

Index

- Abate, Vincenzo, 104
 abortion, 143, 158
 spontaneous, 185, 186
 accessibility, treatment, 158, 162–165, 174
 accreditation program, 144–145
 Acosta, Dr. Anibal, 66, 67, 70
 add-on services, 242, 247
 adoption, 234, 236, 238
 Africa, 158–170
 ART registration, 161–162
 IVF, accessible and affordable, 162–165, 245
 IVF, history of, 159
 IVF, lack of expertise, 166
 IVF, unmet need for, 160
 lack of consumables, 166
 major challenges and hurdles, 166
 age
 and aneuploidy, 185
 ethical issues, 149
 fertility and, 78
 social freezing and, 138
 Agrawal, Rina, 148–151
 Ahrén, Professor Kurt, 111
 Alberda, Bert, 15, 130
 Ali, J., 193
 Alpha society, 33, 200
 amenorrhea, 133
 American Society for Reproductive
 Medicine (ASRM), 71–72, 78
 amniocentesis, 53, 80
 ANARA (African Network and Registry for
 Assisted Reproductive Technology),
 161
 Andrews, Dr. Mason C., 66
 aneuploidy testing, 79, 185, 187
 animal studies, 38. *See also* mouse embryos;
 rabbit studies
 1950s and 1960s advances, 4
 embryo biopsy, 180
 from human IVF, 8–19
 Heape experiments, 1
 ovarian tissue cryopreservation, 198
 Pincus experiments, 2
 Argentina, 229, 241
 arrayCGH, 187–188
 ART cycles. *See* IVF cycles
 artificial insemination with donor sperm
 (AID), 84
Ascaris megalocephala, 10
 Asch, Dr. Ricardo, 76, 81
 Asherman, Joseph, 132
 assisted hatching, 78, 136
 Asztély, Dr. Mats, 116
 Austin, Bunny, 43
 Austin, C.R., 3
 Australia, 46–65
 1980 onwards, 54–60
 commercialization, 242, 243, 244, 247
 early success with IVF, 48–49
 first human embryos, 47–48
 IVF births, 52–54, 59, 60
 IVF workshop, world's first, 60
 legislation, 183, 224–228
 Melbourne, 46–63
 New South Wales, 63–64
 Queensland, 64
 South Australia, 64–65
 West Australia, 64
 Austria, 87–100
 first IVF outpatient clinic, 93–96
 first IVF trials, 87
 IVF program grows, 88, 89–91
 IVF road to success, 89–91
 Jovanovic family. *See* Jovanovic family
 preliminary studies at 2nd VUWH, 87
 Avery, Dr. Sue, 33
 azoospermia, 77, 84, 85, 86, 178
 DAZ gene, 210
 azoospermia factor (AZF) gene, deletion, 77
 Baby Joseph, 178
 Baby M, 80
 back to nature principle, 12
 bacterial artificial chromosomes
 (BAC), 187
 Balfour Studentship, 1
 Balfour, Professor Francis, 1
 Balmaceda, Dr. Jose, 81
 Bartoov, Benjamin, 137
 Bavister, Barry, 4, 14
 Ben-Rafael, Zion, 132–138
 Berlusconi, Silvio, 106
 Biggers, John D., 1–6, 12, 13, 78
 birth-associated tissues, stem cells from,
 219–220
 Blakemore, Jennifer, 21–26
 blastocentesis, 109
 blastocysts
 biopsy, 185, 246
 cryopreservation, 154, 193
 culture, 79, 215–216
 embryonic stem cells from, 216–217
 hatching, 195
 blastomere biopsy, 19, 79
 BlueGnome, 187, 188
 BMOC2 medium, 13
 Bomsell, Ondine, 102
 bone marrow stem cell transplantation,
 216, 221
 Bongso, Ariff, 214–222
 Borini, Andrea, 195, 196
 Bourn Hall clinic, 8, 15, 16, 28–35
 commercialization issues, 245
 cryopreservation prohibition, 18
 first IVF international meeting, 32, 90,
 114–115
 numbers of births, 32
 research papers from, 36
 site of, 31, 35
 Bourn-Hallam Group of IVF Clinics, 33
 Boveri, Theodor, 10–11
 Boveri–Sutton chromosome theory, 10
 Braude, Peter, 42
Brave New World (Huxley), 11
 Brinsden, Peter, 28–35
 Brinster method, 14
 Brinster, Ralph, 13, 14
 British Medical Association (BMA), 43
 Brown, Leslie, 15, 30
 Brown, Louise
 birth of, 15, 30, 52
 birth of, media on, 30, 31, 41
 birth of, public backlash, 5–6
 fortieth birthday, 35
 twenty fifth party, 35
 Brown, Professor James, 50
 Brül and Kjaer (company), 117
 Brussels, 84–86
 Bull, Graham, 43
 Bunge, Raymond, 11
 Burt, Elizabeth, 148–151
 Buster, John, 76, 182
 Canada, 229
 Cannon, Graham, 43
 capacitation, 3, 13
 Carr, Elizabeth, 31, 67, 75
 Carter, President Jimmy, 5
 Catholic Church, 30, 61, 72, 80, 104
 Latin America, 141, 143–144
 cell theory, 9
 centrifugation-migration technique, 177
 centriole, 10
 centrosome, 10
 Certificate of Need, 6
 CFTR gene mutation, 77
 CGH. *See* comparative genomic
 hybridization (CGH)
 Chalmers, Theo, 38
 Chambers, Joanna, 42
 Chambers, Robert, 9

Index

- Chang, M.C., 3, 11, 12, 22, 25
Chang's medium, 216
Chapman, Dr. Michael, 243, 244, 245
Chen, Zi-Jiang, 152–156
Chile, 141–147
China, 152–156
 development of IVF, 152
 IVF techniques, 153–156
 surrogacy, 156
choline, 196
chromosomes, 10
 abnormalities, 154, 180–190
 aneuploidy, 185
 bacterial artificial, 187
 diploid and haploid, 10
 model of inheritance, 10
 sex chromosomes, 10, 184, 188
Cittadini, Ettore, 104
Clayton, Stanley, 40
cleavage stage embryos, cryopreservation, 192–193
Clinical Care Groups (CCGs), 246
clinical embryologists, first, 17
clomiphene, 47, 50, 51, 90, 92
clomiphene citrate (CC), 203
Cobo, Ana, 197
co-culture systems, 193, 215, 216
Coddington, Charles C., 66–73
Cohen, Jacques, 8–19, 79, 136, 193
Cohen, Jean, 102, 103
colchicine, 184
collaboration
 Bob Edwards and Patrick Steptoe, 14
 regional, in Latin America, 141–147
 regional, in Scandinavia, 116–119
Comisión Nacional de Reproducción Humana Asistida (CNRHA), 121
commercialization, 63, 172–176, 240–248.
 See also funding
 advantages and disadvantages, 247
 birthplace of IVF, 245–247
 definition, 240
 ethics, 244
 goals of healthcare, 240
 patient responses to, 245
 profit motive, 242–243
 regulations, 244–245
 surrogacy, 227
 types of healthcare system, 240–241
comparative genomic hybridization (CGH), 182
 arrayCGH, 187–188
 metaphase, 186–187
compensation, donors, 121, 245. *See also* reimbursement
Conant, James, 23
congenital bilateral absence of vas deferens (CBAVD), 77
Conn, Clare, 188
Connell, Matthew, 75–82
Contraceptive Research and Development (CONRAD) Program, 68
controlled ovarian hyperstimulation (COH), 67, 75
controlled ovarian stimulation (COS), 75–76, 133, 206
Controversies in Obstetrics Gynaecology and Infertility (COGI) Congress, 132
corporatization of medicine, 243–244
Costa Rica, 143
costs. *See* compensation; funding; reimbursement
Cox, Lloyd, 64
Craft, Professor Ian, 32, 42, 54, 245
Creutzfeld-Jakob disease (CJD), 202
criminal offence, 227
CRISPR, 155, 190
Croxatto, Horacio, 11
cryopreservation, 15, 18–19, 192–200
 blastocysts, 154, 193
 China, 153–154
 embryo, 18, 31, 62, 153, 154
 human embryo, 192–194, 215
 human ovarian tissue, 198–200
 oocytes, 78, 153, 154
 oocytes, human, 194–198
 social freezing, 77, 137–138, 198
cryotop, 197
cryptozoospermia, 85
Culture Club, 78
culture media, 12–14
 in IVF tests, 4
 KSOM, 78
culture systems, 12–14
 blastocyst, 79, 215–216
 co-culture, 193, 215, 216
cystic fibrosis, 77, 174, 186, 188
cytoplasm, donor oocyte, 79
cytotoxic therapies, 192, 194, 197, 198
DAZ (deleted in azoospermia) gene, 210
de Kretser, David, 60, 177–179
deafness, 154
DeCherney, Alan H., 81, 75–82
Delhanty, Dr. Joy, 184, 188
Del-Zio, Doris, 80
developing countries. *See also* Africa; India; Latin America
 fertility rates, 165
 infertility and, 158, 165
 Special Task Force on infertility, 159, 166
Devroey, Paul, 84
diabetes, 219
 gestational, 220
diathermy, 39
Dickey-Wicker Amendment, 81
Diczfalusy Egon, 111
Diedrich, Klaus, 129–130
Dignitas Personae, 80
Dill, Sandra, 228–231
dimethyl sulfoxide (DMSO), 15, 192, 194, 198
DNA
 mitochondrial, 155, 239
 recombinant, 76, 205
donor anonymity, 234
donor disclosure, 234–237, 237
donor embryos, 156, 234, 236
donor gametes, 155–156
 ban on, 108
 families, 234–237
 legislation, 224, 225, 226
donor insemination, 61, 155
 AID, 84
 early 20th century, 11
 lawsuit, 81
donor oocytes, 76, 98, 155, 197
 cytoplasm, 79
 pregnancies, 61–62
 Spain, 121–122
Donor Sibling Registry, 235, 236
donors
 compensation, 121, 245
 reimbursement, 108, 245
Dor, Dr. Jehoshua, 134
Driscoll, Geoffrey, 63
Dunstan, Gordon, 5
East Virginia Medical School (EVMS), 16, 66, 68, 69
ectogenesis, 11–12
Edgar, David, 192–200
Edwards, Sir Robert, 4–5, 5, 12, 26, 28–35, 132
 awards and honors, 32
 blastomere biopsy, 19
 early years, 29
 first successful human IVF, 14
 forecasting future directions of IVF, 34
 France, speaking in, 102
 hostility to work, BMA and, 43
 hostility to work, early inklings, 37–38
 hostility to work, MRC and, 41–42
 hostility to work, Nature 1969 paper, 38
 hostility to work, Parliament and, 42
 hostility to work, referees' reports, 38–41
 Howard Jones and, 66
 Nobel Prize, 8
 ovarian stimulation protocol, 202
 psychological/social aspects of IVF, 232
 Spain and, 120
 Steptoe collaboration, 14
 supporters of work, 43
 Zegers-Hochschild, Influence on, 141
Elder, Dr. Kay, 33
embryo biopsy, 14, 62, 180–182, 190
embryo cryopreservation, 18, 31, 62, 153, 154
 human, 192–194, 215
embryo donation, 156
 families, 234, 236
embryo transfer (ET)
 first attempts, 1
 frozen vs fresh, 154
 multiple, 134, 177, 192
 single, 34, 79, 85
embryo vitrification, 193
embryonic stem cells
 blastocyst culture, 215–216
 first, 34
 from blastocysts, 216–217
 human. *See* human embryonic stem cells (hESCs)
embryotrophic factors, 215
endometrial scratching, 137
Ennals, David, 41
Enzmann, E.V., 2
Estes operation, 1

- Estes, W.L., 1
estradiol, 75
ethics, 40, 41, 232, 244
 approval sought, 84
 donor egg pregnancy, 61–62
 donor insemination, 81
 four principles of practice, 244
 France, 103
 India, 149
 Nuffield Council on Bioethics, 235
Ethics Advisory Board, 81
ethylene glycol, 197
European Convention on Human Rights, 228
European Society of Human Reproduction and Embryology (ESHRE), 109, 120
 award from, 186
 Bonn meeting, 129
 Special Task Force on infertility, 159, 166
European Study of Assisted Reproduction Families, 233, 235
Evans, Martin, 8
experimental embryology
 hundred years of, 10–11
 Nobel prizes for, 8
eye diseases, 218
- Fabrizi, Raffaella, 196
fallopian tubes
 blockage, 1, 92
 environment, 50, 215
 gamete intra-fallopian transfer, 76
 microsurgery, 211
families, 232–239
 gamete donation, 234–237
 IVF and ICSI, 232–234
 lesbian, 237, 238
 same-sex parents, 227, 238
 single-mother, 237, 238
 surrogacy, 237–238
Fanconi's anemia, 189
Fasolino, Antonio, 105
Fauser, Bart, 125–131
federal regulations, 81–82
Fehilly-Willadsen, Carole, 8
Feichtinger, Dr. Wilfried, 87–100
feminists, 61, 183
Ferraretti, Anna Pia, 104–109
Fertility Clinic Success Rate and Certification Act, 81
Fertility Society of Australia (FSA), 64
fertility tourism, 106, 121, 149, 151, 244
fibrin sealant glue, 136
Ficoll, 178
First World Congress on IVF, 97
Fisbel, Simon, 8, 14
fluorescent in situ hybridization (FISH), 79, 182, 188
 multi-probe, 185
 single cell, 183–186
fluorochromes, 184, 185, 186
Follicle Programme, 89
follicles. *See* ovarian follicles
follicle-stimulating hormone (FSH), 16, 76, 111, 177
 characteristics, 202
 dosages, 134
 recombinant-hFSH, 205
follitropin alfa, 205
Ford Foundation, 56, 87
Fowler, Bob, 208
Fowler, Norman, 42
France, 102–103
frozen embryo pregnancies, 62, 154
Frydman, René F., 102–103
funding
 Africa, 158, 162–165, 245
 government, lack of, 8, 16
 India, 148, 149
 lack of, 30, 38, 41, 42
 Latin America, 144
 misappropriation, 81
 Russia, 174
gamete donation. *See* donor gametes
gamete intra-fallopian transfer (GIFT), 29, 76, 154
gamete intrauterine transfer (GIUT), 154
Garcia, Dr. Jairo, 66
Gardner, David, 79, 193
Gardner, Richard, 19, 37
gay father families, 238
gender inequality, 148
gene editing, 154–155
Germany, 129–130
Gianaroli, Luca, 104–109, 185
Gibbons, William, 70
GIERAF (Groupe Inter Africain d'Etude, de Recherche et d'Application sur la Fertilité), 162
Gleicher, Norbert, 17, 242
glucose, 13
glycerol, 18, 193, 198
Godfrey, Malcolm, 43
Golombok, Susan, 232–239
gonadotrophin releasing hormone (GnRH), 32
 agonists, 16, 204
 antagonists, 205, 206
gonadotrophins, 202, *See also* follicle-stimulating hormone (FSH); luteinizing hormone (LH)
hCG. *See* human chorionic gonadotropin (hCG)
hMG, 75, 76, 132, 134
HPG, 50, 51
introduction of, 132–134
stimulation, 67, 70
superovulation from, 13
urinary, 205
Gook, Debra, 192–200
Gorbachev, M., 173
Gosden, Roger, 198
Goswamy, Rajat, 31
Gothenburg, 111–113
 Bourn Hall meeting, 114–115
 time-lapse photography, 113
 ultrasound, 115
Gould, Donald, 42
government
 restrictive legislation for IVF, 229–230
 view on infertility, 228
government funding, lack of, 8, 16
government opposition
 Edwards and Steptoe, 42
 Indian, 148
 Italy, 106
 PGD, 183
Gowans, James, 41, 42
grafting, ovarian tissue, 199
Gray, Sir John, 41
Greece, 125–131
Griffin, Darren, 184, 188
Gruzdev, V.S., 172
Gurdon, Jon, 8
- Haan, Nick, 187
hemophilia, 184
Haldane, J.B.S., 11
Hamberger, Lars, 17, 97, 111–119
Hammarberg, Karin, 112
Hammersmith Hospital, 183, 246
Hammond, John, 12
Handyside, Alan, 180, 182, 184, 188, 189
haploblocks, 189
Harris, Muriel, 43
Hartman, Carl, 3
Harvard, Dr. John, 43
hCG. *See* human chorionic gonadotropin (hCG)
health insurance, 138, 174
Heape, Walter, 1–2, 11
heart failure, 219
hemagglutination assay, 204
hematopoietic diseases, 216, 220, 221
hematopoietic stem cells (HSCs), 219
Hennessey, John, 64
Hertwig, Oscar, 10
hESCs. *See* human embryonic stem cells (hESCs)
heterotopic grafting, 200
Hillensjö, Torbjörn, 111–119
hiPSCs. *See* human induced pluripotent stem cells (hiPSCs)
HIV, 163, 165
HLA testing, 189
hMG. *See* human menopausal gonadotropin (hMG)
Hoagland, Dr. Hudson, 23
Hochfellner, Christa, 94
Hodgen, Gary D., 68, 69
Holm, Dr. Hans Henrik, 115, 116
hormonal contraception, 26
hostility. *See* government opposition;
 media backlash; professional
 hostility; public backlash; religious
 opposition
Howarth, Sheila, 38, 41
Howles, Colin M., 202–206
Hughes, Mark, 188
human chorionic gonadotropin (hCG), 16, 47, 48, 50
 protocol, 203
human embryo
 cryopreservation, 192–194, 215
 development, 214
human embryo research, 42
 moratorium on, 16

Index

- human embryonic stem cells (hESCs), 216
beneficial uses of, 219
characterization and differentiation, 217
clinical grade, 217
clinical trials using, 218
hurdles in using, 217–218
- Human Fertilisation and Embryology Act
1990, 5, 246
- Human Fertilisation and Embryology
Authority (HFEA), 82, 230, 246
- Human Genome Project, 187
- human induced pluripotent stem cells
(hiPSCs), 218, 221
beneficial uses of, 219
clinical trials using, 218
- human IVF. *See also* in-vitro fertilization
(IVF)
1960s and 1970s work on, 14–16
1980s and 1990s work on, 16–19
controversiality of, 183
first successful demonstration, 14
from animal IVF, 8–19
- human menopausal gonadotropin (hMG),
75, 76, 132, 202
dosages, 134
protocol, 203
- human oocyte cryopreservation, 194–198
- human ovarian tissue cryopreservation,
198–200
- human pituitary gonadotrophin (HPG),
50, 51
- human recombinant leukemia inhibitory
factor (hLIF), 216
- Humana Wellington Hospital, 32
- Hunter, Dr. John, 11
- Huxley, Aldous, 11
- hypo-gonadotrophic hypogonadism, 177
- hypoxanthine phosphoribosyl-transferase
enzyme (HPRT), 180
- hysterosalpingogram (HSG), 92, 163
- ICSI. *See* intracytoplasmic sperm injection
(ICSI)
- identity issues, 238
- idiopathic infertility, 60
- immuno-rejection, 217
- incubators, earliest, 9
- India, 148–151
current legislation, 150
National Registry, 149–150
reproductive medicine bills, 150–151
reproductive medicine in, 148–149
subfertility in, 148
surrogacy, 244
- infant of the diabetic mother (IDM), 220
- infections, screening for, 163
- infertility
Africa, 158, 168, 245
China, 152
consumers as partners, 230
diagnosis and treatment, 11
India, 148
isolating experience, 228
limited resources argument, 165
low priority in investing, 39
low priority in solving, 40
male factor. *See* male factor infertility
medical condition, 228–229
microsurgery, 208–213
neglected problem, 158, 165
one-stop clinic for diagnosis, 163
overpopulation argument, 165
real costs of, 230–231
Step toe and Edwards commitment to
help, 34
stigma, 148, 149, 158
treatment in Israel, 132
- Infertility Medical Procedures Act 1984, 62,
224, 225
- Infertility Treatment Authority (ITA), 226
- informed consent, 150
- inner cell mass (ICM), 214, 216
- Institute of Medicine (IOM), 82
- Instituto Valenciano de Infertilidad (IVI),
120, 122, 123
- International Consumer Support for
Infertility (iCSi), 229
- International Fertility Congress,
Berlin, 113
- intracytoplasmic morphologically selected
sperm injection (IMSI), 137
- intracytoplasmic sperm injection (ICSI), 14,
18, 77, 78, 84–86, 178, 179, 210
China, 153
commercialization, 246
families, 233
Israel, 135
overuse of, 242
- Investigational New Drug (IND) review
process, 218
- in-vitro fertilization (IVF), 214–215
alternatives to traditional techniques, 76
American roots of, 21–26
birthplace of, 245–247
commercialization, 63
early instruments and equipment, 9
families, 232–234
First World Congress, 97
historical outline, 1–6
professional hostility to, 37–43
psychological aspects, 232
sixth World Congress, 136
unmet need for, 160
- in-vitro maturation (IVM), 153
- in-vivo fertilization, 214
- Ishihara, Dr. Osamu, 241
- Israel, 132–138
first IVF clinic, 134–135
IVF cycles *per capita*, 138
legislation, 136
OHSS, 135
social egg freezing, 137–138
- Italy, 104–109
commercialization, 245
current and future issues, 108–109
late 1980s and 1990s, 105–106
legislation, 104, 106–108, 195, 229
pioneers, 104–105
year 2000 onwards, 106–108
- IVF births
Australia, 52–54, 59, 60
Baby Joseph, 178
Baby M, 80
Bourn Hall clinic, 32
chronology in different countries, 54
Elizabeth Carr, 67, 75
France, 103
Greece, 126, 129
ICSI treatment, 85
India, 148, 149
Italy, 104
Latin America, 146
Louise Brown. *See* Brown, Louise
numbers, 238
numbers worldwide, 8, 247
Scandinavia, 119
- IVF clinics. *See also* Bourn Hall clinic
Africa, 160, 161
Bologna, Italy, 105
business objectives, 240
China, 153
corporatization, 243–244
early ones worldwide, 16
India, 149
Israel, 134–135
numbers worldwide, 19
organization of, 242
profit motive, 242–243
Russia, 173, 174
types of, 240–241
UK, 246
USA, 6, 75
world's first, 8, 16
world's first outpatient, 93–97
- IVF cycles
Africa, 160, 162
Africa, access to, 161
Bourn Hall clinic, 31
China, 152
monitoring, 115
per capita in Israel, 138
reimbursement, 160, 247
Russia, 174
- Jacobson, Dr. Cecil, 80
- Janisch, Herbert, 88, 89, 90, 92
- Jansen, Rob, 63
- Janson, Per Olaf, 111
- Japan, 241
- Jeffcoate, Norman, 38, 39, 40
- Johnson, Martin, 14, 37–43
- Johnston, Dr. Ian, 46, 52
- Jones catheter, 66
- Jones Institute, 6, 26, 67–69, 71
- Jones, Georgeanna, 6, 16, 26, 66–73
profile of, 72
- Jones, Howard, 4, 6, 16, 26, 54, 66–73
vision and legacy, 72–73
- Jovanovic family, 87
25th celebrations, 100
IVF treatment, 92
pregnancy and birth, 92–93
- karyomapping, 189–190
- karyotyping, 182
metaphase CGH, 186–187
- Keefe, David, 21–26
- Keen, Dr. Jeffrey, 76

- keloids, 220
 Kemeter, Peter, 87, 89, 93–96, 100
 Kennedy, Senator Edward, 81
 Kirkman family, 62
 Klinefelter's syndrome, 77
 Kola, Ismail, 182
 Korsak, Vladislav, 172–176
 Kovacs, Gabor, 46–65, 177, 242
 Krasovskaya, O.V., 172
 Krebs, Professor D., 129
 Kruger, Thinus, 70
 KSOM media, 78
 Kuang, Professor Yanping, 153
 Kumar, Dr. Anand, 149
- Lancet, letter in, 15, 30
 laparoscopy, 4, 16
 Australia, 46
 drawbacks to, 76
 ethics of, 40
 introduction, 15
 opposition to, 39
 Steptoe's work in, 28, 29
 laparotomy, 48
 Lassalle, B., 192
 Latin America, 141–147
 regional collaboration, 144–146
 Latin American Registry (RLA), 144, 145, 161
 Laurentian Hormone Research
 Conferences, 23
 Law 40, 107–108, 109, 229
 Lawson, R.A.S., 47, 48
 Ledger, Dr. Bill, 247
 Leeton, John, 46, 47, 49, 51, 62, 102
 legal actions
 Baby M, 80
 Costa Rica, 143
 Del-Zio v. Vande-Weile, 80
 Edward's for defamation, 43
 Jacobson v. United States, 80
 legislation
 Australia, 183, 224–228
 commercialization, 244–245
 effect on infertile couples, 228–231
 Germany, 129
 Greece, 127
 India, 150–151
 information and its disclosure, 226–227
 Israel, 136
 Italy, 104, 106–108, 195, 229
 Spain, 120, 121
 surrogacy, 227
 USA, 16
 USA, federal regulations, 81–82
 Leibo, Stanley, 9, 192
 lesbian families, 245, 246
 Lesch-Nyhan syndrome, 180
 leukemia, 189
 life expectancy, 166
 limited resources argument, 165
 Lithuania, 109
 London Gynaecology and Fertility Centre, 246
 Lopata, Alex, 31, 46–65, 89
 Lunenfeld, Bruno, 132
- luteinizing hormone (LH), 16, 76, 114, 177, 202
 surge, 202–206
- M16 medium, 13
 Macdonald, Alastair, 30
 Macnamee, Dr. Mike, 33
 Maddox, John, 38
 Magli, Maria Cristina, 104–109, 185
 Male Factor Group, Monash, 177
 male factor infertility, 15, 17, 18, 77, 177–179
 Africa, 163
 Australia, 60
 ICSI, 85, 210
 microsurgery, 208–213
 male infertility program, 67, 70–71
 malignant disease, 78, 192, 194, 195
 Malta, 109
 Malter, Henry, 18
 mammalian reproductive cycles, 2
 Marle, Gerard van, 9
 Mashiach, Shlomo, 134
 Mason, Dr. Bridget, 33
 Massouras, Dr. Harris, 126, 127
 Mathews, Dr. Thomas, 33
 Matthews, Colin, 64
 Mazur, Peter, 9, 192
 McBain, John, 50, 52
 McLaren, Anne, 13, 41, 180
 media, 231
 Austrian, 93
 birth of Louise Brown, 30, 31, 41
 Edward's research, 43
 India, 148
 professional antagonism towards, 39
 media backlash
 birth of Louise Brown, 5
 Chile, 143
 Italy, 107
 IVF treatment, 1, 19
Nature 1969 article, 38
 Pincus experiments, 2
 media, culture. *See* culture media
 medical insurance, 247
 Medical Research Council (MRC)
 change of policy, 41
 changing stance, 41
 experimental subjects/procedures, 40
 human embryo research, 42
 lack of support, 16, 38
 taking a stand, 41–42
 medical tourism, 106, 122, 149, 151, 244
 Medical, Ethical and Social Aspects of
 Assisted Reproduction (WHO), 159
 Medicare, 247
 medication, 16, 76
 meiotic spindle, 194, 195
 Meirov, D., 137
 Mendel's laws, 10
 Menezo, Yves, 193
 Menkin, Miriam, 3, 12, 24
 menotrophin, 202
 mesenchymal stem cells (MSCs), 219
 metaphase CGH, 186–187
 methotrexate, 98
 micro-drop method, 14
- microepididymal sperm aspiration
 (MESA), 77
 microepidymal sperm aspiration
 (MESA), 210
 microinjection, sperm, 178
 micromanipulation, 9, 14, 16, 17, 18, 84, 180
 micropipettes, 180
 microsurgery, 208–213
 microtools, 197
 Mills, Ivor, 43
 MINC incubator, 10
 mineral oil, 14
 miscarriage, spontaneous, 155, 185
 mitochondrial DNA, 155, 239
 mitochondrial replacement, 155–156
 mitochondrial transfer, 82
 Mohr, Linda, 62
 Monash clinic, 46, 63, 64, 177, 243
 Monk, Marilyn, 180
 monogenic disease, 154, 180–190
 Morris, R.T., 1
 Mortimer David, 10
 motile sperm organelle morphology
 examination (MSOME), 137
 mouse embryos
 cryopreservation, 192
 culturing, 4, 13, 180, 182, 183
 Muasher, Dr. Suheil, 67, 70
 Muggleton-Harris, Audrey, 180
 Mukerji, Dr. Subhas, 148, 149
 multiple annealing and looping-based
 amplification cycles (MALBAC), 155
 multiple embryo transfers, 134, 177, 192
 multiple pregnancies, 73, 130, 134, 177, 192
 multiple sclerosis, 80
 multi-probe FISH, 185
 Munné, Santiago, 106, 185
 muscular dystrophy, 184
- Naftolin, Frederick, 21–26
 National Cooperative Program on Non-
 Human In Vitro Fertilization and
 Preimplantation Development, 12
 national infertility awareness campaign
 (NIAC), 246
 National Institute for Health and Care
 Evidence (NICE) guidelines, 246
 National Institute of Health (NIH)
 backlash on IVF, 5
 National Research Act 1974, 81
Nature, 1969 paper, 38
 Netherlands, 9, 130–131
 neural progenitor cells, 217
New England Journal of Medicine,
 editorial, 2, 11
 New Zealand, 229, 235
 next generation sequencing (NGS), 187,
 190, 246
 NHS provision of IVF, 245, 246
 Nikitin, A., 172–176
 Nilsson, Lars, 111, 115
 Nilsson, Lennart, 113, 114
 Nobel prizes, 8, 10, 33, 120, 132
 Norfolk Clinic. *See* Jones Institute
 Norfolk system, 14
 Nuffield Council on Bioethics, 235

Index

- Oehninger, Sergio C., 66–73
 Oktay, Kutluk, 200
 Oldham General Hospital, 43, 245
 oligospermia, 77
 oligo-terato-asthenospermia (OTA), 135
 Ombelet Willem, 158–170
 oncofertility, 77
 Oncofertility Consortium, 77
 one-stop clinics, infertility diagnosis, 163
 oocyte donation. *See also* donor oocytes
 pregnancy, 61–62
 oocyte recovery with tubal insemination
 (ORTI), 29
 oocytes
 cryopreservation, 78, 153, 154
 cytoplasm, 79
 fertilization *in vitro*, 4, 22, 41
 human oocyte cryopreservation, 194–198
 maturation, 5
 pick-up, 115, 116, 135
 recovery and fertilization rates, 47, 51
 recovery and yield, 50
 recovery, laparoscopic, 4
 recovery, mistimed, 203
 retrieval, 76
 orchidometer, 178
 orthotopic grafting, 199
 ovarian follicles
 atresia, 204
 monitoring, 50
 recruitment, 16, 211
 ovarian hyperstimulation syndrome
 (OHSS), 122, 133, 134, 206
 controlled, 67, 75
 Israel, 135
 ovarian stimulation, 50, 51, 69, 98,
 202–206
 China, 153
 controlled, 75–76, 133, 206
 improving, 50
 protocols in Africa, 164
 ovarian tissue
 cryopreservation, 198–200
 transplantation, 137
 ovary transplant, 211
 overpopulation argument, 165
 overseas surrogacy, 227
 over-treatment, 242
 ovulation induction (OI), 133
 ovulation, timing of, 16
 package pricing, 243, 247
 Papiernick, Professor Emile, 102
 paraffin oil, 14
 parthenogenesis, 22
 partial zona dissection, 84, 136
 payment. *See* compensation;
 reimbursement
 Pellicer, Antonio, 120–123
 pelvic infections, 158, 163
 Pennings, Guido, 235
 Pepperell, Professor Roger, 54
 Pergonal clinic, 133
 Perrutz, Max, 40
 Petri dish, 14, 97
 Petrov, G.N., 172
 PGD. *See* preimplantation genetic diagnosis
 (PGD)
 PGS. *See* preimplantation genetic screening
 (PGS)
 Pincus, Gregory, 2, 3, 12, 19, 22–24
 Poland, 109
 polar body biopsy, 185
 Polge, Chris, 11
 polycystic ovary syndrome, 148, 153, 154
 polymerase chain reaction (PCR), 19, 182,
 188, 189
 polyspermy, block to, 17
 poor ovarian response (POR), 153
 poor responders, 75, 137
 Pope Benedict XVI, 143
 population-control, worldwide priority, 39
 Porcu, Eleonora, 107
 Powell, Enoch, 42
 Pratt, Hester, 42
 prednisolone, 98
 pregnancies
 donor egg, 61–62
 multiple, 73, 130, 134, 177, 192
 pregnanediol, 48
 preimplantation genetic diagnosis (PGD),
 19, 85, 107–108, 180–190
 China, 154–155
 early techniques, 182–183
 public controversy, 183
 single gene, 188–189
 preimplantation genetic screening (PGS),
 79, 106, 185
 overuse of, 242
 pre-pronuclear transfer (PPNT), 155
 professional hostility
 PGD work, 183
 to Steptoe and Edwards, 37–43
 profit motive, 242–243
 Progress campaign group, 42
 PROH-sucrose method, 192, 194, 196
 psychological effects
 donor disclosure, 235, 237
 ICSI, 234
 IVF, 232
 public backlash, 81
 birth of Louise Brown, 5–6
 Italy, 107, 109
 IVF treatment, 1, 15
 PGD treatment, 183
 Pincus experiments, 2
 Purdy, Jean, 8, 28–35, 37
 pyruvate, 4, 13
 Qin, Yingying, 152–156
 quality control, 17
 Queen Victoria Medical Centre (QVMC),
 46, 47, 51
 Rabau, Ervin, 132
 rabbit studies, 22, 180
 first, 1, 2
 Racowsky, Catherine, 1–6
 Ragni, Guido, 104
 Rawlings, Dr. Richard, 144
 Rechitsky, Svetlana, 189
 reciprocal translocations, 188
 recombinant DNA, 76, 205
 recombinant human insulin, 205
 recombinant-hFSH, 205
 red-green fluorescence ratio, 186, 187
 Reed, Candice, 31, 53, 58, 224
 Reed, Linda and John, 53
 referees' reports, 38–41
 regulations. *See* legislation
 reimbursement, 230
 donors, 108, 245
 IVF cycles, 160, 247
 policies, 244
 religious opposition, 30, 61, 73, 80
 Australia, 224
 Italy, 104, 107, 109
 Latin America, 141, 143–144
 religious support, Israel, 135
 reproduction, 21
 control of, 21
 lectures on, 37
 reproductive cycles
 first work on, 1
 mammalian, 2
 reproductive endocrinology and infertility
 (REI), 66
 retinal macular degeneration, 218
 Right to Life organization, 183
 Rijkmans-Verhamme, Camilla, 15
 Rios, Mario and Elsa, 62
 Robertson, Robert, 6
 Robertsonian translocations, 188
 Rock, Professor John, 2–3, 3, 4, 11, 12, 22,
 24–25
 Rolla, Dr. Edgardo, 241
 Rosenwaks, Dr. Zev, 67, 79
 Royal Women's Hospital (RWH), 46, 52
 Rudak, Dr. Edwina, 134
 Russia, 172–176
 commercialization of IVF, 172–176
 Russian Association of Human
 Reproduction (RAHR), 174
 Rutherford, Tony, 245–247
 salt solutions, 4, 12
 same-sex parents, 227, 238
 Sarris, Dr. Spyros, 126
 Saunders, Doug, 63
 saviour sibling PGD, 189
 Scandinavia, 111–119. *See also* Gothenburg
 collaboration within, 116–119
 Schenk, M., 10
 Schoolcraft, William, 79
 Schurs, Bridget, 184
 second polar body transfer (PB2T), 155
 Second Vienna University Women's
 Hospital (2nd VUWH), 87,
 93–96, 97
 sepsis, pregnancy-related, 158
 Sermon, Karen, 187, 189
 sex chromosomes, 10, 184, 188
 sex selection, 79, 150, 184, 188
 sexually transmitted diseases (STDs), 148,
 158, 163, 165
 Sgargi, Serena, 104–109
 Shah, Dr. Duru, 244
 Shanghai protocol, 153

- Sherman, Jerome, 11
Shettles, Landrum, 4, 25, 80
Short, Roger, 38, 40, 41
sickle cell anemia, 79
Silber, Sherman, 77, 208–213
Simons, Roger, 18
simplex optimization, 12
Singapore, 243
single cell fluorescent in situ hybridization (FISH), 183–186
single embryo transfer, 34, 79, 86
single gene PGD, 188–189
single nucleotide polymorphisms (SNPs), 187
single-mother families, 237, 238
Sjögren, Anita, 112
slow freezing
 cleavage stage embryos, 192–193
 human oocytes, 196
Smith, John Lawrence, 9
smoking, 137
social freezing, 78, 137–138, 198
Society for Assisted Reproductive Technologies (SART), 72, 78, 81
somatic cell nuclear transfer (SCNT), 218
Soupart, Pierre, 113
Southwick, Graeme, 178
Spain, 120–123
Special Task Force on infertility in developing countries, 159, 166
Speirs, Andrew, 53
sperm
 cryopreservation, 153
 donation. *See* donor insemination
 ICSI. *See* intracytoplasmic sperm injection (ICSI)
 microinjection, 178
 preparation, 13, 50
 production rate, 177
 subzonal injection, 62, 84–85, 178
 transfer, 11
sperm banks
 China, 153, 155
 world's first, 11
spermatogenic stem cells (SSCs), 211
spinal cord injury, 219
spontaneous abortion, 185, 186
spontaneous miscarriage, 155, 185
St Mary's Hospital, Manchester, 245
stakeholders, 240
Standing Review and Advisory Committee on Infertility (SRACI), 183, 224, 225
Stargardt's disease, 218
stem cells
 birth-associated tissues, 219–220
 embryonic. *See* embryonic stem cells
 spermatogenic, 211
 transplants, 216, 221
 umbilical cord Wharton's jelly, 219, 220–222
Stephen, Sir Ninian, 228
Stephens, Douglas, 208
Steptoe, Patrick, 4, 5, 8, 18, 28–35
 awards and honors, 32
 early years, 28
 Edwards collaboration, 14
 hostility to work, BMA and, 43
 hostility to work, early inklings, 37–38
 hostility to work, MRC and, 41–42
 hostility to work, Nature 1969 paper, 38
 hostility to work, Parliament and, 42
 hostility to work, referees' reports, 38–41
 lack of cooperation with Australia, 51
 ovarian stimulation protocol, 202
 role in British Fertility Society, 32
 supporters of work, 43
Stern, Elizabeth and William, 80
stigma
 infertility, 148, 149, 158
 same-sex parents, 238
Stock-Myer, Sharyn, 189
Stokes, Julian, 59
Stone, Dr. Sergio, 81
Strohmer, Dr. Heinz, 247
stromal cells, 219
subzonal sperm injection (SUZI), 62, 84–85, 178
success rates, annual improvements in, 8
sucrose, 192, 193, 194
 concentration, 196, 197
Sundström, Per, 114
superovulation, 13
surrogacy, 62–63, 77, 80, 227
 China, 156
 ethics, 244
 families, 237–238
 India, 150
 Israel, 135
 overseas, 227
Sutton, Walter, 10
Suzuki, Nao, 199
Svetlov, Professor P.G., 172
Sweeney, Dr. William, 80
swim-up technique, 50, 177
Szalay, Stefan, 88, 89, 90, 97

Tarkowski, Andrzej, 180
Tarlatis, Basil C., 125–131
Tasca, Dr. Richard, 78
Taylor, Dr. Patrick, 33
Taylor, Ian, 208
Taymor, Melvin, 5
Temple-Smith, Peter, 178
teratomas, 218
Testart, Jacques, 102, 103
testicular biopsy, 179
testicular size, 178
testicular sperm extraction (TESE), 77, 210
testicular transplants, 208
thalassemia, 189
Thibault, Charles, 12, 13, 102
threshold theory, 133
Time to Tell campaign, 227
time-lapse microscopy, 17
time-lapse photography, 113
Toner, James, 70
total reproductive potential, 70
translocation testing, 188
transplants
 bone marrow stem cell, 216, 221
 ovarian tissue, 137
 ovary, 211
 testis, 208
transport IVF program, 131
transvaginal ultrasound-guided oocyte retrieval (TVOR), 117, 135
Treff, Nathan, 187
trehalose, 196
Trounson, Alan, 15, 51, 52, 56, 90, 178, 180
 frozen embryo pregnancies, 62
 open attitude, 183
 subzonal sperm injection, 62
tubal environment, 50–51, 215
tubal microsurgery, 211
tumorigenesis, risk of, 217, 218
Turner Syndrome, 149, 188
TWE lab method, 164
Tygerberg criteria, 70

UK Longitudinal Study of Assisted Reproduction Families, 234, 235, 237
ultrasound, 16, 52, 98
 Gothenburg team, 115
 oocyte pick-up, 116
 TVOR, 117, 135
 vaginal, 116
 vaginal retrieval, 76
umbilical cord Wharton's jelly, 219, 220–222
United States
 commercialization, 243
 federal regulations, 81–82
 first IVF clinic, 6
 IVF post-Joneses, 75–82
 IVE, roots of, 21–26
 Jacobson v. United States lawsuit, 80
 Joneses and Jones Institute, 66–73
 legislation bans, 16
Universal Declaration of Human Rights, 228, 247
urinary gonadotrophins, 205
uterine abnormalities, 164
Utian, W.H., 77

Van Blerkom, Jonathan, 164
van der Ven, Professor K., 129
Van Steirteghem, André, 84–86, 178
Vande Wiele, Dr. Raymond, 80
varicocelectomy, 211
vasectomy reversal, 208, 209
Vatican, 30, 72, 80, 143
Veeck, Lucinda, 66
Verlinsky, Yuri, 173, 174, 185, 189
Victorian Assisted Reproductive Treatment Authority (VARTA), 226, 227
Victorian IVF Committee, 61, 224, 228
 information and its disclosure, 226–227
 regulatory experience, 225–226
Victorian Law Reform Commission (VLRC), 226
Virtus Health, 63, 243
vitrication, 19, 78, 154, 206. *See also* cryopreservation
 embryos, 193
 unfertilized oocytes, 196–198
von Baer, Karl Ernst, 172
Voullaire, Lucille, 186

Index

- Walking Egg Project, 164, 166–168
 Waller, Louis, 224–228
 Wang, Jianfeng, 152–156
 Warnock Committee report, 5, 42
 Warnock, Dame Mary, 5
 Watson, James, 30, 40
 Waxman, Henry, 81
 Wei, Daimin, 152–156
 Weinberger, Casper, 81
 Wells, Dagan, 186
 whalebone bougie, 1
 Wharton's jelly stem cells, 219, 220–222
 Whitehead, Mrs, 80
 Whitten, Wesley, 13
 Whittingham, David, 3, 4, 9, 192
 Wide, Leif, 111
 Wikland, Matts, 17, 111, 111–119
 Williamson, Professor Bob, 186
 Wilton, Leeanda, 62, 180–190
 Winston, Lord Robert, 39, 125, 183, 194, 242, 246, 247
 Wiquist, Nils, 111, 113
 Wiscott-Aldrich syndrome, 189
 Wood, Gillian, 56
 Wood, Professor Carl, 31, 46, 47, 51, 52, 54, 56
 frozen embryo pregnancies, 62
 Woodruff, Dr. Theresa, 77
 Worcester Foundation for Experimental Biology, 23
 World Congresses
 first, 97
 sixth, 136
 wound healing, 220
 Yale University program, 125
 Yamanaka, Shinya, 8
 Yanagimachi, Ryuzo, 25
 Yovich, Dr. John, 33, 64, 126, 127
 Zaccheddu, Eleanora, 104
 Zegers-Hochschild, Fernando, 141–147, 240
 Zeilmaker, Gerard, 9, 14, 15, 130
 Zhang, Professor Lizhu, 152, 154, 155, 156
 Zika virus, 220
 zona drilling, 17, 84
 zona hardening, 194, 195
 Zondek, Bernard, 132