

Preface

The written qualifying examination, a little publicized requirement of graduate physics programs in most universities, brings some excitement to the generally dull life of the graduate student. While undergoing this ordeal ourselves, we were reminded of the initiation ceremonies into certain strict monastic orders, designed to cause the novices enough pain to make them consider their vocation seriously. However, as the memory of the ghastly experience grows dim, our attitudes are gradually changing, and we now may agree that these exams help assure a minimal level of general physics knowledge necessary for performing successful research. Still, the affair is rather stressful, sometimes more a test of character than of knowledge (see Figure P.1). Perhaps it is the veteran's memory of this searing, yet formative experience that preserves the Institution of the Qualifying Exam.

Some schools do not have written exams, for instance: *Brown, Cal-Tech, Cornell, Harvard, UT Austin, Univ. of Toronto, Yale*. However, the majority do administer them and do so in a more or less standard form, though, the level of difficulty of the problems, their style, etc., may differ substantially from school to school. Our main purpose in publishing this book — apart from the obvious one to become rich and famous — is to assemble, as far as possible, a universal set of problems that the graduate student should be able to solve in order to feel comfortable and confident at the exam. Some books containing exam problems from particular universities (*Chicago, Berkeley, Princeton*) have been published; however, this is the first book to contain problems from different American schools, and for comparison, problems from *Moscow Phys-Tech*, one of the leading Russian universities.