Mr. Brodie had formerly observed in dogs poisoned by arsenic, a very copious secretion of mucus and watery fluid from the coats of the stomach and intestines, and so rapidly excited, that he conceived this to be a favourable instance for observing the effect of dividing those nerves which supply the stomach.

He consequently divided the nerves of the eighth pair, with the accompanying sympathetic nerves in the neck of a dog, and immediately afterwards inserted ten grains of arsenic into a wound in the thigh. The symptoms which usually appear from the poison of arsenic were soon produced; but though the dog lingered under this treatment three hours and a half, none of that watery mucus observable in other instances of death by arsenic was found in the stomach and intestines, though both stomach and intestines were found much inflamed.

In a second experiment, during nine hours that the dog lingered under the effects of the arsenic applied also to a wound, no such secretion had taken place.

In the third instance, the dog was made to swallow a solution of arsenic, with the same result, after he had lingered three hours.

Since in the preceding trials, respiration was disturbed in consequence of the injury done to the nerves supplying the thorax, a fourth experiment was made by dividing the lower branches of the eighth pair after their passage through the thorax, where they appear in the œsophagus, just above the cardiac orifice of the stomach. In this mode of operating the respiration was not affected; but still the symptoms and visible effects of the arsenic were the same as before, without any fluid evacuations from either the stomach or intestines.

From these experiments, the author thinks it hardly possible to avoid the conclusion, that the suppression of these secretions was owing to the division of the nerves; and that the secretions from the stomach, in general, must be much under the controul of the nervous system. But it appears premature to deduce any conclusion respecting their influence over other secretions.

On a fossil human Skeleton from Guadaloupe. By Charles König, *Esq. F.R.S. In a Letter addressed to the Right Hon. Sir* Joseph Banks, *Bart. K.B. P.R.S.* Read February 10, 1814. [*Phil. Trans.* 1814, *p.* 107.]

The skeleton described in this letter was contained in a mass of stone nearly two tons in weight, brought home by Sir Alexander Cochrane, and presented by the Admiralty to the British Museum. The existence of such skeletons had been mentioned by General Ernouf, in a letter to Faujas St. Fond, published in the fifth volume of the *Annales du Museum;* and also by Lavaisse, in his *Voyage à la Trinidad.* The block brought home by Sir Alexander Cochrane agreed very correctly with the description given by General Ernouf, measuring 8 feet by $2\frac{1}{2}$, having very much the appearance of a huge nodule separated from a surrounding mass, without any marks of a

tool, excepting a few holes that had evidently been made to assist in raising it. The situation of the skeleton in the block was so superficial, that it had probably been discovered by the projection of a part of the left fore-arm. Nevertheless, the operation of laying the whole open to view, with all the care that was requisite for its preservation, was attended with very considerable difficulty, on account of the excessive hardness of the stone adjacent to the bones, and the comparative softness of the bones themselves.

Unfortunately the skull is wanting; and the author, with much reason, regrets the loss of this characteristic part, which by its form might have thrown some light on the period when it was deposited, or at least as to the nation to whom the individual belonged. The vertebræ of the neck are also lost along with the head; the thorax bears marks of violent compression. The seven ribs of the left side are complete, but dislocated. Those of the right side are all broken; and their extremities are found on the left side of the spine. Such parts of the arms and legs as remain, are found in their natural position; but many are entirely wanting, and most are broken, or otherwise imperfect.

The bones are thought to have acquired a degree of hardness since their first exposure, though still far inferior to that of the surrounding stone. A small portion of one of the bones examined by Sir Humphry Davy was found to contain a part of its animal matter, and the whole of its phosphate of lime. The rock in which they are imbedded consists of a calcareous sand, firmly agglutinated. Some of the grains appear to be portions of compact limestone; others are particles of zoophytes; some white, others yellowish; and many which are red in various degrees appear to be fragments of *Millepora miniacea*. Some shells are also found, but in no great number; one of them much resembles *Helix acuta* of Martin; and another is a Turbo, the species of which is not yet determined. The only bony substance observed beside the skeleton itself, has a concentric laminated structure, and appears to be part of a tusk, but from what animal cannot be ascertained. There are also here and there a few specks of a black substance that has the properties of charcoal.

By the workmen employed in exposing the skeleton, the stone is thought to be harder than statuary marble, by the degree of impression made by their saw or chisel. Its formation appears to be similar to that of common sandstone, only that the grains of which it is composed are calcareous, and have in some parts become confluent, particularly in the parts adjacent to the bones, and in these parts Dr. Thomson has found traces of phosphoric acid. From all the circumstances, it is pretty evident that the injury which the bones have sustained has occurred subsequently to their deposition, and before the sand in which they lie had concreted into the present stony substance.

With respect to the period at which this may have happened, the author thinks it impossible to pronounce with decision. It may be of very recent formation, but there is nothing which necessarily im-

plies it to be so. The presence of animal matter is by no means conclusive; since bones from the plaster quarries at Paris still contain it.

Unfortunately, our geological knowledge of Guadaloupe is yet too imperfect to assist in determining this question. The only positive information being, that the bed in which these skeletons are found is nearly an English mile in length, and that it is covered by the sea at high water.

A new Method of deducing a first Approximation to the Orbit of a Comet from three Geocentric Observations. By James Ivory, *A.M. Communicated by* Henry Brougham, *Esq. F.R.S.* Read February 17, 1814. [*Phil. Trans.* 1814, *p.* 121.]

Although it be true that three geocentric observations are really sufficient for determining the parabolic orbit of a comet, as well as the elliptic orbit of a planet; the latter problem is far the easier, because we can select those positions of a planet from which its heliocentric places are found without any intricate calculation: but with regard to comets it is far otherwise. Since their appearance is unexpected, we are under the necessity of drawing our inferences from those positions in which they may happen to present themselves; and it is generally extremely difficult to deduce, with accuracy, their heliocentric positions from observations necessarily confined to a small part of their orbit.

In order to obtain an approximate solution, Sir Isaac Newton considered a small portion of the orbit as a straight line, the projection of which on the plane of the ecliptic will be also straight, and the parts of each will bear the same proportion to each other as the intervals of observation. But three observations alone leave the problem indeterminate; and though when four observations are employed the problem is generally determinate and easily solved, it is also often indeterminate even when four are employed.

In general it may be said that no solution is free from this imperfection, in which the velocity in the orbit does not enter as a principal condition, as in the methods of Boscovich, Laplace, and Legendre. But in that of Laplace, the first and second differential coefficients of longitude and latitude can be obtained but imperfectly, and only by interpolation; and in that of Legendre his formulæ are complicated, and the number of equations that require to be solved render it ill adapted for general use.

The object of the present paper is to give a new solution of the problem, which, in the author's estimation, is at least as accurate as any former method; and in practice, he thinks, as commodious as the nature of such a calculation can well admit.

After detailing the particulars of this method, which from its nature cannot admit of abridgement, the author gives various instances of its successful application in discovering the orbits of the comets of 1769, 1781, and two comets of 1805, from observations selected by Legendre for the same purpose; and he shows, by comparison of his