CONTENTS

INTRODUCTION

CHAP	TER 1. CLASSIFYING SPACES AND COBORDISM	
B. C. D.	Bundles with fiber F and structure group II The classifying spaces for the classical Lie groups The cobordism classification of closed manifolds Oriented cobordism theories and localization Connections between cobordism and characteristic classes	14 21 24
CHAP'	TER 2. THE SURGERY CLASSIFICATION OF MANIFOLDS	
B. C.	Poincare duality spaces and the Spivak normal bundle The Browder-Novikov theorems and degree 1 normal maps The number of manifolds in a homotopy type	29 34 38
CHAP'	TER 3. THE SPACES SG AND BSG	
B. C. D.	The spaces of stable homotopy equivalences The space $Q(S^0)$ and its structure Wreath products, transfer, and the Sylow 2-subgroups of Σ_n A detecting family for the Sylow 2-subgroups of Σ_n The image of $H^*(B\Sigma_n)$ in the cohomology of the detecting groups	45 48 51 54
F.	The homology of $Q(S^0)$ and SG	57 64
	The proof of Theorem 3.32	70
CHAPT	FER 4. THE HOMOTOPY STRUCTURE OF G/PL AND G/	тор
A. B. C. D.	The 2-local homotopy type of G/PL Ring spectra, orientations and K-theory at odd primes Piece-wise linear Pontrjagin classes The homotopy type of G/PL[½]	77 81 86 89
E.	The H-space structure of G/PL	93

vi CONTENTS

СНАРТ	TER 5. THE HOMOTOPY STRUCTURE OF MSPL[½] AND MSTOP[½]	
Α	The KO-orientation of PL-bundles away from 2	99
	The splitting of p-local PL-bundles, p odd	102
	The homotopy types of G/O[p] and SG[p]	106
	The splitting of MSPL[p], p odd	113
	Brumfiel's results The map f: SG[p] → BU [⊗] [p]	116
Г.	The map 1: SG[p] → BU [p]	118
CHAPT	TER 6. INFINITE LOOP SPACES AND THEIR HOMOLOGY OPERATIONS	
Α.	Homology operations	125
	Homology operations in $H_*(Q(S^0))$ and $H_*(SG)$	130
	The Pontrjagin ring H _* (BSG)	137
CHAPT	TER 7. THE 2-LOCAL STRUCTURE OF B(G/TOP)	
Α.	Products of Eilenberg-MacLane spaces and operations	
	in H _* (G/TOP)	142
В	Massey products in infinite loop spaces	149
	The proof of Theorem 7.1	154
C.	The proof of Theorem 7.1	-01
CHAPT	TER 8. THE TORSION FREE STRUCTURE OF THE ORIENTED COBORDISM RINGS	
Α	The map $\eta: \Omega_*(G/PL) \to \Omega_*^{PL}$	158
В.		164
	Constructing the exotic complex projective spaces	167
C.	Constitucting the exotic complex projective spaces	107
CHAPT	TER 9. THE TORSION FREE COHOMOLOGY OF G/TOP AND G/PL	
Α	An important Hopf algebra	174
	The Hopf algebras $F^*(BSO^{\otimes})$ and $F^*(G/PL) \otimes Z[\frac{1}{2}]$	180
C.	The 2-local and integral structure of $F^*(G/PL)$ and	200
0.	F*(G/TOP)	188
СНАРТ	TER 10. THE TORSION FREE COHOMOLOGY OF BTOP AND BPL	
Α.	The map $j_*: F_*(BO) \otimes F_*(G/TOP) \rightarrow F_*(BTOP)$	193
В.	The embedding of F*(BTOP; Z.,) in H*(BTOP; O)	200
C.	The embedding of $F^*(BTOP; Z_{(2)})$ in $H^*(BTOP; Q)$ The structure of $\Omega^{PL}_*/Tor \otimes Z_{(2)}$	205
Ű.	* / *** (2)	
СНАРТ	ER 11. INTEGRALITY THEOREMS	
Α.	The inclusion $F_*(BTOP; \mathbb{Z}[\frac{1}{2}]) \subseteq H^*(BTOP; \mathbb{Q})$	209
	Piece-wise linear Hattori-Stong theorems	216
	Milnor's criteria for PI manifolds	221

CHAPTER 12. THE SMOOTH SURGERY CLASSES AND H _* (BTOF); Z /2)
A. The map $B(r \times s) : B(G/O) \rightarrow B^2O \times B(G/TOP)$ B. The Leray-Serre spectral sequence for BTOP	223 231
CHAPTER 13. THE BOCKSTEIN SPECTRAL SEQUENCE FOR BTOP	
A. The Bockstein spectral sequences for BO , G/TOP and $B(G/O)$	235
B. The spectral sequence for BTOP	238
C. The differentials in the subsequence 13.21	243
CHAPTER 14. THE TYPES OF TORSION GENERATORS A. Torsion generators, suspension and the map η	246
B. Torsion coming from relations involving the Milnor	
manifolds C. Applications to the structure of the unoriented bordism	249
rings $\mathfrak{N}^{ ext{PD}}_*$ and $\mathfrak{N}^{ ext{PL}}_*$	251
D. p-torsion in $\Omega_*^{\rm PL}$ for p odd	253
APPENDIX. THE PROOFS OF 13.12, 13.13, AND 13.15	256
BIBLIOGRAPHY	
INDEX	
	274