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EVERY CLOSED ORIENTABLE 3-MANIFOLD IS A 3-FOLD BRANCHED COVERING SPACE OF S^3

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Let p: $M \longrightarrow N$ be a nondegenerate simplicial map between compact triangulated manifolds of the same dimension n. This is a branched covering space if the restriction of p, called $\tilde{p}$, gives a covering space map $\tilde{p}$: $M -$ ($n - 2$ skeleton) $\longrightarrow N -$ ($n - 2$ skeleton). The set of points x in M such that p does not map any neighborhood of x homeomorphically into N is called the branch cover B. The ($n - 2$)-dimensional set $p(B)$ is called the branch set. J. W. Alexander asserted the following theorem [1].

ALEXANDER'S THEOREM. *Every closed orientable 3-manifold is a branched covering space of S^3 with the branch set a link in S^3.*

For a proof see [5].

The purpose of this paper is to announce the following result.

THEOREM 1. *Every closed orientable 3-manifold is an irregular 3-sheeted branched covering of S^3 with branch set a knot.*

We shall only sketch the proof of the theorem. A detailed proof will appear elsewhere.

The main part of the proof consists of constructing a certain irregular 3-fold branched covering of the 3-ball, D^3, by a handlebody of genus g, X_g, with branch set A, a set of $g + 2$ proper arcs, and observing that for this particular branched covering any homeomorphism ψ of ∂X_g is isotopic to a homeomorphism ϕ that projects to a homeomorphism ϕ of ∂D^3. ϕ necessarily leaves the branch set $A \cap \partial D^3$ invariant as a set. Moreover we can choose ϕ and ϕ so that ϕ induces a cyclic permutation on the branch set. Let i(i) be the map that identifies X_g with X_g' (D^3 with $D^{3'}$) restricted to the

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