

7. Criticize the following “proof” that $\overline{\bigcup A_\alpha} \subset \bigcup \bar{A}_\alpha$: if $\{A_\alpha\}$ is a collection of sets in X and if $x \in \overline{\bigcup A_\alpha}$, then every neighborhood U of x intersects $\bigcup A_\alpha$. Thus U must intersect some A_α , so that x must belong to the closure of some A_α . Therefore, $x \in \bigcup \bar{A}_\alpha$.

(from Closed Sets and Limit Points)