The cine-x-ray photos of Barclay, Franklin and Pritchard[3] suggest that in the sheep only a small fraction of the blood from the umbilical vein reaches the heart through the ductus venosus; the greater part goes through the liver reducing the pressure in the thoracic inferior vena cava to a still lower level.

Indeed the degree of openness of the sphincter of the ductus venosus[4] may be one factor which effects the pressure in the umbilical vein. However, the readings of the pressure have this property: that, in cases of approximately equal age, the lower venosus pressure is always accompanied by the higher pressure in the umbilical artery, which suggests that the explanation of the variation in pressure lies either in the degree of resistance presented by the placental vessels or the distance of the point at which the pressure is measured from the foetus.

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FUSION OF TOP SOIL BY AN ELECTRIC ARC

AN interesting and spectacular event took place during a violent thunderstorm on May 30. The point of location of this event is 4 miles east of Wooster, Ohio, in Green Township, Wayne County, Section 32, along the highway on the farm of S. S. Woods. A stroke of lightning sheared off the field wire at the insulator on a pole supporting a 3-phase, 60-cycle transmission line carrying 22,000 volts. The wire and insulator were blistered by the heat. The bare wire, a No. 2, about 5 sixteenths of an inch in diameter, approximately the diameter of a lead pencil, and supported by poles 150 feet apart, was severed at one end and dropped into a field. For a distance of 45 feet, where the wire touched the ground, the current produced a series of electric arcs. Where these arcs occurred, tremendously high temperatures were produced, such as those in an electric furnace. The loud, somewhat musical sound of variable intensity, characteristic of the electric arc, could be heard at a distance of an eighth of a mile. The brilliant, bluish white light and flames, increasing and decreasing in intensity, produced a weird effect.

The downpour of rain was accompanied by heavy flashes of lightning which produced additional voltage and increased the surges of current along the wire. The wire was severed at 12.18 P.M. and the location of the break was not discovered until 3 P.M. During this interval, nearly 2 and ¾ hours, at the point of the arc, the soil was fused into molten material. These masses of molten rock or slag were lying parallel with the wire. They cooled into round, elongate masses, having the shape of the trunk of a tree with branches extending from the main mass. The branches extended into the ground for a distance of not more than a foot. At the point of the greatest arc, the ground is baked for a distance of not more than a foot from the location of the wire. From this area, a mass of fused material, 18 inches long and 4 inches in diameter, with 4 branches more than an inch in diameter, was removed.

It is obvious that the material was in a molten condition, for it is glassy in character and thoroughly vesicular like volcanic scoria or pumice, due to the expansion of enclosed gases, mostly steam. The soil in this locality is glacial in origin, containing clay, sand, humus and occasional rocks. The ground was wet and the soil with its carbon is a good conductor. The high temperature, driving off the water and baking the soil, as well as burning out the carbon, making the ground a poor conductor, would cause the arc to extend parallel with the wire to points beyond, where the ground was wet, producing by this process an elongate structure. The forking of the arc produced the branches extending from the main mass.

There are instances where lightning has struck beach sands and produced round, rod-shaped, fused masses extending into the ground. All the specimens seen by the writer are of small diameter. It may be that the observations described here will help in the interpretation of the structures produced by lightning.

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MODERN FACSIMILE REPRODUCTIONS OF RARE TECHNICAL PUBLICATIONS

NOT infrequently basic technical publications, especially those of the older authors, are unavailable in modern libraries, and it becomes increasingly difficult to secure copies of them. Sometimes the reason is the original small edition, sometimes because the reserve stock was destroyed by accident or otherwise, and sometimes because of the very great demand for what was considered to be an adequate edition at the time the publication was issued. In any case, these rare items are always high-priced. Many of them are rarely or never quoted in catalogues of out-of-print books, yet the actual demand for them is usually insufficient to warrant one in undertaking the expense of issuing facsimile editions.

The case of Rafinesque's very numerous publications is an interesting one, and copies of his original papers are almost never offered by dealers. He was particularly productive in the decade preceding his death in Philadelphia in September, 1840, yet it is now impossible to acquire copies of the majority of

[3] *Brit. Jour. Rad.*, 15: 69.
[4] *Anat. Rec.*, 82: 398.