

Contents

Preface and acknowledgements page xv

Part one: Reproductive biology

1	Fertility and infertility	3
	Health determinants	3
	Infertility: the price of excess fecundity?	6
	Medical techniques for assisted reproduction	11
	Surrogate parenthood	17
2	Sex determination and gamete maturation	21
	Our origins	21
	Sexual differentiation	22
	Pseudohermaphroditism	29
	Gametogenesis and maturation	29
	Differentiation of sexual behaviour	36
	Hormonal control of brain differentiation	38
3	Neuroendocrine control of puberty	41
	The phases of puberty	42
	Gonadal function during puberty	43
	The adrenarche	45
	The neuroendocrine control of puberty: an overview	46
	Adolescent sexuality: behavioural aspects	50
	Light, soltriol and reproduction	51
4	Control of the menstrual cycle	54
	Gross anatomy	55
	Steroid hormones	58
	Pathways of steroid biosynthesis	60
	Mechanism of ovulation	65
	Mechanism of menstrual bleeding	68
	Premenstrual syndrome	69
	Historical attitudes to menstruation	71

Cambridge University Press

978-0-521-42925-2 - A Guide to Reproduction: Social Issues and Human Concerns

Irina Pollard

Table of Contents

[More information](#)x *Contents*

5	The testis and control of spermatogenesis	74
	Gross anatomy	74
	The spermatogenic cycle	76
	Sertoli cells and the Sertoli cell barrier	78
	Leydig cells and the interstitial tissue	81
	Testosterone biosynthesis, transport and metabolism	81
	Spermatogenesis	83
	Temperature and spermatogenesis	87
	Maturation of spermatozoa	88
	Immunology of spermatogenesis	88
	Accessory sex glands: the formation and functions of seminal plasma	89
	Common modifiers of steroid hormone secretion and fertility	90
6	Sexual behaviour and pheromones	94
	The human male	96
	The human female	97
	Mate choice: conscious or unconscious?	98
	Types of communication	99
	Pheromones and mammalian reproduction	99
	Pheromones in the rodent	102
	Possible origins of a personal pheromone: the involvement of the major histocompatibility complex (MHC)	104
	Overview	109
7	Sociobiology and reproductive success	113
	Strategies of reproduction	114
	Evidence of strategies favouring sperm competition	116
	The biological basis of female choice	122
	The biological basis of parenting	122
	The biological basis of altruism and aggression	124
8	Fertilization and the initiation of development	126
	Preconceptual care	126
	Sperm migration	128
	Ovum 'pick-up' and survival	130
	Sperm capacitation and the acrosome reaction	132
	Fusion and ovum activation	133
	Early embryogenesis	135
	Maternal recognition of pregnancy	140
	Genomic imprinting	142

9	Maternal physiology during gestation and fetal development	146
	The placenta as a maternal–fetal interface	146
	The placenta as an endocrine organ	156
	Nutrient utilization during gestation	159
10	Parturition and lactation: hormonal control	165
	A Parturition	165
	Uterine contractions and cervical ripening	166
	Hormonal effects on the myometrium and the cervix	168
	Overview	172
	B Lactation	174
	Storage of milk within the mammary gland	174
	Lactogenesis	177
	The milk-ejection reflex	179
	Lactation and nutrition	181
11	Parental behaviour and the physiology of the neonate	185
	The period of gestation	185
	The physical adaptation of the newborn to extrauterine life	187
	The significance of low birthweight and associated risk factors	193
	Sudden infant death syndrome, maternal drug abuse and IUGR	195
	The privilege of reproduction: individual and collective responsibility	197
	Adaptation to motherhood	198
12	Decline in male reproduction and the menopause	205
	Neuroendocrine control of senescence: animal experiments	206
	Reproductive senescence in men	208
	Reproductive senescence in women	210
	Postmenopausal phenomena	215
	Sex steroid hormone replacement therapy	219

Part two: Reproduction and social issues

13	Population dynamics, stress and the general theory of adaptation	225
	A Demography and stress: adaptation and stress	225
	The link between population density and reproduction	228
	Common modifiers of the stress response	234

Cambridge University Press

978-0-521-42925-2 - A Guide to Reproduction: Social Issues and Human Concerns

Irina Pollard

Table of Contents

[More information](#)xii *Contents*

B Demography and stress: hormonal factors	237
Biochemical aspects of the general adaptation syndrome	237
Stress and aggression: a view from sociobiology	239
The energetics of fertility: ethical considerations	241
Where does the limit lie?	244
How to cope with our individual limit	246
 14 Extinctions and the conservation of endangered species	 249
A 'Survival of the fittest'	249
Endangered animals and the phenomenon of species extinction	250
The value of genetic diversity	253
Conservation	255
The present situation	261
B Conservation by management	262
Tactics of conservation	266
 15 Artificial control of fertility	 274
Historical perspective	274
New approaches to fertility regulation	279
The prevention of the formation or release of gametes	280
The prevention of fertilization	292
The prevention of implantation or development of the early embryo	298
Overview	305
 16 Hormonal contributions to errors of sexual differentiation	 307
Exposure to synthetic hormonally active agents	308
Exposure to naturally occurring biologically active compounds	314
 17 The acquired immunodeficiency syndrome (AIDS) epidemic: a global emergency	 320
Historical background	320
HIV and the immune system: pathogenic properties and evolutionary considerations	324
Body fluids and infection	326
Antiviral drugs and chemotherapy	328
The search for a vaccine	330
HIV infection during pregnancy	331
Strategies for the prevention and control of AIDS	333
Adolescent sexuality	335

18	The effect of nutrition and exercise on the hypothalamic–pituitary–gonadal axis	338
	Nutrition and the menstrual cycle	338
	Food restriction in the female rat	339
	Food restriction in the human	341
	Eating disorders	342
	The relationship between hyperactivity and food supply	344
	Women and exercise: modern trends	346
	Men and exercise	347
	Pregnancy and exercise	349
19	Principles of teratology and an update on nicotine, ethanol and caffeine abuse	353
	Developmental toxicology	353
	Teratogenesis	354
	The critical phase of intrauterine development	357
	Teratogenicity: ethical and legal considerations	359
	The biochemistry and physiology of drug abuse	361
	Nicotine	361
	Ethanol	367
	Caffeine	370
	Overview	374
20	Ethical aspects of human reproductive biology	376
	Social impact of the reproductive revolution	376
	History of the bioethics movement	379
	Bioethics committees in practice	381
	Ethical principles of health care	385
	Index	389