

CHAPTER ONE: INTRODUCTION.....	1
STUDY GOALS AND OBJECTIVES.....	1
REASONS FOR STUDY.....	1
SCOPE OF STUDY.....	1
METHODOLOGY AND INFORMATION SOURCES.....	2
ANALYST CREDENTIALS.....	2
RELATED BCC REPORTS.....	2
BCC ON-LINE SERVICES.....	3
DISCLAIMER.....	3
 CHAPTER TWO: EXECUTIVE SUMMARY.....	 4
EXECUTIVE SUMMARY.....	4
<i>SUMMARY TABLE GLOBAL MARKET FOR CONGESTIVE HEART     FAILURE DEVICES, THROUGH 2016 (\$ MILLIONS)</i> .....	 5
<i>SUMMARY FIGURE TOTAL GLOBAL MARKET FOR CONGESTIVE     HEART FAILURE DEVICES, 2010-2016 (\$ MILLIONS)</i> .....	 5
EXECUTIVE SUMMARY (CONTINUED).....	6
 CHAPTER THREE: OVERVIEW.....	 7
ETIOLOGY.....	7
SYSTOLIC FAILURE.....	8
DIASTOLIC FAILURE.....	9
COMPENSATION.....	9
Sympathetic Nervous System Activation.....	10
Increased Preload.....	10
Myocardial Hypertrophy.....	11
MANAGEMENT OF HEART FAILURE.....	11
<i>FIGURE 1 STAGES OF HEART FAILURE</i> .....	 12
CLINICAL PRESENTATION OF CHF.....	12
Left-Sided Heart Failure.....	13
Right-Sided Heart Failure.....	14
Biventricular Heart Failure.....	14
DEMOGRAPHICS.....	15
<i>TABLE 1 TOAL GLOBAL POPULATION BY SELECTED     GEOGRAPHICAL REGION, 2000-2050</i> .....	 16
<i>FIGURE 2 TOTAL GLOBAL POPULATION BY SELECTED     GEOGRAPHICAL REGION, 2000-2050</i> .....	 17
TREATMENTS.....	18
MANAGEMENT OF PRELOAD.....	18
MANAGEMENT OF AFTERLOAD.....	18
MANAGEMENT OF CONTRACTILITY.....	19
TREATMENT DEVICES.....	19
VENTRICULAR ASSIST DEVICES.....	19
AB5000 Ventricle, VAD, Abiomed.....	20

CentriMag, Right Ventricular Assisted Device (RVAD), Thoratec .....	20
HeartMate Family, Left Ventricular Assisted Device (LVAD), Thoratec .....	20
Jarvik 2000, VAD, Jarvik Heart .....	21
<i>TABLE 2 VENTRICULAR ASSIST DEVICES</i> .....	22
IMPLANTABLE CARDIOVERTERS/DEFIBRILLATORS.....	22
Cognis, Cardiac Resynchronization Therapy – Defibrillator (CRT-D), Boston Scientific .....	23
Confient, ICD, Boston Scientific .....	23
Current Plus, ICD, St. Jude Medical .....	23
Fortify, ICD, St. Jude Medical .....	23
Unify, CRT-D, St. Jude Medical .....	24
Protecta XT DR and VR, ICD and CRT-D, Medtronic .....	24
Secura DR/VR, ICD, Medtronic .....	24
<i>TABLE 3 IMPLANTABLE CARDIOVERTER DEFIBRILLATORS (ICDS)</i> .....	25
PACEMAKERS .....	25
Altrua Pacemaker Family: Altrua 50 and Altrua 60, Pacemaker, Boston Scientific .....	25
Contak Renewal TR, Cardiac Resynchronization Therapy- Pacemaker (CRT-P), Boston Scientific .....	26
Accent, Pacemaker, St. Jude Medical .....	26
Identity ADx, Pacemaker, St. Jude Medical .....	26
Adapta with MVP, Pacemaker, Medtronic .....	27
Revo MRI, Pacing System, Medtronic .....	27
Effecta, Pacemaker, Biotronic.....	28
Reply, Pacemaker, Sorin .....	28
<i>TABLE 4 PACEMAKERS</i> .....	29
OTHER DEVICES AND TOTAL ARTIFICIAL HEART .....	29
<i>TABLE 5 OTHERS AND TOTAL ARTIFICIAL HEART</i> .....	30
<i>TABLE 5 (CONTINUED)</i> .....	31
CHAPTER FOUR: RESEARCH AND DEVELOPMENT .....	32
COUNTERPULSATION DEVICE .....	32
LILLEHEI E.V.A. ....	32
WIRELESS SENSOR, CARDIOMEMS .....	32
MYOCELL, BIOHEART .....	33
COAPSYS, MYOCOR .....	33
MITIHEART LVAD, MITIHEART.....	33
TOTAL ARTIFICIAL HEART, SYNCARDIA SYSTEMS .....	33
SYNERGY POCKET MICRO-PUMP, CIRCULITE.....	34
EVAHEART LVAS, EVAHEART MEDICAL .....	34
GRNCM1, GERON.....	34
SMARTHEART LVAD AND SMARTHEART TAH, CLEVELAND HEART .....	34

TABLE 6 PIPELINE DEVICES AND TECHNOLOGY.....	35
TABLE 6 (CONTINUED).....	36
CHAPTER FIVE: GLOBAL MARKET SIZE AND GROWTH.....	37
GLOBAL MARKET SIZE AND GROWTH.....	37
TABLE 7 THE GLOBAL MARKET BY REGION FOR CONGESTIVE HEART FAILURE DEVICES, THROUGH 2016 (\$ MILLIONS).....	38
FIGURE 3 TOTAL GLOBAL MARKET SIZE AND GROWTH BY REGION FOR CONGESTIVE HEART FAILURE DEVICES, 2010-2016 (\$ MILLIONS).....	38
GROWTH BY GEOGRAPHIC REGION.....	39
TABLE 8 TOTAL GLOBAL MARKET PERCENTAGE FOR CHF REVENUES BY REGION, 2011 (%).....	39
FIGURE 4 TOTAL GLOBAL MARKET PERCENTAGE FOR CHF REVENUES BY REGION, 2011 (%).....	40
GROWTH BY TREATMENT TYPE.....	40
TABLE 9 GLOBAL MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	41
FIGURE 5 GLOBAL MARKET BY DEVICE TYPE, 2010-2016 (\$ MILLIONS).....	41
TABLE 10 GLOBAL CHF MARKET PERCENTAGE, BY DEVICE TYPE, 2011 (%).....	42
FIGURE 6 GLOBAL CHF MARKET PERCENTAGE, BY DEVICE TYPE, 2011 (%).....	42
TABLE 11 GLOBAL CHF MARKET PERCENTAGE BY DEVICE TYPE, 2016 (%).....	43
FIGURE 7 GLOBAL CHF MARKET PERCENTAGE, BY DEVICE TYPE, 2016 (%).....	43
COMPETITIVE ANALYSIS.....	43
TABLE 12 TOTAL GLOBAL CONGESTIVE HEART FAILURE TREATMENT DEVICE MARKET COMPETITIVE ANALYSIS, 2011 (\$ MILLIONS/%).....	44
FIGURE 8 TOTAL GLOBAL CONGESTIVE HEART FAILURE TREATMENT DEVICE MARKET COMPETITIVE ANALYSIS BY PERCENT (%).....	45
TABLE 13 GLOBAL CONGESTIVE HEART FAILURE MANUFACTURER PRODUCT PARTICIPATION BY DEVICE TYPE.....	45
TABLE 13 (CONTINUED).....	46
CHAPTER SIX: THE AMERICAS MARKET.....	47
UNITED STATES.....	47
CANADA.....	48
CANADA (CONTINUED).....	49
CANADA (CONTINUED).....	50
CANADA (CONTINUED).....	51

LATIN AND SOUTH AMERICA .....	52
LATIN AND SOUTH AMERICA (CONTINUED) .....	53
BRAZIL .....	54
MEXICO .....	55
VENEZUELA .....	56
ARGENTINA.....	56
PERU, OFFICIALLY THE REPUBLIC OF PERU .....	57
CHILE.....	58
COLOMBIA, OFFICIALLY NAMED REPUBLIC OF COLOMBIA.....	58
CUBA.....	58
<i>TABLE 14 CHF POPULATION BY AMERICAS COUNTRY 2011.....</i>	<i>59</i>
AMERICAS ELDERLY POPULATION.....	59
UNITED STATES .....	59
<i>TABLE 15 UNITED STATES OLDER POPULATION BY AGE GROUP,     2000-2050 .....</i>	<i>60</i>
CANADA.....	60
<i>TABLE 16 CANADA OLDER POPULATION BY AGE GROUP, 2000-2050.....</i>	<i>61</i>
LATIN AND SOUTH AMERICA.....	61
Brazil.....	61
<i>TABLE 17 BRAZIL BY OLDER POPULATION BY AGE GROUP, 2000-     2050.....</i>	<i>62</i>
Mexico .....	62
<i>TABLE 18 MEXICO BY OLDER POPULATION BY AGE GROUP, 2000-     2050.....</i>	<i>62</i>
Venezuela.....	63
<i>TABLE 19 VENEZUELA BY OLDER POPULATION BY AGE GROUP,     2000-2050 .....</i>	<i>63</i>
Argentina .....	63
<i>TABLE 20 ARGENTINA BY OLDER POPULATION BY AGE GROUP,     2000-2050 .....</i>	<i>64</i>
Peru .....	64
<i>TABLE 21 PERU BY OLDER POPULATION BY AGE GROUP, 2000-     2050.....</i>	<i>64</i>
Chile .....	65
<i>TABLE 22 CHILE BY OLDER POPULATION BY AGE GROUP, 2000-     2050.....</i>	<i>65</i>
Columbia.....	65
<i>TABLE 23 COLOMBIA BY OLDER POPULATION BY AGE GROUP,     2000-2050 .....</i>	<i>66</i>
Cuba .....	66
<i>TABLE 24 CUBA BY OLDER POPULATION BY AGE GROUP, 2000-     2050.....</i>	<i>66</i>
AMERICAS MARKET SIZE AND GROWTH OF THE CHF MARKET .....	67

<i>TABLE 25 AMERICAS MARKET BY GEOGRAPHIC REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	67
<i>FIGURE 9 TOTAL AMERICAS MARKET BY GEOGRAPHIC REGION, 2011 (\$ MILLIONS)</i> .....	68
<i>FIGURE 10 TOTAL AMERICAS MARKET BY GEOGRAPHIC REGION, 2016 (\$ MILLIONS)</i> .....	68
<i>TABLE 26 TOTAL AMERICAS MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY TREATMENT DEVICE TYPE AT MANUFACTURERS' SALES LEVELS, THROUGH 2016 (\$ MILLIONS)</i> .....	69
<i>TABLE 27 TOTAL AMERICAS CHF MARKET SHARE BY DEVICE TYPE, 2011 (%)</i> .....	69
<i>FIGURE 11 TOTAL AMERICAS CHF MARKET SHARE BY DEVICE TYPE, 2011 (%)</i> .....	70
<i>TABLE 28 TOTAL AMERICAS CHF MARKET SHARE BY DEVICE TYPE, 2016 (%)</i> .....	70
<i>FIGURE 12 TOTAL AMERICAS CHF MARKET TREATMENT SHARE BY DEVICE TYPE, 2016 (%)</i> .....	71
<i>TABLE 29 U.S. REGIONAL REVENUE BREAKDOWN BY TREATMENT DEVICE TYPE THROUGH 2016 (\$ MILLIONS)</i> .....	71
<i>TABLE 30 CANADA REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	72
<i>TABLE 31 LATIN AMERICA/SOUTH AMERICA REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	72
CHAPTER SEVEN: THE EUROPEAN MARKET.....	73
FRANCE.....	73
FRANCE (CONTINUED) .....	74
FRANCE (CONTINUED) .....	75
GERMANY.....	76
GERMANY (CONTINUED).....	77
ITALY.....	78
ITALY (CONTINUED).....	79
ITALY (CONTINUED).....	80
SPAIN.....	81
UNITED KINGDOM.....	81
UNITED KINGDOM (CONTINUED) .....	82
UNITED KINGDOM (CONTINUED) .....	83
<i>TABLE 32 CHF POPULATION BY EUROPEAN COUNTRY 2011</i> .....	84
EUROPE'S ELDERLY POPULATION.....	84
FRANCE.....	84
<i>TABLE 33 FRANCE BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	85
GERMANY .....	85

<i>TABLE 34 GERMANY BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	85
ITALY .....	86
<i>TABLE 35 ITALY BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	86
SPAIN .....	86
<i>TABLE 36 SPAIN BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	87
UNITED KINGDOM.....	87
<i>TABLE 37 UNITED KINGDOM BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	87
EUROPE MARKET SIZE AND GROWTH FOR THE CHF MARKET .....	88
<i>TABLE 38 TOTAL EUROPEAN MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY GEOGRAPHIC REGION AT MANUFACTURERS' SALES LEVELS, THROUGH 2016 (\$ MILLIONS)</i> .....	89
<i>FIGURE 13 TOTAL EUROPEAN MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY GEOGRAPHIC REGION AT MANUFACTURERS' SALES LEVELS, 2011 (\$ MILLIONS)</i> .....	89
<i>FIGURE 14 TOTAL EUROPEAN MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY GEOGRAPHIC REGION AT MANUFACTURERS' SALES LEVELS, 2016 (\$ MILLIONS)</i> .....	90
<i>TABLE 39 TOTAL EUROPEAN MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY DEVICE TYPE AT MANUFACTURERS' SALES LEVELS, THROUGH 2016 (\$ MILLIONS)</i> .....	91
<i>TABLE 40 EUROPEAN MARKET SHARE BY DEVICE TYPE, 2011 (%)</i> .....	91
<i>FIGURE 15 TOTAL EUROPEAN CHF MARKET SHARE BY DEVICE TYPE, 2011 (%)</i> .....	92
<i>TABLE 41 TOTAL EUROPEAN CHF MARKET SHARE BY DEVICE TYPE, 2016 (%)</i> .....	92
<i>FIGURE 16 TOTAL EUROPEAN CHF MARKET SHARE BY DEVICE TYPE, 2016 (%)</i> .....	93
<i>TABLE 42 FRANCE REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	93
<i>TABLE 43 GERMANY REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	94
<i>TABLE 44 ITALY REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	94
<i>TABLE 45 SPAIN REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	95
<i>TABLE 46 UNITED KINGDOM REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE THROUGH 2016 (\$ MILLIONS)</i> .....	95
CHAPTER EIGHT: THE ASIAN MARKET .....	96

THE ASIAN MARKET .....	96
TABLE 47 CHF POPULATION BY ASIAN COUNTRY 2011 .....	97
ASIA'S ELDERLY POPULATION .....	97
JAPAN .....	97
TABLE 48 JAPAN BY OLDER POPULATION BY AGE GROUP, 2000- 2050.....	98
CHINA .....	98
TABLE 49 CHINA BY OLDER POPULATION BY AGE GROUP, 2000- 2050.....	99
ASIAN ELDERLY POPULATION .....	99
JAPAN .....	99
Japan (Continued) .....	100
CHINA .....	101
ASIAN MARKET SIZE AND GROWTH FOR THE CHF MARKET .....	102
TABLE 50 TOTAL ASIAN MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY GEOGRAPHIC REGION AT MANUFACTURERS' SALES LEVELS, THROUGH 2016 (\$ MILLIONS).....	103
FIGURE 17 TOTAL ASIAN MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY GEOGRAPHIC REGION AT MANUFACTURERS' SALES LEVELS, 2011 (\$ MILLIONS).....	104
FIGURE 18 TOTAL ASIAN MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY GEOGRAPHIC REGION AT MANUFACTURERS' SALES LEVELS, 2016 (\$ MILLIONS).....	104
TABLE 51 ASIAN CHF MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	105
TABLE 52 TOTAL ASIAN CHF MARKET SHARE BY DEVICE TYPE, 2011 (%).....	105
FIGURE 19 TOTAL ASIAN CHF MARKET SHARE BY DEVICE TYPE, 2011 (%).....	106
TABLE 53 ASIAN CHF MARKET SHARE BY DEVICE TYPE, 2016 (%).....	106
FIGURE 20 ASIAN CHF MARKET SHARE BY DEVICE TYPE, 2016 (%).....	107
TABLE 54 JAPAN REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	107
TABLE 55 CHINA REGIONAL REVENUE BREAKDOWN BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	108
CHAPTER NINE: EMERGING/REST OF WORLD MARKETS.....	109
TABLE 56 CHF POPULATION BY REST OF WORLD COUNTRY, 2011.....	109
REST OF WORLD ELDERLY POPULATION.....	109
AUSTRALIA.....	109
TABLE 57 AUSTRALIA OLDER POPULATION BY AGE GROUP, 2000- 2050.....	110
INDIA .....	110

<i>TABLE 58 INDIA BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	111
ISRAEL.....	111
<i>TABLE 59 ISRAEL BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	111
RUSSIA AND OTHERS.....	112
<i>TABLE 60 RUSSIA BY OLDER POPULATION BY AGE GROUP, 2000-2050</i> .....	112
REST OF WORLD MARKET SIZE AND GROWTH FOR THE CHF MARKET.....	112
AUSTRALIA.....	112
Australia (Continued).....	113
INDIA.....	114
India (Continued).....	115
ISRAEL/MIDDLE EAST.....	116
RUSSIA.....	117
EMERGING/REST OF WORLD MARKETS.....	118
<i>TABLE 61 EMERGING/ REST-OF-WORLD MARKETS BY GEOGRAPHIC REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	119
<i>FIGURE 21 TOTAL REST OF WORLD MARKET SIZE OF CONGESTIVE HEART FAILURE MARKET REVENUE BY GEOGRAPHIC REGION, 2010-2016 (\$ MILLIONS)</i> .....	119
<i>TABLE 62 EMERGING/REST-OF-WORLD MARKETS BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	120
<i>TABLE 63 TOTAL REST OF WORLD CHF MARKET SHARE BY DEVICE TYPE, 2011 (%)</i> .....	120
<i>FIGURE 22 TOTAL REST OF WORLD CHF MARKET SHARE BY DEVICE TYPE, 2011 (%)</i> .....	121
<i>TABLE 64 TOTAL REST OF WORLD CHF MARKET SHARE BY DEVICE TYPE, 2016 (%)</i> .....	121
<i>FIGURE 23 TOTAL REST OF WORLD CHF MARKET SHARE BY DEVICE TYPE, 2016 (%)</i> .....	122
AUSTRALIA.....	122
<i>TABLE 65 AUSTRALIA MARKET BY DEVICE TYPE, THROUGH-2016 (\$ MILLIONS)</i> .....	122
INDIA.....	123
<i>TABLE 66 INDIA MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	123
ISRAEL/MIDDLE EAST.....	123
<i>TABLE 67 ISRAEL/MIDDLE EAST REGIONAL MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	123
RUSSIAN AND OTHERS.....	124
<i>TABLE 68 RUSSIA AND OTHER REGIONAL CHF REVENUE BREAKDOWN BY DEVICE TYPE THROUGH 2016 (\$ MILLIONS)</i> .....	124



CHAPTER TEN: COMPANY PROFILES .....	125
ABIOMED .....	125
HISTORY.....	125
PRODUCTS.....	125
REVENUE HISTORY .....	126
CORPORATE MANAGEMENT .....	126
BERLIN HEART, INC.....	126
HISTORY.....	126
PRODUCTS.....	126
REVENUE HISTORY .....	126
LOCATIONS.....	126
CORPORATE MANAGEMENT .....	127
BIOHEART, INC.....	127
HISTORY.....	127
PRODUCTS.....	127
REVENUE HISTORY .....	127
LOCATIONS.....	128
CORPORATE MANAGEMENT .....	128
BIOTRONIK.....	128
HISTORY.....	128
PRODUCTS.....	128
REVENUE HISTORY .....	128
LOCATIONS.....	128
BOSTON SCIENTIFIC.....	129
HISTORY.....	129
PRODUCTS.....	129
Products (Continued).....	130
REVENUE HISTORY .....	131
LOCATIONS.....	131
CORPORATE MANAGEMENT .....	131
HEARTWARE INTERNATIONAL, INC. ....	131
HISTORY.....	131
PRODUCTS.....	132
REVENUE HISTORY: .....	132
LOCATIONS.....	132
CORPORATE MANAGEMENT .....	133
JARVIK HEART .....	133
HISTORY.....	133
PRODUCTS.....	133
REVENUE HISTORY .....	133
CORPORATE MANAGEMENT .....	133
MEDTRONIC, INC. ....	134
HISTORY.....	134
PRODUCTS.....	134

REVENUE HISTORY .....	135
LOCATIONS.....	135
CORPORATE MANAGEMENT .....	135
MICROMED CARDIOVASCULAR, INC.....	135
HISTORY.....	135
PRODUCTS.....	136
REVENUE HISTORY .....	136
LOCATIONS.....	136
CORPORATE MANAGEMENT .....	136
ST JUDE MEDICAL, INC.....	136
HISTORY.....	136
PRODUCTS .....	137
REVENUE HISTORY .....	137
LOCATIONS.....	137
CORPORATE MANAGEMENT .....	138
TELEFLEX, INC.....	138
HISTORY.....	138
PRODUCTS .....	138
REVENUE HISTORY .....	139
LOCATIONS.....	139
CORPORATE MANAGEMENT .....	139
THORATEC.....	139
HISTORY.....	139
PRODUCTS .....	140
REVENUE HISTORY .....	140
LOCATIONS.....	140
CORPORATE MANAGEMENT .....	140
WORLD HEART CORPORATION .....	140
HISTORY.....	140
PRODUCTS .....	141
REVENUE HISTORY .....	141
LOCATIONS.....	141
CORPORATE MANAGEMENT .....	141
APPENDIX: OTHER CHF DEVICE COMPANIES.....	142
APPENDIX.....	142
APPENDIX (CONTINUED) .....	143
APPENDIX (CONTINUED) .....	144
APPENDIX (CONTINUED) .....	145
APPENDIX (CONTINUED) .....	146
APPENDIX (CONTINUED) .....	147
APPENDIX (CONTINUED) .....	148
APPENDIX (CONTINUED) .....	149
APPENDIX (CONTINUED) .....	150