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Mircea Sofonea* (sofonea@univ-perp.fr), Laboratoire LAMPS, University of Perpignan, 52 Avenue Paul Alduy, 66100 Perpignan, France. *History-dependent Quasivariational Inequalities Arising in Contact Mechanics.*

We consider a class of quasivariational inequalities arising in a large number of mathematical models which describe quasistatic processes of contact between a deformable body and an obstacle, the so-called foundation. The novelty arise in the special structure of these inequalities which involve a history-dependent term as well as in the fact that the inequalities are formulated on an unbounded interval of time. We prove an existence and uniqueness result of the solution, then we complete it with a regularity result. The proofs are based on arguments of monotonicity, convexity, and fixed point. Further, we consider a quasistatic frictional contact problem in which the material's behavior is modeled with a viscoelastic constitutive law, the contact is bilateral, and the friction is described with a slip-rate version of Coulomb's law. We prove that this problem cast in the abstract setting of history-dependent quasivariational inequalities, with a convenient choice of spaces and operators. Then we apply the abstract results in order to prove the unique weak solvability of this contact problem and to describe the regularity of the weak solution, as well. (Received January 06, 2011)