and swims as formerly when restored to a proper degree of warmth.

Spallanzani travelled through Switzerland and the Gri sons in the year 1779, after which he went to Geneva, spending a month with his friends, by whom his conversation was not less admired than his masterly writings. In the year 1780 he published, in two volumes quarto, his “ Dissertazioni di Fisica Animale e Vegetabile,” in which heun folded the secrets of the interpretation of two very intricate phenomena, concerning the economy of animals and vege tables. To this study he was led, from some experiments made by him upon *digestion;* and he repeated the experiments of Reaumur on gallinaceous birds, remarking that the trituration which in this case is favourable to digestion, could not be a very powerful means. He perceived that the gizzard of those birds, by which the stones of fruit are pulverized, did not digest the powder thus formed ; it being necessary that it should undergo a new operation in the stomach, previous to its becoming chyle for the production of the blood and other humours. This subject may be regard ed as one of the most difficult in physiology, because the observer is always under the necessity of finding his way in the midst of darkness : the animal must be managed with care, that the derangement of the operations may be avoid ed ; and when the experiments are completed with great labour, it is requisite that the consequences be well distinguished. In this work, Spallanzani analyses facts with scrupulosity, in order to ascertain their causes with certainty ; comparing nature with his experiments, in order to form a correct judgment respecting them ; laying hold of every thing essential to them in his observations, and measuring their solidity by the increase or diminution of supposed causes. John Hunter appears to have been greatly hurt by this work ; and in the year 1785, he was induced to publish “ Some Observations upon Digestion,” in which he throws out some bitter sarcasms against the Italian naturalist. Spallanzani took ample revenge by publishing this work in the Italian language, and addressing to Caldani in 1788, “ Una Lettera Apologetica in Risposta alle Osservazioni del Signor Giovanni Hunter.” Here he exposed with great moderation, but at the same time with logic which nothing could resist, the mistakes and errors of the British physiologist.

The generation of animals and plants is discussed in the second volume of his Dissertazioni ; where, by experiments as satisfactory as surprising, he proves the pre-existence of germs to fecundation, shewing also the existence of tadpoles in the females of five different species of frogs, insalaman ders, and toads, before their fecundation. He likewise re counts the success of some artificial fecundations upon the tadpoles of those five species, and even upon a quadruped.

In the year 1781, he took the advantage of the academical vacation, for the purpose of making a journey, in order to add to the cabinet of Pavia. In the month of July he set out for Marseilles, where he began a new history of the sea, which presented him with many new and curious facts on numerous genera of the natives of the ocean. He went also to Finale, Genoa, Massa, and Carrara, to make observations on the quarries of marble, held by statuaries in such estimation. He then returned to Spezzia, and brought from thence to Pavia a vast number of fishes, which he deposited in the cabinet of that city, wholly collected by himself. With the same view and success he visited the coasts of Istria in 1782, and the Apennine mountains the subsequent year, taking notice of the dreadful hurricanes, and the as­tonishing vapours by which that year became so noted in meteorology. The emperor Joseph, on examining this cabinet, presented Spallanzani with a gold medal. In 1785, he was offered the chair of natural history by the university of Padua, vacant by the death of Antonio Vallisnieri ; but in order to prevent his acceptance of it, his salary was

doubled by the archduke, and he went to Constantinople with Zuliani, who had been appointed ambassador from the Venetian republic. He set out on the 21st of August, and on the 11th of October reached the Turkish metropolis, where he remained during eleven months. His attention was fixed by the physical and moral phenomena of this country, which were new even to Spallanzani. He wandered along the borders of the two seas, and ascended the mountains in the vicinity ; he paid a visit to the island of Chalki, discovering to the Turks a copper mine, the existence of which they had never once conjectured. In the island of Principi, not far from Constantinople, he discovered an iron mine, of which the Turks were equally ignorant.

A voyage by sea was undoubtedly the safest, but the dangers to which he would be exposed by land were regarded as nothing when contrasted with the idea of being beneficial to science and to man. Having reached Bucharest, Mauroceni, the friend of science, received Spallanzani with marks of distinction, presented him with many rarities which the country produced, and supplied him with horses for travelling, with an escort of thirty troopers, to the confines of his own dominions. The philosopher passed by Hermanstadt in Transylvania, and on the 7th of December 1786, reached Vienna, where he remained during five days, and had two long conferences with the emperor. He was much esteemed by the nobility of that city, and respectfully vi­sited by many literary characters. When he arrived at Pa via, the students advanced from the city-gates to meet him, and testified their joy at his return by repeated acclamations. He was almost instantly drawn to the auditory, and compelled to ascend the chair from which he had been accustomed to deliver his fascinating lectures ; but in the midst of these demonstrations of joy and shouts of applause, he requested them to indulge him with that repose in his own house which was now so absolutely necessary. His students this year exceeded 500.

The reputation of Spallanzani was sufficiently brilliant to excite envy and detraction. His discoveries were too original and solid to be successfully disputed ; but some of those who could not rival his successful ingenuity, began to call in question his integrity in the management of the museum at Pavia. A judicial investigation completely established the purity of his character ; and it must be mentioned to his honour, that he had the fortitude to forget this event. His enemies in general confessed their mistake, renounced their unprovoked animosity, and still hoped to regain a friendship of which they had proved themselves so unworthy.

In 1792 he published at Pavia, in 6 vols. 8vo, his “ Viaggialle due Sicilie, ed al alcune parti dell’ Appennino.” Here we meet with what may be denominated a new volcanology. We are instructed how to measure the intensity of volcanic fires, and almost to touch the particular gas which tears those torrents of stone in fusion from the bowels of the earth, and raises them to the top of Mount Etna. This delightful work is closed by some important inquiries into the nature of swallows, the mildness of their dispositions, the rapidity of their flight ; discussing the celebrated problem respecting their remaining torpid during the winter seasonproving that artificial coId, much more intense than what is ever naturally experienced in our climates, does not reduce these birds to the torpid state.

Things apparently impossible were discovered by Spallanzani. In the year 1795 he made one of this description, which he gave to the world in his “ Lettere sopra il Sospetto di un nuovo Senso nei Pippistrelli.” In that work we are informed that bats, deprived of sight, act with the same precision in every instance as those which have their eyes ; that they shun in the same manner the most trivial obsta cles, and also know where to fix themselves when their flight is terminated. Several philosophers confirmed these