



**Photograph of the bust by Merlieux, in possession of the  
Société Entomologique de France**

**P. A. Latreille (1762-1833)**

# PIERRE ANDRÉ LATREILLE (1762-1833): THE FOREMOST ENTOMOLOGIST OF HIS TIME

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Towards the end of the eighteenth century Latreille, whose major work was the "Précis" (1796), was named "foremost entomologist of his time" by Fabricius.<sup>1</sup> That praise has often been endorsed verbatim by his contemporaries who were able to appreciate the other important books of the "Master" and the incentive and first rank adepts which entomology owes him. For Eiselt (6) Latreille is a bright genius whose great contribution places him at the side of Linnaeus and Fabricius.

Latreille was therefore far from being underestimated. However, actual and official recognition of his merits, a professorship at the Muséum National, only came to him at the age of 68! This is but the last of a long line of hardships encountered by him during his life, as described in the first biographical part of this paper. In the following parts devoted to Latreille's achievements and influence, I shall try to show how he overcame these difficulties by his labor and talents.

The present paper is based primarily on a personal study of Latreille's writings, of which the most significant are quoted below, and on biographical accounts attributable to French contemporary scientists, of whom the most objective are listed in the literature cited (1, 4, 7, 10, 15, 19). The best bibliographies of Latreille are by Jourdan (10, 11) and by Horn & Schenckling (9) (merely entomological) but they omit various constructive abstracts, reports to the *Académie des Sciences*, etc. I have therefore drawn up a critical catalog of Latreille's scientific works (5) and I beg my readers to refer to it.

<sup>1</sup>As early as 1801, Coquebert called Latreille "entomologiae primatum" but it was Geoffroy (7) who recalled having "heard this solemn designation from the mouth of the Professor of Kiel himself."

The original files referring to Latreille and letters received by him are kept mostly in the *Archives de la Société Entomologique de France*. A number of letters written by him are to be found in the libraries of the Muséum National d'Histoire Naturelle and of the Institut de France. This entire group of documents deserves a more scientific survey than the one made by Nussac (13, 14) who was no entomologist.

## LIFE AND WORKS OF LATREILLE

The successive periods of Latreille's life match approximately the changes in the eventful history of France of that period. Although still lacking precise details showing that such coincidences have a meaning other than a mnemonic utility, I want to stress this relationship.

### *Youth and Studies (1762–1792)*

Pierre André Latreille was born on November 29, 1762 in Brive, province of Limousin (now the Corrèze department). He spent the whole of his youth during the period of the decline of the Ancien Régime. It is noteworthy that Latreille was the natural child of Jean Joseph Sahuguet d'Amarzit, général baron d'Espagnac (1713–1783), who, at the end of his military career, was governor of the Hôtel Royal des Invalides in Paris. The identity of his mother remains unknown. Although he never recognized his son, his father provided financial support during Latreille's boyhood and also for his basic education at the Collège des Doctrinaires at Brive and, from 1778 onwards, for his studies at the Collège du Cardinal Lemoine in Paris.

After having qualified as Master of Arts of the Paris University in 1780, Latreille entered the Grand Séminaire of Limoges and came out as a deacon in 1786. Most probably he became a priest soon afterwards but the reference is not to be found in the files. Latreille was acting as a vicar at Lostanges in October 1789 and signed his letters, etc as "l'Abbé Latreille" or "Latreille, Prêtre" until March 1792. Later, he made the statement that he had never carried out his functions as a minister. This is believable for he seems to have devoted himself mainly to entomology, living on the income his father had set up for him from 1779 to 1781.

His apparently inborn taste for natural history had probably been encouraged while he stayed in Brive (13). It seems, however, that his vocation as an entomologist actually has been more influenced by his first stays in Paris (where he came, at least for a second time, in the beginning of 1791). Latreille himself said that he often visited the Jardin du Roi at the time of Buffon (d. 1788) and caught insects in the neighborhood of Paris in 1781. He also insisted on the fact that Abbé R. J. Haüy, the famous mineralogist who lived in the Collège du Cardinal Lemoine, gave him lessons on botany, a fact which helped him to make the acquaintance of Lamarck. It is therefore quite logical that Latreille would submit his first article (on *Mutilla*) to both the *Journal d'Histoire Naturelle* edited by Lamarck and the *Société d'Histoire Naturelle de Paris* in 1792.

Be that as it may the seeds of the French Revolution had long been stirring up Paris and the enlightened bourgeois. Whatever the praise of Nussac (13) for the intelligentsia of Brive, one can hardly dismiss the idea that Latreille's education,

partly provincial and partly aristocratic, had made him a priest, and even worse an entomologist and a man with an income, which was enough to make him a likely victim of the storm brewing ahead.

### *The Turmoil (1792-1798)*

The Civil Constitution of the Clergy (1790) introduced the civic oath for priests. Latreille (sick or absent?) did not take the oath before the deadline and thus fell within the provisions of a subsequent decree (May 27, 1792) condemning to deportation those priests who failed to be sworn in. Consequently, he endured a long imprisonment, first in Brive then in Bordeaux (from November 1793 to January 1795). He avoided, however, "déportation" (this was actually execution by drowning), thanks to the protection of two fellow naturalists, d'Argelas and Bory de St. Vincent, with whom he was able to get in touch as an entomologist while still in prison. (This is the well-known episode of the *Necrobia ruficollis*, often told even by Latreille himself.)

Meanwhile the Convention Nationale had instituted on June 10, 1793 the Muséum National d'Histoire Naturelle of which the four chairs of Zoology were soon held by Lamarck, Geoffroy St. Hilaire, Cuvier, and Lacépède for the following 30 or 40 years.

After his imprisonment, Latreille gave up his priesthood, under conditions unknown to us, and turned towards a teaching career. He came to Paris in March 1795 in order to attend the lectures of the new École Normale, which had started on January 20, 1795 at the Muséum. But the school did not meet the needs for the practical training of teachers; it was therefore closed down on May 19, 1795. Latreille, who had been awarded on May 13 the title of Correspondant du Muséum, returned to his native province.

It is likely that he lived there on subsidies received from his family (around 1797 he was a tutor to his nephew Charles d'Espagnac) but it is doubtful whether he held an appointment to the École Centrale. However he carried on his entomological activities and sent his papers to the *Société Philomatique* and to Millin's *Magasin Encyclopédique*.

At the end of 1796, encouraged by Fabricius with whom he usually corresponded, he published his "*Précis des Caractères Génériques des Insectes*" at his own expense. This highly original work provides two most important innovations: the natural method for the first time is applied to Arthropoda and delimitations corresponding to our families are proposed between the genera and orders (but unfortunately no names are given to them). The "Précis" earned its author a well-deserved widespread reputation. Towards the end of 1797, Latreille, with his name still on the list of émigrés, was temporarily placed under house arrest and his books were confiscated. However this harassment did not last for long. On June 24, 1798, after a report by Cuvier, Lacépède, and Lamarck on various memoirs sent by him to the Classe des Sciences of the Institut National, Latreille received the title of Associate Member of the Institut in the Section of Anatomy and Zoology (8). Now he had reached a position where he was even more favorably known by the professors of the Muséum.

### *The Refuge (1798–1814)*

On July 22, 1798, Latreille was appointed acting Assistant Naturalist at the Muséum (8). He thus obtained, at the side of Lamarck, “a honorable haven in conformity with his tastes” but, nevertheless, a minor and uncertain post. Latreille, especially entrusted with the articulates, helped Lamarck in the daily work such as making inventory and sorting out the collections. This busy but little known period of his life was to continue, however, until he became, in 1814, a member of the Académie des Sciences. It is noteworthy that these years coincide with the Napoleonic era: Bonaparte, although not yet Premier Consul, was already ruling the people’s minds, at least since the start of the Egyptian Campaign (May 1798).

It seems that Latreille was very poor. His master and friend Olivier entrusted him with the writing of numerous entomological entries in the *Nouveau Dictionnaire d’Histoire Naturelle* (1803–1804) and in Volume 8 of the *Encyclopédie Méthodique, Entomologie* (1812). Sonnini engaged him as a collaborator for various volumes on vertebrates, of his edition of the works of Buffon, and also the monumental *Histoire Naturelle Générale et particulière des Crustacés et des Insectes* (14 vols., 1802–1805). These works helped him make a living but can also be praised for their scientific merits. They were carried out along with the publication of a dozen memoirs in the *Annales du Muséum* (1802–1812) and the following three major works: 1. *Histoire Naturelle des Fourmis et Recueil de Mémoires et Observations sur les Abeilles, les Araignées, les Faucheurs et autres Insectes* (1 vol., 1802), is a valuable synthesis of taxonomical and ethological data followed by new printings of previously published miscellaneous papers. 2. *Genera Crustaceorum et Insectorum* (4 vols., 1806–1809), a strictly taxonomic work, is unanimously considered Latreille’s masterpiece, superior by its conciseness to the *Histoire Naturelle Générale et particulière*, but with no emphasis on biological and philosophical views. 3. *Considérations Générales sur l’Ordre naturel des Animaux composant les Classes des Crustacés, des Arachnides et des Insectes* (1 vol., 1810), summarizes the previous work and is mainly known for its *Table des Genres avec l’Indication de l’Espèce qui leur sert de Type* (see section on nomenclature below).

In 1808 Latreille wrote the obituary of Fabricius whose death had just occurred, but in 1809 he failed to acknowledge the publication of Lamarck’s *Philosophie Zoologique* as a major scientific event.

In 1813 following a judgment of the Court of Justice of Brive, he was awarded the right to add to his Christian names (the only ones written on his baptismal certificate) the surname of Latreille, from a nickname unaccounted for to this day.

### *The Institut (1814–1823)*

On November 14, 1814 Latreille succeeded Olivier as Titular Member of the Académie des Sciences de l’Institut de France in the section of Zoology. This is the starting point of a brilliant and still very productive period of his life covering approximately the years of the reign of Louis XVIII (June 1815–September 1824). At that time the works of the Institut were a focus for the attention of the learned world in Europe. Latreille took an active part in it, attending the meetings regularly and writing many reports on the memoirs read at the Academy.

His scientific achievements were still considerable. Besides the publication of about ten important papers in the *Mémoires du Muséum*, he had prepared all of Volume 3 on *Arthropoda* in the *Règne Animal* by Cuvier (December 1816). He drew hundreds of entomological entries for the second edition of the *Nouveau Dictionnaire d'Histoire Naturelle* (1816–1819). Furthermore he continued the publication of the *Encyclopédie Méthodique, Entomologie* (Vol. 9, with the collaboration of Godart, 1819–1823).

His *Mémoires sur divers Sujets de l'Histoire Naturelle des Insectes, de Géographie ancienne et de Chronologie* (1 vol. 1819, with an untitled supplement in 1820) contains some nonentomological contributions revealing various aspects of the author's philosophical thought.

During this time, Latreille carried on his daily duties as an assistant naturalist [as to the entomological collections of the Muséum in 1823, see Deleuze (3)]. In 1821, he was made a Chevalier of the Legion of Honor. He seems to have supplied numerous materials for the *Histoire Naturelle des Animaux sans Vertèbres* (1815–1822) by Lamarck. Since 1818, he had fully replaced Lamarck in the laboratory as well as in lectures. On May 6, 1822, his *Discours d'Entrée à la Suppléance* of Lamarck (who had become blind) marked the intellectual summit of his career: now the master had reached a position where he had genuine disciples who would be most helpful during the difficult years still to come.

### *The Decline (1824–1829)*

The years of Charles X's reign with their climate of "secret and religious purging"<sup>2</sup> were a period of physical and intellectual hardship for Latreille. Often sick, he took a first leave in April 1824, then others during 1826 and 1827. He entrusted Audouin with his lectures and ceased the collaboration with Dejean on the *Histoire Naturelle et Iconographique des Insectes Coléoptères d'Europe* (3 parts, 1822–1826). In order to achieve the publication of the *Encyclopédie Méthodique, Entomologie* (Vc. 10, 1825–1828) he depended upon the help of Lepeltier, Serville, and Guérin-Ménéville.

The entomological entries by Latreille in the *Dictionnaire Classique d'Histoire Naturelle* (1822–1830) are very uneven in both their bulk and significance. His *Familles Naturelles du Règne Animal* (1 vol. 1825), a broad picture of zoological classification, did not receive unanimous appreciation. In translating this under the title: *Latreille's . . . Natürliche Familien des Thierreichs* (1 vol., Weimar 1827), Berthold criticized its careless style and improved certain weaknesses of the original work particularly in latinizing those of the generic names which Latreille had given only in French.

On the other hand, Volumes 4 and 5 of the second edition of Cuvier's *Règne Animal* (1829) are a major work and, when compared with the 1816 edition, entirely new. Here Latreille laid down the taxonomy of the whole of the Arthropoda with an apparently undiminished mastership. That surely explains why Cuvier helped him (15) to obtain the succession of Lamarck, who had died on December 18, 1829.

<sup>2</sup>Letter to Charles d'Espagnac, December 22, 1829 (Bibliothèque du Muséum, Paris).

*Final Recognition (1830–1833)*

The last three years of the life of Latreille belatedly brought him a formal reward for his outstanding achievements but no tranquillity.

On February 7, 1830, an "ordonnance royale" divided the chair of "Animals without backbone" of Lamarck into two new chairs at the Muséum. On February 15, the Académie des Sciences proposed Latreille as Professor of the Chair of "Articulate Animals."

On that same day Geoffroy St. Hilaire and Latreille had read a report at the Academy on a memoir by Meyranx and Laurencet devoted to the organization of mollusks. This report is a historical one as it revealed the ten-year old concealed quarrel between Cuvier and Geoffroy. Latreille who had previously published *De l'Organisation Extérieure des Céphalopodes Comparée avec celle de divers Poissons* (1823) as well as *Esquisse d'une Distribution Générale des Mollusques* (1824) certainly did more than only lend his name to this report. Since 1820 he had been interested in the hypothesis of the "unité de plan de composition" throughout the whole animal kingdom. However he was far from taking this concept for granted, having previously attacked the exaggerations of Geoffroy. I think that he did not go any further into this famous controversy for he was busy preparing his lectures (he had been appointed Professor at the Muséum on March 10) and also because he had to look after his wife<sup>3</sup> (she had been sick since the beginning of March and died on May 5, 1830).

The Revolution of July 1830 ousted Charles X and postponed for a whole year Latreille's inaugural lecture. It eventually took place on May 31, 1831 and was published in his last important work, the *Cours d'Entomologie* (1 vol. 1831). This book rather hastily brought together miscellaneous previous materials; nevertheless, it remains a most useful testimony about Latreille's ideas at the higher level of his knowledge.

On February 29, 1832, the Master presided with emotion at the inaugural meeting of the Société Entomologique de France, the first of its kind in the world. Latreille's disciples had made the point of placing the newly founded society under his intellectual sponsorship.

About that time he suggested to the bookseller Roret a project of a series of *Nouvelles Suites à Buffon*, an idea later skillfully carried on by his pupils.

Involved in a controversy between Cuvier and Geoffroy about the management of the *Nouvelles Annales du Muséum*, Latreille resigned on April 10, 1832 from the post of Secretary of the Professors' Assembly of the Muséum. He retired to the country in order to escape the cholera epidemic. There he was informed of Cuvier's death which occurred on May 13. In November he returned to Paris where he died of a bladder disease, in his lodgings in the Muséum, on February 6, 1833. He left behind many friends and disciples anxious to perpetuate his memory (1, 4, 7, 11, 15, 19) and the enormous volume of work we are now going to survey.

<sup>3</sup>Latreille's request for release from his sacerdotal vow of celibacy had never been acknowledged. The date of his (civil) marriage remains unknown to us.

## LATREILLE'S ACHIEVEMENTS

All the classical as well as the little-known publications of Latreille contain "an undercurrent of merely indicated scientific views, which he has abstained from working out" (17) and which are, nevertheless, of great historical and methodological significance. Despite this, I shall try to limit myself to summarizing Latreille's main contributions in the fields where he distinguished himself as observer, systematist, and biologist.

### *Latreille as a Taxonomist*

Because of the guiding principle of priority in modern zoological nomenclature, the aspects of Latreille's work that are most frequently referred to nowadays are his taxonomical contributions. However, Latreille himself always considered taxonomy as subservient to the other branches of natural history. The lasting importance of his taxonomical achievements is due both to the new features of his methodology applied to insects as well as to the enormous number of taxa studied by him.

By "method" he and his contemporary naturalists mean the apparent tabulated results of a classification, whatever the approach leading to such a statement. For Latreille this method has to be natural. Unlike the authors bringing forward a posteriori and with a pompous philosophy the means to achieve this kind of method, he is always plain and direct. "I did take no exclusive care of any specific organ," he writes, "whenever I thought that I came across some important character that might help to determine a taxon I have been eager to use it. That's the reason why . . . Mr. Kirby . . . qualified me as the founder of the eclectic method."

All this is nothing else than intuition ["esprit de finesse" as Peyerhimoff (16) puts it]. On the contrary, a systematic (i.e. geometrical) mind might consider only one type of organ (an approach that Latreille dismissed) or subordinate the various types of organs according to the supposed hierarchy of functions (an anthropocentric criterion objected to by Latreille, see below).

The basic approach to an eclectic taxonomy leads, therefore, towards a construction starting from the bottom to the top and assembling species into genera, then genera into families, and so on. Such is Latreille's viewpoint when defining a family as "an assemblage of several genera." Consequently I shall examine his taxonomic achievements beginning with the species.

Latreille is but an occasional species maker. He describes new species found among the materials sent to him but prefers to revise the species belonging to his favorite groups such as ants, Apidae, Carabidae, and Elateridae. He admits that he is, in fact, primarily interested in establishing new genera. It is actually as a generist that he gained fame with his "Précis" which contained so many new genera, all of them important and for the most part still valid. It might be remembered that out of 723 genera cited in 1810 in Latreille's *Considérations Générales*, 323 are his, e.g. *Machilis*, *Harpalus*, *Geotrupes*, *Nabis*, *Velia*, *Sialis*, *Psocus*, *Lophyrus*, *Perilampus*, *Astata*, *Xylocopa*, *Simulium*, *Phora*, etc.



The families established by Latreille are numerous, too, whether named after a diagnostic character or by the name of an included genus (see section on nomenclature below).

Above the family level he attributes names and characters to many orders or coordinate taxa of insects (e.g. Thysanura, Siphonaptera, Heteroptera, Homoptera, Aleurodina) or other Arthropoda (Ostracoda, Stomatopoda), as well as to certain classes (Xiphosura) or pseudo-classes (Myriapoda, Acera, i.e. Arachnida s. str.). As early as 1802 he distinguished our Arthropoda under the name of *Condylipodes*. I believe him to have been the first to separate under the names of *Polygnathes* and *Pseudognathes* (1820), the two major phyla presently recognized in the Arthropoda, the Antennata and the Chelicerata.

The value of Latreille's taxa is ascertained (a) by the formal validity of a great number of them in our nomenclature, (b) by all his genera which serve as types of important families, and (c) by all the taxa above the family level which are still recognized in our classifications, although some might be assigned nowadays to different groups.

### *Latreille and the Zoological Nomenclature*

Concerning the nomenclatural implications of taxonomy, Latreille "opposed to or a great deal ahead of the practices and ideas of his contemporaries" has expressed "entirely right views that modern zoologists were bound to adopt" (12).

Throughout his works, the principle of priority is defended against that of notoriety. He applied to Arthropoda the principle of naming families after the name of an included genus rather than after a diagnostic character. Such a practice, implying the principle of typification as a guarantee of any stability, certainly reveals an orderly mind. Moreover it is to him that we owe the invaluable notion of type species of a genus. This concept, quite new at the time, is particularly known from the *Table des Genres avec l'Indication de l'Espèce qui leur sert de Type* (1810). It should be pointed out, however, that Latreille has mentioned type species of genera as early as 1802 and up to 1831, which shows that the idea of type species has not been a transitory one in his mind but one of his lasting views.

Another inventive view he brought forward is that of the coordination of taxa and subtaxa very clearly defined in 1829. Of course, Latreille himself has more than once infringed upon or did not consistently apply his own principles. This can easily be explained by the enormous amount of his entomological work and by the practices of an epoch in which personal considerations were given much more attention than nowadays. It thus remains that those scattered seeds have proven extremely fruitful, so that Latreille might well be considered one of the most prominent forerunners of modern nomenclature rules in zoology.

### *Latreille as a Morphologist and an Orismologist*

During his whole career Latreille has shown a great interest in the external anatomy of Arthropoda and in the relevant terminology. His descriptive work in these fields is neither a treatise nor a monograph, but rather a number of valuable separate observations. Among others, we owe him the notions and names of chelicera,

maxillary and labial palps, maxillipeds, hemielytra, epistoma, postabdomen, rostellum, proboscis, etc. He inspired the definition and the nomenclature of the fundamental parts of the thorax applied by Audouin and Chabrier. These few examples give but a very limited idea of his achievements in the field of orismology which still remain as one of the basic sources of our terminology of the arthropodan pseudo-skeleton (so named by Latreille, 1831).

Latreille devoted much of his efforts to establishing "analogies" (we now say homologies) of segments and appendages throughout the classes and orders of Arthropoda. His starting point was the idea of a uniformity of the plan of the insects' buccal apparatus (1802), an original notion later successfully brought forward again by Savigny. He proceeded with the study of maxillipeds, then with the other appendages of various Crustacea compared with the same parts in insects and arachnids, and eventually came to the conclusion that appendages have to be homologized according to the rank of their segments without taking into account their functional adaptations.

Nevertheless, in spite of some brilliant intuitions, Latreille committed some errors of interpretation, as for example not recognizing the haltera of Diptera as homologs of hind wings; furthermore he is at the origin of certain confusions, some of which still exist to this day (e.g. his segment *médiaire*).

In addition, Latreille also attempted some philosophical interpretations based upon his morphological knowledge. Prior to Geoffroy St. Hilaire, he thought of extending the plan of the composition of the vertebrates to invertebrates. However, when Geoffroy put forward the vertebral theory of the arthropodan exoskeleton in 1820, Latreille raised a protest. He did it with sound arguments (the continuity of arthropodan integument) and in successive moves, backing up research on the nervous system, chitin, etc. From 1825 onward, he definitely asserted that the arthropodan tegument was no vertebra and that the arthropodan head was not made up of a succession of vertebrae. He still was inclined to believe in some unity of the plan of animal composition provided that the link between vertebrates and invertebrates were to be found outside Arthropoda.

Such questions are no longer raised nowadays; however, the homologies, as well as the terminology of the sclerites of Arthropoda, are still a major concern with entomologists who, consciously or not, continue to refer to many notions attributable to Latreille, one of the great forerunners in these fields, too.

### *Latreille as an Ethologist*

An enthusiastic admirer of the works of Réaumur, De Geer, Bonnet, and Huber, Latreille started his career observing among Arthropoda those with the most remarkable habits, Hymenoptera and arachnids. His interest in this field lasted throughout his life and he considered this sort of investigation superior to taxonomic research.

I cannot include a detailed survey in this paper of Latreille's discoveries concerning ants (confirmation of the existence of Amazon ants), Apidae, wasps, *Philanthus apivorus* (first example of an adult predatory wasp feeding on the prey intended for its progeny), conopid parasitism, etc, nor is a discussion of his observations on

Arachnida, *Phalangium*, and *Polydesmus* within the scope of this review. On the other hand, I must emphasize some modern aspects of the learning that Latreille received from his ethological observations.

In the field of taxonomy he often insisted on the diagnostic importance of ethological characters of species or even higher taxa. Regarding methodology, he expressed concern about the imperfections of Réaumur's determinations and asked for precise identifications of species of which the behavior is being described. He was anxious to ensure clear distinctions when dealing with terminology. (e.g. between "casual crowds" and "true societies"). Finally, he required direct experiments. The idea as well as the word were rather new for the time. Although he himself was not currently carrying out experiments, Latreille certainly was the first to practice antennectomies in order to locate the olfactory center of ants in the antennae (1802).

As to his philosophical views, although he denounced anthropocentrism, he did not markedly depart from the conformism of his epoch. For him "a bee-hive has long been the stumbling block of all philosophy" and "the observer's last aim must be the enhancement of his feeling of love and respect towards the divinity" (1802).

### *Latreille as a Pioneer of Zoogeography*

Latreille visited several regions of France but never travelled outside the country. He acquired, however, a sound experience of the distribution of insects throughout the world. He owed this ability to the study of the national and private collections in Paris, as well as to the information gathered from the literature and from a widespread correspondence and exchange of material; this extensive knowledge is conveyed in a memoir published in 1817 and reissued in the *Cours d'Entomologie* (1831).

His most original statement in comparison with the ideas then prevailing is that zonation of climates (temperature, day length) cannot entirely account for the distribution of insects "since different animals are to be found in places where temperature is the same." His main argument in this respect is the marked differences between European and eastern U.S. faunas. An explanation used by him is the existence of natural barriers (oceans, deserts, mountains) brought forward by Buffon. Furthermore, he outlines the difficulty of overcoming the impact of many factors such as quality of soil, orientation of relief, rainfall, plant cover, and so on. He suggests a scheme of progressive latitudinal and longitudinal substitutions in the fauna (which might apply only inside major biogeographical regions).

Historical explanations were still impossible at that time. Nevertheless, in the case of the emergence of the Ponto-Caspian Basin, he makes a prophetic allusion to the benefits biogeography might provide to mineralogists and geologists.

Outside those general considerations, Latreille has given examples, but without applying modern terminology, of boreo-alpine areas, of north-south and east-west distribution gradients of insects in Europe, of relations between ecology and distribution (calcicolous and halophilous species, relations between insects and vegetation), cases of dispersion centers, vicariance, and endemism. He even noticed the biogeographical relations between the continents within the southern hemisphere. From a methodologic viewpoint Latreille insisted on the need for precise records concerning localities and altitudes for any gathering of material of natural history.

### *Works Other than Entomological*

Besides his works on Arthropoda, Latreille has published: *Histoire Naturelle des Salamandres de France* (1800) and *Histoire Naturelle des Reptiles* (with Sonnini, 4 vols., 1802) which show that his zoological career might have taken a very different course; chapters on various mammals, particularly on monkeys in the Buffon by Sonnini; short essays on mollusks (herein referred to in connection with the controversy of 1830); a few reports on memoirs other than entomological (on annelids by Savigny, on mollusks by Ferussac and d'Orbigny) and on *Voyages* (by Dumont d'Urville, Quoy, and Gaymard); and several erudite dissertations (on Egyptology, ancient chronology, and geography) which, although apparently little appreciated by specialists, give to the historian of the sciences useful insights into the philosophical thought of the author.

### THE THOUGHT AND INFLUENCE OF LATREILLE

The personality of Latreille is nowadays totally overshadowed by the fame of his more illustrious colleagues. This posthumous injustice is but the continuation of his life's misfortunes. It is noteworthy to remember that Latreille was a natural child and a persecuted priest who later cast off his frock. He was always poor and of a delicate complexion. He had to wait until the age of 36 to be appointed to only a minor post he was to hold for 30 years at the Muséum. Furthermore he seems to have been neither a great speaker nor a good writer<sup>4</sup>.

These few remarks explain why Latreille could not possess that firm belief in his thoughts which characterized Lamarck, nor Geoffroy St. Hilaire's combativeness, nor the power of intellectual seduction of Cuvier. Nevertheless, I shall try to compare Latreille with these three inspired men with whom he was, for more than 30 years, in daily intellectual touch: a relationship which may help us to understand his own thought.

The philosophical mind of Lamarck proceeds less from an aspiration of learning than from the urge to explain the major problems of nature and man. Latreille's approach is just the opposite. He admires the "strong dialectic" of Lamarck but only incidentally does he mention the latter's ideas. At the funeral of the man, whom he called his adopted father, he paid tribute to his human virtues, but in the field of science he only regarded him as a "French Linnaeus."

Cuvier had, since 1798, always been greatly and most sincerely admired by Latreille. Still one can detect in this a certain reluctance regarding the thought of the great man. Just as he reduced Lamarck's quests to mere taxonomy, Latreille constantly reduced the works of Cuvier to descriptive anatomy. Moreover, he believed that such works ought to be extended. He therefore instigated the new anatomical research of Dufour, as well as those of Audouin and Milne-Edwards and of Serres. The actual reason for this attitude is that he was disinclined to accept the anthropocentric hierarchy of functions and organs which, according to Cuvier (and Lamarck), determined the rank of the various taxa. This hierarchy hindered some

<sup>4</sup>According to Walckenaer (19), he spoke with difficulty, owing to inferior prognathism.

of Latreille's taxonomic constructions and he criticized it on various occasions. The two parallel series of invertebrates he had suggested to Lamarck in 1815 and the volumes entirely written by him in Cuvier's *Règne Animal* are, in this respect, quite significant.

It is therefore logical that the objectivity which Geoffroy St. Hilaire displayed in establishing his anatomical determinations had been perfectly appreciated by Latreille. But Geoffroy had an adventurous mind and thus Latreille, who, prior to him, had assumed an extension to invertebrates of the plan of composition recognized among vertebrates, could not follow his colleague after 1820. His most extensive comparative knowledge and also his ability to renew his views allowed Latreille to turn his efforts towards concrete investigations rather than try to foster new speculations. Nevertheless the two men remained very close to each other through their ideas, as well as through their judgements about other zoologists.

Thus Latreille appeared to have in fact a scientific objectivity that neither friendship nor admiration could sway. It is obvious too, that learning meant more to him than attempting to equal the genius of his three colleagues. Moreover, embracing an immense field unknown to them, Latreille had fully realized that the great discoveries in embryology, geopaleontology, physiology, ethology, biogeography, etc still lay ahead; whereas Lamarck, Cuvier, and Geoffroy considered their achievements to be definitive ones. This philosophical restraint of Latreille was by no means influenced by his religious beliefs. Although he remained a traditionalist (see above), he expressly stigmatized anthropocentrism, final causes, and, above all, the fanaticism which had condemned Galileo and Buffon. All this is in accordance with his positive and orderly mind as well as with his natural modesty (4).

This intellectual attitude is likely to have been a stimulus for the independent research of a whole generation of young scientists (Dufour, Lepeltier, Serville, Audouin, Guérin) preferring his example rather than the authority of a doctrine. As Audouin has rightly pointed out, Latreille's pupils were "all the entomologists of France and even of the whole of Europe" (7). Bouvier too has made the well-founded statement that "the descent of his disciples included [in 1907] all the entomologists of the world" (2).

But Latreille's influence was also due to his human qualities. He had always shown a steadfast fidelity toward his masters (Haüy, Lamarck), friends (Dargelas, Bory de St. Vincent, Millin, Coquebert, Bosc, Olivier, Sonnini, Dufour), and colleagues (Geoffroy, Cuvier). His goodwill towards his fellow naturalists and students was unanimously recognized. For all these scientific and personal reasons he had been held in such high esteem that as many as 163 species and several books were dedicated to him between 1798 and 1850 (18).

Summing up this short study, inevitably containing some appreciations still open to discussion, I should like to say that it was part of the nobleness of Latreille, as a scientist as well as a man, that he could overcome in so exemplary a way such an adverse life. In this respect, the foremost entomologist of his time ("*entomologorum nostri aevi princeps*") has been rightly called by Audouin (7) the Prince of Entomology ("*Entomologiae Princeps*").

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