3 GOOD HEALTH AND WELL-BEING

2 ZERO HUNGER

5 GENDER EQUALITY

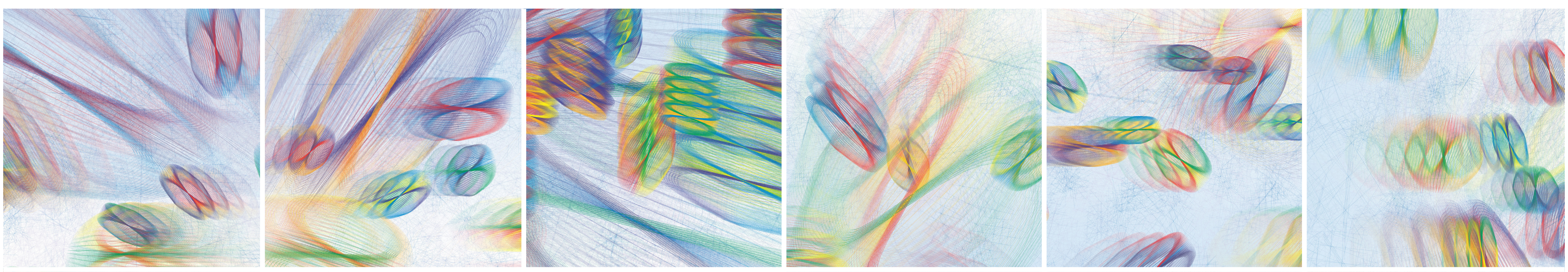
10 REDUCED INEQUALITIES

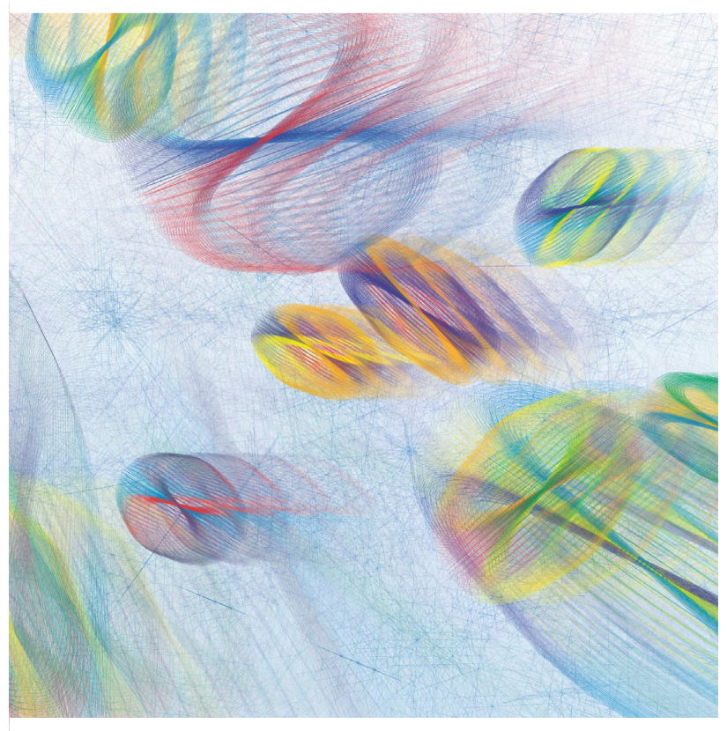
17 PARTNERSHIPS FOR THE GOALS

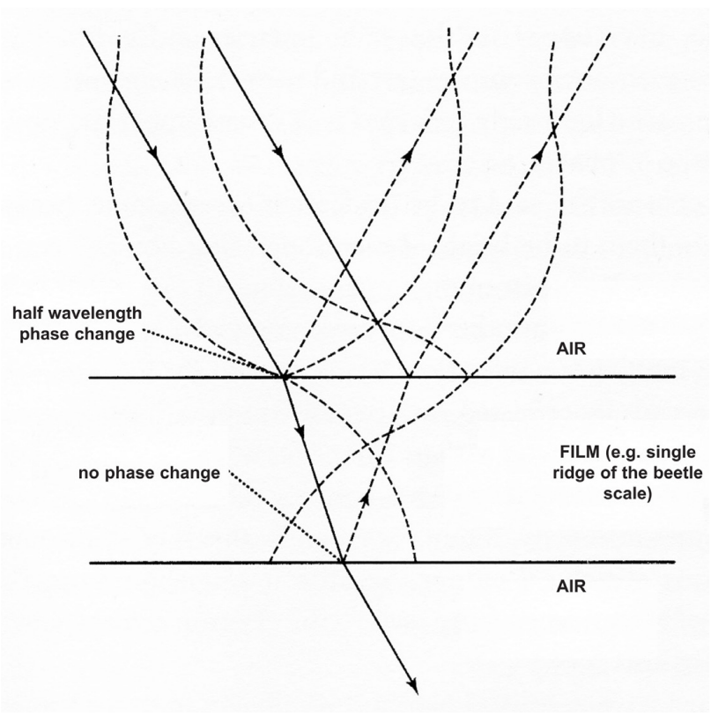
6 CLEAN WATER AND SANITATION

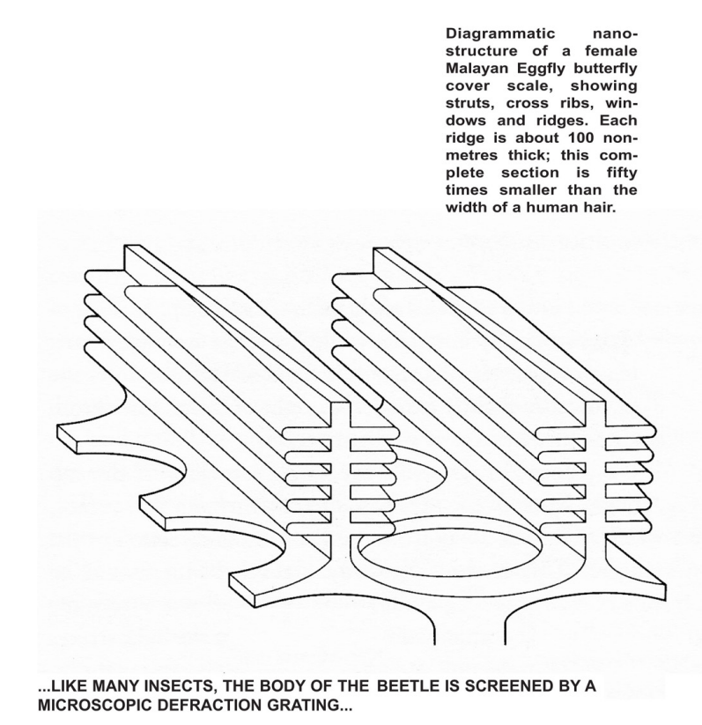
A NEW SKYSCRAPER CONCEPT

Doctor Watson Architects: re-thinking the skyscraper as a means of cleaning air: tiny robot beetles are introduced into a polluted habitat (for purposes of illustration we have selected Canary Wharf in London). The beetles can metabolise pollutants, they feed-off filthy air and in the process they clean it. An individual beetle is too small for human eyes to see, but when satiated the beetles will swarm and then they become visible. Beetle swarming is rhythmic, it is guided by the Earth's geomagnetic field. Depending on their polarity, some beetles will glide back and forth, from north to south and then from south to north while others glide from east to west and then from west to east. Like many other insects, the beetle body is screened by a microscopic refraction grating and this means when beetles swarm in sunlight they produce waves of spectral colour that is visible to human eyes. To humans, the beetle swarm appears as a vast lattice of vibrant colour, a rainbow-like body of light, shimmering, suspended in the air and signalling cleanliness.



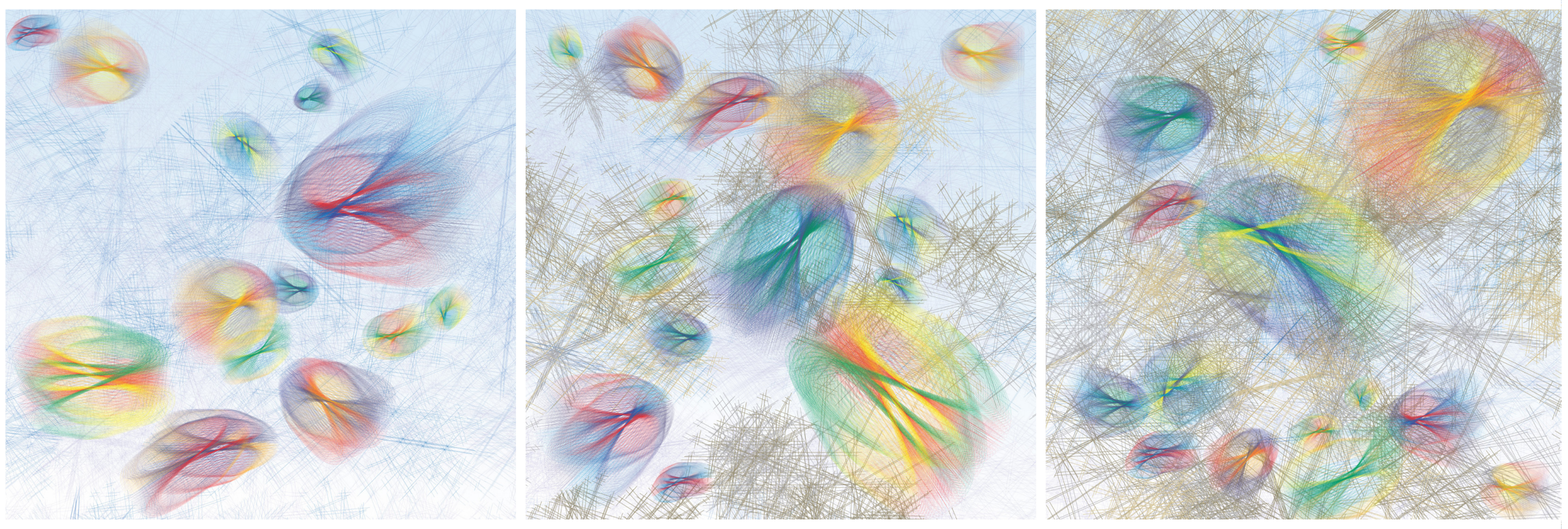


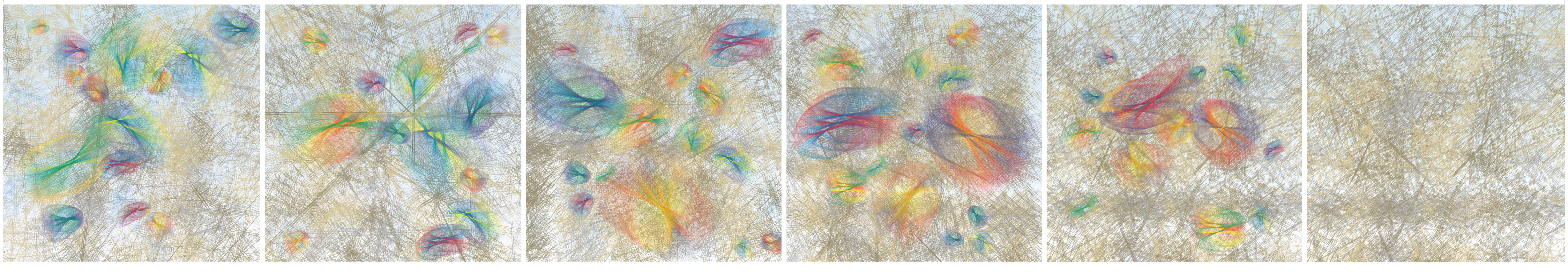




Diagrammatic nano-structure of a female Malayan Eggfly butterfly cover scale, showing struts, cross ribs, windows and ridges. Each ridge is about 100 non-metres thick; this complete section is fifty times smaller than the width of a human hair.

...LIKE MANY INSECTS, THE BODY OF THE BEETLE IS SCREENED BY A MICROSCOPIC DEFRACTION GRATING...





NAME/DESCRIPTION	SOURCE	PATHWAY	BIOLOGICAL EFFECTS	TABLE 01 - BEETLES: NAMES & APPETITES													
				VIOLLETCYVI	BLUETURQ	CYANCYEL	GREENGRANGE	YELLOWORD	ORANGEORVI	REDROSE	VIOLLETORVI	BLUEPURP	CYANCYVI	GREENGLUE	YELLOWCYN	ORANGEGRANGE	REDORD
SPM or Aerosols (solid particles or liquid droplets 0.1-25nm)	heating systems, power stations, diesel exhaust emissions,	suspended particles act as condensation nuclei during conditions of low temperature and high humidity, leading to fog formation, smoke & fog combine to form smog	loss of sunlight & increased cloud cover; reduced visibility; particles< 500nm in diameter may reach & stay in the alveoli for years, leading to lung disease		●	●	●				●		●	●		●	●
Sulphur dioxide (SO_2 acidic, colourless gas, pungent smell)	combustion of sulphur-containing fuels; over 70% comes from power	it may remain in gaseous form or dissolve in rainwater or fog to form sulphurous and sulphuric acids	bronchial & asthmatic attacks; blocks stomata reducing CO_2 absorption, chlorosis of the leaf; erosion of limestone & sandstone buildings, NO_X synergy	●						●		●			●		●
Nitrogen oxides (NO_X, NO_2, N_2O & NO are the major pollutants)	fossil fuels, power stations, vehicles, lightening, bacteria, volcanic erup-	photochemical smog, acid rain, regional hazes in sunlight, NO_2 & hydrocarbons produce ozone; N_2O is a strong greenhouse gas	respiratory infections & asthma; NO is a throat & eye irritant, may cause skin problems; decreases visibility; causes necrosis of leaves	●	●	●			●	●	●		●			●	
Photochemical oxidants (secondary pollutants)	action of sun on hydrocarbons and nitrogen oxides	O_3 & PAN produced contributing to smog; problem is greater in cities due to traffic emitting both hydrocarbons & nitrogen oxides; carried by wind	damages plants, PAN causes eye irritation and respiratory problems; city-centre joggers may experience shortness of breath & throat irritation		●				●	●	●		●	●			
Ground-level ozone	when nitrogen oxides react with volatile hydrocarbons in sunlight	may be blown long distances - high concentrations found in rural, traffic free areas	respiratory problems & eye nose & throat irritation	●			●						●		●		●
Dioxins	incinerators, vehicle exhausts, chlorine bleached paper prod-	may travel through air or water	absorbed through inhalation & skin contact; may cause skin problems		●	●		●			●	●		●	●	●	
Carbon monoxide	incomplete combustion of fuels	released into atmosphere and rapidly oxidised into CO_2	forms carboxyhaemoglobin, thereby decreasing the oxygen content of blood; small amounts impair visual acuity & concentration	●			●	●			●			●			
Lead	was used as anti-knock in petrol, water pipes	released as very fine mist of inorganic lead	food may be contaminated from air, soil or water, causes disabilities & emotional disturbance in children			●	●		●			●					●
PCBs (polychlorinated biphenols)	protective sealants for wood & metal & as coolant in transformers	PCBs are given off as a gas when matter is incinerated	may become concentrated in oily fish; large concentrations seem to be connected to bird deaths		●			●	●	●						●	
Thermal pollution	waste heat emitted from power stations, industrial plants & urban	may lead to increased precipitation & thunderstorms if released into air	direct toxic effects can result from heating of water; at the same time the inspiration rate of aerobic organisms increases, more may therefore suffocate	●							●			●	●		
VOCs (volatile organic compounds)	industrial solvents, cleaning materials, adhesives, petrol evapora-	may have local effect or travel long distances	drowsiness & eye irritation; some are carcinogenic, e.g. benzene; reactions with nitrogen oxides produce ground-level O_3					●	●	●		●		●	●		