lated as store for future growth, and returned from its reservoirs into the circulation, it may be difficult clearly to discover anything certain; but the author has not ceased to prosecute his experiments on the varying density of the alburnum, and other parts of the wood, and on the proportion of moisture which they lose by drying; and he hopes at some future time to lay before the Society his observations, showing how far the durability of the heart wood depends on the period at which a tree is felled.

On the Manufacture of the Sulphate of Magnesia at Monte della Guardia, near Genoa. By H. Holland, *M.D. F.R.S.* Read June 13, 1816. [*Phil. Trans.* 1816, *p.* 294.]

The site of this manufactory is about eight miles N.W. of Genoa, at about 1600 feet above the level of the sea, from which the top of the mountain is five miles distant, and elevated about 2000 feet. The ascent from Sestri is by a deep ravine, the course of a torrent, the eastern side of which is composed of serpentine in vast masses, lying unconformably on primitive schist, and containing talc, steatite, asbestus, and many small veins of pyrites. On the western side of the ravine are mountains of magnesian limestone. In passing to the upper end of this ravine, the stratification of the primitive schist appears mixed with chlorite, slate, and other magnesian minerals, and containing numerous veins or layers of pyrites, both of copper and iron. The substance of these ores is schistose, as well as the rock in which they lie, and they are so intimately mixed with the same magnesian minerals, as to feel unctuous to the touch. These, together with a certain portion of magnesian limestone, are the materials used in the manufacture of the sulphate of magnesia, in an establishment originally set up for converting copper and iron pyrites into sulphates of those metals.

The sulphate of magnesia was at first observed only as an accidental product, but has now become the principal object of the work. For this purpose the pyrites is extracted from the mountain by tunnels, the largest of which is about 200 feet in length, and from 10 to 15 feet wide. The ore is then broken into small pieces, roasted for about ten days, and being then collected in heaps, is kept moist with water for several months, during which the salts are forming. The materials are then lixiviated, and after the liquor has been filtered through sand, the copper is first precipitated by refuse iron, after which a portion of lime, prepared from the magnesian limestone of the adjacent mountain, is added, in order to precipitate the iron, and at the same time to make some addition to the product of sulphate of magnesia.

The circumstance particularly to be attended to in this process, is the proportion of lime employed, which in general does not exceed $\frac{1}{100}$th of the weight of ore. For if this were added in excess, it would occasion the precipitation of the magnesia along with the metals. The whole produce of this manufactory, we are told, does

not exceed $1\frac{1}{2}$ cwt. per week; but it is of very good quality, and is used extensively in Italy under the name of Sal Inglese.

On the Formation of Fat in the Intestine of the Tadpole, and on the Use of the Yolk in the Formation of the Embryo in the Egg. By Sir Everard Home, *Bart. V.P.R.S.* Read May 23, 1816. [*Phil. Trans.* 1816, *p.* 301.]

From the smallness of tadpoles in this country, they have not attracted the notice of naturalists so much as their peculiarities deserve. But those of the *Rana paradoxa* of Surinam being of a much larger size, are fitter subjects for observation. The tadpole of this frog bears so strong a resemblance to a fish, that it is commonly sold as such for the use of the table. But as these are not to be had here in sufficient quantity for examination, the author had recourse to the common tadpole of this country.

This animal, as soon as it leaves the ovum, has ten filaments projecting from the neck on each side, which answer the purpose of gills. In the young shark, while yet in the egg, there are twenty-four similar filaments to answer the same purpose. In the common newt also is a similar apparatus, but the number is only three on each side. In each instance this structure is but temporary, and drops off when the permanent structure of lungs in the frog, and of gills in the shark, is completely formed.

During the growth of the tadpole its abdomen becomes distended, the intestine being then very capacious, and filled throughout its whole extent with a soft substance, that burns with a vegetable smell. Behind the intestine, along the posterior part of the abdomen, is accumulated a quantity of fat of a yellow colour, inclosed in long thin transparent membranous bags. During the conversion of the tadpole into the frog by development of the legs, lungs, and other organs before wanting, the whole of this fatty matter becomes absorbed, in the same manner as the yolk of the hen's egg is taken up during the progressive growth of the young chicken. So that although the egg of the frog differs from that of other animals of the same class in having no yolk, a substance corresponding to it appears to be necessary previous to the formation of bones, and other more solid parts of the perfect frog. For the production of this matter, it is observed that the tadpole is provided with a most uncommon length of intestine, which contracts to one of ordinary size as soon as the full supply of fat is generated.

The author adds the result of various chemical experiments, made by Mr. Hatchett and Mr. Brande on the spawn of the frog, from which it appears, that it is of a nature between gelatin and albumen; that it contains no concrete oil like that of the hen's egg; that the ova of the lizard and snake, and of cartilaginous fishes, have, on the contrary, yolks which do contain a concrete oil, that in its nutritive qualities corresponds to the butyraceous part of milk with which the young of viviparous animals are supported for a certain time after birth.