

note that in the majority of cases the intraspinal inoculation of rabbits results in the development of testicular lesions. The investigations of others, especially Brown and Pearce,⁴ indicate that the spirochetes migrate from the site of the testicular inoculation into the intraspinal canal and generally to the cerebrospinal system. Our experiments, however, definitely establish the fact that they travel from the cerebrospinal system to the superficial tissues, particularly the testicles.

¹ Uhlenhut, P., *Med. Klinik*, 1922, xviii, 1210, 1246.

² Noguchi, H., *Berl. Klin. Wchnschr.*, 1913, xli, 1884; Bartarelli, E., *Zntribl. f. Bakt. and Parasitenk.*, 1907, xliii, 238.

³ Plaut, F., and Mulzer, P., *Muench. med. Wchnschr.*, 1922, lxi, 1779.

⁴ Brown, W., and Pearce, L., *Arch of Derm. and Syph.*, 1920, ii, 635.

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The Antirachitic Activity of Monochromatic and Regional Ultraviolet Radiations.

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In a communication published some years ago it was shown that ultra-violet rays longer than about $324\mu\mu$ exert no antirachitic potency, and that waves $302\mu\mu$ are of great value in this respect.¹ Somewhat later we suggested, as the results of experiments with selective filters, "that the intense line of the mercury vapor spectrum $302\mu\mu$ in length conferred definite protection and that the $313\mu\mu$ waves exerted probably a feeble action in this respect."² The question as to whether antirachitic potency ceases at the $313\mu\mu$ or the $302\mu\mu$ level is of both theoretical and clinical importance, as the shorter rays are present to but a small extent and in low intensity in the solar radiations which reach the surface of the earth. This is especially the case where the rays are intercepted by moisture or smoke. It, therefore, seemed worth while to make a more minute dissection of the spectrum in this region. This has been accomplished by means of the isolation of these two lines of the mercury vapor spectrum and testing their power to activate cholesterol. The radiations were of equal intensity, and the same amounts (2.5 mg. per capita daily) of the irradiated cholesterol were fed to

rats which had been rendered rachitic. Without going into detail at this time, it may be stated that a series of experiments of this nature showed that the $302\mu\mu$ line possessed marked antirachitic potency, whereas the $313\mu\mu$ line exerted very slight specific power. This result emphasizes more strongly than ever the remarkable specificity of wave lengths of light in relation to rickets.

It has never been accurately determined whether radiations less than $290\mu\mu$, the shortest emitted by the sun, have curative power in rickets. About two years ago the shorter ultra-violet waves were segregated from the longer radiations by means of a filter containing chlorine and bromine, which, however, allowed the passage of about 0.1 per cent of radiations between $290\mu\mu$ and the visible blue.² Recently we were able to isolate two bands of radiations given off by the mercury-vapor lamp—those less than $290\mu\mu$ in length and those between $290\mu\mu$ and $313\mu\mu$. Their antirachitic activity was tested directly by irradiating rachitic rats. It was found that radiations shorter than $290\mu\mu$, in other words shorter than those produced by the sun, exert a more intense antirachitic effect than the most potent region of the solar spectrum. This result is in accordance with clinical experience.

This is a preliminary report.

¹ Hess, A., and Weinstock, M., *J. Am. Med. Assn.*, 1923, lxxx, 1687.

² Hess, A. F., and Weinstock, M., *J. Biol. Chem.*, 1925, lxiv, 181.

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The Protoplasmic pH of Living Cells.*

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The intra protoplasmic pH of Amoeba and of cells from different tissues of Necturus and the Frog was obtained by injecting with the micrurgical technique solutions of Clark and Lubs' indicator dyes. This method allows the use of dyes which cannot penetrate living cells from without, a situation which obtains for the majority of indicator dyes. The protoplasm tolerates only a limited amount of the injected fluid. If too much is injected the protoplasm

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