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REMARKS CONCERNING THE 2-HILBERT CLASS FIELD OF IMAGINARY QUADRATIC NUMBER FIELDS: CORRIGENDA

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In my earlier paper [1] I made the claim that there are three groups in Hall and Senior's book "The Groups of Order $2^n (n \leqslant 6)$" that are in error (groups 64/140, 64/141, 64/143). However, it has been pointed out to me by Franz Lemermeyer that I made the unfortunate oversight of using the definition $[x, y] = xyx^{-1}y^{-1}$ for the commutator whereas Hall and Senion use the definition $[x, y] = x^{-1}y^{-1}xy$ (see [2]). With this correction there is no problem with the above three groups in Hall and Senior.

In the course of proving my Theorem 2 in [1], which states that if k is an imaginary quadratic number field with $C_{k,2} \cong (2, 4)$ and $C_{k_1,2}$ elementary then k has finite 2-class field tower of length at most 2, the corrected group presentations should be as follows:

$$G_1 = \langle q, s \rangle : x^2 = y^2 = z^2 = 1,\ zrzr = x,\ ys^{-1}y\,s = x,\ qrqr = y,\ zs^{-1}zs = y,$$
$$qs^{-1}qs = z,\ q^2 = 1,\ r^2 = 1,\ s^2 = r.$$
$$G_2 = \langle 1, s \rangle : x^2 = y^2 = z^2 = 1,\ zrzr = x,\ ys^{-1}ys = x,\ q^{-1}rqr = y,\ zs^{-1}zs = y,$$
$$q^{-1}s^{-1}qs = z,\ q^2 = x,\ r^2 = 1,\ s^2 = r.$$

Since the new computations once again yield the same kernels for the transfer maps as in [1], the above theorem is still valid.

I would like to express my gratitude to Franz Lemermeyer for pointing out to me my mis-use of Hall and Senior's commutator definition. Dr. Lemermeyer has also conveyed to me a few typographical misprints in my paper:

p.380 line 8 from bottom: $G' = \mathrm{Gal}(k_1/k)$ should be $G' = \mathrm{Gal}(k_2/k_1)$;
p.380 line 3 from bottom: $G \cdot G \to H/H'$ should be $t : G/G' \to H/H'$;
p.380 diagram: the arrow $C_L \xleftarrow{\phi} H/H'$ should be reversed;
p.381 line 8 from bottom: $G/G \cong (2, 4)$ should be $G/G' \cong (2, 4)$;
p.381 line 5, from bottom: the relation $s^2 = r$ is missing.

In Dr Lemermeyer's recently completed Ph.D. thesis, he has obtained some interesting group theoretical results regarding the assumptions for my Theorem 2; I believe these results will be forthcoming.

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References

[1] E. Benjamin, 'Remarks concerning the 2-Hilbert class field of imaginary quadratic number fields', *Bull. Austral. Math. Soc* **48** (1993), 379–383.

[2] M. Hall and J.K. Senior, *The groups of order* $2^n (n \leqslant 6)$ (Macmillan, New York, 1964).

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