The title of the book is taken from the 1936 paper [**4**] by Birkhoff and von Neumann, which gave the impetus for much of the research in quantum mechanics. The word "logic" in the title refers to the mathematical foundations of quantum mechanics and not to quantum logic which is mentioned only briefly in the book.

A person unfamiliar with quantum theory will have difficulty reading the book. The authors might have pleased more readers by restructuring the book and including more background material. But the majority of readers will consider it a worthwhile addition to the literature.

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*Representations of real reductive Lie groups*, by David A. Vogan, Jr., Progress in Mathematics, vol. 15, Birkhäuser, Boston, Basel, Stuttgart, 1981, xvii + 754 pp., $35.00.

**1. Introductory.** The representation theory of Lie groups is a vast and imposing edifice. Its foundations were laid by E. Cartan in 1913. He gave a classification of the finite-dimensional irreducible representations of a complex semisimple Lie algebra $\mathfrak{g}$ [**2**]. This is the "infinitesimal" version of the classification of finite-dimensional irreducible representations of a semisimple Lie group $G$. It was realized by H. Weyl in the twenties [**9**] that if $G$ is compact (and connected and simply connected in the topological sense) any continuous irreducible finite-dimensional complex representation of $G$ can be obtained by "integration" from a similar representation of the complexification $\mathfrak{g}$ of the Lie algebra of $G$. He also showed that any representation of $G$ is equivalent to a unitary one.

Around the same time Peter and Weyl [**6**] showed that these irreducible unitary representations are fundamental objects for noncommutative Fourier analysis on the compact Lie group $G$. The representation theory of Lie groups is thus tied up with Fourier analysis.

Any attempt at a straightforward generalization of these elegant results to the case of noncompact Lie groups breaks down. To develop Fourier analysis on noncompact Lie groups one needs infinite-dimensional representations of a Lie group $G$, more precisely continuous representations $\pi$ of $G$ by bounded operators in a Hilbert space $H$. Such a representation $\pi$ is irreducible if no closed nontrivial subspace of $H$ is invariant under all $\pi(x)$ $(x \in G)$.