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Effect of Ultraviolet Light Upon Genus Trichophyton.*

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Ring-worm infection is very common in tropical countries but is also quite prevalent in temperate climates. The genus trichophyton seems to be widespread over the face of the earth. Sabouraud lists some 30 species. These are differentiated chiefly by cultural characteristics, morphology, pigment formation, character of the lesions produced and the host affected. Ring-worm infection is very persistent and frequently responds only to the most vigorous treatment. One of us (McK.) has observed cases in the Philippines which have persisted for fifteen to twenty years, the lesions appearing and disappearing periodically during this time. Patients have stated that sojourns in colder climates are frequently accompanied by disappearance of the lesions which promptly return when they again take up residence in the tropics.

It has been thought that these fungi are very resistant to ultraviolet light since they produce lesions on parts of the body normally exposed to sunlight (particularly in animals) as well as other parts (in man) which are protected by clothing. However, both the X-ray and the ultraviolet rays have been used empirically for the treatment of some of these conditions in man.

We have recently tested the effect of ultraviolet light upon the *Trichophyton asteroides,* a variety which affects chiefly horses and cattle and gives rise to inflammatory lesions with folliculitis and formation of kerion, the clinical picture of which has usually been designated *Herpes tonsurans.* The fungus was grown on Sabouraud and after a growth measuring 8 cm. was obtained it was lifted off and ground up in a sterile mortar with sterile sand and suspended in physiological saline. To quartz tubes containing 2 cc. of saline a small quantity (0.1 cc.) of the fungus suspension was added. Six tubes were prepared in this manner including a control. Two ordinary test tubes containing glucose broth were also similarly inoculated. The quartz tubes 1, 2, 3, 4 and 5 were then exposed to ultraviolet light as generated by the Alpine sun lamp at one foot dis-

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tance for 5, 10, 15, 20 and 30 minutes respectively. At the end of the experiment 5 cc. of glucose broth were added to each tube. All the tubes, including the 3 controls, were left at room temperature for several days. Growth of the fungus did not occur in any of the tubes containing the fungus which were exposed to ultraviolet light but luxuriant growth was obtained in all of the controls.

Under the conditions of these experiments it would seem that at least one member of the Gypseum group of ring-worm fungi *(Trichiphyton asteroides)* is markedly susceptible to the action of ultraviolet light. Probably other members of the genus are also susceptible, though such tests as we have employed are more qualitative than quantitative. The rationale of treating this type of infection with ultraviolet light is apparently borne out by the experimental method.

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Experimental Aortic Insufficiency. I. Regurgitation Maximum and Mechanisms for Its Accommodation Within Mammalian Ventricle.

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The investigations reported in this paper were designed to determine the greatest magnitude of regurgitation possible in the relaxing mammalian heart under optimal conditions and to study the mechanisms by which such volumes are accommodated. These questions have previously been studied chiefly with the aid of artificial circulation machines. But, as Allan[1] properly concludes, conditions are manifestly so different in the mammalian heart that it would be unwise to transfer such values to the human circulation. A number of physical factors enter into relaxation of the mammalian heart which are difficult to reproduce in an artificial model. Ventricular diastole begins with a phase of *isometric relaxation* during which the intraventricular pressure is reduced from that existing in the aorta to a level below that in the auricle. During this early diastolic phase, averaging 0.07 second in the dog and 0.12 second in man, the ventricular cavity remains in the state of obliteration reached at the end of ejection. Consequently, by far the greatest

[1] Allan, *Heart*, 1926, xii, 200.