

**Correction: Semi cubical theory on homotopy classification**

(this journal, vol. 10, no. 1, 1959)

By Katuhiko MIZUNO

(Received April 20, 1961)

- p. 44. l. 1b. Insert sentences. "The tensor product  $K \otimes L$  is an S.Q. complex defined as follows (See D. Kan: Abstract Homotopy I, Proc. Nat. Acad. Sci. U.S.A. 41, 1092-1096):

$(K \otimes L)_{p+q} \ni (a_p, b_q) \quad a_p \in K, b_q \in L$ , where  $(D_{p+1}a_p, b_q)$  and  $(a_p, D_1b_q)$  are identified; the element represented by  $(a_p, b_q)$  is denoted by  $a_p \otimes b_q$ ;

$$\begin{aligned} F_i(a_p \otimes b_q) &= F_i(a_p) \otimes b_q \quad i \leq p, & D_i(a_p \otimes b_q) &= D_i(a_p) \otimes b_q \quad i \leq p, \\ &= a_p \otimes F_{i-p}(b_q) \quad i > p, & &= a_p \otimes D_{i-p}(b_q) \quad i > p. \end{aligned}$$

- p. 52. Insert sentences in the beginning of §7. "Two S.Q. maps  $T_0, T_1: K \rightarrow L$  are called S.Q. homotopic if there exists a S.Q. map  $F_T: Q(I) \otimes K \rightarrow L$  such that  $F_T(\varepsilon_1^i \otimes \sigma) = T_i(\sigma) \quad i=0, 1$  for every cube  $\sigma$  of  $K$  (notation  $T_0 \cong T_1$ ). Two S.Q. maps  $T_0, T_1$  are called weakly S.Q. homotopic (W.S.Q. homotopic  $T_0 \simeq T_1$ ) if there exists a sequence  $T^{(0)}, T^{(1)}, \dots, T^{(p)}$  such that  $T^{(0)} = T_0, T^{(p)} = T_1$  and  $T^{(i)} \cong T^{(i+1)} \quad i=0, \dots, p-1$ . This relation is an equivalence relation. The classes of S.Q. maps which are W.S.Q. homotopic are called S.Q. homotopy classes. We shall denote  $Q(I) \otimes K$  by  $I \otimes K$  in the following." Read "S.Q. homotopy" for "chain homotopy" in l. 11b, 10b. Insert between l. 2b-1b " $\bar{\omega}(\eta_1 \cdots \eta_{p-1} \otimes \sigma_{n-p}) = (-1)^{p-1} \omega(D_1^{p-1} \sigma_{n-p})$ , where  $D^n \sigma = D_1(D_1^{n-1} \sigma)$ ."

- p. 53. Insert between l. 4-5 " $\delta \bar{\omega}(\eta_1 \cdots \overset{i}{\vee} \cdots \eta_p \otimes \sigma_{n+1-p}) = (-1)^i \bar{\omega}[(\varepsilon_1^i \eta_1 \cdots \eta_{p-1} - \varepsilon_1^1 \eta_1 \cdots \eta_{p-1}) \otimes \sigma_{n+1-p}] + (-1)^p \bar{\omega}(\eta_1 \cdots \overset{i}{\vee} \cdots \eta_p \otimes \partial \sigma_{n+1-p}) = (-1)^{i+1} \delta \omega(D_1^{p-1} \sigma_{n+1-p}) + (-1)^p \bar{\omega}(\eta_1 \cdots \eta_{i-1} \otimes D_1^{p-i} \partial \sigma_{n+1-p}) = (-1)^{i+1} \omega(\partial D_1^{p-1} \sigma_{n+1-p}) + (-1)^{p+i-1} \omega(D_1^{i-1} D_1^{p-i} \partial \sigma_{n+1-p}) = 0$  since  $\partial D_1 = -D_1 \partial$ ." Read "S.Q. homotopy" to "chain homotopy" in l. 9.

- p. 54. Read "Proposition (7.3)" for "Lemma (7.3)", "Namely" for "Proof" and "S.Q. homotopy" in l. 3, 4, 5. Insert between l. 12b-11b " $y_q(\eta_1 \cdots \eta_{p-1} \otimes \sigma_{n-p}) = (-1)^{p-1} b_n(D(D_1^{p-1} \sigma_{n-p}))$  for  $\sigma_{n-p} \in K_{n-p}$ " and between l. 6b-5b " $y_q(\eta_1 \cdots \eta_{p-1} \otimes \sigma_{q-p}) = (-1)^{p-1} b_q(D(D_1^{p-1} \sigma_{q-p}))$  for  $\sigma_{q-p} \in K_{q-p}$ ."

- p. 55. Insert between l. 9-10 " $y_{q^{(i)}}(\eta_1 \cdots \eta_{p-1} \otimes \sigma_{q^{(i)}-p}) = (-1)^{p-1} b_{q^{(i)}}(D(D_1^{p-1} \sigma_{q^{(i)}-p}))$  for  $\sigma_{q^{(i)}-p} \in K_{q^{(i)}-p}$ ." Read "S.Q. homotopy" for "chain homotopy" in l. 3b. Replace " $T(x_n) \cong T(x'_n)$ " l. 8b by " $T(x_n) \simeq T(x'_n)$ ".

- p. 56. Read "S.Q. homotopy" for "chain homotopy" in l. 15, "W.S.Q. homotopy"

- for “chain homotopy” in l. 13b, 10b, 5b. Replace “ $T(x_n) \cong T(x'_n)$ ” in l. 11b, 5b by “ $T(x_n) \simeq T(x'_n)$ ”.
- p. 57. Read “S.Q. homotopy” for “chain homotopy” in l. 2, 4b. Insert between l. 7-8 “ $\bar{x}'_q(\eta_1 \cdots \eta_{p-1} \otimes \sigma_{q-p}) = 0$  for  $\sigma_{q-p} \in K_{q-p}$ .”
- p. 58. Replace the notation “ $\cong$ ” l. 6, 9, 9b by “ $\simeq$ ”. Read “W.S.Q. homotopy” for “chain homotopy” in l. 6, 8, 15, 17, 18, 9b, “S.Q. homotopy” for “chain homotopy” in l. 3b.
- p. 59. Read “S.Q. homotopy” for “chain homotopy” in l. 1, 2b. Insert between l. 5-6 “ $\bar{x}'_{q(i)}(\eta_1 \cdots \eta_{p-1} \otimes \sigma_{q(i)-p}) = 0$  for  $\sigma_{q(i)-p} \in K_{q(i)-p}$ .”
- p. 60. Read “S.Q. homotopy classes” for “chain homotopy classes” in l. 12, “S.Q. homotopies” for “chain homotopies” in l. 16, and “W.S.Q. homotopies between the W.S.Q. homotopic maps” for “chain homotopies between the chain homotopic maps” in l. 18.
- p. 61. Read “S.Q. homotopy” for “chain homotopy” in l. 9, 4b, and “W.S.Q. homotopic” for “chain homotopic” in l. 7b.
- p. 62. Read “S.Q. homotopy” for “chain homotopy” in l. 4b.

I thank Prof. D. Puppe who indicated me the insufficiency of my discussion and kindly communicated me the corrections of my paper.

**Correction: Semicubical theory on higher obstruction**  
(*this journal, vol. 11, no. 1, 1960*)

By Katuhiko MIZUNO

- p. 17. Read “W.S.Q. homotopic” for “homotopic” in l. 13, and “W.S.Q. homotopies” for “chain homotopies” in l. 16.