Thus any (standard) regenerative event can be represented by a Markov process on a continuous state space. It follows, for example, that the fact that $p_{00}(t)$ is almost everywhere differentiable is a consequence of the regenerative property of the state 0, but the deeper result that $p_{00}(t)$ is everywhere differentiable requires also the discrete nature of the state space.

It is possible to extend the whole theory to take in properties of several states simultaneously, by considering systems of regenerative events. In particular, we can examine the transition probabilities $p_{ij}(t)$ $(i \neq j)$ of a Markov chain. The theory may also be applied to certain Markov processes with continuous state space, and so, via the method of supplementary variables, to some non-Markovian processes.

It is hoped to publish elsewhere a detailed account of the theory summarised here, and of its various applications.

I am deeply grateful to Professor D. G. Kendall for much helpful discussion, and also to the Department of Scientific and Industrial Research for financial support.

References

1. K. L. Chung, *Markov chains with stationary transition probabilities*, Springer, Berlin, 1960.

2. W. Feller, *An introduction to probability theory and its applications*, Wiley, New York, 1957.

UNIVERSITY OF CAMBRIDGE, CAMBRIDGE, ENGLAND

ORIENTABLE EMBEDDING OF CAYLEY GRAPHS

BY WILLIAM GUSTIN

Communicated by J. W. T. Youngs, November 14, 1962

I present a method whereby a polygonal embedding of a Cayley graph in a closed oriented polyhedral surface may be represented as the dual of a quotient embedding of a quotient graph and diagrammed as a linked network of circuits carrying currents satisfying Kirchhoff's node law. By this means, devised to aid construction of triangular embeddings of a complete n node to affirm Heawood's map color conjecture [3] in Heffter's dual formulation [4] for those cases $n \equiv 0, 3, 4, 7 \bmod 12$ where such triangulation is compatible with Euler's polyhedral formula, I have been able to solve the cases $n \equiv 3, 4, 7 \bmod 12$, unaware that Ringel [5] had already resolved cases $n \equiv 3, 7$ by a similar though less developed method. Case $n \equiv 0$ remains