

CORRIGENDUM TO MY PAPER:  
"RECOGNIZABLE ALGEBRAS OF FORMULAS"

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By constructing a counterexample Martin Ziegler has shown that Theorems 1 and 2 are incorrect in the paper "Recognizable algebras of formulas," this Journal, Volume XIII (1972), pp. 521-526. The proof given in the paper breaks down unless only existential (or universal) formulas are considered about recognizable algebras of formulas.

We explain the problem where (as in the counterexample)  $\mathcal{L} = \mathcal{L}_{\omega\omega}$  and there is one alternation of quantifiers. Suppose that we are given a recognizable algebra of formulas  $R$ , sentences  $J_1 = (\exists y_1)(\exists y_2)J(y_1, y_2)$ ,  $J_2 = (\forall y_1)(\exists y_2)J(y_1, y_2)$  in the language of  $R$  and  $\mathfrak{A} \equiv \mathfrak{B}$ . Let the translation of  $J(y_1, y_2)$  be  $J^*(Y_1, Y_2)$  in the proof of Theorem 1. Then it is claimed in the proof that  $R(\mathfrak{A}) \models J_1$  iff there exists an allowable  $\psi_1$  and there exists an allowable  $\psi_2$  such that  $\mathfrak{A} \models J^*(\psi_1, \psi_2)$ . Also  $R(\mathfrak{B}) \models J_1$  under the same condition. Thus  $R(\mathfrak{A}) \models J_1$  iff  $R(\mathfrak{B}) \models J_1$  and so the proof goes through for existential sentences. But it is also claimed in the proof that  $R(\mathfrak{A}) \models J_2$  iff for every allowable  $\psi_1$  there exists an allowable  $\psi_2$  such that  $\mathfrak{A} \models J^*(\psi_1, \psi_2)$ . This claim is incorrect. For notice the implicit assumption that given a  $\psi_1$  there exists a unique  $\psi_2$  such that  $\mathfrak{A} \models J^*(\psi_1, \psi_2)$ . However  $\psi_1$  by the use of different sequences of parameters of  $\mathfrak{A}$  may define many elements of  $R(\mathfrak{A})$ . Then there need not exist a unique  $\psi_2$  such that  $\mathfrak{A} \models J^*(\psi_1, \psi_2)$  even though  $R(\mathfrak{A}) \models J_2$ .

The corrections in the statements are as follows: Page 523, line 25: change " $\mathcal{L}$ - $\equiv$ " to " $\mathcal{L}$ -existentially equivalent to."

Page 524, line 26: insert "existential" between "an" and " $\mathcal{L}$ -embedding".

Page 524, line 41: omit "and to".

Page 524, line 42: insert "to a category of algebras (the maps being existential  $\mathcal{L}$ -embeddings)" between "(" and ".".

*Received August 22, 1974*

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