Correction to "Polar Reciprocal Convex Bodies", by H. Guggenheimer, Israel Journal of Mathematics, Vol. 14, No. 3, 1973, pp. 309–316.

Professor E. Makai, Jr., has pointed out to me that the complement to the theorem, and therefore the proof of the theorem, does not hold for $n > 3$. For $n = p + q$ let K_p and K_q be symmetric convex bodies of center $*$ in orthogonal p and q spaces, respectively. Then

$$V(K_p \times K_q)V((K_p \times K_q)*) = V(K_p)V(K_q)V(\mathrm{conv}(K_p^*, K_q^*))$$

$$= \frac{p!q!}{n!} V(K_p)V(K_p^*)V(K_q)V(K_q^*)$$

where the volume is taken in the appropriate spaces. Hence, if $f(K_p) = V(K_p)V(K_p^*) = 4^p/p!, f(K_q) = 4^q/q!$, it follows that $f(K_p \times K_q) = f(\mathrm{conv}(K_p, K_q)) = 4^n/n!$. For $n = 4$, the value $f(K) = 4^4/4!$ is assumed not only by parallelotope and crossbody but also by the product of octahedron and segment and the convex hull of cube and segment. These examples show that the error is on page 314 where it is asserted without proof that $P = \mathrm{conv}\, S(a_i) \cup \mathrm{conv}\, S(-a_i)$ implies that P is a combinatorial cube and this is not true for $n > 3$.

A detailed proof of $\min f(K) = 4^n/n!$ with a determination of the bodies P will be given in a separate paper.