3.2. Let $\Omega = \mathbf{N} = \{1,2,\ldots\}$ denote the numerals. For all $n = 1,2,\ldots$ define $\mathscr{F}_n$ to be the σ-algebra generated by $\{1\},\ldots,\{n\}$. For example, $\mathscr{F}_1 = \{\varnothing,\mathbf{N},\{1\},\mathbf{N}\setminus\{1\}\}$, $\mathscr{F}_2 = \{\varnothing,\mathbf{N},\{1\},\{2\},\{1,2\},\mathbf{N}\setminus\{1\},\mathbf{N}\setminus\{2\},\mathbf{N}\setminus\{1,2\}\}$, and so on. Evidently, $\mathscr{F}_n \subset \mathscr{F}_{n+1}$. However, $\{1,3,5,\ldots\} \notin \cup_{i=1}^{\infty}\mathscr{F}_i$.