

and the works of Cuvier,<sup>1</sup> Blumenbach,<sup>2</sup> Duméril,<sup>3</sup> Lamarck,<sup>4</sup> Oken,<sup>5</sup> Goldfuss,<sup>6</sup> and Schweiger,<sup>7</sup> suggest successive improvements in their classification. There remains, however, so much uncertainty respecting the general characteristics of the different groups of Radiates or Zoophytes, that naturalists disagree even as to the classes that should be referred to this type. Cuvier, for instance, unites the Intestinal worms and the Infusoria with the Radiates, while DeBlainville refers the first to the Articulata, and the second to his Microzoaires. Cuvier also at first unites the Actiniæ with the Acalephs, while he afterwards separates them.<sup>8</sup> Even the limits between the Radiates and the lower Mollusks are ill-defined, so that Sa-

<sup>1</sup> CUVIER (GEORGE), *Tableau élémentaire de l'Histoire naturelle des animaux*, Paris, 1798, 8vo. fig. — *Le Règne animal distribué d'après son organisation, pour servir de base à l'Histoire naturelle des animaux et d'introduction à l'Anatomie comparée*, Paris, 1817, 4 vols. 8vo. fig.

<sup>2</sup> BLUMENBACH (J. FR.), *Handbuch der Naturgeschichte*, Götting. 1779, 8vo. fig.; Götting. 1825 (11th ed.), French transl. by Artaud, *Manuel d'Histoire Naturelle*, Paris, 1803, 2 vols. 8vo. fig.

<sup>3</sup> DUMÉRIL (A. M. C.), *Zoologie analytique, ou Méthode naturelle de Classification des Animaux*, Paris, 1806, 8vo.

<sup>4</sup> LAMARCK (J. B. DE), *Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, etc.*, Paris, 1815–1822, 7 vols. 8vo.; (Sec. édit. augmentée de notes par MM. DESHAYES et MILNE-EDWARDS), Paris, 1835–1843, 10 vols. 8vo. — His *Cours de Zoologie* is also important.

<sup>5</sup> OKEN (LOR.), *Lehrbuch der Naturgeschichte*, Weimar, 1816, 2 vols. 8vo. — *Allgemeine Naturgeschichte*, Stuttgart, 1833–1842, 14 vols. 8vo. fig.

<sup>6</sup> GOLDFUSS (G. A.), *Handbuch der Zoologie*, Nürnberg, 1820, 2 vols. 8vo.

<sup>7</sup> SCHWEIGER (A. FR.), *Handbuch der Naturgeschichte der skelettlosen ungegliederten Thiere*, Leipz. 1820, 8vo. One of the most valuable text-books of that period. It is full of original observations.

<sup>8</sup> At the time Cuvier characterized the Acalephæ as a distinct class among Radiata in the first edition of the *Règne Animal*, published in 1817, the great

French naturalist included among them the Actiniæ, now generally referred to the class of Polypi. To this class he himself removed them in the second edition of that important work. It is a remarkable circumstance, that no advance was made towards a natural classification of the Acalephs from the days of Aristotle to the period when Savigny, Schweiger, Cuvier, and others attempted to improve our knowledge of the lower animals. In the first edition of the *Règne Animal* we find the same distinction introduced among the Acalephs, between the free and the fixed Acalephs, which Aristotle had adopted; whilst a number of animals which must be united with the Acalephs are still left among the Polyps, as they were centuries before. From the beginning, then, the class of the Acalephæ was far from being circumscribed within natural limits; and we shall presently see, that it has required the indefatigable investigations of some of the ablest observers for about a century, before the natural affinities of the animals belonging to this class were fully appreciated. It is one of the most instructive lessons for a student of nature to trace the gradual progress of the discoveries which have led to the views now prevailing respecting these animals, as they involve discussions upon all the fundamental principles of Zoölogy. Instead, therefore, of giving only the results of my own studies of the Acalephs, I will attempt, in this work, to trace also this successive growth of our present knowledge, with the special view of teaching the young naturalists of America how to proceed in their own researches.