1023-32-1880 **Hiroaki Terao*** (hterao00@za3.so-net.ne.jp), Mathematics Department, Hokkaido University, N10 W8 Chuo-ku, Hokkaido 0600004, Japan. *On the Heavyside functions of arrangements and the impossibility theorem by Kenneth Arrow.*

Let $\mathcal{A}$ be a real central arrangement of hyperplanes in $V = \mathbb{R}^\ell$ and $Ch(\mathcal{A})$ be the set of chambers. For each $H \in \mathcal{A}$, let $V \setminus H = H^+ \cup H^-$ be the decomposition into connected componenets. The Heaviside functions χ_H^+ and χ_H^- are the characteristic functions of H^+ and H^- respectively. Then the Heaviside functions induce a map from $Ch(\mathcal{A})$ to $\mathbb{F}_2 = \{0, 1\}$ and a map from $Ch(\mathcal{A})^m$ to $\mathbb{F}_2^m$ for each positive integer m. We ask which maps of $Ch(\mathcal{A})^m$ to $Ch(\mathcal{A})$ and maps $\mathbb{F}_2^m$ to $\mathbb{F}_2$ commute with the Heaviside maps. Our result can be regarded as a result in the social choice theory in microeconomics. In the case of braid arrangements, it is equivalent to Kenneth Arrow's impossibility theorem. (Received September 27, 2006)