sorption are performed. A semi-fluid matter, possessing all the characters of albumen, is found closely adhering to the inner coats of the small intestine; and is more especially abundant around the papillary projection, through which the common duct of the liver opens into the duodenum, and diminishes in quantity as we trace it towards the termination of the ileum. The great intestines are generally distended with a dark green homogeneous fluid, containing no albumen, and apparently excrementitious. No albumen can be detected in the contents of the stomach. Hence the author infers that an absorption of some nutritious substance, which he brings forward several arguments to show must be derived from the liver, takes place from the intestinal canal in the latter months of gestation. He states that in two instances he detected the presence of a substance, similar to that which he had found in the duodenum, in the hepatic duct itself; hence he is led to the conclusion that the function of the liver in the fœtus is not confined to the separation of excrementitious matter from the blood, but that it supplies materials subservient to nutrition. That the substances existing in the intestines of the fœtus are not derived from the mouth, is proved by their being equally found in acephalous children, or where the œsophagus is impervious, as where no such mal-conformation exists.

A note is subjoined to this paper by Dr. Prout, giving an account of the mode by which he ascertained the chemical character of the substance referred to his examination; and the paper is accompanied by drawings of the intestinal tube in the fœtus.

Experiments on the Modulus of Torsion. By Benjamin Bevan, *Esq. Communicated by the President.* Read December 18, 1828. [*Phil. Trans.* 1829, *p.* 127.]

The object of the author in this paper is to ascertain the modulus of torsion in different species of wood, and also of metals, deduced from experiments on a large scale, which he conceives will furnish many useful data, applicable to practice by the mechanic and engineer. Care was taken that the specimens of wood which were the subjects of experiment were sound and dry, and free from any large knots; and their correct dimensions were ascertained by an improved kind of callipers.

To every specimen two indexes were attached; one, a few inches from the end, fixed in the clamp or vice, and the other, at a small distance from the attachment of the lever, to which the straining power was applied; and the length of the bar subjected to torsion was estimated by the distance of the points of attachment of the indexes. A pivot was fixed at the supported end of the bar, in lieu of its axis.

The author gives the following rule for finding the deflection of a prismatic shaft; namely, that it is equal to the product of the straining power into the square of the radius by which it acts, and into the length of the shaft, divided by the modulus of torsion into the fourth power of the side of the square shaft. He then gives a table of the

modulus of torsion in different woods, which he finds to vary from about 9000 to 30,000 pounds, and to follow nearly the order of the specific gravity. In the metals, the modulus of torsion is one sixteenth of the modulus of elasticity.

On a Differential Barometer. By the late William Hyde Wollaston, *M.D. F.R.S. Communicated by* Henry Warburton, *Esq. F.R.S.* Read February 5, 1829. [*Phil. Trans.* 1829, *p.* 133.]

The instrument described in this paper is capable of measuring with considerable accuracy extremely small differences of barometric pressure. It was originally contrived with the view of determining the force of ascent of heated air in chimneys of different kinds; but as its construction admits of any assignable degree of sensibility being given to it, it is susceptible of application to many other purposes of more extensive utility. A glass tube, of which the internal diameter is at least a quarter of an inch, being bent in the middle into the form of an inverted siphon, with the legs parallel to each other, is cemented at each of its open extremities into the bottom of a separate cistern about two inches in diameter. One of these cisterns is closed on all sides, excepting where a small horizontal pipe opens from it laterally at its upper part; while the other cistern remains open. The lower portion of the glass tube is filled with water, or other fluid, to the height of two or three inches; while the remaining parts of the tube, together with the cistern, to the depth of about half an inch, are filled with oil; care being taken to bring the surfaces of water in both legs to the same level, by equalizing the pressures of the incumbent columns of oil. If the horizontal pipe be applied to the key-hole of a door, or any similar perforation in a partition, between portions of the atmosphere in which the pressures are unequal, the fluid in the corresponding half of the instrument will be depressed, while it is raised in the opposite one, until the excess of weight in the column thus elevated will just balance the external force resulting from the inequality of atmospheric pressures upon the surfaces of oil in both cisterns. This excess, however, is equal only to the difference between the weight of the column of water pressing on one side, and that of an equal column of oil which occupies the same length of tube on the other side. This difference depending upon the relative specific gravities of the two fluids will, in the case of olive oil and water, be about one eleventh of the weight of the column of water elevated; but the sensibility of the instrument might be increased at pleasure, by mixing with the water a greater or less quantity of alcohol, by which the excess of its specific gravity over that of oil may be reduced to one twentieth, one thirtieth, or any other assignable proportion. The instrument may be converted into an anemometer by closing both the cisterns, and by applying to the upper part of each a trumpet-mouthed aperture opening laterally.