J. Opl Res. Soc. Pergamon Press 1978. Vol. 29, 1, p. 95. Printed in Great Britain

Addendum

to

"*Goal-seeking Behaviour in Queueing Systems*" (*Opl Res. Q.* 1976 **27**, 605–614)

GEORGE W. TYLER

No EXACT criterion was given previously for states of accommodation, although they were linked generally to maximum waiting times. Following Beneš,[1] we can now propose that the energy of our goal-seeking queueing system is represented by the number of customers in the system, and states of accommodation correspond to states of maximum entropy. In our particular case, the situation is complicated slightly by customer discouragement, because a proportion of customers queueing at any instant will be selected out before service commences. However, since these particular customers contribute nothing to the effectiveness of the system we can simply discount them and define energy on the effective number of customers in the system, i.e. those that are subsequently accepted for service. States of accommodation then correspond to maximum values of the entropy based on these effective customers alone. To estimate the effective number of customers in the system, we simply divide the waiting times of serviced customers by the mean service time. So for the probabilities of finding n effective customers in the system we get:

$$\underset{n<\sigma T}{p_n} = A\exp\{-[(\sigma-\alpha)/\sigma]n\}$$

$$\underset{n\geqslant\sigma T}{p_n} = A\exp(\alpha T - n).$$

The entropy is given by:

$$H = -\int_0^\infty p_n \log p_n \,\mathrm{d}n.$$

Taking natural logs, this gives:

$$H = 1 - \ln A - \alpha A T\exp[-(\sigma-\alpha)T].$$

GEORGE W. TYLER

REFERENCE

[1] V. E. BENEŠ (1963) A "thermodynamic" theory of traffic in connecting networks. *Bell Syst. tech. J.* **42**, 567–607.

J. Opl Res. Soc. Pergamon Press 1978. Vol. 29, 1, p. 96. Printed in Great Britain

Corrigendum

Minimum Paths in Directed Graphs, Opl Res. Q. **28,** pp. 339–346

IN THE proof of theorem 2 on pp. 344–345 it states "Once a tree is changed in step 3 it cannot re-appear as the y values never increase". This statement would be valid if y_i was always the ϕ value of the path from s to i defined by the tree. This is not always true as the y values "lag behind" in this algorithm. However, it is always true that y_i is the ϕ value of some path from s to i and the number of such paths is finite. Thus one can see that a tree could only re-appear a finite number of times. The proof then continues as before.

A. M. FRIEZE