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CORRECTIONS TO THE PAPER "A REMARK ON THE ORBIT SPACES UNDER MULTIPLICATIVE GROUP ACTIONS"

(Colloquium Mathematicum 54.1 (1987), pp. 67–70)

BY

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1° In the Theorem on page 67, in place of "singular" one should read: "either a singular set or a projective space". The assumption "$n \geqslant 3$" may be dropped.

2° The proof of the Theorem alters as follows:

Lines 1–6 on page 69 are to be replaced by

"fixed points in $\boldsymbol{P}_n$. Let $\{x_0, x_1, \ldots, x_{u-1}\}$, $\{x_u, \ldots, x_n\}$, where $1 \leqslant u \leqslant n$, be the cross-section defining $\mathscr{U}$."

The text in lines 20–27 on page 69, beginning with "contains" and ending with "singular", is to be replaced by

"consists, by Proposition 1, of the $(n-1)$-cones $\sigma_{k,l} = \sigma_k \cap \sigma_l$ (where $k < u$, $l \geqslant u$) and their faces. Let $f_j = p(e_j)$, $j = 0, 1, \ldots, n$. Then the $(n-1)$-cone $p(\sigma_{k,l})$ is spanned by

$$F_{k,l} = (f_j)_{0 \leqslant j \leqslant n, k \neq j \neq l}.$$

Assume that $\mathscr{U}/k^*$ is smooth. We will prove that it is a projective space. By Proposition 2 above and by Theorem 4 in Section 1 of [2], $F_{k,l}$ is a basis of the lattice N/aZ. Moreover, the ordered bases $F_{k,l}$ and $F_{k,l+1}$ have distinct orientations, and so have $F_{k,l}$ and $F_{k+1,l}$. Now choose the basis $F_{0,u}$ and express all f_j in terms of this basis. A computation on determinants shows that either

$$f_0 + f_1 + \ldots + f_{u-1} = 0$$

or

$$f_u + f_{u+1} + \ldots + f_n = 0.$$

By the definition of f_j this means that either

$$a \in \operatorname{lin.hull}(e_0, \ldots, e_{u-1})$$

or

$$a \in \operatorname{lin.hull}(e_u, \ldots, e_n).$$

If $2 \leqslant u \leqslant n-1$, we get a contradiction, since both $\{e_0, \ldots, e_{u-1}\}$ and $\{e_u, \ldots, e_n\}$ are contained in $(n-1)$-cones of Σ. If $u = 1$, then it must be $f_1 + \ldots + f_n = 0$; therefore $\mathcal{U}/k^*$ is the torus embedding corresponding to the complex of all cones spanned by the subsets of $\{f_1, \ldots, f_n\}$. Hence $\mathcal{U}/k^* \cong \boldsymbol{P}_{n-1}$. The remaining case $u = n$ leads to the same conclusion, and the proof is complete."

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