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Phenomenon of Local Tissue Reactivity to Bacterial Filtrates Elicited in Heart and Femoral Artery.

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The following report deals with an attempt to reproduce the Schwartzman phenomenon of local tissue reactivity¹ in the heart and blood vessels. The experimental procedures were similar to those employed by others in various organs in the elicitation of this immunologic response. Stock rabbits of the average weight of 2 kg were used. "Agar washings" filtrate of 24-hour-old cultures of meningococcus (strain B group 3) were employed for preparatory and provocative injections.

Schwartzman Phenomenon in the Heart. Rabbits were given single intracardial injections of the filtrate directly into the heart muscle through the epilated intact chest wall. Others received single intravenous injections of the same filtrate. The protocols of these control experiments are omitted. It was found that a dose of 0.03 cc of the filtrate diluted 1:30 produced a negligible primary tissue reaction and thus could satisfactorily serve our purpose. Various concentrations of the intravenous provocative units were always injected in a volume of 1 cc per kg of body weight. In all experimental animals submitted to the double injections a myocardial necrotizing hemorrhagic lesion was the outstanding feature at the site of preparation. This effect appeared promptly following the intravenous injection. The degree of muscle necrosis and infiltration with polymorphonuclear leucocytes were subject to individual variation. Vascular injury found constantly consisted of various degrees of venous congestion, frequently very marked, and accompanied by hemorrhage and thrombosis (homogeneous plugs, hyaline in appearance). Pyknosis, rhexis and lysis of the nuclei of the leucocytes, only rarely observed in the controls, were so pronounced in the animals receiving the combined local and intravenous injections that this further served to delineate the unique features of the phenomenon. While acute parietal thrombo-endocarditis (Fig. 1)

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¹ Schwartzman, G., *Phenomenon of Local Tissue Reactivity*, Paul B. Hoeber, New York, 1937.



FIG. 1.

Microphotograph of parietal thrombo-endocarditis and mural thrombosis in femoral artery produced in rabbit at the site of local preparatory inoculation subsequent to intravenous injection of "agar washings" meningococcus filtrate. $\times 95$.

was seen in 5 animals, valvulitis was noted only once. The latter finding must, therefore, be considered with reservation.

Shwartzman Phenomenon in the Femoral Artery. Again, the meningococcus filtrate in a dose of 0.03 cc of a dilution of 1:30 produced the same negligible primary tissue reaction as in the heart. Three rabbits were prepared peri-arterially. Three other rabbits received the preparatory injection into the lumen of the artery. All rabbits were injected intravenously 24 hours later with the same filtrate as above (1 cc per kg of filtrate, diluted 1:30). In each instance the reaction at the site of preparation was characterized by an outstanding necrotizing and hemorrhagic lesion. Overwhelming leucocytic infiltration and frequent luminal thrombosis were consistently found in both series (Fig. 1).

In 3 out of 4 animals the phenomenon was successfully elicited simultaneously in the heart and femoral artery.

Summary. To sum up, the Shwartzman phenomenon of local tissue reactivity was successfully produced in the heart and blood vessels by the use of "agar washings" filtrates of meningococcus. The hemorrhagic and necrotizing feature of the reaction together with altered vascular response at the sites of preparation were consistent findings.

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Smooth Muscle Effects of Carnosine.

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Koinaroff¹ reported that carnosine, B-alanyl-l-histidine, produced a marked increase in the tonus of isolated rabbit intestine. McClintock and Hines² confirmed this observation and also noted that

¹ Koinaroff, S. A., *Chem. Zentralblt.*, 1922, 636.

² McClintock, J. T., and Hines, H. M., *PROC. SOC. EXP. BIOL. AND MED.*, 1924-25, **22**, 515.