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Movements Observed in certain Animals after Death.

By J. EMILE BONNET.

(Translated from the French.)

For a long time it has been noticed that after the death of an animal, its body is still capable of producing certain movements. This phenomenon is observed in a large number of animals, but in certain ones it exhibits more remarkable peculiarities. Let us take a frog for example. If we cut off the head of this animal with a sudden blow so as to injure its organs as little as possible, we can observe the very curious fact that its heart still continues to beat for several hours.

At the International Exposition at Paris in 1878 one could study in a physiological laboratory, several of these animals thus decapitated and could hear the beating of their hearts, at least with a microphone. One could make upon the frog a still more interesting experiment. If we take one of these batrachians, recently decapitated, and put upon its back a drop of strong acid, sulphuric for example, we shall immediately perceive one of the hind legs of the animal stretch out in an effort to rub the part burned by the acid.

What is the cause of this phenomenon? Is the frog still living in spite of its decapitation? At the first view one is inclined to reply in the affirmative, and certain physiologists of acknowledged proficiency think that the animal actually lives several seconds after decapitation, for, they say, we cannot admit that an animal that makes efforts to carry relief to a wound is altogether deprived of life.

This, however, is nothing. The decapitated frog is quite dead and we must seek for some other cause for these movements than the survival of life. Let us distinguish first between the two examples which we have given and examine in the first place the second. Every one knows that there exists in the superior animals two kinds of nervous movements: First, the cerebro-spinal movement which receives impressions from without and transforms them into action. This is the nervous system of conscious life. It has its centre in the brain. Second, the grand sympathetic system which produces the automatic movements (digestion, circulation, etc.) This is the nervous system which is charged with the movements of organized life. It has its centre in a union of ganglia placed in the neighborhood of the stomach called *solar plexus*.

But in our second hypothesis the cerebro-spinal system is completely separated from its centre, while the grand sympathetic system is dependent upon its own. There is then nothing astonishing in this last instance; and it is precisely that which explains move-