equations are neither hyperbolic nor parabolic are not discussed. A start in this direction is made by considering materials whose stress-relaxation moduli have initially infinite slopes. Even for initially elastic materials this produces a smoothing effect like that of viscosity, although weaker. When the stress relaxation modulus itself is initially infinite, the governing integrodifferential equation is squarely not a perturbation on a partial differential equation, and no results of any great generality are available for such cases.

The book is complete in itself so far as the fundamentals of nonlinear viscoelasticity are concerned. The methods that are used for proving existence theorems are always introduced and explained in terms of simpler model equations, and the difficulties are taken one at a time. This style of exposition makes the proofs comprehensible even to one who is not an analyst, and for that I am most grateful.

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The Malliavin calculus, By Dennis R. Bell. Pitman Monographs and Surveys in Pure and Applied Mathematics, vol. 34, Longman Scientific and Technical, Essex, and John Wiley, New York, 1987, x + 105 pp., $62.95. ISBN 0-582-99486-1

The Malliavin calculus refers to a part of Probability theory which can loosely be described as a type of calculus of variations for Brownian motion. It is intimately concerned with the interplay between Markov processes with continuous paths (i.e., *diffusions*) and partial differential equations.

A time homogeneous diffusion X with values in $\mathbf{R}^n$ can be represented as a solution of a stochastic integral equation of the form

$$X_t = x + \int_0^t a(X_s)\,dB_s + \int_0^t b(X_s)\,ds, \tag{1}$$

where B is a Brownian motion on $\mathbf{R}^m$ (also known as a Wiener process), provided X satisfies mild regularity conditions. From a statistical standpoint, the diffusion X is determined by its *transition probabilities*, since it is a Markov process $P_t(x, A) = P(X_{u+t} \in A | X_u = x)$, all $u \geq 0$, all $t > 0$. The measures $P_t(x, dy)$ induce operators on bounded Borel functions $P_t f(x) = \int f(y) P_t(x, dy)$, and since they are a semigroup of operators there is an *infinitesimal generator* ($P_0 = I$),

$$Lf(x) = \lim_{t \downarrow 0} \frac{P_t f(x) - f(x)}{t},$$