Comment

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Walters & Tullis (1967) suggest that urination may be one cause of measurement artifacts in the situation first used by Kaplan & Kaplan (1962) to record the basal resistance level of the free-roving rat. Their data appear to support this hypothesis in that a urinating group of rats had higher conductance scores over five days of testing than a nonurinating group. They also found a progressive increase in resistance level between trials over the five days, which they attributed to changes in the level of emotionality of the animals. Another possible interpretation of this particular result and previous results (Kaplan, 1963) regarding temporal changes in skin resistance implicates the role of skeletal activity in producing artifacts. Exploration by a rat placed in a novel environment such as the one used by Walters and Tullis starts at a high level then declines rapidly, this decline continues across days if the animal is tested on more than one occasion (Berlyne, 1960). When exploration ceases and the animal is at rest on the grid floor in this situation its feet drop through the bars, thus not making contact with them. A higher level of resistance results. This explanation would account for the generally found increase in resistance between days (Kaplan, 1963; Walters & Tullis, 1967).

Although this does not call into question the role of urination in producing artifacts, it does suggest that activity as well as urination should be observed in this sort of situation. Walters and Tullis also mention that it is not clear to them that the rat has

sweat-glands (Rowett, 1962). Ring & Randall (1947) have in fact shown that Wistar rats have sweat-glands only in their palmar and plantar surfaces. More importantly the function of these glands has been demonstrated by stimulation of the sciatic nerve and measurement of secretion by the starch iodine test. Accepting this finding, and relating it to Kaplan's method, it remains to be shown that the sweat-glands function in this situation and, if they do, that their activity is not obscured by artifacts such as urination and skeletal activity. The solution of this problem is being attempted in Cardiff by pharmacological studies aimed at increasing and decreasing sweat-gland activity and relating the changes to the basal resistance level of the rat in Kaplan's situation.

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Reply

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Blizard is probably correct in his suggestion that locomotor activity may produce measurement artifacts during the recording of skin resistance in unrestrained rats. In fact, in a very thorough series of studies Roberts (1967) found that there was an inverse relationship between skin resistance and activity in mice. There is little doubt that urination, activity, contact area, and pressure of the animal's feet on the grid bars are all potential sources of measurement artifact in the recording of basal skin resistance using the Kaplan & Kaplan (1962) technique. However, it is highly unlikely that the reported increase in skin resistance over days which we have reported (Walters & Tullis, 1966; 1967) was due, as Blizard suggests, to the animal's feet dropping through the grid bars of the test chamber. For one thing, our initial study (1966) employed only five 10 min habituation periods in the novel test chamber during which time we periodically observed our animals

— there was no noticeable decrease in general activity over these short test periods, and we never observed any animal to even rest in this situation let alone drop its feet through the bars of the chamber floor. Additionally, in some early pilot work (unpublished) using restrained rats with attached foot electrodes, we also found resistance increases over days although these were not as dramatic as in our later studies with unrestrained rats.

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