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CORRECTIONS TO "COMPACT GROUP ACTIONS AND THE TOPOLOGY OF MANIFOLDS WITH NON-POSITIVE CURVATURE"

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IT WAS KINDLY pointed out by Prof. F. Raymond to us that in §4 of the paper, we overlooked an assumption that we should impose on the map f: $M \to N$. This assumption can be either one of the following:

(1) $\mathrm{Ker}(f_*)$ is a characteristic subgroup of $\pi_1(M)$,

(2) the group G leaves $\mathrm{Ker}(f_*)$ invariant.

This assumption is needed in the last two statements of Corollary 6, (vi) of Theorems 8, Theorem 11 and Theorem 13.

In Theorem 12, the corresponding assumption can be stated as follows: Let H be the subspace of $H_1(M, R)$ defined by $\{\beta | \beta \cup \alpha_{i_1} \cup \ldots \cup \alpha_{i_{n-1}} = 0$ for all $i_j\}$. Then G leaves H invariant.

Without this assumption, Prof. Raymond has shown counterexamples to the corresponding statements in Theorem 11 and Theorem 12. He also pointed out that Theorem 10 is not true without extra assumptions. He and his student Dr. K. B. Lee have given a complete analysis of the question of how to realize a finite group in Out $[\pi_1(M)]$ by a finite group of affine transformations. Their paper is entitled "Topological, affine and isometric actions in Riemannian flat manifolds" and will appear in *J. Differential Geom.* A special case of Theorem 10 is needed in Theorem 13. It turns out that this special case can be treated by the method indicated in the proof of Theorem 10 in the following way. If we assume $\pi_1(N)$ has no center then Corollary 4 shows that each $g \in G$ is homotopic to a unique harmonic map $\tilde{g}$. As N is flat, $\tilde{g}$ must be linear. As the composite of two linear maps is linear, the uniqueness shows that G can be realized as a group of linear transformations acting on N. By averaging the flat metric of N with respect to G, we obtain another flat metric with G acting as a group of isometries. Hence Theorem 10 remains valid if $\pi_1(N)$ has no center.

Professor Raymond also pointed out that there are earlier works of Conner and Raymond related to this paper. (See the reference of the above mentioned paper.)

We would also point out some typographical erros. The last statement of Theorem 4, (v) should read "The group G is equal to $\bar{G}$. The proof follows from Corollary 3 and Corollary 4."

On line 12, p. 377, "harmonic" should be replaced by "harmonic form".

On line -4, p. 377, "M" should be replaced by "N".

On line -10, p. 377, "f" should be replaced by "h".

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