Index

absenteeism, 13,81, 160	
accidents	amnesia, 110
compressed workweek and, 13, 81	amphetamines, 110 Angola, shift work regulation in, 199,209,211
data sources on, 18, 100-101	
·	anticancer drugs, timing of administration, 43
employer liability for, 130-131 nuclear powerplant, 102, 143, 150	antidepressant drugs, 52
	antihistamines, 17, 110
by nurses, 155	anxiety, 57, 110, 165, 178
see also injuries; safety; traffic accidents Accreditation Council for Graduate Medical Education, 21,173,	Area and Industry Wage Surveys, 71
	Argentina, shift work regulation in, 200,207,208,209.211
170-171, 176	Army operations, see US. Army
activity, see physical activity Adamson Act, 124	Association of American Medical Colleges, 167, 170, 173
adenocarcinoma, 43	asthma, 41,43,44, 97
,	astronauts, and bright light, 108
administrative work, 13, 81	attention span, 48, 149
overtime compensation, 83	Australia, shift work regulation in, 200,207,209,210,211, 215
shift work, 11	Austria, shift work regulation in, 199,200,207,208,209, 211
adriamycin, 43	Automated Performance Test System, 111
afternoon shifts, 99	D 1 1 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
age/aging	Barbados, shift work regulation in, 210,211
and adjustment to shift work, 7, 50, 89, 95	behavior
and body temperate, 49	aging and, 7
of children, and shift work by parents, 79	sleep and, 45
and circadian rhythms, 92	Belgium, shift work regulation in, 200,207,211
and health, 95	benzodiazepines, 8,56-57,58, 109-110
and hormone secretion, 49	Berne Convention, 209
and internal clock, 49-51,58	biological rhythms
and physical activity, 49	adjustment of, 30
and shift work, 11, 12,76,77	biorhythms distinguished from, 3,30
and sleep habits, 7,49,95	cycles, 3, 30
agitation, 57	data collection of effects of work schedules, 33
Agriculture, shift work regulation in, 199,207	defined, 3,29
Air Force operations, see U.S. Air Force	disruption by work schedules, 3, 32; see also disruption of
air traffic controllers, 88,93, 126, 127	circadian rhythms
air transportation/travel	entraining factors, 30
accident data, 101, 102	infradian, 5,44
cockpit simulators, 88	purpose, 4,29
direction of, 48; see also jet lag	Ultradian, 5,44
overtime provisions, 128	and workplace, 31-32
see also civil air safety; flight crews	see also circadian rhythms
Alcohol, Drug Abuse, and Mental Health Administration,	biorhythms, distinguished from biological rhythms, 3,30
research activities, 217	birds, circadian pacemaker, 55
alertness, 5,47,49,50	bladder cancer, 43
fitness and, 112	blind persons
measures of, 88, 111	melatonin and sleep-wake cycles in, 56
nighttime, 110, 112	non-24-hour sleep-wake disorder, 51
shift duration and, 106, 146, 161	blood cell functions, 45
sleep disorders and, 51	blood Pressure, 44
stimulant drugs and, 110	blood tests, 43
alertness-sleepiness cycles, 44	blood volume, 44
Algeria, shift work regulation in, 209,211	body clock, see internal clock
allergies, 43	body temperature
American Board of Medical Specialties, 170, 173	adjustment after transmeridian flight, 48
American Federation of State, County and Municipal	aging and, 49
Employees, 155	amplitude, 95
American Federation of Teachers, 155	and circadian rhythms, 8,31,40,41,49,88
American Hospital Association, 170	control center, 41
American Medical Association, 170, 173	depression and, 52
American Nurses Association, 155	and human performance, 6,47,98, 100

light and, <i>8</i> , <i>109</i>	in psychological functions, 4,6
night shifts and, 90	research needs, 112-113
and rotating shifts, 14,91	synchronized, 38,58
and sleep, 14,38,45,46	see also disruption of circadian rhythms; human circadian
and tolerance of shift work, 95	rhythms
Bolivia, shift work regulation in, 199,200,207,209,211	cisplatin, 43
brain	civil air safety
depression and chemical secretion in, 52	enforcement of, 127
differences during stages of sleep, 45	international flight crew problems, 48
pacemaker for circadian rhythms, 4, 40-41; secalso internal	work schedule limitations, 126-127
clock Proof: chift work regulation in 200 207 211	Civil Rights Act, 209
Brazil, shift work regulation in, 200,207,211	clerical workers, shift work by, 10-11, 13,69,74,76,81
bread mold, circadian rhythm in, 39 breast cancer surgery, 5,44	cognitive performance, 31,48,98, 100, 111, 166, 176-177, 187
brotizolam, 109-110	collective bargaining agreements for government employees, 139
Bulgaria, shift work regulation in, 199,201,209,211	
Bureau of the Census, 69	international, 199, 207, 210, 214 work schedule regulation, 4, 19, 124, 134, 136, 137, 155-156
Bureau of Labor Statistics, 18,22,33,69,71,80-81, 100	Colombia, shift work regulation in, 201,207,211
Bureau of Mines, research activities, 219	Committee of Interns and Residents, 167
Bureau of National Affairs, 137	compensatory time, 139
	compressed workweek
a for gone 40, 41	advantages and disadvantages, 13,81,82
c-fos gene, 40, 41 caffeine, 17,97, 110	effects of laws and regulations on, 13, 79
California	employment sectors using, 13, 81
Agricultural Labor Relations Act, 137	for Federal employees, 138-139
residents' work hours in, 171	and health, 106
Canada, shift work regulation in, 199,201,209,210,211	and moonlighting, 13, 81
Cape Verde, shift work regulation in, 209,211	and patient satisfaction with care, 161
carbachol, 57	performance and safety concerns, 13,81,82,106
cardiovascular disease, 16,96-97	schedule, 13, 81
cardiovascular function, circadian rhythms in, 44	computer operations, 11, 81
case studies, see military operations; nuclear powerplant control	conductors, 123
room operators; nursing shift work; residents/residencies	Connecticut
catecholamines, 57	Labor Relations Act, 137
cellular clocks, 38-40	residents' work hours in, 171 construction
Center for Demography and Ecology, 9,70	continuous-operation projects, 32
Center for Human Resource Research, 70,71	overtime compensation, 83
Centers for Disease Control, research activities, 217	prevalence of shift work in, 3, 11,74
chemical manufacturing industries, 6, 13, 81, 101, 106 child care, shift work and, 11-12,70,76,78-79,94	coronary heart disease, 44
child labor, regulation of, 18, 128-129, 130, 136	cortisol secretion
childbirth, 41,55	aging and, 49
children, see married couples with children	purpose of, 43
Chile, shift work regulation in, 203,211	and sleep, 38
China, shift work regulation in, 199,201,211	Costa Rica, shift work regulation in, 209,211
chronobiology, and mood disorders, 51-53	Council of Medical Specialty Societies, 170, 173
chronopharmacology, 43	criminal actions and penalties, 128
circadian rhythms, 30-31	Current Population Survey
brain pacemaker, 5,37, 40-41; see also internal clock	comparability of data, 71-72
cellular clocks, 38-40	definition, 69,70
definition, 4-5,58	job characteristics of female shift workers, 77
and diagnosis of medical problems, 41	overtime data, 83
in flight crews, 88	personal characteristics of shift workers, 76
free-running, 38	shift work prevalence data, 8,71,73,76
genetic control of, 4,39,58	Czechoslovakia, shift work regulation in, 201,207,208,209, 211
and health, 41	411
length of cycle, 5-6,30,37,45	1 110 1 01 1 74
meal anticipation, 41	day shift, defined, 71
and medical intervention, 5,41	de Mairan, Jacques d'Ortous, 31
phase response curves, 7,37-38,39,54 in physiological functions, 4-6, 31,40,42-45	decisionmaking, 100, 176, 187 demographics of shift work, 69-78
properties, 37-38	Denmark, shift work regulation in, 201,209,211
Properties, or ou	Zemmin, Smit Worn requirement, 201,207,211

Denmark, shift work regulation in, 201,209,211

Department of Defense, research activities, 33, 112,219-220	performance on, 100
Department of Health and Human Services, research activities,	prevalence, 9, 10
217	extended duty hours
Department of the Interior, research activities, 219	and circadian disruption, 13, 15
Department of Labor, regulation of working conditions, 18,32,	defined, 3,32,87
128, 130 Department of Transportation	double shifts, 147,208
data on accidents and incidents, 101	effects on residents, 92, 176-178 and family and social life, 177-178
regulation of work schedules, 19, 123, 125, 126, 134, 135	and fatigue, 17,87,89,92,101-102, 106, 46,168, 87,188
research activities, 33, 218-219	and radigue, 17,07,09,72,101-102, 100, 40,100, 67,100 and graduate medical education programs 166-178
safety research, 103	international regulation of, 207-208
Department of Veterans Affairs, research activities, 218	and napping, 107
depression, nonseasonal, 7-8,52-53,57,97, 110, 178	and overtime, 87
diabetes, 97	and patient satisfaction with care, 161
diet	and performance, 100, 106, 147
controlling circadian rhythms in humans with, 57, 58	regulation of, 79, 87; see also hours of service
and jet lag, 48, 57	and safety, 101-102, 106
digestive disorders, see gastrointestinal problems	and sleep loss, 17,21, 87, 89, 100, 101-102, 106, 155, 176,
disruption of circadian rhythms	185, 187, 188
adjustment flexibility, 6,89,95 aging and, 49-51,92	stimulant drugs and, 110
compounding factors, 5, 15, 29, 87	in transportation sector, 72-73, 101-102 see also overtime
and fatigue, 15, 92	Exxon Valdez grounding, 102, 103
and health, 15,49,92,95	eye, circadian rhythm generation, 41, 50
military operations and, 21,22, 185, 187, 188, 191	Eysenck Personality Inventory, 165
and mood disorders, 51-53	Lybonom 1 orbonumby inventory, 100
nature of task and, 97-98,99-100, 102, 187, 191	Fair Labor Standards Act
and performance, 5, 15,49,92,98	
and safety, 100, 101, 160	applicability to government workers, 138-139 child labor provisions, 18, 128-129, 136, 139
and sleep disorders, 5,7,49,51,92	equal pay for equal work, 128
work schedules and, 5, 13, 15, 87, 89-92, 107	exemption from requirements, 128
diurnal organisms, 29	8-hour day, 129
divorce, shift work and, 94, 177-178	40-hour workweek, 3,32,79, 129
Dominican Republic, shift work regulation in, 199,201,211	jobs not covered by, 83
doxorubicin, 43 dual-earner couples	minimum wage, 18, 128, 129
prevalence of shift work, 11,82	overtime provisions, 18, 124, 128, 129-130, 136, 139
reasons for shift work, 78-79,94	family attitudes and behavior, shift work and, 71
work schedules of, 77-78	family life/responsibilities
dreaming, 5,44,45	compressed workweek and, 13, 81
Drosophila melanogaster, 39	employed persons with children, 71
1	measures of, 88
eating and drinking establishments, shift workers in, 10, 11,76,	nursing shift work and, 162, 166 and psychological stress, 96
77	residents' extended duty hours and, 177-178
eating habits, shift work and, 96,97, 162, 208	and safety, 100
Ecuador, shift work regulation in, 201,207,211	shift work and, 32,78, 82, 87, 93-94,96, 105
education of workers, on effects of shift work, 18, 111-112	and sleep disruption, 93, 104, 162
employment sector	of women shift workers, 94
shift workers by, 72-76	fatigue, 32,87,97
see also specific sectors	aging and, 50
Energy Reorganization and Development Act, 19, 128, 135	circadian disruption and, 16,92
entertainment industries, shift work in, 10, 73, 75, 76	compressed workweek and, 13,81, 82, 106
Equal Employment Opportunity Commission, 209	defined, 87
errors nursing shift work and, 160	drugs to counteract, 109-110
vigilance and, 147-148	environmental factors in, 149
Ethiopia, shift work regulation in, 209,211	extended duty hours and, 17, 87,89,92, 101-102, 106, 146,
evening person, 95, 165	168, 187, 188 fitness and, 112
evening shifts, 32	and human performance, 48,58,98, 100, 112, 187
defined, 71	and injuries, 160, 166, 168
demographic profile of workers, 11, 12,76,77	interventions, 145, 148
by occupation, 11-12,74-75,77	night Shifts and, 13, 81, 92

psychological state and, 165	flight crews
research on, 88	circadian rhythms in, 88,89
rotating shifts and, 13, 81, 105, 106, 161	fatigue and performance, 187
and safety, 101, 103	hours of service regulations, 126-127, 134-135
sleep disruption and, 51,92-93	international, schedules, 48,75
sleep duration and, 94	jet lag in, 92
stimulant drugs and, 110, 111	napping during slack periods, 107, 110
task performance time and, 187	sleep duration and fatigue in, 94
Faverty v. McDonald's Restaurants of Oregon, Inc., 131	flowers, biological rhythms, 29,32
Federal Aviation Act, 126, 127, 134	5-fluoro-2-deoxyuridine, 43
Federal Aviation Administration, 32	food intake, 41; see also eating habits
hours of service regulations, 18, 123, 126, 127, 134	France
research activities, 218	field studies of work schedules, 88
Federal Claims Collection Act, 124	shift work regulation in, 199,202,208,210,211
Federal Government	frq gene, 39
employee working conditions, 11, 138-139	fruit fly, 39
labor relations statutes, 136-137	
preemption of State regulations, 131, 137-138	gastrointestinal problems
prevalence of shift work in, 75	gastrointestinal problems
regulation of working conditions, 4,32-33, 123-130	circadian desynchronization and, 92,96,97
	jet lag and, 48
research activities, 217-219	nursing shift work and, 162, 165
see also specific departments and agencies	rotating shifts and, 208
Federal Highway Administration, 32	stimulant drugs and, 110
enforcement of Motor Carrier Safety Act, 126, 134	work-related stressors and, 16
Hours of Service of Drivers regulations, 18, 125	gender
Office of Motor Carriers, 125	and differences in regulation of shift work, 131
research activities, 218	and shift work prevalence, 11, 12,76,77,79,82
Federal Labor Relations Authority, 139	and stress in medical residents, 177
Federal Railroad Administration	genes, for circadian rhythms, 39-40
hours of service regulation, 18.123-125	German
research activities, 218	field studies of work schedules, 88
Federal Railroad Safety Act, 134	shift work regulation in, 202,207,208, 209,210,212
Federation of Nurses and Health Professionals, 155	Ghana, shift work regulation in, 209,212
Fellowship in Residency Electronic Interactive Database Access	glucose, 43
System, 173	Gompers, Samuel, 129
fertility	graduate medical education programs
melatonin and, 55	current status of, 170
shift work and, 70	extended duty hours and, 166-178
Finland, shift work regulation in, 199,202,207,208,210, 211	Libby Zion case, 168-170
firefighters	see also residents/residencies
railroad, 123	graveyard shift, 29; see <i>also</i> night shift
see also protective services	Greece, shift work regulation in, 199,202.207,208,209, 212
fitness	growth hormone, 42
and adjustment to shift work, 112	Guyana, shift work regulation in, 209,212
	Guyana, Sinte Work regulation in, 207,212
and sleep loss, 187	
see also physical activity	hamsters
fixed shifts	circadian rhythms in, 39
and body temperature, 90	phase-shifting effects of benzodiazepine, 56-57, 110
characteristics of workers, 77	suprachiasmatic nucleus, 40,41
and circadian rhythm disruption, 90, 92, 104	Hawaii, residents' work hours in, 171
defined, 87	health
and divorce and separations, 94	and circadian rhythms, 41,44,49,58,208
and effects of sleep loss, 93	compliance with health and medication regimens, 97
and family and social problems, 94-95	diagnosis of medical problems, 41,43
and health, 162-164, 165	duration of shift and, 106
and job performance, 99, 160	extended duty hours, 87
occupations of workers, 77-78	nursing shift work and, 161-166
panel mill example, 80	timing of medical interventions, 5, 8,41,44
and sleep patterns, 90,92,94, 104	timing of sleep and, 107
see also night shifts	work-related stressors and, 32,96-97,98
flextime, 138	health professions, see graduate medical education; nursing shift
Fliess, Wilhelm, 30	work: residents/residencies

health services	body temperature and, 6,47
characteristics of workers, 78	circadian rhythms and, 5,47-49,58,92
compressed workweek, 13, 81	duration of shift and, 106
continuous-operation, 32	extended duty hours and, 87, 106
medical examination of shift workers, 208	fatigue and, 48, 187
shift work in, 3, 11,69,73,75,76,77, 82	and injuries and mishaps, 101
use by shift workers, 96, 160	light effects, 54, 109.
heart attacks, 41	measurement of, 58, 88, 99, 150
heart function, 44	medication and drug therapies and, 109-110
heart muscle function, 44	monitoring, 111, 112
heart rate, 44	motivation and, 47,48, 97
honeybees, biological rhythms, 29	napping and, 17,46, 107
Hong Kong, shift work regulation in, 202	nighttime, 48, 58,99
hormone production	nursing schedules and, 6, 160-161
aging and, 49	overtime and, 83
circadian rhythms in, 5, 31,40,42-43,44	reaction time, 47-48
depression and, 52	sleep loss and, 6,45, 4748,58, 185, 187
light and, 53	speed of identification, 47
hormones, responsiveness to, 44	split shifts and, 106-107
hours of service/work	stimulant drugs and, 110
for drivers, 72-73, 125-126	transmeridian flight and, 48
in emergency situations, 125-126, 130	work-related stressors and, 32,97-100
enforcement of, 123, 124, 126, 132	see also job performance
Federal laws, 18, 32-33; seealso specific statutes	Hungary, shift work regulation in, 207,208,209,212
for flight crews, 126-127	hunger, 44
for medical residents, 168, 170-176	hypnotics, 17,48,51, 109
in military services, 186	hypothalamus, 40
on-duty time, 124, 125, 130	
penalties for violations of regulations, 124, 126, 127, 132	Illinois, residents' work hours in, 171
railroad employees, 123-124	immune system
regulation of, 4, 10,32-33, 123-124, 186	function, 45
rest periods, 124, 126, 127, 129, 137	suppression, 43
State laws, 18	India, shift work regulation in, 207,208,212
survey data on, 70-71	Indonesia, shift work regulation in, 209,212
in transportation sector, 18, 103, 123	Industrial Revolution, 31,87
and wages, 207-208	industries
Hours of Service Act, 18, 123-125, 134, 135	continuous-operation, 10, 31-32, 72
Hours of Service of Drivers regulations, 125	paying overtime compensation, 83
human circadian rhythms, 42-45	using shift schedules, 9-11, 69, 72-75
aging and, 49-51	injuries, shift work and, 18, 100-101, 160, 166, 168; see also
benzodiazepines and, 8,56-57	accidents; safety
and body temperature, 8, 31,40,41,49,88	insomnia, 7,48,51,55, 57, 110
characterization of, 31	Institute for Social Research, 70
controlling, 8, 37,53-58	insulin, 43
diet and, 57	interleukin-2, 43
eating patterns and, 96	internal clock, 29-31
length and amplitude, 50	aging and, 49-51,58
light and, 8,37,53-55	control center in brain, 4,40-41, 58
marker for, 55	defined, 29,58
measures of, 88,98-99 melatonin and, 8,55-56	desynchronization, 46,58
and performance, 47-49	entraining agents, 5-6, 15, 37, 38, 39, 89
physical activity and, 8,57-58	evaluation of, 37-38,41-42
in physiological functions, 5, 31	gene expression in, 40
in psychological functions, 5, 31	light-dark cycles and, 5-6,53,58
sleep timing, 45-47	phase shifts, 6,37,44,48,53, 105
studies of, 41-42	resetting, 30,40,41,54, 105
see also disruption of circadian rhythms	synchronization by Sun, 30
human performance	technological development and, 31
accuracy of response, 13,47,48, 81	see also circadian rhythms; human circadian rhythms
afternoon, 99	International Congress for the Protection of Workers, 209
aging and, 50	International Labor Organization conventions, 209, 210-215
	CONVENIUMS, 207, 210-213

U.S. approval of conventions, 215	and melatonin production, 53,56
international regulation of shift work	and performance, 54, 109, 149
comparability of data, 215	phase-shifting properties, 7,54
by country, 200-207	therapeutic effects of, 51,52,54
hours and wages, 207-208	light-dark cycles, synchronization of circadian rhythms with,
International Labor Organization conventions, 210-215	5-6,37,41,53,58
types of regulations, 210	lithium, 57
women's night work, 209-210	locomotive engineers, 73,89, 123
Interstate Commerce Commission, 123	logical reasoning, 47, 100
interventions	luteinizing hormone, 5,44
clinical support, 111-112	Luxembourg, shift work regulation in, 207,209,210,212
employee education, 18, 111-112	
fitness, 112	
for jet lag, 48	managerial jobs
light, 17,58, 107-109	overtime compensation, 83
medication and drug therapies, 17, 58, 109-1 11; seealso	prevalence of shift work, 11,74
specific substances	manual dexterity, 5,47, 99
monitoring systems, 17-18, 111	manufacturing industries
research needs on, 102, 113	continuous-operation, 12, 32,99
sleeping and napping, 17, 107, 187	occupations using shift workers, 3, 69
work schedule-related, 17, 102-107	overtime compensation, 83
intestinal tract, cycles in cell functions, 45	prevalence of shift work in, 11,74,82
Iowa, residents' work hours in, 171	reasons for shift work, 72
Iraq, shift work regulation in, 208,209,212	shift schedules in, 12, 13,79, 81
Ireland, shift work regulation in, 199,203,207,208,210, 212	marital status
irritability, 11,97, 165	of medical residents, 177-178
	of nurses, 156, 162, 165
Israel, shift work regulation in, 203,207,210,212	and shift work, 11, 12,76,77, 94
Italy, shift work regulation in, 203,212	see also dual-earner couples; married couples with children
	Maritime Administration, research activities, 218-219
Jamaica, shift work regulation in, 203,212	maritime safety, 127, 128
Japan, shift work regulation in, 199,203,207,210,212, 215	maritime transportation, 128
jet lag, 3,5,29,47	married couples with children
aging and, 7	effects of shift work on, 82
diet therapy, 48,57	reasons for shift work, 78-79
in flight crews, 92	shift work prevalence, 11, 78
light therapy, 54	sleep disturbances, 162
melatonin and, 56	see also single parents
and menstrual cycle, 5,44	Massachusetts, residents' work hours in, 171
in military operations, 21, 188	Mauritius, shift work regulation in, 209,212
job performance	medical education, see graduate medical education; residents/
compressed workweek and, 13, 81	residencies
by job setting, 99	
and marital problems, 177-178	Medical Research and Development Command, research
measurement of, 88,99	activities, 218-219
nursing shift work and, 99, 160	medication and drug therapies, 109-111; see also specific
Johns Hopkins Hospitals, 158	substances
Johns Hopkins School of Medicine, 167	melatonin
ooms hopans senoor of wederic, 107	controlling circadian rhythms in humans with, 8,55-56,58,
1. J f	110
kidney function, 44-45	light and production of, 53,56, 108
	memory, 5, 31,47,48,57, 100, 105, 187
Labor-Management Relations Act, 19, 136-137, 139	menstrual cycle
latitude, and seasonal affective disorder, 51	circadian rhythms in, 3,5, 30,44
Libby Zion case, 168-170	dysfunctions due to shift work, 97, 165
light	and jet lag, 5, 44
adverse effects of, 54-55	therapeutic implications, 5,44
aging, and relay of, 50	mental functions
and body temperature, 8, 109	circadian rhythm disruption and, 49
controlling circadian rhythms with, 8, 17, 37, 39,40,51, 52,	circadian rhythms in, 5,47
53-55	mental illness, 52,58
fluorescent, 55	merchant marines
interventions in shill work, 58, 107-109	hours of service regulation, 135
and jet lag, 48, 54	watch schedules, 92, 100, 103, 106-107, 127

message decoding, 100	napping and, 46
metabolism, cortisol secretion and, 43	sleep deprivation and, 177
metastatic adenocarcinoma, 43	stimulant drugs and, 110
meteorologists, 92	work schedules and, 93
Michigan	moonlighting, 13,81,83,93, 173
child labor law, 130	Morocco, shift work regulation in, 203,212
minimum wage law, 130	morning person, 95, 165
residents' work hours in, 171	motivation
microsleeps, 45	and performance, 47,48,58
military operations	work schedules and, 93
Air Force, 189-190	Motor Carrier Safety Act of 1984, 125-126
amphibious assault, 192-193	enforcement of, 126
Army, 188-189	hours of service regulations for drivers, 125-126
combat, 21, 185, 186, 188, 189, 190, 192	safety standards, 134
conditions of readiness, 191	motor vehicle operators
deployment, 185, 186, 188, 189	circadian disruption in, 92
Desert Storm, 185	monitoring of, 125
drug interventions, 110	overtime provisions, 128
extended duty hours, 87	performance during extended duty hours, 100
flight operations, 187, 188,189-190,192	regulation of, 18, 125, 134
24-hour marming, 188-193	shift work among, 10,72
hours of service regulations, 21, 186, 188, 189, 190, 192	sleep detector, 111
Marine Corps, 192-193	State regulation of, 130
nature of, 185-187	muscle aches, 96
Navy, 21-22,93, 190-192	
and night shift paralysis, 93	napping, 17,46,47,49, 107, 187
reinforcement, 188	narcolepsy, 46
rest requirement, 21, 185, 186, 189, 190	National Aeronautics and Space Administration
shift work in, 3, 73	light therapy for astronauts, 108
sleep discipline plans, 187	research activities, 33,48,88, 112,219
and sleep loss, 21, 185, 187	National Federation of Housestaff Organizations, 172
special operations, 188-189	National Institute for Occupational Safety and Health
strategic forces, 190	Daily Sleep and Habits Questionnaire, 111
on submarines, 185, 191	Fatigue Test Battery, 111
on surface ships, 185, 191-192	research activities, 33, 160, 162, 165, 217
tasks, 21, 187	National Institute of Child Health and Human Development, 70
training and operational readiness exercises, 21,185-186,188 Mine Safety and Health Act, 19, 133, 135	National Institutes of Health, research activities, 33,217
Mine Safety and Health Administration, 19, 133-134	National Labor Relations Act, 124, 136
mining/miners	National Labor Relations Board, 137
adjustment to rotating shifts, 105	National Longitudinal Survey, Youth Cohort, 70,71,78
eating habits of miners, 97	National Science Foundation, research activities, 217-218
injuries, 101	National Survey of Families and Households, 9,70,71
occupational safety and health, 133-134, 135	National Transportation Safety Board
overtime compensation, 83	data on accidents, 101, 102, 103
shift work, 11	research activities, 218 scope of authority, 127-128
sleepiness in, 107	Naval operations, see U.S. Navy
ministeel industries, 13, 81	nerve cells, in SCN, 50
Minnesota, residents' work hours in, 171	nervousness, 11, 165
miscellaneous shifts, 11, 71,76, 77	Netherlands, shift work regulation in, 203,208,210,212
Missouri, residents' work hours in, 171	Neurospora crassa, 39
Mongolia, shift work regulation in, 209,212	Nevada, residents' work hours in, 171
monitoring	New Deal, 128
circadian disruption and, 92	New Jersey, residents' work hours in, 171
to detect performance impairment, 17-18, 111, 149-150	New York State, regulation of residents' work schedules, 130,
motor vehicle operators, 125, 126	169, 171
mood	New Zealand
circadian rhythms in, 47	residents' hours in, 172
disorders, chronobiology and, 7,51-53	shift work regulation in, 199-200,203, 210,212
drug interventions and, 110	Nigeria, shift work regulation in, 199,204,209,212
environmental and physiological factors in, 149	night shifts, 32
measures of, 88	adjustment to, 90, 92, 109

and alertness, 112	research activities, 33
and body temperature, 90	resident inspectors, 144, 149
capital investment and, 72	scope of authority, 18, 128, 135, 143, 144, 149-150
and circadian desynchronization, 90, 92	and shift schedules, 144-147
defined, 71, 157,214	Systematic Assessment of Licensee Performance, 146
demographic profile of workers, 11, 12,76,77	nursing shift work, 6
and divorce, 94	and accidents, 155
by employment sector, 11-12,74-75	and collective bargaining by unions, 155-156, 157
and fatigue, 13, 81, 92	compressed workweek, 13, 81
and health, 96	consequences, 159-166
injuries and accidents during, 101, 131	and digestive disorders, 162, 165
international regulation of, 199-207	extended duty hours, 155, 156
occupational differences in, 76, 77	and family and social life, 20, 156, 166
paralysis, 93	and fitness, 112
part-time workers, 72	full-time, 156
pay differentials, 199,207	and health, 20, 160, 161-166
performance on, 99, 100, 105	and injuries, 166
prevalence, 9, 10,72,82	and job dissatisfaction, 20, 158-159
reasons for, 72, 78	job performance ratings, 99, 160
regulation of women's work schedules, 131, 209-210	licensed practical nurses, 159
and sleep disturbances, 17, 104, 162	and marital status, 156
and sleep patterns, 90,93, 107	and menstrual dysfunction, 165
and sleepiness, 92, 104	and night shift paralysis, 93
task differences on, 99	overtime, 156, 162
in transportation industries, 10, 72	part-time, 156, 162
see also fixed shifts	patterns, 156, 157-158
nocturnal animals, 29	and performance of workers, 160-161
norepinephrine, 96-97	prevalence, 11,20,77,82, 156
Norway, shift work regulation in, 199-200,204,208,209, 212	and psychological and nervous disorders, 20, 165
• • • • • • • • • • • • • • • • • • • •	and quality of patient cam, 20, 160-161
nuclear powerplant control room operators	registered nurses, 155-156
characteristics of, 143	research needs, 20-21
fitness-for-duty regulations, 20, 135, 150	sick days and use of health services, 20, 160
8-hour schedules, 144, 145, 146-147	•
12-hour schedules, 106, 144, 145-147	and sleep disturbances, 20, 162
hours-of-work regulation, 128	stress, 20, 159
job characteristics and effects, 106, 143, 147-149	and substance use and abuse, 165-166
licensed reactor operators, 143, 147	
monitoring performance of, 20, 149-150	occupations
overtime schedules, 128, 144, 147, 147	continuous-operation, 31-32
senior reactor operators, 143, 147	with extended duty hours, 87
sleepiness in, 107, 143	fatigue during night work, 92
training, 143	of female shift workers, 11, 77
vigilance of, 148, 149	receiving overtime compensation, 83
nuclear powerplants	using of nonstandard work schedules, 3-4,6,9-11, 13,69,
accidents/incidents, 102	72-75,81,82
control room configuration, 148	Occupational Safety and Health Act
control room simulators, 88	applicability to government workers, 138, 139
outages, schedules during, 147	employer obligations under, 132
Peach Bottom atomic power station, 143, 150	enforcement of, 33, 132
regulation of, 128, 144-147	general duty clause, 19,33, 132-133
Shift staffing, 128, 144-147	jurisdictional overlap with other laws, 133, 135-136
technical specifications, 18, 145	purpose, 131-132, 136
Three Mile Island, 102, 143,150	State plan provisions, 133
Nuclear Regulatory Commission, 32	Occupational Safety and Health Administration
cooperation with OSHA, 144	burden in general duty proceedings, 132
data on accidents and incidents, 101	cooperation with NRC, 144
examination of control room trainees, 143	data on workplace accidents, 101
fitness-for-duty regulations, 20, 135, 150	research on biological rhythms, 4, 33
guidance on shift scheduling and working hours, 18,20,144,	rulemaking by, 132
150	scope of authority, 4, 32-33, 132
jurisdiction, 144	standards for work scheduling, 132
oversight of nuclear powerplants, 144	Occupational Safety and Health Review Commission, 132-133

offshore oil rigs, 13, 81	characteristics of workers, 78
Ogle, William, 31	continuous-operation, 10, 32
ovarian cancer, 43	fatigue during night work, 92
overtime	four-platoon schedule, 104
basis for calculating pay, 124	health of workers, %
and extended duty hours, 87	Philadelphia police work schedules, 104
at nuclear powerplants, 144, 145, 147	prevalence of shift workers, 3, 10, 11,73,76
by nurses, 156	protein synthesis, 38
and performance, 83	proto-oncogene, 41
prevalence of, 83	psychological functions
regulation of, 79, 129-130, 137, 147	circadian rhythms in, 5, 31,47
and rotating shifts, 87	extended duty hours and, 106
and safety, 83	light and, 108
for State employees, 139	measurement of, 165
see also extended duty hours	in medical residents, 178
	monitoring of, 112
Panama, shift work regulation in, 204,208,212	of nurses on shifts, 165
paper industry, 13,80,81,94	and performance, 100
Papua New Guinea, shift work regulation in, 204,212	psychomotor tests, 111
Paraguay, shift work regulation in, 208,212	puberty, melatonin, 55
Pennsylvania, residents' work hours in, 171	
peptic ulcer disease, 96	quality control, circadian disruption and, 92
per gene, 39	Quality of Employment Survey, 70-71
perceptual-motor tasks, 100	quality of patient care
performance, see human performance; job performance	nursing shift work and, 160-161
personality, and adjustment to work schedules, 95	resident work schedules and, 168
Peru, shift work regulation in, 209,212	Quality Patient Care Scale, 161
petroleum industry, 13,81,89,98	Quality Tutient Cure beare, 101
pharmacokinetics, 43	
phenobarbital, 57	race/ethnicity, and shift work, 11, 12,76,77
Philippines, shift work regulation in, 204,207,209,212	Rail Safety Improvement Act of 1988, 124
physical activity	railroad engineers, 92 Railroad Safety Act of 1970, 19, 125, 135
aging and, 49	
and circadian rhythm adjustment, 8,57,58, 109, 187	railroads, hours-of-work regulations, 18, 123, 128, 131, 134 Railway Labor Act, 124, 136-137
and jet lag, 48	rats, circadian rhythm synchronization in, 55-56
see also fitness	reaction time, 5,47, 97, 100, 161, 176
physiological functions	recognition, 47
aging and, 7	
circadian rhythms in, 5,31,47, 88	registered nurses, 155-156; see <i>also</i> nursing shift work regulation of working conditions
depression and, 52	compressed working conditions
effects of work-related stressors on, 89	•
light and, 108	costs of implementation for residents, 169-170 current areas of action, 18, 123-130
measures of, 88	by Federal Government, 18-19,32-33, 123-130
monitoring of, 112	Federal preemption of State laws, 131, 137-138
see also specific functions	
pineal gland, 55,56	gender differences in, 131 hours of service, 32
plants, circadian rhythms in, 31	labor relations statutes, 136-138
Poland, shift work regulation in, 204,209,212	for medical residents, 170-176
policy issues and options	occupational safety and health laws, 131-133
data collection on workplace safety statistics, 23-24	penalties for violations of, 124, 126, 127
research effort on effects of work schedules, 22-23	potential areas of action, 18-19, 130-138
well-being of shift workers, 24-25	by States, 18-19, 130
polysomnography, 45	see <i>also</i> international regulation of shift work; nuclear
Portugal, shift work regulation in, 207,208,212	powerplants; transportation; and specific agencies and
pregnancy	statutes
outcomes, shift work and, 16,97, 178	research activities
restrictions on work during, 209-210,214, 215	data collection by Federal Government, 22,33
printers, 93	Department of Defense, 33, 112,219-220
professional jobs, overtime compensation, 83	Department of Health and Human Services, 33,217
Profile of Mood States, 165	Department of the Interior, 219
prolactin, 42	Department of Transportation, 33,218-219
protective services	Department of Veterans Affairs, 218
	* ··· ··· / ·

National Aeronautics and Space Administration, 33,88,112, 219	defined, 3,32,87
National Science Foundation, 217-218	demographic profile of workers, 11, 12,76,77,78
National Transportation Safety Board, 218	direction of rotation, 12-13, 17,79, 105, 145 every other weekend off, 146
research methodologies	and family responsibilities, 79, 166
and comparability of data, 71, 215	and fatigue, 13, 81, 105, 146
design needs, 112	and health, 96, 160, 162-165
field studies, 88	8-hour schedules, 80, 106, 145, 146, 157
human circadian rhythms, 41-42	12-hour schedule, 80, 106, 145-146, 157, 161
human performance and work schedules, 98-99	and injuries, 166
laboratory studies, 88	light therapy, 109
physiological measures, 88	at nuclear powerplants, 20, 145
placebo effects, 88	by occupation, 11-12,74-75,77
problems in studying seasonal affective disorder, 52	and overtime, 87
self-selection process, 96	part-time, 78
survey studies, 88	patterns of, 157-158
on work schedules, 88,96	performance on, 99, 100
research needs	prevalence of, 9,71,72,82,156
on circadian rhythms and shift work, 18, 82, 112-113	in pulp/paper mills, 80
on interventions, 17, 102, 113	reasons for, 145
nursing shift work, 20-21	and sleep disruption, 14, 15, 17,92,93, 105, 107, 162
performance effects of work schedules, 98	and social life, 166
safety and work schedules, 18, 113	speed of rotation, 12-13, 17,79, 89,91, 105, 107, 145,208
transportation safety, 103	and substance use and abuse, 165-166
Residency Review Committee guidelines, 21, 173-175	survey data on, 70, 71
residents/residencies, 87	2-2-2 system, 91
characteristics, 167	and task characteristics, 105
classifications of, 167	in transportation industries, 10, 72
continuity of care by, 21, 167, 168, 169, 173	
defined, 155	safety
effects of extended duty hours on, 21,92, 155, 168, 176-178	compressed workweek and, 13, 81
family and personal life, 177-178	emergency authority of FRA, 124-125
marital status, 177-178	extended duty hours and, 106
medical mistakes by, 168-169, 170, 177	overtime and, 83
in New Zealand, 172 night floats, 176	research needs on, 17, 113
pregnancy outcomes of students, 178	shift work and, 17, 18, 131
regulation of hours, 21, 130, 168, 169, 170-176	of women, 209
sleeping patterns, 168	work-related stressors and, 32,97-100
specialty-related standards, 21, 173-176	Safety Appliance Act, 123
State regulation of work hours, 171	Saudi Arabia, shift work regulation in, 209,213
substance abuse by, 178	search performance, 99
training programs, 166-167, 173	seasonal affective disorder, 7,51-52,53,54,55
unions, 167	semen production, melatonin and, 55 serotonin, 57
work schedules, 155, 167	Service Employees International Union, 155
workload, 168	service industries
see also graduate medical education	continuous-operation occupations, 10, 32, 73-76
respiratory infections, 96	dual-earner couples in, 78
respiratory system, circadian rhythms in, 44	prevalence of shift work in, 3, 10,11,74,75,76,82
rest-activity cycles, 44, 97	sex hormones, 42
rest periods, 124	sexual excitement, 44
retail industries, shift work in, 10, 11, 73,75	shift changes, 13, 81, 82
Romania, shift work regulation in, 204,213	shift work, 29
Roosevelt, Franklin D., 129	adjustment to, 15,89,95, 112
rotating shifts	age and, 7, 76, 95
4 to 40, 158,161	body temperate and tolerance of, 95
adjustment to, 17,50,89-90,95	capital investment and, 10, 72
aging and, 50,95	data sources on, 8,9, 13,69-71,80-81
Baylor plan, 158	definition, 3,32,87
and body temperature, 14, 91	demographics of, 69-78
circadian disruption, 13, 15, 89	by employment sector, 9-11,72-76,82
4 days on, 4 days off, 147	and family life, 32,78,82,87,93-94,96, 105

health and, 32,87,96-98, 106, 161-166	total time, 46
8-hour schedules, 80, 145	wrist activity monitors, 88
12-hour schedules, 80, 145-147	sleep disorders
motivations for, 10, 11-12,69,72,76,78-79, 87	advanced sleep phase syndrome, 50,51
at nuclear powerplants, 144-147	age and, 50, 58
and occupational exposure limits, 13, 81	circadian rhythm disruption and, 49, 51
pay differentials, 158	clinics, 112
and performance, 6,97-100	delayed sleep phase syndrome, 51
physiological effects of, 6,32	insomnia, 7,48,51,55,57
prevalence, estimates of, 8-13,32,69,70,71-72, 87, 199	jet lag and, 48
and safety, 17, 18, 131	light therapy, 54
schedule determinants, 79-80	night Shifts and, 104
and sleep loss, 14,32,58,87,92,97, 107, 112, 162	non-24-hour sleep-wake disorder, 51
social effects of, 3,29,32,87,94-95,96, 105, 166, 176-177	sleep disruption/loss, 3, 29
types, 12-13,69,79,80	adjustment to, 95, 176
see also extended duty hours; fried shifts; international	and behavior, 45
regulation of shift work; night shifts; regulation of work	causes, 92-93
schedules; rotating shifts; split shifts	
shift workers	circadian rhythm disruption and, 5, 16,49,92
characteristics, 11-12, 76-78,79, 82	detection, 111
	and employer liability for accidents, 130
defining, 69	extended duty hours and, 17, 21,87,89, 100, 101-102, 106
full-time, 9,72,73,76	155, 176, 185, 187, 188
part-time, 72,73	and fatigue, 92-93
problems of, 58, 208-209; see also family life/	and night Shift paralysis, 93
responsibilities; health; safety; sleep disruption/loss;	nursing shift work and, 162
social life	and performance, 6,45,4748,58,98, 100, 162, 176, 185
surveys of, 69	and safety, 101, 112, 178
sick days, shift work and, 96, 160	shift work and, 14,32,58,87,92,97, 107, 112, 162
signal detection, 97	sleep-wake cycles
Singapore, shift work regulation in, 203,213	adjustment after transmeridian flight, 48
single parents, shift work by, 11	of blind persons, 56
sleep	body temperature and, 46
accommodations for, 124, 130	circadian rhythms, 31, 37
aging and, 49,95	
and body temperature, 14, 38,45,46	depression and, 52
brain activity during, 99	and napping, 107
compressed workweek and, 13, 81	and shift work, 6,58
and cortisol secretion, 38	sleepiness
	aging and, 49
daytime, 95, 110,208	control of, 40
debt, 15,93, 105,107,208	daytime, 47
depression and, 52-53	defined, 87
detectors, 111	drugs to counteract, 109-110
diaries and questionnaires, 88	jet lag and, 48
dreams, 5,44,45	interventions for, 148, 149
duration, 15,92,93, 112, 162	and napping, 107
employee education on, 111-112	and night Shift paralysis, 93
falling asleep, 46,95	night shifts and, 15, 92
habits, 93,95	and performance, 6, 100, 187
and hormone secretion, 42	and safety, 100
latency test, 46	social life
measurement of, 45, 88	disruption by work schedules, 3,29,32,87,94-95,96, 105
microsleeps, 45	measures of, 88
napping, 17,46,47,49, 107	nursing shift work and, 166
quality, 16,38,45,58,88, 104	residents' extended duty hours and, 176-177
regulation under FLSA, 129-130	sleep disorders and, 51, 104, 162
REM, 45,46,52	and synchronization of circadian rhythms, 53
research, 88	South Africa, shift work regulation in, 205
slow wave, 45	South Korea, shift work regulation in, 205
social and domestic disturbances and, 93	
stages, 5, 44	Spain, shift work regulation in, 199,205,207
stimulant drugs and, 110	split shifts
timing 7 38 45-47 51 52 58 88 105 107 111	defined, 3,32,71

prevalence, 9	transmeridian flight, effects of, 5,7,44,48,58, 89;
restrictions on, 137	see also jet lag
women on, 77	transportation problems of shift workers, 208,209
see also merchant marines	transportation sector
Sri Lanka, shift work regulation in, 210,213	civil air safety, 126-127
Stanford Research Institute, 160	continuous-operation occupations, 32
States	extended duty hours, 87, 100
employee working conditions, 11, 139	fatigue in workers, 92
Federal preemption of regulations, 131, 137-138	hours of service regulations, 10,32,72-73, 103, 123-126
labor relations legislation, 137-138	industries using shift workers, 3
mine safety and health standards, 133	international regulation of, 199, 207
occupational safety and health enforcement, 133	maritime safety, 127
prevalence of shift workers in public sector, 11,75	motor carrier safety, 125-126
regulation of working conditions, 4, 32, 130, 131	occupational safety and health regulation in, 134-135
resident work hours regulation, 171	overtime compensation, 83
steel workers, 92	prevalence of shift work, 10, 11,72,75,82
Stimulant drugs, 110	railway, 92,123,124,125,128,131, 134,135, 136-137
stomach, cycles in cell functions, 45	safety concerns, 18
stress	shift schedules in, 79
and cortisol secretion, 43	State regulation of work schedules, 130
and health, 97	work history of locomotive engineer, 73
on-the-job monitoring and, 111	work schedule limitations, 126-127
among nurses, 159	see also air transportation/travel; civil air safety
stressors, see work-related stressors	tranquilizer use, 97
substance use and abuse	triazolam, 56-57, 109-110
detection of, 111	tryptophan, 17, 110
by medical residents, 178	tumor necrosis factor, 43
regulation of, 134, 135	Tunisia, shift work regulation in, 199,205,213
shift work and, 96,97, 102, 165-166	Turkey, shift work regulation in, 199,206,207,208,209, 213
suicide, 52	
suprachiasmatic nucleus, 5,4041,50,58	14 14
Surinam, shift work regulation in, 210,213	ultraviolet radiation, 55
Swaziland, shift work regulation in, 209,213	United Kingdom
Sweden	field studies of work schedules, 88
divorce rate in shift workers, 94	nursing shift work in, 158
field studies of work schedules, 88	residents' hours in, 171
shift work regulation in, 199,205,207,209,213	shift work regulation in, 199,206,209,210,213
switch operators, 123	United States
Switzerland, shift work regulation in, 199,205,207,209,210,	approval of International Labor Organization conventions,
213	215
	shift work regulation in, 199,206,207, 209, 213
technical jobs	Uruguay, shift work regulation in, 206,213
overtime compensation, 83	U.S. Air Force
shift work in, 11	Office of Scientific Research, 33,220
	research activities, 33, 220
technical maintenance, 13, 81	strategic forces, 190
technological development	tactical and transport forces, 189-190
and circadian rhythms, 31-32	US. Army
and shift work prevalence, 10-11,76	Aeromedical Research Laboratory, 220
teenagers	biological rhythm research activities, 219-220
insomnia in, 51	combat operations, 189
work restrictions, 128-129, 136,207	deployment operations, 188
temperature, see body temperature	flight operations, 189
Thailand, shift work regulation in, 209,213	reinforcement operations, 188
theophylline, 57	research activities, 219-220
tides, 29	Research Institute of Environmental Medicine, 220
traffic accidents	Research Institute for the Social and Behavioral Sciences,
drug use and, 102	219-220
factors contributing to, 17, 101-102, 104, 178	Safety Management Information System, 101
fatigue-related, 102, 178	special operations, 188-189
shift duration and, 106	U.S. Coast Guard
timing of, 46,99	authority over work scheduling, 18, 103, 127, 135
train operators, 123	research activities, 218-219

U.S. Congress, Subcommittee on Investigation and Oversight,	medical residents, 176, 177 moonlighting by, 83
U.S. Constitution	night work regulation, 131,209-210
commerce clause, 130	prevalence, 76
equal protection clause, 131	safety of, 209
U.S. Marine Corps, amphibious assault operations, 192-193	stress in, 16,94
U.S. Navy	surveys of, 70
flight operations, 192	Women's Health Equity Act of 1991, 161
Navy Health and Research Center, 220	
Office of Naval Research, 220	work schedules, 87
research activities, 220	characteristics that can be varied, 87, 103-104
· · · · · · · · · · · · · · · · · · ·	compressed workweek, 79
submarine operations, 191	and disruption of circadian rhythms, 3,5, 89-92
surface ship operations, 191-192	economic incentives for limiting, 124
U.S.S.R., shift work regulation in, 206,207,208	and fatigue, 92-93
urine production, 44-45	4-hours-on, 8-hours-off, 100
utilities	8-hour day, 79, 129
overtime compensation, 83	12-hour, 82, see <i>also</i> compressed workweek
using shift workers, 3, 10,72	40-hour workweek, 3,32,79
work schedules, 13, 81	interventions related to, 17, 102-107
see also nuclear powerplants	methodology for studying effects of, 88
	research needs, 112-113
Valium, 56	and safety, 103
Venezuela, shift work regulation in, 206,208,213	and sleep disruption, 92-93
verbal reasoning, 47	and social and domestic disturbances, 93-95
vigilance	stressors caused by, 89-95
circadian disruption and, 92	see also shift work
environmental and physiological factors affecting, 149	work-related stressors
and human error, 147-148	circadian rhythm disruption, 15, 87,89-92
in military operations, 191	consequences of, 16,.89,95-102
napping and, 187	and health, 16,96-97
and performance, 100, 149	and performance, 97-100
sleep loss and, 187	and safety, 100-102
and sleepiness and fatigue, 147	sleepiness and fatigue, 92-93
stimulant drugs and, 110	social and domestic disturbances, 93-95
tests of, 88,99	sources, 15-16,89
	worker satisfaction, work schedule and, 13, 81, 82, 96, 104,
Walter Reed Army Institute of Research	158-159
Performance Assessment Battery, 111	working conditions, Federal Government oversight, 32-33
research activities, 218-219	workplace
women shift workers	biological rhythms and, 31-32
with children, 13, 78, 81	simulators, 88
compressed workweek, 13,81	Simulaturs, 00
family responsibilities of, 16,94	Vugaslavia shift work regulation in 104 107 112
international restrictions on, 207	Yugoslavia, shift work regulation in, 206,207,213
	7-1
job characteristics, 11,77,78	Zaire, shift work regulation in, 209,213