that a live organism was the model for the illustration (Stijnman 2012). Of all of Prêtre's work I examined, these plates are the only one I found so noted. Furthermore, they were of marine invertebrates and fish, in principle, live specimens would be unavailable to a Paris-based illustrator. Unfortunately, the identity of the organisms gives little indication of a collection sight where Prêtre might have seen them as they are all are found on both the Atlantic and Mediterranean coasts of France.

The second reason that the Prêtre plates of the *Faune Française* are of special interest is that some were cited by Risso in his *Histoire Naturelle* indicating that Risso owned or had had access to copies of the *Faune Française* and therefore knew of Prêtre's work. It is tempting to speculate that Risso and Prêtre knew each other from Risso's visit to Paris in 1813. However, the only document linking the two in any fashion is the 1822 list of members of the *Société Linnéenne de Paris* (Anon. 1822). It lists Prêtre as among "*Membres Auditeurs*" (auditor member) with the entry reading "*Prêtre (Jean Gabriel), dessinateur et peintre d'histoire naturelle*" (natural history illustrator and painter) and Risso among "*Correspondans Etrangers*" (corresponding members) with the entry under *Piémont* reading "*Risso (Antoine) naturaliste à Nice*". Even if they knew one

another, it is unknown if the choice of the illustrator for a given work in the early 19th century was up to the author or the publisher. Examples of Prêtre's illustrations in the *Faune Française*, including two of the *"ad. nat. viv."* plates are shown in Figure 3.

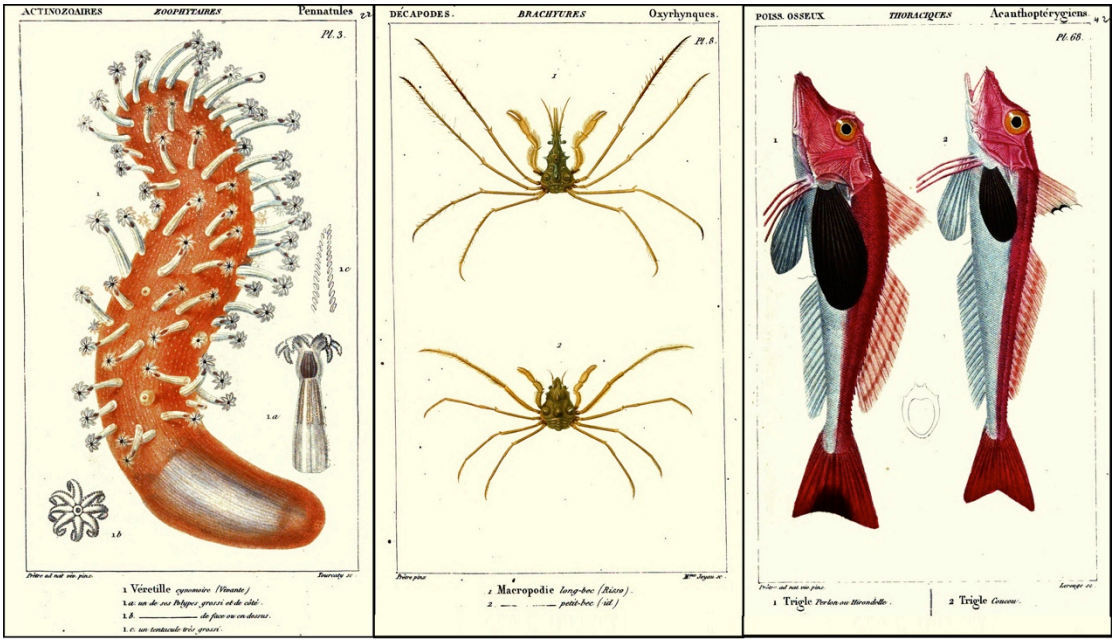


Figure 3. Examples of Prêtre's illustrations from *Faune Française*. The left panel shows the Sea Pen (related to corals). Prêtre's inscription indicates that the model was a living specimen. The middle panel show two species of crabs. The right panel shows fish that, according to the inscription, were painted from living specimens.

Prêtre's work on Risso's 1826 *Histoire Naturelle*, consisting of 44 plates (discussed in the following sections), was likely a relatively minor project compared to both his previous work and his later work. For example, in the *Dictionnaire d'Histoire Naturelle* that appeared between 1816 and 1830, Prêtre did over 650 plates. Prêtre did the artwork for about half of the over 500 plates illustrating birds in Temminck's five volume "*Nouveau Recueil de Planches Coloriées d'Oiseaux*" (Temminck 1820-1839). Prête was listed on the title page along with another illustrator, Huet, as "painters of the Museum of Natural History".

One of the last publications with illustrations by Prêtre was an article that appeared in 1843, when he was 75 years old, in the *Magasin de Zoologie*. Prêtre provided the artwork for 7 plates illustrating new bird species described by De Lafresnaye, including one named by De Lafresnaye for Prêtre: *Tanagra pretre*i (De Lafresnaye 1843). Thus, one of Prêtre's last illustrations was of a bird named for him. It was not the first species named for him. Temminick named a parrot for Prêtre (Temminck 1838), Duméril & Bibron (1839) a worm lizard, De Lattre

and Lesson (1839) named a hummingbird for Prêtre. However none had done so with a tribute such as that of De Lafresnaye's:

"We dedicate this charming species to the well known painter whose expert brush has given for such a long time already, and gives still everyday, great service to natural science with the truth and elegance of his touch." (my translation)

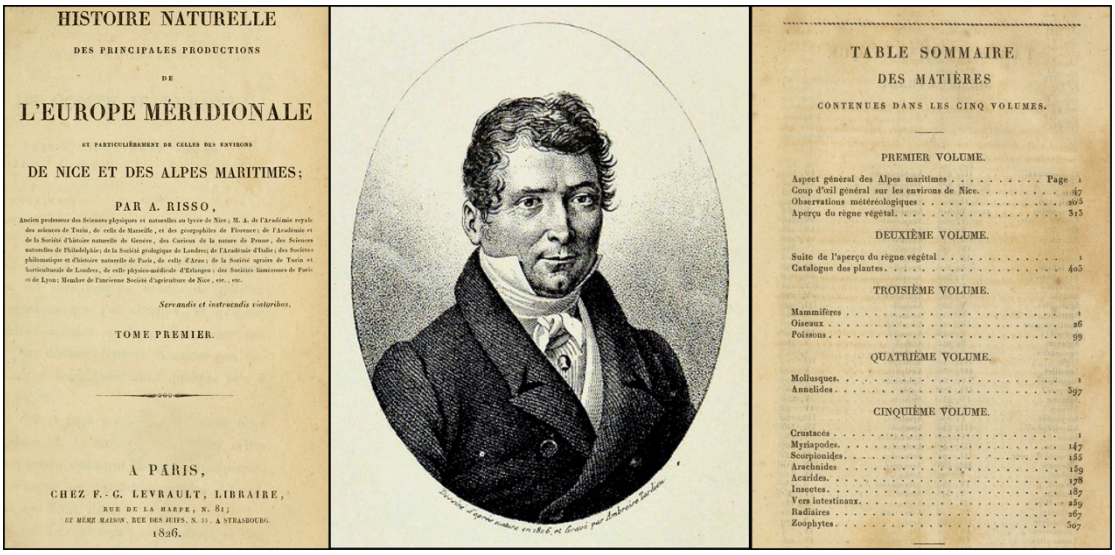
Jean Gabriel Prêtre died a few years later at the age of 81.

Histoire Naturelle des Principales Productions de l'Europe Méridionale et Particulièrement de Celles des Environs de Nice et des Alpes Maritimes

Here will be presented the contents of Risso's *Histoire Naturelle* and the reception it received. However, first some currently unanswered technical questions will be reviewed. These are: 1) the choice of the publisher, 2) the origin of the five volume structure of the work, 3) the lack of citations to the plates in Risso's texts, 4) the choice of the illustrator, and 5) the actual dates the volumes of *Histoire Naturelle* appeared.

Some Unanswered Questions

Histoire Naturelle was published by F.-G. Levrault in 1826. Risso was 49 years old (fig. 5), a seasoned author as he had already authored four books. Why his major, five volume, work was published with F.-G. Levrault, with whom he had not previously published, is unknown. Oddly, Risso never published twice with the same publisher, except for his last two books, published shortly before his death in 1844. The *Flore de Nice* and *Guide des Etrangers* à *Nice* were both published by the Société Typographique of Nice. Risso's first book, *Ichthyologie de Nice*, was published by F. Schoell in 1810, the second, his 1813 *Essai sur l'Histoire Naturelle des Orangers*, was published by G. Dufour et Cie., the third on crustaceans was published in 1816 by La Librarie Grecque-Latine-Allemande, and the fourth, his book on citrus trees co-authored and illustrated by Poiteau, was published by Audot from 1818 to 1822. All four publishers were Paris-based, like F.-G. Levrault, and produced many natural history works. To my knowledge, there is no archival material available concerning Risso's interactions with his publishers that might explain his singular publishing history.


HISTOIRE NATURELLE

DES PRINCIPALES PRODUCTIONS

DE

L'EUROPE MÉRIDIONALE

ET PARTICULIÈREMENT DE CELLES DES ENVIRONS

DE NICE ET DES ALPES MARITIMES;

PAR A. RISSO,

Ancien professeur des Sciences physiques et naturelles au lycée de Nice; M. A. de l'Académie royale des sciences de Turin, de celle de Marseille, et des georgophiles de Florence; de l'Académie et de la Société d'histoire naturelle de Genève, des Curieux de la nature de Penne, des Sciences naturelles de Philadelphie; de la Société géologique de Londres; de l'Académie d'Italie; des Sociétés philomatique et d'histoire naturelle de Paris, de celle d'Arras; de la Société agraire de Turin et horticulturale de Londres, de celle physico-médicale d'Erlangen; des Sociétés linnéennes de Paris et de Lyon; Membre de l'ancienne Société d'agriculture de Nice, etc., etc.

Servandis et instruendis vinitoribus.

TOME PREMIER.

A PARIS,

CHEZ F.-G. LEVRAULT, LIBRAIRE,

RUE DE LA HARPE, N. 81;

ET MÊME MAISON, RUE DES JUIFS, N. 33, A STRASBOURG.

1826.

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DEUXIÈME VOLUME.

TROISIÈME VOLUME.

QUATRIÈME VOLUME.

CINQUIÈME VOLUME.

Figure 4. The title page of the first volume of Risso's *Histoire Naturelle*, a portrait of Risso, and the table of contents of the five volumes from the fifth volume, all dated 1826.

The division of Risso's work into five volumes ranging in size from 383 to 492 pages may have been due to constraints of manufacturing rather than a specific design by Risso. F.-G. Levrault published many multi-volume works and the volumes rarely exceeded 500 pages in length (e.g. Cuvier & Valenciennes's *Histoire Naturelle des Poissons*, 1828-1849). The first volume contains Risso's descriptions of geology and meteorology as well as the first part of his text on plant life, completed with the entirety of the second volume. The introductory texts for each volume do not consistently introduce the actual contents of the volume. The volumes do not have individual tables of contents nor indexes. A single summary table of contents for all five volumes and a rather inadequate index covering all five volumes appears at the end of volume five. Evidence of the need for separate indexes is that an index of the genera of mollusks in described in the fourth volume on mollusks was published as a 12 page booklet by Vignard (1830).

A peculiarity of Risso's *Histoire Naturelle* is that in his texts no references are made to any of the plates, unlike all of his previous books: on fish (Risso 1810), crustaceans (Risso 1816), and citrus trees (Risso 1813, Risso & Poiteau 1818-1822). This is especially odd as his texts in *Histoire Naturelle,* Risso frequently cite illustrations from his previous books and articles and the works of others. The plates of the second volume are not introduced by a list of plates. In the volumes three, four and five, a list of plates giving the names of species figured precedes the plate section without however, mentioning where in the text the species are described. Thus, it appears possible that *Histoire Naturelle* originally was without illustrations, and that the plates were added on by, or at the request of, the publisher. As mentioned previously, it is unknown who chooses the

illustrator for a given work. F.-G. Levrault was though the publisher of many natural history works illustrated by Prêtre, for example, Cuvier's *Dictionnaire d'Histoire Naturelle* (1816-1830) as shown in fig. 3, Blainville's book on mollusks (Blainville 1825-1827), Desmarest's books on crustaceans (1825), and Duméril's book on insects (1823). Consequently, the choice of Prête as illustrator may have originated with the publisher. However, as noted above, Risso was familiar with the work of Prêtre from the *Faune Française* since Risso cited some illustrations from it in his *Histoire Naturelle*.

There is also lack of clarity concerning when each of the volumes of *Histoire Naturelle* were actually made available. The title pages of all five volumes give the year of publication as 1826. However, the first notice of *Histoire Naturelle* appeared in the January 1927 issue of the *Bulletin des Sciences Naturelles et de Géologie* (also published by F.-G. Levrault), announcing the appearance of volume 1 on geology and volume 4 on mollusks, and stating that volumes 2 (plants) and 3 (mostly fish) were in press (Anon. 1827a). A review of volume 4, in the last trimester of 1927, in the same journal (Férussac 1827), stated that the volumes 2 and 3 still had not yet appeared and no mention was made of volume 5 (on crustaceans and other invertebrates). In Cuvier & Valencience's review of the history of ichthyology in the first volume of their *Histoire Naturelle des Poissons*, Risso's volume on fish is described as 1827 (Cuvier & Valenciennes 1828) and some researchers currently cite volume 5 contents on crustaceans as "Risso 1827". However, library catalogues invariably list all five volumes as 1826 publications.

Volume One

The first volume of *Histoire Naturelle* begins with Risso's dedication of the work to George Hamilton-Gordon, the 4th Earl of Aberdeen for his friendship, encouragement, and advice. The dedication is a bit of a mystery. In Balfour's two volume biography of Hamilton-Gordon, no mention is made of Risso and Nice is mentioned only in passing, stating that he spent the winters of 1825, 1826 and 1827 in Nice, with his youngest surviving daughter, Alice, in hopes of improving her health (Balfour 1922). The first half of volume one, of 448 pages, is devoted to physical descriptions of the region, geography, geology, and meteorology. It includes lengthy lists of fossil taxa found in various geological formations, history of seismic activity, and tables giving minimum, maximum temperatures, and barometric pressure for each month over many years of observation. Risso apparently had previously sent copies of his detailed meteorology tables to the famed explorer Alexander van Humboldt, at that time in Paris. A letter from Humboldt thanking Risso and commenting on the tables was included in the volume. It is quite odd that Risso included the letter as it invalidated his meteorological data. Humboldt stated that maximum temperatures should be

recorded at 14:00, not 12:00 as Risso had done, and that Risso's barometric measures appeared off; Humboldt suggested that Risso should calibrate his barometer by comparing it with those used in Marseille.

The second half of volume one is the start of his descriptions of plant life of the region, which is continued and constitutes the entire second volume. Risso begins with a description of the agricultural practices of the regions followed by descriptions of the citrus tress grown in the region drawn largely from his two books on citrus trees of Nice (Risso 1813, Risso & Poiteau 1822). Among the new taxa described is a variety of citrus tree *Citrus auatus gordonia*, named not for the Earl of Aberdeen, but for after Lady Alicia Gordon, the sister of the Earl, noted as a knowledgeable amateur botanist by Risso. Included at the end of the first volume are two colored maps showing the distributions of various geological formations in the region, one of which is shown in Fig. 5. Like the plates in the other volumes, there is no mention of the maps in the text.

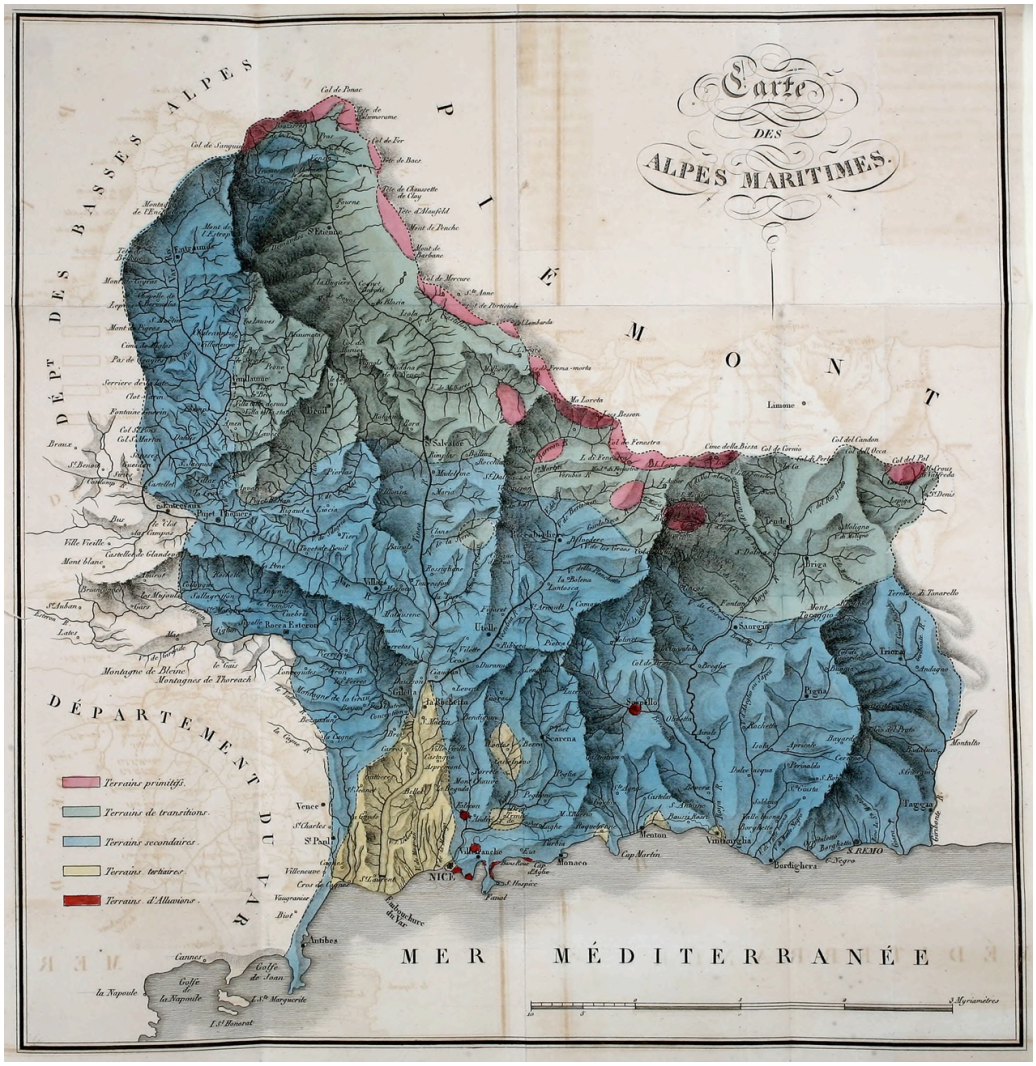

Figure 5. One of the two maps included in the first volume of Risso's *Histoire Naturelle* showing the distributions of various types of soil and geological formations in the region.

Volume Two

The second volume of Histoire Naturelle is entirely consecrated to the plant life of the region of Nice. Risso covers in depth the cultivated forms, both native and non-native, and to a much lesser extent the unexploited indigenous flora. The volume is dominated by the descriptions of the numerous varieties of olives (40 types), figs (72 types) and grapes (99 types). However, as a former pharmacist, also included are descriptions of medicinal plants. The text of the volume ends with a comprehensive, 87 page catalogue of all the plants of the region including species of algae. The catalogue does not include any references to Risso's text in the volume or the text on plants in the first volume. At the end of the first volume, without a list of illustrations, are eight unnumbered plates. Six of the plates are signed by Jean Gabriel Prêtre and two by Pierre Jean François Turpin, a well-known botanical illustrator and botanist in his own right who had been trained by Poiteau (Boisard 1848), Risso's co-author of his illustrated monograph of citrus tress.

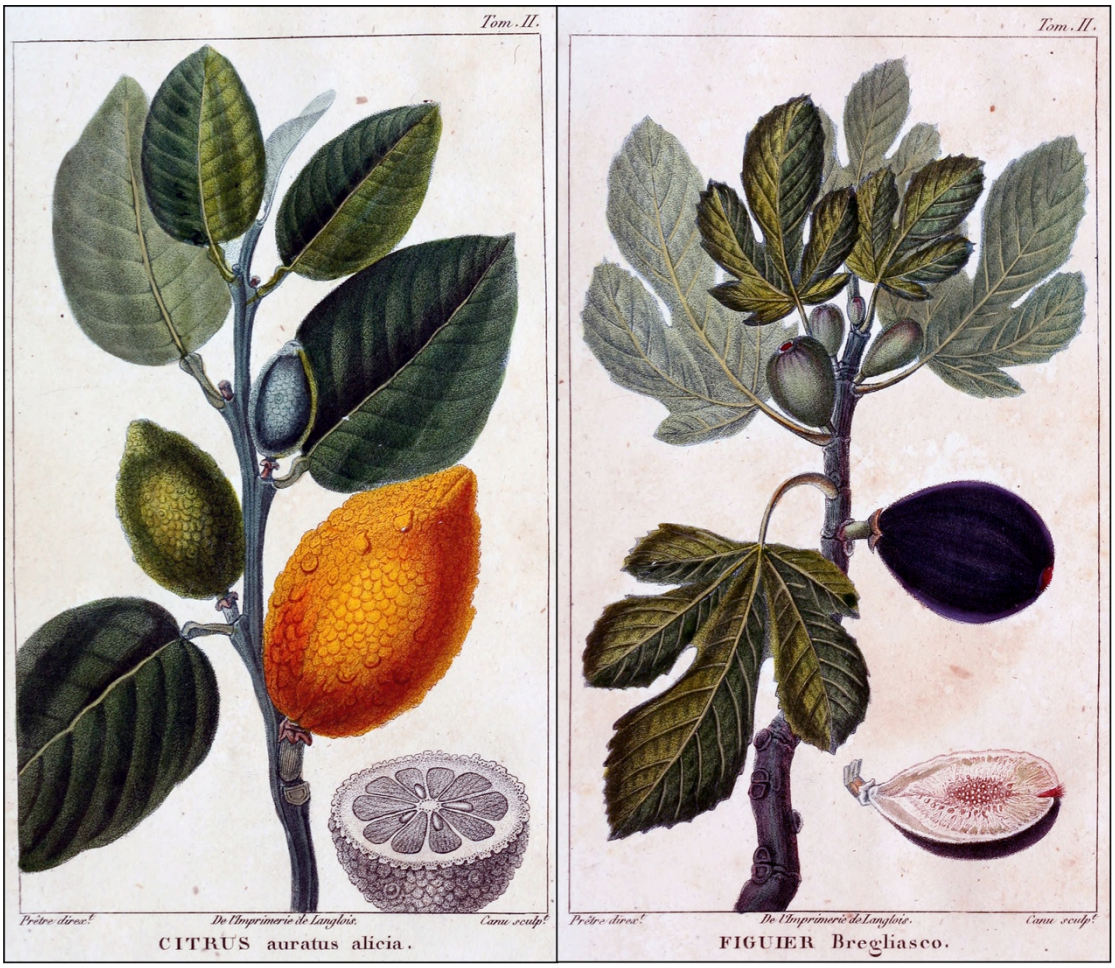

Figure 6. Two of the six unnumbered plates from the second volume. The left panel shows the variety of orange tree Risso named for Lady Alicia Gordon and the right panel the fig tree. The engraver for the 6 plates by Prête was Jean Dominique Etienne Canu. The actual size of the rectangle enclosing the figures is 16.5 x 10 cm.

Volume Three

The third volume of *Histoire Naturelle* contains, in Risso's words, *"...the results of my many observations on animals of the first branch of zoology, principally on fish and birds"*. In reality the third volume is largely devoted to fish, occupying 376 pages out of 480 pages of text. For the mammals, birds and reptiles little more than species lists are provided. However, for the fish species a classification is provided and detailed descriptions are given with notes on the habitats, fishing methods, seasonality, etc. The general text on fishing methods drew heavily on Risso's 1810 book. Risso's fish species (pooling all groups now known to be distinct: bony fish, sharks, rays, etc.) number 382 out of which 157 are described as new species. Occasionally interspersed with dry descriptions of anatomy are "*Remarques*", often quite remarkable, giving details on life histories or habits or as in the example below, an enthusiastic description of colors of a fish (*Gymnetrus longiradiatus*, shown in fig. 7, the fish in the center of the left plate as Risso's fig. 43):

"These gymnastes are the fish of our sea upon which nature has bestowed her treasures with the most profusion. Elegant and varied shades of pleasant reflections and brilliant, the brilliance of the most dazzling jewels, are the rich colors with which she adorned their slender bodies. This magnificent adornment, nuanced with the black amber and the opal of their spots, where the azure and the amethyst are reflected in a thousand directions, joined together with the purple, the rose and the ruby of the fins, form a set of colors so sparkling, that it is impossible to be able to describe them. They approach our shores when the sea is calm and tranquil; they swim gently shaking their bodies, lower, rise, bend, go around in a thousand manners, and by the different reflections of the colors which they cause to spring forth with each undulation, they produce to the eyes of the observer dazzling effects of light." (my translation)

The volume included 16 plates, all the work of Prêtre. The plates are preceded by a list of illustrations giving the names of the 50 species shown, needed as the plates were without legends. Both Latin names and common names are given. As mentioned above, in Risso's volumes the lists of species figured were without references to the corresponding texts, and the volumes lacked indexes so that locating Risso's text concerning a species shown was problematic. Most of the plates showed more than a single species. Oddly, the species shown in the plates are not shown in the same order as they are described in the text. For example the species shown in the last plate are described in different sections in the text. Six different engravers worked on the plates of fish: M. Giraud, Adélaïde Calais, Louviers, Sophie Plée, Victoire Plée, and Rousseau.

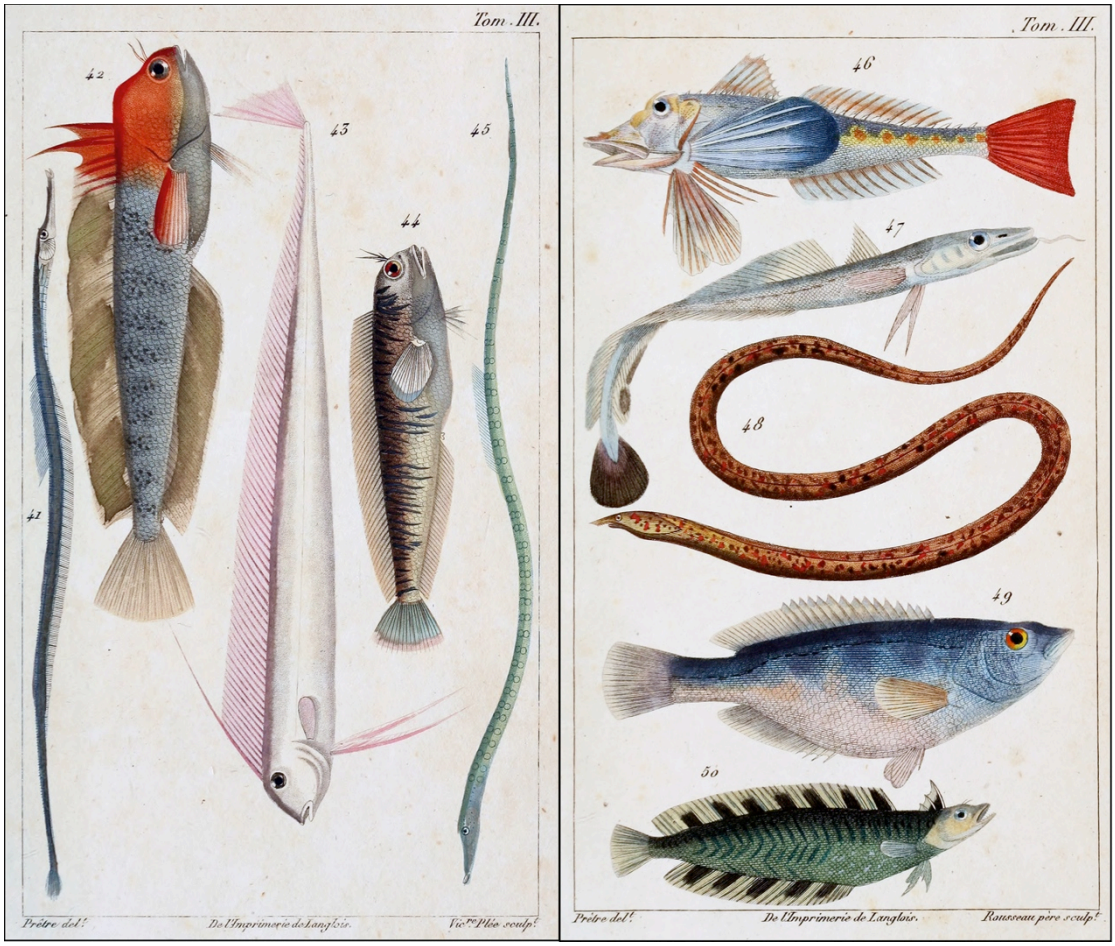

Figure 7. The last two plates of volume 3. The left panel, plate 15, shows *Syngnathus phlegon* (fig. 41), *Blennius erythrocephalus* (fig. 42), *Gymnetrus longiradiatus*, whose colors were described enthusiastically by Risso (fig. 43), *Blennius graphicus* (fig. 44), and *Syphius annulatus* (fig. 40). The right panel, plate 16, shows *Trigla microlepidota* (fig. 46), *Lotta elongata*, (fig. 47), *Sphagebranchus ocellatus*, (fig. 48), *Crenilabrus arcuatus* (fig. 49), *Clinus viridus*, a name not in the text and appears to be the species described in text as *Clinus virescens*. The actual size of the rectangle enclosing the figures is 16.5 x 10 cm. Note that the plates were engraved by different engravers.

Volume Four

Risso's introduction to his fourth volume begins with a long quote from George Cuvier's 1807 which opened his memoire on crocodiles. Cuvier stated the determination of species is the foundation of all solid natural history work:

"The precise determination of species and of their distinctive characters forms the first basis on which all researches in natural history must be founded. The most curious observations, the newest views, loose almost all their merit when they are

devoid of this support; and despite the aridity of this kind of work, it is with this that all who intend to arrive at solid results must begin (my translation)."

There is a certain irony of beginning the volume on mollusks with a quote stressing the need for precise species determinations. Risso's volume on mollusks, of all five volumes, would receive the most withering criticisms, (detailed in the following sections), precisely because of his species descriptions, giving multiple names to the same species and new names to species previously described. Risso then states in the volume he dares present a view of the natural history of the mollusks of the Midi region based on his observations of living specimens and their remains over many years. In volume four, Risso catalogued well over 1000 species of mollusks that included hundreds he described as new species. Risso's text includes relatively few '*Remarques*' giving natural history notes compared to his texts on fish and crustaceans rendering the text rather dry. The mollusks volume also included descriptions of 82 species of worms, now known to be of distinct lineages but grouped together at the time. At the end of the volume, the 16 plates, all signed by Prêtre, are preceded by a list of the 177 figures contained in plates, giving for each the Latin binomials and names in French or common names. The engraver of the mollusks plates were members of the Plée family: Plée, fils ainé, Plée père et F. fils, Plée père. As Sophie and Victoire Plée were engravers of some of the fish plates, the Plée appear to have a family been a family of talented engravers!

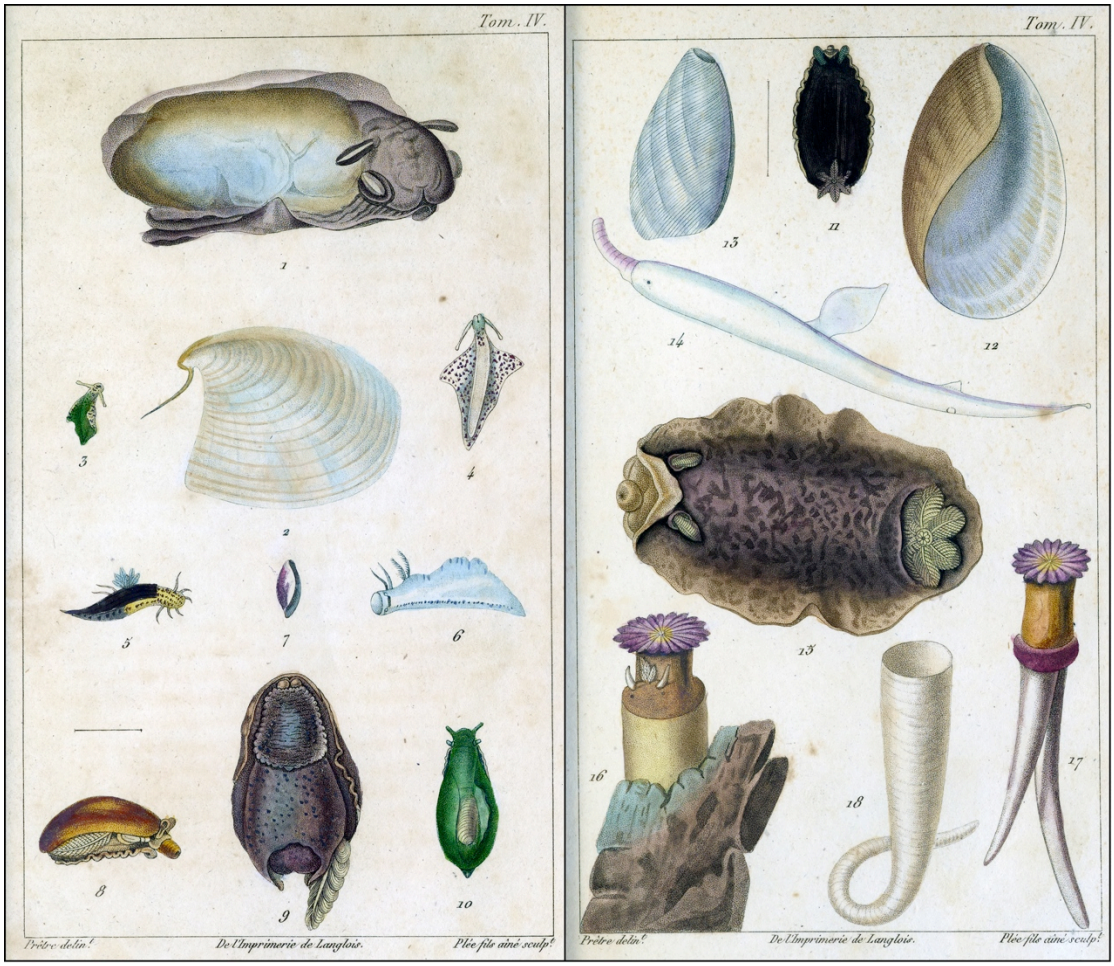

Figure 8. The first two of the 12 plates containing figures of about 170 species of mollusks. The left panel, plate 1 shows various species of nudibranchs. The right panel, plate 2, shows nudibranchs (figs. 11, 15), gastropods (fig. 12, 13), a pteropod (fig. 14) and a "worm-snail" shown encrusted in a rock (fig. 16) its shell (fig. 18) and the animal without the shell (fig. 17). The actual size of the rectangle enclosing the figures is 16.5 x 10 cm.

Volume Five

The final volume begins with a long "preliminary note" given over mainly to introducing the crustaceans of the region, giving the impression that bulk of the volume is on crustaceans. In reality, crustaceans account for about half of the text pages and five of the ten plates. Risso describes 200 species of crustaceans including the 76 species he describes as new. Other groups of invertebrates, both aquatic and terrestrial, account for the remainder. These include spiders, insects, echinoderms, worms of various sorts, meduse and corals. He reserved, however, for the crustaceans, all of his "*Remarques*" on natural history of an animal commenting on particular aspects of a species such as the example below describing the behavior of a crab.

"This is one of the decapods which allows a patient observer to most accurately study the habits of these animals. Weak and timid, they cease their races, their games or their fights, as soon as they feel the slightest danger: they stop staring at the object of their fear, and are quick to reassure themselves and resume their exercises if they are not worried, or else otherwise, they flee with speed at the slightest movement what you do to seize them. It is truly worthy of the curiosity of a naturalist to study the strategies that this animal uses to evade his enemy, when he is pursued in one of these waterlines separated from the sea, such as is found on our shores: it seems to calculate his steps, he runs in one direction, returns or stops, and if he finds some crevice in the rock to place himself, he threatens with his claws, and flees only when he is guaranteed to escape danger. It gives up its aquatic dwelling several times a day to walk in the sun. He prowls through the night to seek the dead bodies washed up by the waves." (my translation)

At the end of volume five are the table of contents for the five volumes and the index for all five volumes, followed by the legends for the 10 plates showing 62 figures, all engraved by V. Plée fils. The first five plates show crustaceans and the last five a large variety of invertebrates, all marine (see fig. 9).

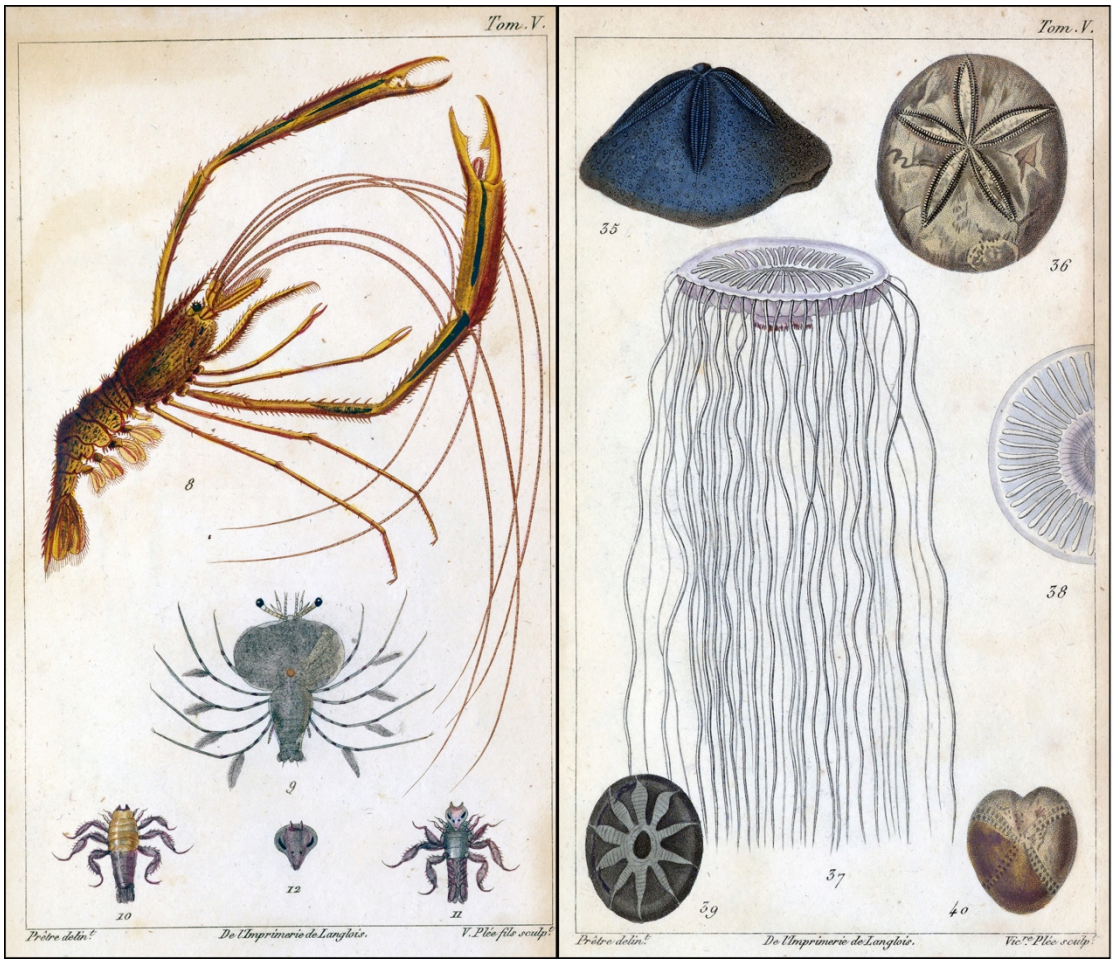

Figure 9. Plates 3 and 7 from volume 5 of Histoire Naturelle. The left plate shows the decapod crustaceans *Stenopus spinosus* (fig. 8) and *Chrysoma mediterranea* (fig. 9), and the amphipod *Phrosina semilunata* from above (fig. 10), the head from below (fig. 11) and from below (fig. 12). The right plate shows the shells of species of echinoderms (sea urchins) *Scutella pyramidalis* (fig. 35), *Spatangus stellatus* (fig. 36), Ananchites stella (fig. 39), *Spatangus chloriteus* (fig. 40) and the medusa *Equorea rissoana* (fig. 37 and fig. 38), found by Péron and Leseuer in Nice and named for Risso (Péron & Lesueur 1809). The actual size of the rectangle enclosing the figures is 16.5 x 10 cm.

The Reception of Risso's *Histoire Naturelle* in the 19th Century

As noted above, the first and brief review (approx. half a page) of Risso's *Histoire Naturelle* appeared in the *Bulletin des Sciences Naturelles et de Géologie* as an anonymous note (Anon. 1827a). While unsigned, it was likely by A.E. Férussac, editor of the journal and one of the foremost experts on mollusks at the time. In the brief note, with regard to volume four on the mollusks, readers were warned the Risso's taxonomy was not to be trusted:

"A first glance at this volume, and the acquaintance with part of the manuscript and the drawings that M. Risso, had shown us before leads us to suggest that this

work must be used with great caution. The author has created, without any reason, a jumble of geographical and specific names; some of these new generic denominations were borrowed from Dr. Leach, without mention being made of them: the synonymy of species is missing or very slightly mentioned." (my translation)

Férussac's second, detailed and signed review (Férussac 1827), was also in the *Bulletin des Sciences Naturelles et de Géologie*. It was relatively long (over 6 pages) and very critical, stating that the text descriptions of new taxa were inadequate and almost all lacked figures. Importantly, synonyms from previous studies of the species listed were entirely missing. Overall, Férussac judged the mollusk volume to be fatally flawed and even reproached Risso for having refused his offer of help with the manuscript:

"We stop here; it is impossible for us to go further; our article would exceed the proper limits. For all the orders one finds, in this work, a great number of new denominations of genera and species, novelties which the known and de-baptized things make us strongly suspect them to be very lightly established, and the discoveries are sown in this book like rain and shine in an Almanac. A work of this kind is a real calamity for naturalists, and does great harm to science.
.... M. Risso is all the less excusable, in that we had placed our collection and our library at his disposal, and that we had offered to review his manuscript with him, help of which he did not think he should profit." (my translation)

A third review of Risso's mollusks volume was published in the British *Zoological Journal* in December of 1827 (Anon. 1827b.). While considerably less critical, it too pointed out that many new taxa were established based on minute differences with known taxa. It concludes with the statement that the promise Risso makes to send all his specimens to *Muséum National d'Histoire Naturelle* will surely end some of the apparent confusion of taxa in his text. Notably, Risso never did send any specimens of mollusks to the Muséum, perhaps because of the criticism he received?

An anonymous review of both volumes three (largely fish) and volume five (crustaceans and other invertebrates) appeared in the *Zoological Journal* in April of 1828 (Anon. 1828). Both of Risso's volumes were described quite favorably. Only in the last sentences is a minor complaint of perhaps needlessly creating some new taxa:

"*Availing himself most zealously of the opportunities afforded by his fortunate location of becoming intimately acquainted with Nature in her infinitely varied productions, he has not limited his ambition to the bare possession of specimens of them, but has aimed at communicating to others the knowledge he has himself*

acquired from their contemplation. If in so doing he may have erred occasionally, especially in too minute a sub-division, as well of species as of genera, the error, although to be deprecated by every one who wishes well to the progress of zoological knowledge, can by no means be put in competition with the good he has effected by his really valuable publication."

The next review published concerned Risso's third volume, concerning mainly fish and appeared in mid-1828 in the *Bulletin des Sciences Naturelles et de Géologie* by Luroth (1828). He too brought up Risso's omission of existing synonyms when he re-named species. However, Luroth described such omissions as a slight fault.

A review of the geology part of the first volume was published in January of 1829, again in the *Bulletin des Sciences Naturelles et de Géologie* (Boué 1829). The review was very critical, demanding proof of Risso's assertions and it concluded describing the work as only an imperfect sketch.

Decades later, Risso's was subjected to a surprisingly strong attack by a renowned malacologist, whose specialty was freshwater and terrestrial mollusks, Jules René Bourguignat (1829-1892). He published in 1861, a study of the synonyms in Risso's mollusk volume, "*Étude synonymique sur les mollusques des Alpes Maritimes publiés par A. Risso en 1826*". Bourguignat described Risso and his works thusly:

"*Among false naturalists, among works of low scientific erudition, you have to place Risso and there keep his works. A fertile writer, but without judgment, an indefatigable innovator, but absurd, Risso embraced in his writings almost every branch of natural history, without have treated one well. Sad products of a lively but disordered imagination, his works are the children of a "mad housewife" over which neither discernment nor judgment presided; the detestable classification of his families, the false classification of genera, no less than the inaccuracy of synonyms, the erroneous appreciation of characters, are as many proofs which demonstrate that, in his writings, everything is false, everything is error*." (my translation)

Bourguignat's venom with regard to a work published some 35 year earlier, by an author deceased for 16 years, is surprising. Bourgiognat's characterization of Risso's work is all the more surprising when one considers that in his subsequent work, actually he cited Risso's volume on mollusks (e.g. Bourguignat 1862, 1864, 1877). Eugene Caziot, writing many years later, was much less critical of Risso's work on mollusks simply remarking that some forms had apparently been given more than one name (Caziot 1910, Caziot and Dall 1910). Caziot speculated that some of Bourguignat's rancor might be due to the fact that

by the time he examined Risso's shell collection, it had become frustratingly useless as his inheritors severely mistreated the collection with many specimens missing, or wrongly relabeled, or broken.

None of the reviews of Risso's *Histoire Naturelle* included any comments on the quality of the plates, only on the fact that not all the species described as new were included. Perhaps the copies of the reviewers saw were all of the edition with black and white plates. A relatively recent work mistook Risso for the artist and called him an exceptional artist (Damkaer 2002). Overall, it appears that Prêtre's contributions to Risso's *Histoire Naturelle* have been completely overlooked.

Risso's *Histoire Naturelle* today

In contemporary science, for better or for worse, the currency used to estimate the value of a given piece of work is the number of citations to the work by other researchers in their publications. Here, in the Introduction, mention was made of the impressive cumulative total number of citations to Risso's *Histoire Naturelle*, relative to other works published in 1826. It is a valid approach for the judgment of Risso's work compared to others of the same age. However, it gives no indication of the usage today of Risso's *Histoire Naturelle*. For that one must consider recent citations. Below is a graph showing the number of citations, by volume and pooled for all five volumes, for each year since 2018. Risso's *Histoire Naturelle*, nearly 200 years old, is still regularly cited. Interestingly, the volume on mollusks, that received such negative attention in 19 century, is well-cited in the 21st century. This is despite the fact that Risso's classifications and descriptions of mollusks continue to be denigrated (e.g., Spada & Bella 2010). The group that Risso accorded the most attention (in terms of number of pages), the plant life, appears to have received the least attention in recent years. As previously mentioned, most citations are in regard to species occurrence records, or habitats, or as the original description of a species.

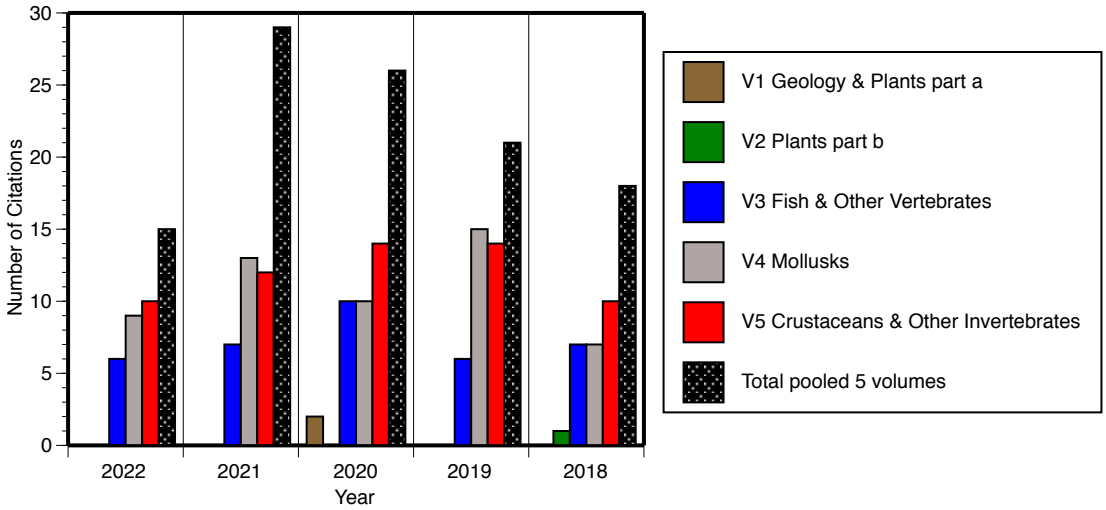

Figure 10. Citation data for Risso's *Histoire Naturelle*, by volume and pooled for all five volumes, over the past five years. Note that the volumes most often cited are volume four on mollusks and volume five on crustaceans and other invertebrates. Nearly 200 years after publication, the work is still regularly cited.

Conclusion

Antoine Risso's *Histoire Naturelle* is still used today by members of the scientific community, as clearly shown above, defying the critics who called it 'a real calamity' or filed with' falsehoods and errors'. Furthermore, Risso's work undeniably brought attention to Nice and especially the 'Sea of Nice'. Nearly all of his many publications contained 'Nice' in the tittle. One of his last publications was a Guide to Nice filed with list of species and sites to be explored (Risso 1844b). He aided many who traveled to the region, and in so doing was a pioneer guide in scientific tourism, a role that would later be assumed by his successor Jean-Baptiste Vérany, another pharmacist turned naturalist, and founder of the *Muséum d'Histoire Naturelle de Nice*. Vérany, in his time, would aid, for example, Karl Vogt and Ernst Haeckel whose work would solidify the region's reputation among naturalist as a destination of high interest (Dolan 2022).

Risso's *Histoire Naturelle* deserves attention also for the scattered passages, the "*Remarques*", describing peculiarities of plants and animals- their uses at the time, their tastes, and odd details on organisms. His text provides precious glimpses into life in the region in the early 19th century and an appreciation for the knowledge of the people of Nice, especially the fisherman. Hopefully, with this essay some will be inspired to stroll through Risso's *Histoire Naturelle* and also enjoy the marvelous artwork of Jean-Gabriel Pêtre, and the engravers and anonymous colorists of the plates.

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