

the first few moments. This latter phenomenon should, in my opinion, be attributed also to anæmia, as this is the immediate result of nerve section.

The celebrated experiments of MM. Cl. Bernard, Vulpian, and others have demonstrated, that in the muscular nerves there are vaso-motor branches, the excitation of which produces a complete anæmia of the muscles, while their section causes a hyperæmia and increase of temperature. But we have, as a first result of the section, a mechanical excitation of the nerve.

That the anæmia is the cause of increased irritability of the muscles, I have proven by the following experiments :

1. After compression of the aorta or ligating the artery of a muscle, we cannot produce any augmentation of the irritability after section of a nerve. This demonstrates that this augmentation depends exclusively upon the circulation, for, as I say, the circulation once interrupted, the section of the nerve is without effect.

2. In curarizing an animal to the stage of complete paralysis, we always find an increase of muscular irritability following the section of the nerve. Here evidently, only, the vaso-motor nerves can act, since, as has been demonstrated, they are not easily paralyzed by curare.

Anæmia, therefore, like certain affections of the nervous system that disorder the functions of the vaso motors, should increase the muscular irritability, a fact observed clinically, but not as yet sufficiently demonstrated theoretically.

TERMINATION OF NERVES IN THE VOLUNTARY MUSCLES.—At a recent session of the Acad. des Sciences, Paris (rep. in *L'Union Médicale*, Nov. 9), M. Tschiriew offered the following communication in regard to the nerve terminations in the striped muscles.

The termination of the nerves in the striped muscles has been the subject in recent times of numerous investigations, which, in spite of their interest, have not as yet given us complete light upon the subject. It has been thought, indeed, for example, that the terminations of the sensory nerves in the muscles have been found, but this discovery due to defective investigations cannot be considered as exact. Besides, all the efforts to find the intermediate forms between the terminations *en plaques* and the motor terminations in the frog have been so far without success.

"The procedure of staining the nerves with the chloride of gold, recently communicated by M. Ranvier, having supplied me with an excellent and certain method for the study of the nerve terminations, I undertook a series of researches that have yielded me some new results, which I have the honor to detail.

1. "The non-medullated nerve fibres found in the smooth muscles of the frog, such as the thoracic cutaneous muscle, and what have been considered hitherto as sensory fibres, do not appertain to the muscle, properly speaking, but to its aponeurosis. These fibres, coming from the intra-muscular nerves, form in the aponeurosis a large-meshed net-work. Their terminations are similar to the nerve terminations in the cornea.

"It is evident from their microscopic structure as well as from their anato-

tomical relations, that these nerves of the aponeuroses ought to be considered as centripetal nerves from the muscle. The need of admitting the existence of these nerves has been demonstrated in a physiological memoir I recently published on the *origin and signification of the knee phenomenon and other analogous phenomena*.

"Nerve fibres similar to those, the existence of which in the frog I have noticed, have been detected also in the aponeuroses of other animals.

2. "I have found it quite impossible to determine in the dissociated muscles of the frog, and of some other species of animal (tortoise, frog, lizard, snake, and rabbit), the presence of non-medullated fibres, other than those that appertain to the vascular or aponeurotic nerves, and the presence of terminations other than motor terminations.

3. "I have, on the other hand, been able to find in many species of animals new forms of nerve terminations which constitute the intermediate forms between the motor terminations, such as we see in the frog, and the end plates. I have found these in the tortoise, the triton, the salamander, the lizard, and the serpent. In the three first named these are the only terminations I could find, while in the lizard and the serpent I met with them together with the end plates, especially in young muscular fibres.

"The simplest form of these terminations is seen in the tortoise; non-medullated nerve fibres ramify without anastomosing and terminate in the muscular bundles by stems that are sometimes smooth, but which are more frequently moniliform or surrounded by granulations strongly tinged by the gold. These granulations, which are disposed around the terminal stems, are sometimes so numerous that they form, as a whole, a resemblance to the terminal arborization of a little motor end plate.

"These new forms of nerve terminations all present this peculiarity, that they are only found in non-medullated nerves, although the latter always come from medullated nerves. In the snake the non-medullated fibres may run a long distance.

"In cases where the nerve ends in the muscle by a well developed plate, we never observe more than one such for each muscular fibre; when, on the other hand, we meet with the terminations I have described, we generally find many nerves ending on the same muscular fibre, and in the snake there may be as many as six or seven."

A more detailed memoir with illustrations will shortly be published.

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INFLUENCE OF PHYSICAL AGENTS ON THE PERIPHERAL NERVES.—At the session of the Soc. de Biologie, Oct. 19 (rep. in *Gaz. des Hôpitaux*), M. Onimus offered the following communication:

Mechanical excitations and thermic agents often give the same results as metallic applications in hysterical cases, that is to light currents of electricity. This shows very clearly that in all the modifications of hemianæsthesia in achromatopsia and contracture, we have principally to do with molecular changes in the peripheral nerves.

A simple shock, or more exactly, very frequently repeated and short vibrations may also cause the same modifications of the peripheral nerves in cases of hysteria. The lesion appears, therefore, to be solely a sort of benumb-