nonvasodilator substance may stimulate these changes, but in the presence of the obviously dilated capillaries in the eyes and skin we feel that they are more likely to be related to repeated flushing. Rowell & Summerscales (1961) examined the 5-hydroxyindoleacetic acid (5HIAA) excretion of 21 rosacea patients and found it to be normal. The negative results are not really surprising as subsequent investigation has shown that 5HT does not produce the cutaneous flush even in carcinoid patients. Bradykinin levels in rosacea patients have not yet been measured.

With one of our rosacea patients in whom flushing was a prominent feature we carried out tests of various vasodilating agents. Rather as we expected, he flushed well with intravenous histamine and bradykinin, moderately with alcohol, and not at all with noradrenaline. This supported our view that in rosacea the receptors of the flushing mechanism are unduly sensitive to normal substances, rather than to abnormal humoral factors such as those circulating in carcinoidosis. We are developing a quantitative technique for measuring the flushing responses to dilator agents, but at present we have no results.

The part played by capillary dilatation in the ætiology of rosacea is to a certain extent open to speculation. We feel that the telangiectatic state is the end result of repeated flushing, leading to loss of integrity of the capillary walls and transudation of blood constituents into the tissue spaces of skin, conjunctiva or cornea. Secondary inflammatory lesions may result.

The basic question remains, what causes the initial dilatation? The following possibilities exist:

(1) That the papular and hypertrophic changes in the skin are produced by the disease rosacea, and that the capillary dilatation is secondary. We think this unlikely in view of the vascular and hypertrophic changes seen in carcinoid patients.

(2) That constitutional vasomotor instability *per se* is responsible for repeated vasodilatation which in time becomes permanent. This ignores the part played by factors which are well established as causing flushing responses.

(3) That the dilatation is due to a circulating factor, similar though not identical to that in carcinoidosis.

(4) That there is excessive release of, or tissue response to, a local vasodilator substance such as bradykinin.

It is possible to block pharmacologically some of the stages in the evolution of the carcinoid flush, but no effective bradykinin antagonist is known; it is likely that the mechanism of active vasodilatation, and its significance in rosacea will remain obscure until such an agent is available.

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Tetracyclines in the Treatment of Ocular Rosacea

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Ocular involvement in rosacea, which is characteristically a skin disorder, may be either a blepharoconjunctivitis or a keratitis, or very rarely an episcleritis. There is a high degree of correlation of the changes occurring in the eye with skin disease and treatment which is effective for the skin disorder, as suggested by Sneddon (1966), may therefore be of value in treatment of the ocular condition. The two facets of the ocular condition which have not previously been emphasized are the secondary complications of lid disease, that is, trichiasis and recurrent chalazia. The second aspect of the disease is the effect of trichiasis on the cornea and its relation to the keratitis which can be, and often is, an entity on its own.

A series of 23 patients were studied initially. Five of the patients with keratitis had no lid involvement. These patients were treated with oral oxytetracyclines 150 mg twice a day for six

Table 1
Classification of cases of ocular rosacea

	Objective improvement	*Subjective improvement*	*Skin improvement*
Blepharo-conjunctivitis	17	16	18
Keratitis	12	11	14
Episcleritis	1	0	1

weeks, and local zinc sulphate 0·25% and adrenaline 1:80,000 twice a day for the same period of time. The condition was assessed every two weeks and improvement was assessed on the basic objective changes, that is, reduction in cornea staining and vascular proliferations and, in the lids, reductions in vascular proliferations, the resolution of chalazia and the failure of trichiasis to recur. Subjective improvement was based on the patient's comfort.

The results are as shown in Table 1. The treatment was effective in restoring corneal thickness and eliminating the Grübchen of Arlt. There was also reduction in the interpalpebral staining with rose bengal. This treatment can be repeated without loss of effect and no complications were noted during any course of therapy.

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The following paper was also read:

Inherited Morphogenetic Defects of the Skin and Eyes
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