larger tree had its solid trunk split and twisted in the manner shown in the second photograph (Fig. 2).

The top of the tree and most of the lateral branches were broken off, and doubtless the leverage exercised by the action of the rotating wind on the boughs assisted materially in the twisting and shattering of the trunk, since it is almost inconceivable that the force exerted would be so excessive as to twist a tree trunk by direct action on the trunk itself.

The great suctional force was demonstrated by the tree which was drawn up into the air. It is clear that, if the whirlwind had happened to pass over a body of water containing fishes, a rain of fishes would have resulted. In this connexion it may be mentioned that on April 14, 1909, an authentic case of the fall of fresh-water fishes occurred at Newcastle, Natal.

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The Oogenesis of *Lumbricus*.

THE current number of the *Quarterly Journal of Microscopical Science* contains an interesting paper by Dr. Vishwa Nath on the vexed question of the oogenesis of the earthworm (*Pheretima*, in his case).

After having gone over the earthworm oogenesis again, we agree with practically everything Dr. Nath has written. However, we have found a 'vacuolar system' as well. Dr. Nath states that "Vital dyes, namely, neutral red and janus green B, have been extensively used [by him] in the form of very thin watery solutions, but they do not in any way improve the appearance of the egg. . . ." Dr. Nath, Mr. Harvey, and the senior writer have previously overlooked the 'vacuolar system', but if the ovary is left for about an hour in neutral red Ringer (pink solution) a fine system of red globules stains up. We have no doubt that if Dr. Nath tries longer periods he will also find these globules.

Now there can be no doubt that there is a real vacuolar system in mammals, molluscs, and insects, for in certain cases it can be seen without staining, or in directly fixed tissues (Kolatschew). But these globules in the germ cells of earthworms take a much longer

time to stain (or appear). In coelomic epithelial cells (Fig. 1, A), however, they appear quickly, and certainly resemble the 'vacuome' of molluscs. We could not satisfy ourselves that the globules were present in *Lumbricus* cells, *intra vitam*, without staining, or after osmic acid. It does not seem possible entirely to dismiss the idea that these globules might be segregation vacuoles and not pre-existing structures. Possibly many neutral red staining globules are segregation vacuoles and have been confused with the neutral red vacuoles of such animals as *Abraxas* and *Cavia*, where there is, before staining, a definite pre-existing aggregation of globules. We have also succeeded in staining a 'vacuome' in nerve cells of *Lumbricus*.

One point we should like to stress. These vacuoles filled with neutral red dye are not related in any way to the argentophile and osmiophile bodies, which can be seen *intra vitam* in the earthworm ovary and nerve cord, and are known as Golgi elements.

The mitochondria, the neutral red globules, and the Golgi elements can be seen side by side separately (Fig. 1, B).

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Fechner's Law.

THE power of the eye to distinguish differences in brightness has hitherto been specified by the ratio $\Delta I/I$, where ΔI is the least perceptible increment in brightness when the eye is observing a surface of brightness I . Weber stated that the ratio was constant, and this statement has been known as Weber's law or Fechner's law. It was obvious to Fechner that the law did not hold for high and low intensities. But he considered that these deviations were due to disturbing factors, dazzle at high intensities, and the intrinsic light of the eye at low intensities.

In a recent paper (*Phil. Mag.*, 8, p. 520; 1929) R. A. Houstoun suggested that the reciprocal of Weber's ratio was a Gaussian probability curve when

FIG. 1.

plotted as a function of the logarithm of the intensity. We have tested this point, and a full description of the experiments will be published in due course, but we think it desirable to state here, in view of the number of physiologists and psychologists interested in the matter, that $I/\Delta I$ forms a good probability curve. The accompanying diagram (Fig. 1) shows typical sets of observations for red light, the abscissae giving logarithms of the intensity and the ordinates $I/\Delta I$. In the interests of clearness, the zero of the one curve has been displaced vertically upwards. The curves are probability curves fitted to the results. The observations for blue light agree with those for red except at low intensities, where there is a deviation if the eye is dark adapted.

It may be shown that the sensation at any intensity is proportional to the area to the left of that intensity, and that the obvious interpretation of the observations