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THE RÔLE OF EPITHELIUM IN EXPERIMENTAL IMMUNIZATION¹

SOME twelve years ago I became impressed with the idea that the surface epithelium of the body, including the epidermis and the succulent coverings of the respiratory and alimentary canals, must have important functions in mediating between foreign material brought in contact with it and the internal tissues which it covers.²

From either a physiological or pathological point of view the surface epithelium forms the "first line of defense" of the body.

Our modicum of knowledge respecting the protective attributes of this covering embraces two certainties—that it is a mechanical barrier intervened to the passage of foreign material, especially when particulate; and that, when part of a mucous membrane, it is a metabolizing organ capable of chemically changing foreign substances in contact with it.

And yet, in the vast majority of experiments designed to elucidate the reactions of the living tissues toward such materials, these are introduced by traumatic methods avoiding the first line of defense.

An animal might conceivably live long without ever suffering a lesion through which foreign matter might be absorbed, but no mammal has ever escaped the necessity of swallowing or inhaling extraneous substances, including proteins which act as antigens when introduced as such within the body.

The following observations are concerned in no way with reactions of the alimentary canal but only with the mucous membrane of the nasal chambers.

The fact is sufficiently extraordinary that, in the healthy subject, the epithelium of the lungs and bronchi is free from microorganisms, untold numbers of which daily enter the nose. What has become of them? What chemical changes have attended their destruction? What tissue reactions have answered the absorption of such foreign proteins or their digested products?

It seems plausible that "natural immunity" might find its extraneous stimulus in such conditions of antigenic absorption.

For three years, with the invaluable cooperation of my colleague, Dr. Cuthbert Powell, I sought to outline experimentally the immunological attributes of the

¹ Chairman's address, Medical Section, Southwestern Division, of the American Association for the Advancement of Science, Boulder, Colorado, June 9, 1925.

² Sewall, H., *Archives of Int. Med.*, 1914, XIII, 856.

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