

The oxide of lead, which had been deprived of its arsenic acid by the potash, was then dissolved in nitric acid, and precipitated by sulphate of soda in the state of sulphate of lead, from which the quantity of lead in the ore proved to be $69\frac{3}{4}$ per cent.

Mr. Gregor has found only one specimen in which the proportion of lead to the acid was materially different. In this instance the oxide of lead was 71.45, and the acid 23.88, instead of being, as before, $69\frac{3}{4}$ and $26\frac{1}{4}$.

Beside these ingredients, the ore also contains a portion of muriatic acid; and the author has also detected small but variable proportions of iron and silica.

The quantity of muriatic acid was ascertained by solution of the ore in nitric acid, and precipitation as usual by nitrate of silver. But Mr. Gregor found it necessary to take certain precautions; for if the solution be made with much heat, part of the muriatic acid is lost by boiling; and if the solution be too concentrated, an arseniate of silver is precipitated along with the muriate, and will then require to be separated, either by solution of it in nitric acid, or by means of its insolubility in pure ammonia, which dissolves the muriate.

In order to determine decisively the nature of the principal acid present in this ore, Mr. Gregor decomposed a portion by sulphuric acid, and, after evaporation of the fluid poured off, reduced a part of the acid upon charcoal. Part was dissolved in water, and precipitated titanium from sulphate of titanium; part was neutralized with soda, and occasioned a brick-coloured precipitate from nitrate of silver, and a reddish yellow precipitate from nitrate of mercury.

From the whole of the experiments detailed in the paper, the author concludes that 100 parts of the ore contain 69.76 oxide of lead, 26.40 arsenic acid, 1.58 muriatic acid; and that the silica and oxide of iron are not essential to its composition.

An anatomical Account of the Squalus maximus (of Linnæus), which in the Structure of its Stomach forms an intermediate Link in the Gradation of Animals between the Whale Tribe and Cartilaginous Fishes. By Everard Home, Esq. F.R.S. Read May 11, 1809. [Phil. Trans. 1809, p. 206.]

The fish described in this account was caught in a herring-net at Hastings, from whence such parts as were more particularly deserving of notice were brought to London for further examination.

It was a male, thirty feet six inches long, and nine feet broad, from the tip of the dorsal fin to the middle line of the belly.

The skin was of a light slate-colour, and though as rough as a new file in the direction from the tail to the head, yet as smooth as satin in the opposite direction.

The mouth was about five feet wide, with six rows in each jaw of small conical teeth, rather curved inwards.

The nostrils were placed on the edge of the upper lip.

The eyes very small, with pupils perfectly round.

Half way between the eye and the gills was an orifice and canal leading to the mouth. The gills five in number on each side.

The fins, and also their situation, are particularly described.

Adjacent to the anal fins are placed two holders for the purpose of grasping the female, terminated by a flat, sharp, bony process five inches long, which moves on a joint, and is, in fact, the termination of a series of parts corresponding to the pelvis, femur, tibia, and foot of quadrupeds.

The pectoral fins also correspond in some measure to the anterior extremities, and are connected by cartilages, which answer the same purposes as the scapulæ and sternum of quadrupeds.

The heart was not larger than that of a bullock, with three valves at the origin of the pulmonary artery, three at the entrance of the aorta, and also two sets more, of three each, in the course of the artery, at a short distance from each other.

The stomach contained several pails full of pebbles, a quantity of mucus, and a small portion of substance that looked like the spawn of the oyster.

Beside the cardiac and pyloric portions of the stomach observable in other sharks, there was a globular cavity communicating with the pyloric portion by a very small orifice, and by another, equally small, with the intestine.

The liver of this fish yielded about three hogsheads of oil. The vessels of the liver were large enough to admit a man's arm. The bile is conveyed direct to the intestine by twelve hepatic ducts, for there is no gall-bladder.

Although the *Squalus* here described resembles, in many respects, the tribe of Sharks, it is observed to differ essentially in the form of its stomach, which is intermediate between that of the shark and whale.

In the modes of generation, also, as well as in the stomachs, a series of gradations may be observed from whales through the *squalus*, sharks, rays, and skates, to the proper fishes; but this inquiry will form the subject of a future communication.

Mr. Home closes the present account by such particulars as he could collect concerning a large fish thrown ashore on one of the Orkneys, and described as a sea-snake by those who had seen it half putrid and half devoured by sea-fowl; but it was ascertained by Mr. Home to be in reality another specimen of the same *Squalus* as that above described.

On an Improvement in the Manner of dividing astronomical Instruments.
By Henry Cavendish, Esq. F.R.S. Read May 18, 1809. [*Phil. Trans.* 1809, p. 221.]

The use of the common beam-compass for dividing having been justly objected to, on account of the danger of bruising the divisions which have been made, by replacing the points of the compass into