

ADDITIONAL NOTE TO THE AUTHOR'S "THEORY OF
CYCLIC ALGEBRAS OVER AN ALGEBRAIC
NUMBER FIELD"*

BY
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Unfortunately, there has been an embarrassing misunderstanding concerning the proof corrections of my above mentioned paper. As a consequence of this, I have not been able to cooperate in the correction. I wish, therefore, to make the following corrections and additions:

Page 172, line 16, read "Kap. III, 4, 5)".

——— footnote †, line 5, read "(see the footnote ‡ on p. 171)."

Page 173, line 13, replace "reverts to" by "is equivalent to".

——— line 16, for " $N(c)$ " read " $N(\)$ ".

Page 174, line 5, put "for" between "except" and "an".

——— line 21, read "field" instead of "corps".

——— footnote §, line 1, put "have" between "I" and "adjoined".

Page 175, line 11, read "The prime spots \mathfrak{p} for which, at most, the symbol $((\alpha, Z)/\mathfrak{p})$ is different".

——— in (3.10) replace the exponent μ by $-\mu$.

——— line 17, omit "shall".

——— line 18, replace "deal with" by "pursue".

Page 176, in (4.4) omit the bar over Z (twice).

Page 177, line 3, omit the comma after $(\text{mod } n)$.

Page 178, in (6.3) read " $((\alpha, Z)/\mathfrak{p})$ ".

Page 179, last line, read "exponent l ."

Page 180, footnote †, read "In lectures at the University of Göttingen, 1929–30."

——— footnote §, read "In a separate paper; in part also in van der Waerden (1 Kap. 17)."

Page 181, line 5, read: "(2, 3 Kap. III, 4, 5†)."

——— adjoin the footnote "† That the algebras considered by Dickson (5) were actually crossed products and hence not "new" was pointed out by Albert (0). Moreover, Albert (3, 4) has also already given some of the essential facts concerning crossed products."

Page 183, line 8, read "substitution".

* These Transactions, vol. 34 (1932), pp. 171–214.

- line 11, replace “relation reverts to” by “substitution is equivalent to”.
- last line, at the end adjoin “(see p. 178)”.
- Page 185, line 3, read “u” instead of “n”.
- line 19, read “Z” instead of “Z”.
- Page 187, line 1, put a footnote mark † after A .
- line 3, read “ D_Z ” instead of “ DZ ”.
- last line, read “ $y_R = 0$ ” instead of “ $y_R \neq 0$ ”.
- adjoin the footnote “† Artin (2), Brauer (3), van der Waerden (1 Kap. 16).”
- Page 188, footnote *, line 6, after (11.4) adjoin, “and also the proofs of Noether given in van der Waerden (1 Kap. 17)”.
- same footnote, lines 8 and 9, omit “perfect”.
- same footnote, after line 11, adjoin as a new paragraph “(11.3) holds, moreover, in the general case without any restriction, when the supposition is adjoined that A is the algebra similar to D of the least degree which contains a corps isomorphic to Z .”
- same footnote, lines 13–14, replace by “Noether.”
- Page 189, line 22, read “For” instead of “Now”.
- Page 190, line 1, read “ \bar{A}_a in” instead of “ \bar{a}_a of”.
- Page 191, line 3, read “ c_S ” instead of “ c^T ”.
- line 23, instead of “This” read “If these n idempotents can be inserted in a set of n^2 matrix units of which they are the diagonal units, as will be shown later (p. 193), this”.
- line 24, omit “to a set . . . and so”.
- Page 192, lines 4, 6, 12, read “ \tilde{Z}^R ” instead of “ Z^R ”.
- Page 193, line 13, omit, “by the way”.
- lines 15–16, instead of “I do not . . . following” read “, hence the supplementary statement required on p. 191 for the validity of (12.4 2) is correct”.
- line 17, replace “deduced” by “constructed”.
- line 21, read “ $\sum_{R,S,T}$ ”.
- line 23, read “ $z_{R,S,T} e$ ”.
- line 25, read “(12.4 7)”.
- Page 194, line 6, omit the comma at the end.
- line 8, read “ $\tilde{z} = ez$ ”.
- line 10, read “ $\tilde{u}_S \tilde{u}_T = \tilde{u}_{ST} \tilde{a}_{S,T} \tilde{\tilde{a}}_{S,T}$ ”.
- after line 10, adjoin “where $\tilde{a}_{S,T} = e a_{S,T}$ and $\tilde{\tilde{a}}_{S,T} = e \tilde{a}_{S,T}$ are the elements in $\tilde{Z} = eZ = e\tilde{Z}$ corresponding to $a_{S,T}$ in Z and $\tilde{a}_{S,T}$ in \tilde{Z} .”

—— line 11, read "Therefore, really,".

—— line 12, read " $\bar{a}\bar{a}$ ".

—— line 30, read "(Brauer 2a, 3)".

Page 195, line 16, read " $q_i \equiv 0 \pmod{l/p_i^{\lambda_i}}$ ".

—— line 28, read "(13.4 1)".

Page 196, lines 16, 29, 30, read " $e\phi$ " instead of " $e\phi$ ".

—— line 23, read "results, provided that e and the other idempotents arising from the decomposition of Z_ϕ can be inserted in a set of matrix units of which they are the diagonal units, as will be shown later (p. 197)."

Page 197, lines 5, 6, 7, 9, read " $e\phi$ " instead of " $e\phi$ ".

—— line 17, omit "we have in particular that".

—— line 18, read " $e^R u_S = u_S e^{RS}$ ".

—— after line 18, adjoin "From this relation it follows that

$$e_{S,T} = u_S^{-1} u_T e^T$$

is a set of k^2 matrix units in A_ϕ corresponding to the e^S as $e_{S,S}$, hence the supplementary statement required on p. 196 for the validity of (14.1) is correct".

—— line 19, replace "deduced" by "constructed".

Page 198, footnote †, line 1, read "Kap. III, 4, 5"); replace "revert" by "amount."

Page 199, in (15.4 1) read " $c_{S^{\mu+\nu}}$ " instead of " $c^{S^{\mu+\nu}}$ ".

—— line 15, read " c_{S^μ} " instead of " c_S ".

—— line 23, replace "=" by " \sim ".

—— line 27, replace the second "=" by " \sim ".

Page 200, line 21, read "(3.10)".

Page 201, line 2, read " $((\beta_p, W^p)/p)$ ".

—— line 3, put a semicolon after (16.3).

—— in (16.6 3) read "=" instead of " \equiv ".

Page 202, line 15, put the footnote mark † after "an".

Page 203, line 25, read "by (3.1), (3.2)".

—— line 29, read "by (16.3), (16.4)".

Page 204, in (17.10) on the right-hand side replace " p " by " q ".

—— line 27, read "(16.8)".

Page 205, line 9, read " A_ϕ^0 " instead of " A^0 ".

Page 207, line 31, replace "(15.4)" by "(15.2)".

Page 208, line 13, read "cyclic algebra".

—— line 19, read "(15.5)".

Page 209, last line, read " \tilde{Z} ".

Page 210, line 1, read " \tilde{Z} ".

—— line 3, read " $A \sim (\beta, \tilde{Z}, \tilde{S}), \bar{A} \sim (\bar{\beta}, \tilde{Z}, \tilde{S})$ ".

—— line 4, read "(13.1) and (15.2)".

—— line 5, read " $A \times \bar{A} = \tilde{A} \sim (\beta\bar{\beta}, \tilde{Z}, \tilde{S}) = (\tilde{\alpha}, \tilde{Z}, \tilde{S})$ ".

—— line 8, read

$$\begin{aligned} \left(\frac{\tilde{\alpha}, \tilde{Z}, \tilde{S}}{p} \right) &\equiv \left(\frac{\beta, \tilde{Z}, \tilde{S}}{p} \right) + \left(\frac{\bar{\beta}, \tilde{Z}, \tilde{S}}{p} \right) \\ &\equiv \left(\frac{\alpha, Z, S}{p} \right) + \left(\frac{\bar{\alpha}, \bar{Z}, \bar{S}}{p} \right) \pmod{1}. \end{aligned}$$

—— line 14, read "(13.1) and (15.2)".

Page 212, under A. A. Albert add the following:

0. *Normal division algebras in $4p^2$ units, p an odd prime.* Annals of Mathematics, vol. 30 (1929).

3. *The structure of pure Riemann matrices with non-commutative multiplication algebras.* Rendiconti del Circolo Matematico di Palermo, vol. 55 (1931).

4. *On direct products, cyclic division algebras, and pure Riemann matrices.* Transactions of the American Mathematical Society, vol. 33 (1931).

—— under R. Brauer add the following:

2a. *Über Systeme hyperkomplexer Grössen.* Jahresbericht der Deutschen Mathematiker-Vereinigung, vol. 38 (1929), p. 47-48.

—— under L. E. Dickson add the following:

5. *Construction of division algebras.* Transactions of the American Mathematical Society, vol. 32 (1930).

Page 213, under H. Hasse add the following:

15. *Beweis eines Satzes und Widerlegung einer Vermutung über das allgemeine Normenrestsymbol.* Nachrichten von der Gesellschaft der Wissenschaften zu Göttingen, 1931.

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