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**Generalized infection in syphilitic rabbits resulting from the inadequate salvarsan therapy.**By **J. BRONFENBRENNER** and **M. J. SCHLESINGER**.

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In the course of study of the spirocheticidal action of salvarsan in vitro it was observed that in very low concentrations, instead of exerting inhibiting action, salvarsan markedly stimulated the growth of spirochetes.<sup>1</sup> Later, on the bases of this observation one of us recommended the use of minute amounts of salvarsan in the medium for isolation of spirochetes in vitro.<sup>2</sup> At the same time it was suspected that introducing minute amounts of salvarsan might also stimulate the growth of spirochetes in vivo. Accordingly a number of male rabbits with experimental syphilitic orchitis as well as two infected females were treated with varying amounts of salvarsan (from 0.004 gm. per kilo down to 0.000004 gm. per kilo) and several of them developed generalized infection, whereas controls treated with large amounts (0.03 gm. per kilo to 0.005 gm. per kilo) or those left untreated showed no tendency to generalized lues during at least 14 months following the date of the experiment. In addition to the involvement of mucous membranes, skin and bones two rabbits developed keratitis. In one rabbit at the autopsy was found a gumma of the liver which was confirmed as such by several pathologists. One of the infected females lost her young twice and the progeny of the third pregnancy was distinctly inferior and all of the four young died within a month after birth.

The work reported above was carried out at the Laboratories of the Western Pennsylvania Hospital, Pittsburgh, in 1914-1916. While a brief verbal mention of these findings was made at the time<sup>3</sup> we have not thus far communicated our observations in

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<sup>1</sup> Bronfenbrenner and Noguchi, *Jour. Pharm. and Exp. Therapeutics*, 1913, 1, p. 333.

<sup>2</sup> Bronfenbrenner, *PROC. SOC. EXP. BIOL. AND MED.*, 1915, xii, p. 136.

<sup>3</sup> Address before the Medical Society of St. Louis, January, 1915.

print desiring first to confirm them on a larger number of animals. In view of the growing tendency to decrease the dosage of salvarsan in the treatment of syphilis, we feel it useful to call attention to the facts observed by us.

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**The specific electrical conductivity of the tissue fluids of desert Loranthaceae.**

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MacDougal and Cannon<sup>1</sup> and MacDougal<sup>2</sup> suggested some years ago that the osmotic concentration of the tissue fluids of the two organisms is one of the fundamental variables in the relationship between plant parasite and host. Senn<sup>3</sup> has published one plasmolytic determination indicating higher concentration in a *Viscum* than in the leaves of the host tree and has secured similar results with other phanerogamic parasites. In the Jamaican montane rain-forest the concentration of the tissue fluids of the parasitic Loranthaceae is in general higher than those of the host.<sup>4</sup> The same relationship has been found to obtain in desert Loranthaceae.<sup>5</sup>

As far as we are aware the relative electrolyte contents of the tissue fluids of parasite and host have not been determined heretofore.

In August, 1920, we had the opportunity while carrying out work for the U. S. Department of Agriculture at Sacaton, Arizona to measure the specific electrical conductivity,  $K$ , as well as the osmotic concentration in atmospheres,  $P$ , calculated from the freezing point lowering,  $\Delta$ , of the expressed sap of the leaves of the host trees and of the stems of the leafless *Phoradendron cali-*

<sup>1</sup> MacDougal and Cannon, Pub. Carn. Inst. Wash., 1910, No. cxxix, P. 3, 25-49.

<sup>2</sup> MacDougal, *Bot. Gaz.*, 1911, lii, 249-260; *Bull. Torr. Bot. Club*, 1911, xxviii, 54-55, 473-480.

<sup>3</sup> Senn, *Verhandl. Naturf. Ges. in Basel*, 1913, xc, 179-183.

<sup>4</sup> Harris and Lawrence, *Amer. Jour. Bot.*, 1916, iii, 438-455.

<sup>5</sup> Harris, *Mem. Torr. Bot. Club*, 1918, xvii, 307-315.