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Management Science

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Communications to the Editor

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To cite this article:
Dennis W. Fife, (1967) Communications to the Editor. Management Science 14(3):254-255. https://doi.org/10.1287/mnsc.14.3.254

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'If backtracking fails to yield a solution, increase the cycle time by 1, i e , $c = c + 1$ Go to 3 '

E M MANSOOR
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3 MANSOOR, E M , "Assembly Line Balancing—An Improvement on the Ranked Positional Weight Technique," *Journal of Industrial Engineering, 15* 2, pp 73-77
4 ——, "Assembly Line Balancing—Extension and Discussions," *Journal of Industrial Engineering, 15* 6, pp 322-323

Comment to the Editor†

Following publication of my paper entitled "Scheduling With Random Arrivals and Linear Loss Functions" (*Management Science*, January, 1965), a private comment on it was received by the Editor I responded to this, also in a private communication to the Editor However the Editor has now suggested that a published statement from me would be appropriate to close the matter

My paper treated the single server queue with a finite number of classes of Poisson arrivals, arbitrary service time distribution, and a delay cost increasing linearly with time spent in the system by each arrival The aim was to be quite rigorous and to discuss the scheduling optimization problem in a broader context than had been done at the time The paper culminated by extending to this case the well-known scheduling rule of McNaughton[1] and Smith[2] for a non-queueing situation In doing so, the familiar work of Cobham[3] and Holley[4] on priority queues was used

After publication it was pointed out to me that the validity of so extending the McNaughton-Smith rule from Cobham's result had been stated by Conway and Maxwell [5] This is indeed true, but it appears as an introductory observation in their paper which deals principally with simulation of networks of queues No analysis or justification is given, and the optimality of this rule is said by Conway and Maxwell to hold only within the class of simple priority scheduling

† Received May 1967

[1] McNaughton, R , "Scheduling with Deadlines and Loss Functions," *Management Science*, 6, 1-12, 1959

[2] Smith, W E , "Various Optimizers for Single Stage Production," *Naval Research Logistics Quarterly*, 3, 59-66, 1956

[3] Cobham, A , "Priority Assignment in Waiting Line Problems," *Operations Research*, 2, 70-76, 1954

[4] Holley, J , "Waiting Line Subject to Priorities," *Operations Research*, 2, 341-343, 1954

[5] Conway, R W and W L Maxwell, "Network Dispatching by the Shortest-Operation Discipline," *Operations Research*, 10, pp 51-73, 1962

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rules From my analysis, this can be relaxed to the class of all scheduling disciplines for which statistical equilibrium holds

However, the last part of the overall derivation, which begins with Cobham's result, had been done in Cox and Smith [6] Unforgivably, I was unaware of this and failed to reference it in my paper The commentator also claimed that some consideration of this problem appeared in the unpublished thesis of Reinitz [7] This is unavailable to me, however, no direct discussion or results appeared in the thesis excerpt published in Muth and Thompson [8] Leonard Kleinrock has indicated to me privately moreover that J D C Little of M I T had derived the extension of McNaughton's rule in classroom presentations

Hence, the credit for recognizing the validity of this result is due the individuals indicated above My paper contributes by providing a complete and, in fact, broader discussion, with mathematical rigor, and a focus on the issues of this particular scheduling problem This will be of benefit to those for whom the results have potential application

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[6] Cox, D R and W L Smith, *Queues*, Methuen and Co , Ltd , London, 1961

[7] Reinitz, R C , "An Integrated Job-Shop Scheduling Problem," ONR Project NONR-1141 (11), Operations Research Group, Case Institute of Technology, Chap 5, June 1961

[8] Reinitz, R C , "On the Job-Shop Scheduling Problem," in Muth, J F and G L Thompson (Editors), *Industrial Scheduling*, pp 59–82, Prentice-Hall, Inc , Englewood Cliffs, N J , 1963

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Errata*†

An earlier paper of mine in this Journal contains two inaccuracies which I wish to correct hereby

1 Corollary 2 (p 244) suggests that quasi-concavity and explicit quasi-convexity of the minimizing objective function is a necessary condition for the applicability of adjacent vertex methods (That is, every vertex of a polyhedral subset of the polyhedron L should be optimal if no adjacent vertex of this subset gives a smaller value of the objective, and if this is valid for each such subset) To see the inaccuracy of this proposition we have only to consider a one-dimensional polygon L (that is, a line segment), each polyhedral subset of which has only adjacent vertices, and, therefore, quasi-concavity alone is sufficient for the desired property

The correct formulation of the necessary and also sufficient condition requires the function $f(x)$ to be QV in L, and EQX between any two points of L which

* Received June 1967.

† B Martos, "The Direct Power of Adjacent Vertex Programming Methods," *Management Science, 12* 3, pp 241–252