was noted grossly. Microscopically a hyperkeratosis begins at the 30th day, and gradually progresses. At 45 days there is an extensive hyperkeratosis that in some cases involves nearly the entire epithelial layer, with an extension into the hair follicles and glands of the skin.

In comparing the effect of x-rays and the tar preparations in these cases it is interesting to note that the x-rays penetrate deeply to effect the corium and structures in it, while the tar preparations act locally at the site of application. Otherwise the effect of the two are similar.

Former studies from the laboratory show that coal tar, mazola oil, mineral oil, etc., may be classed as lipoid solvents.[1] When they are introduced into the subcutaneous tissue they remove the ergusia (lipoid element) from the tissues with which they come in contact. Further studies from the laboratory have shown that animals on a vitamin A deficient diet are protected for a time by certain doses of x-rays.[2] This indicates that x-rays must liberate this vitamin from the tissue absorbing it.

This is a preliminary report.

[1] Jorstad, L. H., *J. Can. Res.*, 1926, x, No. 2.

[2] Burrows, M. T., Jorstad, L. H., and Ernst, E. C., *J. Am. Med. Assn.*, 1926, lxxxvii, 86-89.

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Further Study of the Bacteriemia of Experimental Streptococcus Endocarditis.

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When the aortic or mitral valves of dogs are injured by passing a suitable steel rod down the left carotid artery, the resulting wound of the valve shows, at the end of 49 days, a hyalin-like mass at the point of injury. As late as 60 days after such injury the injection intravenously, of non-hemolytic streptococci results, constantly, in a bacterial vegetative growth on the injured area productive of petechiae, infarctions, thrombo-glomerular nephritis, and small areas in the heart muscle in which a round cell infiltration follows a punctate hemorrhage.

In four dogs the healing of the injury was not altered by the injection either before or after injury, of egg albumin, followed in three weeks by a second injection, which was in turn made three days before autopsy.

A strain of non-hemolytic streptococcus isolated from the blood of a patient with acute rheumatic fever, and having some virulence for white mice, and a strain from a normal throat having no virulence for mice, were equally successful in producing the infection of the injured valve.

Subacute bacterial endocarditis in humans is characterized by the presence in the blood stream of avirulent non-hemolytic streptococci. These streptococci are said to be avirulent from the standpoint of the action on white mice. They may or may not have been virulent before infecting the human subject.

Cultures of the strain from acute rheumatic fever, recovered from dogs with endocarditis produced as above, failed to infect fresh animals in two instances. A culture of the strain from a normal throat after such passage through a dog failed to infect a fresh animal which had had a valvular injury. Furthermore two different strains from clinical cases failed to infect animals whose valves had previously been injured.

In 21 dogs the bacteriemia, following the establishment of endocarditis, was of a type in which the number of colonies per cubic centimeter of blood rapidly increased to 300 on the fourth day after injection and countless by the 12th. This resembles an acute fatal bacteriemia in man.

In subacute endocarditis, in man, the colony-count remains uniform throughout the disease at a level which may be high or low. In 2 animals in which the strain from acute rheumatic fever was used, and in 2 animals in which the strain from a normal throat was used, the bacteriemia remained for 12 days at a low level, varying between 5 and 20 colonies per cubic centimeter of blood, by the serum of previously infected dogs.

In these experiments the longest duration of life was 31 days, the average, 18.

In 2 animals the inoculation of killed cultures of avirulent non-hemolytic streptococcus, up to the production of strongly agglutinating serum, did not prevent the easy subsequent infection of the injured valves when living cultures were injected.

Conclusions. Lack of virulence in strain from subacute bacterial endocarditis is a characteristic most probably acquired by passage through the host.

Agglutinated streptococci produce a type of bacteriemia in dogs with injured valves which simulates the bacteriemia found in human cases of subacute bacterial endocarditis.

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Filtrates From Scarlet Fever and Surgical Hemolytic Streptococcus Infections.

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In scarlet fever it is held that there is a special strain of hemolytic streptococcus responsible for scarlet fever. Nevertheless, by agglutination tests, all strains isolated from cases of scarlet fever are not identical. It has not been argued that a special phase of reactivity on the part of the host can lead to the clinical picture of scarlet fever after infection by any hemolytic streptococcus.

The criteria for investigating the specific nature of a given strain of hemolytic streptococcus, whether from scarlet fever or from other clinical infections, have been the preparation of a filtrate from special culture medium and the testing of such filtrate for its resistance to heating, its capacity to produce a dermal reaction in a susceptible subject, and its neutralization by anti-scarlet fever serum in skin tests.

The following would indicate either that these criteria are not sufficient to establish the specific qualities of a given strain, or that the phase of reactivity of a patient is important in determining whether infection by hemolytic streptococcus will result in scarlet fever or some other clinical picture. The filtrates were studied from the throat cultures of three cases of scarlet fever, two of which were caused by infection of wounds; and of three cases of bacteriemia following operations, in one of which the attending nurse developed scarlet fever.

In the three cases of scarlet fever the cultures from the throat failed to yield hemolytic streptococcus. In two of these cases, one of which was surgical scarlet and the other the usual variety, the predominating organisms were non-hemolytic streptococcus which were immediately used to infect filtrate broth. Subcultures of this broth failed to show any colonies of hemolytic streptococcus on blood agar plates. Many other cases of scarlet fever at the Isola-