Contents

| Introduction | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Chapter I. Classifications of Causes of Failures | 5 |
| Chapter II. Instantaneous Damage | 10 |
| The exponential distribution The threshold of sensitivity Superposition of exponential distributions | 10 19 25 |
| Chapter III. Cumulative Damages | 28 |
| Models of wear The gamma distribution of the lifetime Normal distribution of lifetime The gamma distribution with bias parameter The functional gamma distribution The logarithmic normal distribution Linear sample functions of wear Analysis of sample functions of wear | 28 58 65 70 76 86 93 |
| Chapter IV. Processes of Damage with Relaxation 1 | .07 |
| Chapter V. Superposition of Causes of Failures. Chain Systems 1 | 16 |
| The simultaneous action of several causes of failure 1 The Weibull-Gnedenko distribution | .16 122 129 |
| Chapter VI. The Failure Rate 1 | 132 |
| The failure rate and the residual lifetime | .32 .38 .42 |
| Conclusion | 153 |
| Appendix | 157 |
| Bibliography | 162 |