serum of each rabbit studied. The tubes were incubated for one hour at 37°C. and read for "rings" at the interface of the fluids. The fluids were then mixed, incubated a second hour at 37°C., placed in the cold for 24 hours, and examined for precipitate.

It was found in these tests that only those animals which harbored the mites possessed demonstrable serum precipitin against an extract of the mite protoplasm. The serum of the uninfested rabbits gave no reaction with the mite extract. It is indicated, therefore, that infestation with this ectoparasite gives rise to a specific antibody in the blood of the infested rabbit.

In the light of this finding, it seems possible that the sloughing of the affected skin is essentially an Arthus reaction, resulting when the specific antigen of the mite saliva is introduced into the sensitized animal as the parasites bite in many places over a limited area. It is generally believed that the slough is a dried deposit of serum exuded from the area injured by the mites.

8044 P

Electrical Stimulation of a Nerve Muscle Preparation Without Contact.

RICHARD M. BRICKNER AND ROYAL E. GRANT. (Introduced by N. Kopeloff.)

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A method has been devised by which it is possible to stimulate a nerve-muscle preparation from a frog without contact between the tissue and the electrode.

The essential principle of the method is the placing of the nerve in the vicinity of, but insulated from, an induction coil. The coil is supplied with energy by an oscillator and suitable amplifier. The preparation is arranged in connection with a kymograph in the usual manner.

Two different exciting coils have been employed thus far. Each is wound with insulated copper wire upon a bakelite bobbin and in each the windings are infiltrated with bee's wax. Each is entirely enclosed in a bakelite case. The body of each contains a lumen, running horizontally through its center from end to end, large enough to admit the sciatic nerve of a frog. In the smaller of the

coils (coil 1) the lumen is lined with bee's wax. In the larger coil (coil 2), the lumen is large enough to hold a glass tube, into which the nerve is inserted. Coil 1 has about 500 turns of wire and coil 2 about 700. In coil 1 the minimum distance between the nerve and the nearest wire is about 1 mm.; in coil 2 it is about 2 mm. It will be seen that, in coil 1, nerve and wire are separated by bakelite and wax, and, in coil 2 by bakelite and glass. It has been found that good contractions could also be obtained with either coil, without inserting the nerve into the lumen at all, but by threading the nerve through a glass tube and strapping the tube across the bakelite front of the coil with tape. With this modification there is a distance of at least 3½ mm. between the nerve and the nearest wire: Precautions have been taken to protect the preparation from parasitic currents and from leakage. The generating unit can supply up to 150 milli-amperes to the exciting coil at the lowest frequencies. The frequency range is from 1 to 17,000 cycles per second. The field strength of the exciting coils has not, as yet, been measured.

With different specimens, and under various conditions, good contractions have been obtained at frequencies ranging from 100 to 1,000. Tetanus can be produced with single stimuli at frequencies usually between 500 and 1,000, or by gradually increasing the frequency while the current is running.

Although measurements of field strength have not been made thus far, it is plain from gross observations that the electromagnetic field is a fairly strong one. The strength of the electrostatic field is also still unknown to us. Up to the present it has not been possible to make observations sufficiently refined to enable us to tell how much of the effect is due to magnetic and how much to static stimulation, nor to enlighten us about the varying effect of changing conditions of all sorts. This communication is a statement of our first experimental results. A great deal of additional study is required before accurate interpretations can be made. It is hoped that further developments of them can be reported later. Experiments are being commenced to test out these and other relevant matters.

The investigation is also being continued with intact animals and with human beings.

Professor Horatio Williams has called our attention to some experiments performed 40 years ago by Professor Danilevsky. This investigator was able to produce contractions in frog nerve-muscle preparations without contact. He used a Ruhmkorff coil for stim-

ulation. His work appears never to have been developed, and to have been unfortunately lost.

This work has been conducted through the courtesy of the Department of Physiology.

8045 C

Detoxification of Amidopyrine by Sodium Amytal.

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The antidotal action of sodium amytal against convulsant drugs has been demonstrated in both animals and men.[1-4] In view of the fact that large doses of amidopyrine cause convulsions of central origin,[5] it appears interesting to ascertain whether or not sodium amytal will similarly reduce its toxicity. Evidence of antagonism between amidopyrine and other barbituric acid derivatives has already been observed by several European workers.[6, 7]

White mice numbering 272 and rats numbering 221 were employed in the present investigation. They were all starved over night prior to medication. The drugs were injected by the tail vein. It is a coincidence that amidopyrine and sodium amytal when given alone have the same toxicity. The M.L.D. (minimal lethal dose) of each was found to be 150 mg. per kg. in mice and 135 in rats—using dose increments of 5 mg., and groups of 5 animals. The determined dose killed at least 3 animals out of an injected group of 5.

In the next series of experiments, sodium amytal was added and injected together with amidopyrine, various amounts of both drugs being used. As shown in Table I, the toxicity of amidopyrine is

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[5] Edmunds, C. W., and Gunn, J. A., *Cushny's Pharmacology and Therapeutics*, 10th edition, 1934, 553.

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