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CORRIGENDUM TO "WEST'S PROBLEM ON EQUIVARIANT HYPERSPACES AND BANACH-MAZUR COMPACTA"

SERGEY ANTONYAN

In our article [1], on p. 3389, the definition of the weak topology of the G-nerve $\mathcal{N}(\mathcal{U})$ contains a gap. Namely, it is claimed there that the topology on $\mathcal{N}(\mathcal{U})$ induced from $\mathcal{J}$ is the weak one, which is false. The author apologizes for this mistake.

Nevertheless, in the proofs of Lemmas 4.2, 4.4 and 5.2, where the topology of $\mathcal{N}(\mathcal{U})$ is essential, in fact *the right weak topology* of $\mathcal{N}(\mathcal{U})$ was applied. Thus, all of the proofs given in [1] are correct and complete.

Using the notation and references adopted in [1], the above-mentioned gap in the definition of the topology of the G-nerve $\mathcal{N}(\mathcal{U})$ may be filled by replacing the text on p. 3389 starting in line 26 and ending in line 35, by the following.

"For every simplex $L = \langle \mu_0, \dots, \mu_n \rangle \subset \widetilde{\mathcal{N}}(\mathcal{U})$, set

$$\Delta(L) = \bigcup \{\Delta(S, F_S) \mid S \text{ is a subsimplex of } L\}.$$

Clearly, $\Delta(L)$ is an invariant subset of the finite join $G/H_{\mu_0} * \cdots * G/H_{\mu_n}$. We always will consider the induced topology and G-action on $\Delta(L)$. Observe that, if N is a subsimplex of L, then $\Delta(N)$ is a closed invariant subset of $\Delta(L)$. Indeed, let $\xi : G/H_{\mu_0} * \cdots * G/H_{\mu_n} \to L$ be the continuous map sending the point $\sum_{i=0}^{n} t_{\mu_i} g_{\mu_i} H_{\mu_i} \in G/H_{\mu_0} * \cdots * G/H_{\mu_n}$ to the point $\sum_{i=0}^{n} t_{\mu_i} \mu_i \in L$. Since $P_{LN}(F_L) \subset F_N$, where $P_{LN} : \prod_{\mu \in L} G/H_\mu \to \prod_{\mu \in N} G/H_\mu$ is the Cartesian projection, we see that the preimage $\xi^{-1}(N)$ is just $\Delta(N)$. Since N is closed in L, this yields that $\Delta(N)$ is closed in $\Delta(L)$, as required. Invariance of $\Delta(N)$ is evident.

It is clear that, if $K \subset \widetilde{\mathcal{N}}(\mathcal{U})$ is yet another simplex, then $\Delta(L) \cap \Delta(K) = \Delta(L \cap K)$. Consequently, $\Delta(L) \cap \Delta(K)$ is closed in both $\Delta(L)$ and $\Delta(K)$.

Consider the following invariant subset of $\mathcal{J}$:

$$\mathcal{N}(\mathcal{U}) = \bigcup \left\{ \Delta(L) \mid L \in \widetilde{\mathcal{N}}(\mathcal{U}) \right\}.$$

We consider the *weak topology* on $\mathcal{N}(\mathcal{U})$ determined by the family

$$\left\{ \Delta(L) \mid L \in \widetilde{\mathcal{N}}(\mathcal{U}) \right\}.$$

Namely, a set $U \subset \mathcal{N}(\mathcal{U})$ is, by definition, open in $\mathcal{N}(\mathcal{U})$ if and only if $U \cap \Delta(L)$ is open in $\Delta(L)$ for every simplex $L \subset \widetilde{\mathcal{N}}(\mathcal{U})$.

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The G-action on $\mathcal{N}(\mathcal{U})$, defined by the following formula, makes $\mathcal{N}(\mathcal{U})$ a G-space, called the G-nerve of $\mathcal{U}$:

$$g * \left(\sum_{\mu \in M} t_\mu g'_\mu H_\mu \right) = \sum_{\mu \in M} t_\mu g g'_\mu H_\mu, \qquad g \in G.$$

Since the intersection $\Delta(L) \cap \Delta(K)$ is closed in both $\Delta(L)$ and $\Delta(K)$, we see that each space $\Delta(L)$ retains its original topology and is a closed invariant subset of $\mathcal{N}(\mathcal{U})$ (see, e.g., [2, Ch. VI, §8]). We call $\Delta(L)$ a *G-n-simplex over the n-simplex* L.

In the proofs of Lemmas 4.4 and 5.2 the following well-known and easily proved property of the weak topology is used: a map $f : \mathcal{N}(\mathcal{U}) \to Z$ is continuous if and only if each restriction $f|_{\Delta(L)}$ is continuous."

As is defined on page 3389, lines 9–10, the elements of a G-normal cover $\mathcal{U}$ are tubular slice-sets gS_μ with companion groups H_μ. However, in order to emphasize the role of H_μ, we have used the denotation (gS_μ, H_μ) instead of gS_μ, which in some occasions may cause confusion. Thus, in Lemmas 4.1, 4.2 and 5.2 the denotation $\mathcal{U} = \{(gS_\mu, H_\mu) \mid g \in G, \mu \in M\}$ should be replaced by $\mathcal{U} = \{gS_\mu \mid g \in G, \mu \in M\}$, where S_μ is an H_μ-slice.

For the proof of Lemma 5.2 it is important to formulate Lemma 4.1 in the following more precise form.

Lemma 4.1. *Let X be a paracompact G-space and $\mathcal{V}$ an open cover of X. Then X admits a G-normal cover $\mathcal{U} = \{gS_\lambda \mid g \in G, \lambda \in \Lambda\}$ with the companion groups $\{H_\lambda\}_{\lambda \in \Lambda}$ such that each H_λ is the stabilizer of a point $x_\lambda \in S_\lambda$ and $\mathcal{U}$ is a star-refinement of $\mathcal{V}$.*

In Lemma 5.2 under the term "ε-cover" we mean the family of *all* open balls in $L_0(n)$ which have radius ε.

In the formulation and in the proof of Lemma 5.2, always $G = O(n)$.

Also, one should correct the following misprints:

(1) page 3389, line 14: "$O \in U_1$" should be "$O \in \mathcal{U}_1$".
(2) page 3389, line 20: "of $\mathcal{U}$" should be "of $\mathcal{V}$".
(3) page 3390, line 27: "(gS_x, G_x)" should be "gS_x".
(4) page 3390, line 30: "an open G-normal cover" should be "a G-normal cover".
(5) page 3391, line 28: "$\Delta(L, F_L)$" should be "$\Delta(L)$".
(6) page 3392, line 2: "$R(x) \in \mathcal{F}_{3^{n-1}}(s)$" should be "$R(x) \in \mathcal{F}_{3^{n-1}}(s^1)$, where s^1 is the 1-dimensional skeleton of s".
(7) page 3392, line 7: "$\Delta(L, F_L)$" should be "$\Delta(L)$".
(8) page 3392, line 13: "$\mathcal{F}_{3^{n-1}}(s) \subset$" should be "$\mathcal{F}_{3^{n-1}}(s^1) \subset$".
(9) page 3394, line 30: "$q'(g_1 A_\mu) = q''(g_0 A_\lambda)$" should be "$q'(g_1 H_\mu) = q''(g_0 H_\lambda)$".
(10) page 3394, line 36: "of $g_0 A_\lambda$" should be "of $g_0 A_\lambda \cup g_1 A_\mu$".
(11) page 3394, line 41: "of $g_1 A_\mu$" should be "of $g_0 A_\lambda \cup g_1 A_\mu$".
(12) page 3398, line 22: "domain. Since" should be "domain V. Since".

References

1. S. A. Antonyan, *West's problem on equivariant hyperspaces and Banach-Mazur compacta*, Trans. Amer. Math. Soc. **355** (2003), no. 8, 3379–3404. MR1974693 (2004d:57028)
2. J. Dugundji, *Topology*, Allyn and Bacon Inc., Boston, 1966. MR0193606 (33:1824)

Departamento de Matemáticas, Facultad de Ciencias, Universidad Nacional Autónoma de México, México D.F. 04510, México

E-mail address: antonyan@servidor.unam.mx