8878 P

Electrophoretic Anesthesia of Skin and its Application to Intradermal Testing in Hay-fever.

HAROLD A. ABRAMSON.
From the Mount Sinai Hospital, New York City.

Although the use of an electric field to force drugs into the skin has been known for many decades, surprisingly few experiments have been performed with local anesthetics. That the unbroken skin can be anesthetized by the electrophoresis of drugs into the skin has been known for many years, but this method has not been developed in the light of the modern theory of electrolytes.

It is of interest both theoretically in connection with electrokinetic properties of the skin, and practically in hay fever, to determine if the anesthetization of a small area is without essential influence on the development of moderately or markedly positive skin reactions.

By the use of an electrode especially designed to anesthetize a large number of small areas of the skin simultaneously, it has been possible to make intradermal tests with ragweed, timothy, dust, and other inhalants without any discomfort to the patient. Anesthesia lasting sufficiently long to perform skin tests can be obtained after 10 to 15 minutes electrophoresis of (1) procaine base in alcoholic or acetone solution, (2) butyn base, (3) cocaine base, (4) procaine hydrochloride, of various concentrations. Some effect was obtained with procaine borate. Agar jellies of the foregoing anesthetics were also effective. Control tests of allergens without the anesthetic have shown with few exceptions only the variability in skin reactions usually found on comparing 2 different skin sites. In fact, because of the anesthesia, the cooperation of the patient is more than usual and the fine needle may be inserted with greater care. Of the anesthetics employed, procaine base containing a trace of alkali has given the most consistent results with current densities of approximately 0.5 milliampere.

In a few instances, moderate or marked food reactions also have been compared. The anesthesia in the cases studied thus far has not decreased or enhanced these reactions although the most emphasis has been laid on experiments with inhalants.

Incidental to the anesthetization of the small areas required for intradermal tests, an erythema may arise. This erythema does not spread. The zone of anesthesia is in most instances definitely demarcated by this zone of erythema, although an erythema can be

produced by the current and the solvent alone. Because the method has not as yet been developed to the point where an erythema can be prevented, slightly positive reactions have not been investigated, although as mentioned above, both foods and inhalants have been successfully studied when moderate or marked reactions occur.

The skin can be anesthetized by procaine base even in the presence of M/20 NaOH. Under these circumstances, practically none of the positively charged form of the procaine is present. The undissociated base must, therefore, be carried passively by electroosmosis rather than by ionic migration. In support of this point of view, that the transfer of the procaine is electroosmotic, wheals were produced when the histamine was dissolved in M/30 NaOH. It can be shown that relatively few positively charged ions are present at the pH of this system, and that this is in accord with the point of view holding that electroosmosis as well as iontophoresis (the migration of the ion itself) may be employed to introduce drugs into the skin.

8879 P

Action of Certain Chlorinated Naphthalenes on the Liver.

F. B. FLINN AND N. E. JARVIK.

From the School of Public Health, Columbia University.

Three cases of yellow atrophy of the liver have occurred in each of 3 widely separated plants and under different management within a year or two. In each instance where the illness appeared, the men were exposed to a chlorinated naphthalene heated above the melting point and giving off fumes. Yellow atrophy of the liver is a rare disease and there have been no cases reported where chlorinated naphthalene was the proven etiological agent.

The following experiments were conducted to determine if some of the chlorinated naphthalenes might produce such lesions. Three naphthalenes obtained from one of the above factories were used in this work. They are designated then as A, B, and C.

Compound A is a mixture of tri- and tetra-chlor-naphthalene. *Compound B* is a mixture of tetra- and penta-chlor-naphthalene and may contain some tri-chlor-naphthalene. *Compound C* is a mixture of penta- and hexa-chlor-naphthalene which is plasticized with a relatively small percentage of asphalt.