

Science Fiction

Readings & Assignments: Week One

Science Fiction

Quiz: Week One

1. Which two writers does “Science Fiction before the Genre” say represent the origins of American science fiction? Explain the term “scientifiction.”
2. According to “The Magazine Era: 1926-1960,” what was the first magazine devoted entirely to science fiction? What was the most important and representative magazine of the 1950s? The chapter quotes John Campbell as saying “the boys don’t like mysticism.” What was Campbell saying about the nature of *Astounding Stories*?
3. “The Land Ironclads”: How many legs does the Land Ironclad have? What snack did the war correspondent keep in his pocket?
4. “Finis”: What building are Eastwood and Alice in? What scientific discovery drives the story?
5. “A Martian Odyssey”: What propellant did Tweel’s gun use to fire projectiles? What was special about the crystal that Jarvis discovered?
6. “Night”: The Bismuth is supposed to be an anti-gravity generator, but what does it actually do to Bob? A colony of machines still thrives on what planet?
7. “Devolution”: What is Woodin’s chief research interest? What did the Arctarians who colonized Earth lose that prevented them from contacting the rest of their race?
8. “Helen O’Loy”: Where did Dave run away to?
9. “Microcosmic God”: How many times faster was life for the Neoterics?
10. “The Weapon Shop”: Why did they pick Mr. Harris’s property for the Weapon Shop?

Science Fiction

Journal: Week One

1. "The Land Ironclads": Does the advancement of technology remove the human factor and therefore reduce the overall causality rate or increase it? What other technologies since the tank represent major leaps in the ways groups of humans organize attacks on one another?
2. "Finis": What do you think about the professor's theory of a limited universe? If you were the only person who knew the world would end in three weeks, what would you do? How would you face the effects of the new "sun" when they began to present themselves?
3. "A Martian Odyssey": What might an alien life form either be or do that would be so qualitatively different as to make it difficult for us to recognize it as such? If we actually ever discover life on another planet, how might you think Earth would react?
4. "Night": The narrator notes that time itself was dying on the planet and in the universe. How is this shown in the story? Machines outlive the human race in the story. In what ways are we headed in that direction today?
5. "Devolution": Is Woodin's response of suicide to learning of Earth's downward devolution from the Arctarians justifiable? How would learning this hard truth change other aspects of society and education?
6. "Helen O'Loy": What was the author trying to say about the popular media of his time and the women who consumed it? If Helen were to educate herself through our media today would the outcome be better, or worse? Explain.
7. "Microcosmic God": Did Kidder have the right to manipulate the Neoterics because he created them? Who is the Microcosmic God? Kidder who controls the Neoterics? Conant who wields Kidder's inventions? Or the Neoterics since their powers save Kidder? Explain.
8. "The Weapon Shop": Compare the standards and rules of the Weapon Shop to the struggle between gun control and gun ownership today. Does the story speak out more against unscrupulous corporations, or the government which influences or even controls those corporations?

Science fiction is at the intersection of numerous fields. It is a literature which draws on popular culture, and which engages in speculation about science, history, and all types of social relations. This volume brings together essays by scholars and practitioners of science fiction, which look at the genre from these different angles. It examines science fiction from Thomas More to the present day, and introduces important critical approaches including Marxism, postmodernism, feminism and queer theory. A number of well-known science-fiction writers contribute to this volume.

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SCIENCE FICTION

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EDWARD JAMES
AND
FARAH MENDLESOHN



CHRONOLOGY

- 1905 Rudyard Kipling, 'With the Night Mail'
 1907 Jack London, *The Iron Heel*
 1909 E. M. Forster, 'The Machine Stops'
 1911 Hugo Gernsback, *Ralph 124C 41+*
 1912 J. D. Beresford, *The Hampdenshire Wonder*
 Garrett P. Serviss, *The Second Deluge*
 Edgar Rice Burroughs, 'Under the Moons of Mars'
 1914 George Allan England, *Darkness and Dawn*
 1915 Charlotte Perkins Gilman, *Herland*
 Jack London, *The Scarlet Plague*
 1918 Abraham Merritt, 'The Moon Pool'
 1920 Karel Čapek, R. U. R.: *A Fantastic Melodrama*
 W. E. B. Du Bois, 'The Comet'
 David Lindsay, *A Voyage to Arcturus*
 1923 E. V. Odle, *The Clockwork Man*
 1924 Yevgeny Zamiatin, *We*
 1926 Hugo Gernsback starts *Amazing Stories*
Metropolis (dir. Fritz Lang)
 1928 E. E. Smith, *The Skylark of Space*
 1930 Olaf Stapledon, *Last and First Men*
 John Taine, *The Iron Star*
Astounding Science-Fiction launched
 1932 Aldous Huxley, *Brave New World*
 1934 Murray Leinster, 'Sidewise in Time'
 Stanley G. Weinbaum, 'A Martian Odyssey'
 1935 Olaf Stapledon, *Odd John*
 1936 *Things to Come* (dir. William Cameron Menzies)
 1938 John W. Campbell, Jr. (as Don A. Stuart), 'Who Goes There?'
 Lester del Rey, 'Helen O'Loy'
 1939 Stanley G. Weinbaum, *The New Adam*
 1940 Robert A. Heinlein, 'The Roads Must Roll'
 Robert A. Heinlein, "If This Goes On —"
 A. E. Van Vogt, *Slan* (book 1946)
 1941 Isaac Asimov, 'Nightfall'
 L. Sprague De Camp, *Lest Darkness Fall*
 Robert A. Heinlein, 'Universe'
 Theodore Sturgeon, 'Microcosmic God'
 1942 Isaac Asimov, 'Foundation' (book 1951)
 Robert A. Heinlein, *Beyond This Horizon* (book 1948)
 1944 C. L. Moore, 'No Woman Born'

- 1516 Thomas More, *Utopia*
 1627 Francis Bacon, *New Atlantis*
 1634 Johannes Kepler, *A Dream*
 1638 Francis Godwin, *The Man in the Moone*
 1686 Bernard de Fontenelle, *Discussion of the Plurality of Worlds*
 1741 Ludvig Holberg, *Nils Klim*
 1752 Voltaire, *Micromégas*
 1771 Louis-Sebastien Mercier, *The Year 2440*
 1805 Cousin de Grainville, *The Last Man*
 1818 Mary Shelley, *Frankenstein*
 1826 Mary Shelley, *The Last Man*
 1827 Jane Webb Loudon, *The Mummy! A Tale of the Twenty-Second Century*
 1848 Edgar Allan Poe, *Eureka*
 1865 Jules Verne, *From the Earth to the Moon*
 1870 Jules Verne, *Twenty Thousand Leagues Under the Seas*
 1871 George T. Chesney, 'The Battle of Dorking'
 Edward Bulwer-Lytton, *The Coming Race*
 1887 Camille Flammarion, *Lumen*
 W. H. Hudson, *A Crystal Age*
 1888 Edward Bellamy, *Looking Backward, 2000-1887*
 1889 Mark Twain, *A Connecticut Yankee at King Arthur's Court*
 1890 William Morris, *News from Nowhere*
 1895 H. G. Wells, *The Time Machine*
 1896 H. G. Wells, *The Island of Dr Moreau*
 1897 Kurd Lasswitz, *On Two Planets*
 1898 H. G. Wells, *The War of the Worlds*
 1901 H. G. Wells, *The First Men in the Moon*
 M. P. Shiel, *The Purple Cloud*

- 1945 Murray Leinster, 'First Contact'
- 1946 Groff Conklin, ed., *The Best of Science Fiction* (anthology)
Raymond J. Healy and J. Francis McComas, eds., *Adventures in Time and Space* (anthology)
- 1947 Robert A. Heinlein, *Rocket Ship Galileo*
- 1948 Judith Merril, 'That Only a Mother'
- 1949 Everett Bleiler and T. E. Dikty, eds., *The Best Science Fiction Stories*
George Orwell, *Nineteen Eighty-Four*
H. Beam Piper, 'He Walked Around the Horses'
George R. Stewart, *Earth Abides*
Jack Vance, 'The King of Thieves'
Magazine of Fantasy and Science Fiction launched
- 1950 Isaac Asimov, *I, Robot* (linked collection)
Ray Bradbury, *The Martian Chronicles* (linked collection)
Judith Merril, *Shadows on the Hearth*
Galaxy Science Fiction launched
Destination Moon (dir. Irving Pichel)
- 1951 Ray Bradbury, *The Illustrated Man* (loosely linked collection)
- 1952 John Wyndham, *The Day of the Triffids*
Philip José Farmer, 'The Lovers'
Clifford D. Simak, *City* (linked collection)
Theodore Sturgeon, 'The World Well Lost'
- 1953 Alfred Bester, *The Demolished Man*, winner of the first Hugo Award for Best Novel
Ray Bradbury, *Fahrenheit 451*
Arthur C. Clarke, *Childhood's End*
Hal Clement, *Mission of Gravity*
Ward Moore, *Bring the Jubilee*
Frederik Pohl and C. M. Kornbluth, *The Space Merchants*
Frederik Pohl, ed., *Star Science Fiction Stories* (anthology)
Theodore Sturgeon, *E Pluribus Unicorn* (collection)
Theodore Sturgeon, *More than Human*
Poul Anderson, *Brain Wave*
Isaac Asimov, *The Caves of Steel*
Hal Clement, *Mission of Gravity*
Tom Godwin, 'The Cold Equations'
James Blish, *Earthmen, Come Home* (fix-up)
Leigh Brackett, *The Long Tomorrow*
Arthur C. Clarke, 'The Star'
William Tenn, *Of All Possible Worlds* (collection)

- 1956 Alfred Bester, *Tiger! Tiger!* (US: *The Stars My Destination*, 1957)
Arthur C. Clarke, *The City and the Stars*
Robert A. Heinlein, *Double Star*
Judith Merril, ed., *The Year's Greatest Science-Fiction and Fantasy* (anthology)
Invasion of the Body Snatchers (dir. Don Siegel)
Forbidden Planet (dir. Fred M. Wilcox)
- 1958 Brian W. Aldiss, *Non-Stop* (US: *Starship*)
James Blish, *A Case of Conscience*
Ivan Antonovich Yefremov, *Andromeda*
Philip K. Dick, *Time Out of Joint*
Robert A. Heinlein, *Starship Troopers*
Daniel Keyes, 'Flowers for Algernon' (book 1966)
Kurt Vonnegut, Jr, *The Sirens of Titan*
Poul Anderson, *The High Crusade*
- 1960 Philip José Farmer, *Strange Relations* (linked collection)
Walter M. Miller, Jr, *A Canticle for Leibowitz*
Theodore Sturgeon, *Venus Plus X*
Gordon R. Dickson, *Naked to the Stars*
Harry Harrison, *The Stainless Steel Rat*
Robert A. Heinlein, *Stranger in a Strange Land*
Zenna Henderson, *Pilgrimage: The Book of the People* (linked collection)
- 1961 Stanislaw Lem, *Solaris* (transl. US 1970)
Cordwainer Smith, 'Alpha Ralpha Boulevard'
J. G. Ballard, *The Drowned World*
- 1962 Philip K. Dick, *The Man in the High Castle*
Naomi Mitchison, *Memoirs of a Spacewoman*
Eric Frank Russell, *The Great Explosion*
- 1963 First broadcast of *Doctor Who*
- 1964 Philip K. Dick, *Martian Time-Slip*
Robert A. Heinlein, *Farnham's Freehold*
Philip K. Dick, *Dr Bloodmoney*
Harry Harrison, 'The Streets of Ashkelon'
Frank Herbert, *Dune*, winner of the first Nebula Award for best novel
- 1966 Jack Vance, *Space Opera*
Donald A. Wollheim and Terry Carr, eds., *The World's Best Science Fiction: 1965* (anthology)
Samuel R. Delany, *Babel-17*
Harry Harrison, *Make Room! Make Room!*

- Robert A. Heinlein, *The Moon is a Harsh Mistress*
 Damon Knight, ed., *Orbit 1* (annual original anthology)
 Keith Roberts, 'The Signaller'
Star Trek first broadcast in the USA
 Samuel R. Delany, *The Einstein Intersection*
 Harlan Ellison, ed., *Dangerous Visions* (anthology)
 Roger Zelazny, *Lord of Light*
 1967 John Brunner, *Stand on Zanzibar*
 Philip K. Dick, *Do Androids Dream of Electric Sheep?*
 Thomas M. Disch, *Camp Concentration*
 Stanislaw Lem, *Solaris*
 Anne McCaffrey, *Dragonflight*
 Judith Merril, ed., *England Swings SF* (anthology)
 Alexei Panshin, *Rite of Passage*
 Keith Roberts, *Pavane*
 Robert Silverberg, *Hawkbill Station*
 2001: *A Space Odyssey* (dir. Stanley Kubrick)
 Michael Crichton, *The Andromeda Strain*
 Ursula K. Le Guin, *The Left Hand of Darkness*
 1970 Larry Niven, *Ringworld*
 1971 Terry Carr, ed., *Universe 1* (annual original anthology)
 Robert Silverberg, *The World Inside*
 1972 Isaac Asimov, *The Gods Themselves*
 Harlan Ellison, ed., *Again, Dangerous Visions* (anthology)
 Barry Malzberg, *Beyond Apollo*
 Joanna Russ, 'When It Changed'
 Arkadi and Boris Strugatsky, *Roadside Picnic*
 Gene Wolfe, *The Fifth Head of Cerberus*
 Science Fiction Foundation begins the journal *Foundation*
 1973 Arthur C. Clarke, *Rendezvous with Rama*
 Thomas Pynchon, *Gravity's Rainbow*
 Mack Reynolds, *Looking Backward, from the Year 2000*
 James Tiptree, Jr, *Ten Thousand Light Years from Home*
 (collection)
 Ian Watson, *The Embedding*
Science-Fiction Studies begins publication
 1974 Suzy McKee Charnas, *Walk to the End of the World*
 Joe Haldeman, *The Forever War*
 Ursula K. Le Guin, *The Dispossessed*
 Samuel R. Delany, *Dhalgren*
 Joanna Russ, *The Female Man*

- Pamela Sargent, ed., *Women of Wonder: SF Stories by Women*
About Women (anthology)
 Robert Shea and Robert Anton Wilson, *Illuminatus!*
 Samuel R. Delany, *Triton*
 Marge Piercy, *Woman on the Edge of Time*
 James Tiptree Jr, Houston, Houston, Do you Read?
 Mack Reynolds, *After Utopia*
 1977 *Close Encounters of the Third Kind* (dir. Steven Spielberg)
Star Wars (dir. George Lucas)
 Douglas Adams, *The Hitch-Hiker's Guide to the Galaxy*
 Octavia E. Butler, *Kindred*
 John Crowley, *Engine Summer*
 Frederik Pohl, *Gateway*
 Kurt Vonnegut Jr, *Slaughterhouse-Five*
Alien (dir. Ridley Scott)
 Gregory Benford, *Timescape*
 Gene Wolfe, *The Shadow of the Torturer* (The Book of the New
 Sun, 1)
 1980 C. J. Cherryh, *Downbelow Station*
 1981 William Gibson, 'The Gernsback Continuum'
 Vernor Vinge, 'True Names'
 Brian W. Aldiss, *Helliconia Spring* (Helliconia 1)
 1982 *Blade Runner* (dir. Ridley Scott)
 1983 David Brin, *Startide Rising*
 1984 Octavia E. Butler, 'Blood Child'
 Samuel R. Delany, *Stars in My Pocket Like Grains of Sand*
 Gardner Dozois, ed., *The Year's Best Science Fiction: First Annual*
Collection (anthology)
 Suzette Haden Elgin, *Native Tongue*
 William Gibson, *Neuromancer*
 Gwyneth Jones, *Divine Endurance*
 Kim Stanley Robinson, 'The Lucky Strike' and *The Wild Shore*
 Margaret Atwood, *The Handmaid's Tale*, winner in 1987 of the
 1985 first Arthur C. Clarke Award for Best Novel published in the UK
 Greg Bear, *Blood Music and Eon*
 Orson Scott Card, *Ender's Game*
 Lewis Shiner and Bruce Sterling, 'Mozart in Mirrorshades'
 Bruce Sterling, *Schismatrix*
 Kurt Vonnegut, *Galápagos*
 Lois McMaster Bujold, *Ethan of Athos*
 Orson Scott Card, *Speaker for the Dead*

- Ken Grimwood, *Replay*
 Pamela Sargent, *The Shore of Women*
 Joan Slonczewski, *A Door into Ocean*
 Iain M. Banks, *Consider Phlebas*
 Octavia E. Butler, *Dawn: Xenogenesis I*
 Pat Cadigan, *Mindplayers*
 Judith Moffett, *Pemterra*
 Lucius Shepard, *Life During Wartime*
 Michael Swanwick, *Vacuum Flowers*
 John Barnes, *Sin of Origin*
 Sheri S. Tepper, *The Gate to Woman's Country*
 Orson Scott Card, *The Folk of the Fringe*
 Geoff Ryman, *The Child Garden*
 Dan Simmons, *Hyperton*
 Bruce Sterling, 'Dori Bangs'
 Sheri S. Tepper, *Grass*
 Colin Greenland, *Take Back Plenty*
 Kim Stanley Robinson, *Pacific Edge*
 Sheri S. Tepper, *Raising the Stones*
 Stephen Baxter, *Raft*
 Emma Bull, *Bone Dance*
 Pat Cadigan, 'Dispatches from the Revolution'
 Michael Crichton, *Jurassic Park*
 Gwyneth Jones, *White Queen (Aleutian Trilogy 1)*
 Brian Stableford, *Sexual Chemistry: Sardonic Tales of the Genetic Revolution* (collection)
 Greg Egan, *Quarantine*
 Nancy Kress, 'Beggars in Spain'
 Maureen McHugh, *China Mountain Zhang*
 Kim Stanley Robinson, *Red Mars* (Mars 1)
 Neal Stephenson, *Snow Crash*
 Vernor Vinge, *A Fire Upon the Deep*
 Connie Willis, *Doomsday Book*
 Eleanor Arnason, *Ring of Swords*
 Nicola Griffith, *Ammonite*
 Peter F. Hamilton, *Mindstar Rising*
 Nancy Kress, *Beggars in Spain*
 Paul J. McAuley, *Red Dust*
 Paul Park, *Coelestinis*
 Kathleen Ann Goonan, *Queen City Jazz*
 Elizabeth Hand, *Waking the Moon*

- Mike Resnick, *A Miracle of Rare Design*
 Melissa Scott, *Trouble and Her Friends*
 Greg Egan, *Permutation City*
 Ken MacLeod, *The Star Fraction* (Fall Revolution 1)
 Melissa Scott, *Shadow Man*
 Neal Stephenson, *The Diamond Age*
 Orson Scott Card, *Pastwatch: The Redemption of Christopher Columbus*
 Kathleen Ann Goonan, *The Bones of Time*
 Mary Doria Russell, *The Sparrow*
 Wil McCarthy, *Bloom*
 Paul J. McAuley, *Child of the River*
 Graham Joyce and Peter Hamilton, 'Eat Reecebread'
 Keith Hartman, 'Sex, Guns, and Baptists'
 Nalo Hopkinson, *Brown Girl in the Ring*
 Ian R. MacLeod, 'The Summer Isles'
 Brian Stableford, *Inherit the Earth*
 Bruce Sterling, *Distraction*
 Howard Waldrop, 'US'
 Greg Bear, *Darwin's Radio*
 Neal Stephenson, *Cryptonomicon*
 Vernor Vinge, *A Deepness in the Sky*
 Nalo Hopkinson, *Midnight Robber*
 Ursula K. Le Guin, *The Telling*
 Ken MacLeod, *Cosmonaut Keep* (Engines of Light 1)
 Terry Bisson, 'The Old Rugged Cross'
 Ted Chiang, 'Hell is the Absence of God'
 John Clute, *Applesseed*
 Mary Gentle, *Ash*
 Maureen McHugh, *Nekropolis*
 China Miéville, *Perdido Street Station*
 Joan Slonczewski, *Brain Plague*
 Greg Egan, *Schild's Ladder*
 Jon Courtenay Grimwood, *Effendi*
 Kim Stanley Robinson, *The Years of Rice and Salt*

Science fiction before the genre

The origins of science fiction

The word 'science' acquired its modern meaning when it took aboard the realization that reliable knowledge is rooted in the evidence of the senses, carefully sifted by deductive reasoning and the experimental testing of generalizations. In the seventeenth century writers began producing speculative fictions about new discoveries and technologies that the application of scientific method might bring about, the earliest examples being accommodated – rather uncomfortably – within existing genres and narrative frameworks.

One genre hospitable to sf speculation was that of utopian fantasy, whose usual narrative form was the imaginary voyage. The rich tradition of sf travellers' tales was launched by one of the first and foremost champions of the scientific method, Francis Bacon, in *New Atlantis* (written c.1617; published 1627), although the importance of technological progress to social reform had earlier been recognised by Johann Valentin Andreae's account of *Christianopolis* (1619) and Tommaso Campanella's description of *La Città del Sole* (*The City of the Sun*, written 1602; published 1623). Most subsequent utopian fantasies took scientific and technological advancement into account, but relegated it to a minor role while matters of social, religious and political reform remained centre stage. Nor were those writers who took account of scientific progress always enthusiastic about it; Baconian optimism prompted a backlash of hostility from those who perceived a threat to religious values in the secularizing tendencies of religion and the materialistic encouragements of technology.

The imaginary voyage was also the usual narrative form of scathing satirical fantasies, and scientists became satirical targets in Margaret Cavendish's *The Blazing World* (1666) and the third book of Jonathan Swift's *Gulliver's Travels* (1726). Such works founded a tradition of 'anti-science fiction', whose reliance on similar motifs and narrative strategies has always resulted in its subsumption within the genre whose ambitions it opposes. Given the

importance of scepticism and theoretical dissent to the advancement of science and the near-oxymoronic quality of the 'science fiction' label, this confusion is not entirely inappropriate.

The more extreme versions of the fantastic voyage overlapped with the standard format of religious fantasy, the dream story. Whenever seventeenth- and eighteenth-century imaginary voyages found it convenient to cross interplanetary space their devices became phantasmagorical, and dreaming remained the only plausible means of gaining access to the future until the late nineteenth century. Another pioneer of the scientific revolution, Johannes Kepler, was the first to couch an earnest scientific argument – a representation of the Copernican theory of the solar system – as a visionary fantasy. His *Somnium* (A Dream, 1634) also includes an ingenious attempt to imagine how life on the moon might have adapted to the long cycle of day and night.

Although most early accounts of lunar voyages are calculatedly ludicrous, the proposition that the moon and the planets were other worlds was a central contention of the heliocentric theory of the solar system. That theory became an important champion of the cause of science in its contest against religious faith because the Christian Church had adopted the geocentric cosmology favoured by Aristotle into its faith-supported world-view. Francis Godwin's farcical account of *The Man in the Moone* (1638) may, therefore, be placed among the ancestors of sf as confidently as John Wilkins's earnest essay celebrating the *Discovery of a World in the Moon* (1638) – to which a supplement was added in 1640, proposing that men would one day journey to the moon.

Such discussions were less risky in Protestant England than in Catholic France, but Pierre Borel's *Discours nouveau prouvant le pluralité des mondes* (A New Discourse Proving the Plurality of Worlds, 1657) and Cyrano de Bergerac's flamboyant *L'Autre Monde – The Other World*, two fragments of which were published in 1657 and 1662 – prepared the way for Bernard de Fontenelle's enormously popular *Entretiens sur la pluralité des mondes* (Discussion of the Plurality of Worlds, 1686). Fontenelle's adaptation of the classical dialogue into a casual and flippant 'conversation' was calculated to defuse criticism, but it helped pave the way for the development of more naturalistic speculative fictions. Throughout the eighteenth century, however, such fictions were handicapped by the lack of any plausible narrative devices capable of opening up the imaginative frontiers of space and time.

Although most satirists were satisfied with the moon as an extraterrestrial venue, a tradition of more wide-ranging cosmic voyages was founded by Athanasius Kircher's *Itinerarium Exstaticum* (Ecstatic Journey, 1656). Cosmic tours taking in all the known worlds of the solar system became a hybrid sub-genre, fusing religious and scientific fantasies, usually incorporating

utopian and eschatological imagery within the same framework. Attempts to describe a universe in which the sun was merely one star had little alternative but to adopt the form of visionary fantasy, however, even when the vision took the form of a voyage through space. Such works as Gabriel Daniel's *Voyage au monde de Descartes* (Voyage to the World of Descartes, 1692) and Christian Huygens's *Cosmotheoros* (1698) struggled to find an appropriate narrative form.

The most ambitious cosmic visions of the eighteenth century were those allegedly experienced in 1743–5 and reported in *Arcana Coelestia* (1749–56) by the Swedish mystical theologian Emmanuel Swedenborg, strongly influenced by Swedenborg's early work in physics, geology and mathematics. In France, the tradition of cosmic voyages was encouraged by a new imaginative licence – often involving the casual deployment of magical devices borrowed from Antoinette Galland's translation of the *Arabian Nights* – associated with the fashionability of fantastic fiction. *Voyages de Mylord Céton dans les sept planètes* (Journeys of Lord Seton in the Seven Planets, 1765) by Marie-Anne de Roumier-Robert was the most extravagant, employing a narrative template established by the Chevalier de Bérthune's *Relation du monde de Mercure* (The World of Mercury, 1750).

The gradual removal of terra incognita from maps of the Earth's surface helped to force utopian and satirical images out into space, although the remoter regions of the southern hemisphere remained useful to such writers as Gabriel de Foigny in *La Terre australe connue* (1676) and Restif de la Bretonne in *La Découverte australe par un homme volant* (The Discovery of the South by a Flying Man, 1781). Ludvig Holberg's *Nils Klim* (1741) pointed out another way to go, but the interior of the Earth was always a minority choice, although the adventurous *Le Passage de pôle arctique au pôle antarctique* (The Passage from the North to the South Poles, 1780) might have attracted more attention had it not remained unattributable. A more significant variation on the cosmic voyage theme was, however, employed in the *conte philosophique* by Voltaire, *Micromégas* (1752), which brought visitors to Earth from Sirius and Saturn.

Many French works, along with several translations from English, were reprinted in a thirty-six-volume series of *Voyages imaginaires* produced by Charles Garnier in 1787–9. This attempt to define and exemplify a genre might have been even more influential had it not been interrupted by the Revolution; even so, it provided a vital landmark for Camille Flammarion – who included many of its constituent works in his pioneering history of cosmological speculative fiction constructed in *Les Mondes imaginaires et les mondes réels* (Imaginary Worlds and Real Worlds, 1864) – and Jules Verne, who described his own works, collectively, as *Voyages extraordinaires*.

The adaptation of traditional narrative frameworks to the work of serious speculation laboured under several handicaps. Travellers' tales, even in their most earnest utopian mode, were infected by a chronic frivolity that increased as the travels extended into regions inaccessible to ships and pedestrians. Literary dreams, even at their most gravely allegorical, were by definition mere phantoms of the imagination, demolished by reawakening. The transformation of moral fables into Voltairian *contes philosophiques* was hampered by the calculated artificiality of their traditional milieus and exemplary characters. These problems became more acute as the philosophy of progress made the future an imaginative realm ripe for exploration. Utopian speculation entered a 'euchronian' mode once Louis-Sebastien Mercier had led the way in *L'An deux mille quatre cent quarante* (1771) – which soon prompted the production of more cynical accounts of futurity, such as Cousin de Grainville's *Le Dernier Homme* (1805) – but the only obvious alternative to dreaming as a means of gaining access to the future was sleeping for a long time. This was no help to a contemporary narrator if the intelligence gained could not be returned to the present. The problem of designing and developing appropriate narrative frames for scientific *contes philosophiques* inevitably became acute during the nineteenth century, and was not easily solved.

Experiments in science-fictional method

The first writer to grapple with this problem in a wide-ranging experimental fashion was Edgar Allan Poe. The earliest poem by Poe to see eventual publication was 'Sonnet – to Science', written in the early 1820s, and his career culminated in *Eureka* (1848), an extraordinary poetic essay on the nature of the universe newly revealed by astronomical telescopes. The imaginative thread connecting these two works ran through Poe's entire career. As his appreciation of the aesthetics of scientific discovery grew, his attempts to find literary means of communicating and celebrating the wonders of science became more varied and more inventive.

Although the prefatory essay on the necessity of verisimilitude attached to reprints of Poe's lunar voyage story 'Hans Phaall' (1835; revised 1840 as 'The Unparalleled Adventure of One Hans Pfaall') was not intended to be taken seriously, it highlighted the problem implicit in extending travellers' tales beyond the Earth's surface. Although balloons had enabled a few intrepid aeronauts to get off the ground, they were not a convincing means of extraterrestrial exploration, and Hans Pfaall's attempt to outdo the hero of Willem Bilderdijk's pioneering *Kort verhaal van eene aanmerkelijke lucitris en nieuwe planeetokdekking* (1813) never seemed convincing even to

its author. Despite its self-taunting sarcasm, however, Poe's preface became the first tentative manifesto for modern sf.

Poe experimented with new frameworks for futuristic speculation in 'The Conversation of Eiros and Charmion' (1839), a dialogue of the dead whose protagonists recall the near-future destruction of Earth by a comet, and 'The Colloquy of Monos and Una' (1841) before producing 'Mesmeric Revelation' (1844), which recognizes and emphasizes the necessity of establishing a more authoritative species of visionary fantasy for science-fictional use. He also used mesmerism as a device in 'A Tale of the Ragged Mountains' (1844) and 'The Facts in the Case of M. Valdemar' (1845); the latter added the further device of mimicking a 'scientific paper' – a prose form then in its infancy – thus paving the way for *Eureka*.

A few British writers contemporary with Poe grappled with the problem of finding appropriate narrative frameworks for bold scientific speculation, without any conspicuous success. Sir Humphry Davy's posthumously published *Consolations in Travel* (1830) was formulated as a series of dialogues extrapolating responses to a cosmological vision. In the same year that Poe published *Eureka*, Robert Hunt – a significant pioneer of the popularization of science – published *The Poetry of Science*, but the metaphysical visions in Hunt's novel *Panthea* (1849) owe more to the 'Rosicrucian romances' popularized by Edward Bulwer-Lytton (building on foundation-stones provided by J. V. Andreae) than to the scientific method for which Hunt gave up his own Romantic aspirations. Hunt's *Poetry of Science* inspired William Wilson to coin the term 'science-fiction' in *A Little Earnest Book Upon a Great Old Subject* (1851), but the only instance of the new genre Wilson could find was R. H. Horne's *The Poor Artist* (1850), a fable in which an artist discovers the wonders of the world as beheld by the eyesights of different creatures.

Modern historians of sf often locate the origins of British scientific romance in the works of Mary Shelley, although the Gothic trappings of *Frankenstein* (1818) place it firmly within the tradition of anti-science fiction, and *The Last Man* (1826), a fatalistic disaster story, is equally antithetical to the philosophy of progress. Neither work made its influence felt immediately, but both became formative templates heading powerful traditions of imaginative fiction. The Frankenstein formula of an unruly and unfortunate artefact bringing about the downfall of its creator became established in the last decade of the nineteenth century as the principal narrative form of anti-science fiction, and still retains that status, while *The Last Man* became grandparent to an entire genre of elegiac British disaster stories, more directly fathered by Richard Jefferies's *After London* (1885). One early work derivative of *Frankenstein* that did offer some tentative championship of progress was *The Mummy! A Tale of the Twenty-Second Century* (1827) by Jane Webb

London, but explorations of the future remained few and tentative for many years. Notable exceptions include *The Air Battle* (1859) by 'Herrmann Lang', which anticipates what was soon to become an important British genre of future war fiction, and *The History of a Voyage to the Moon* (1864), where Poe's demand for more 'verisimilitude' in interplanetary fiction was taken up by the pseudonymous 'Chrysostom Trueman', who employed an early 'antigravity' technology to transport his protagonists to a lunar utopia.

Poe's American contemporary Nathaniel Hawthorne described imaginary scientific experiments in several of his moral tales, but his deep suspicion of the scientific world-view placed him in the antagonistic tradition; 'The Birthmark' (1843) and 'Rappaccini's Daughter' (1844) are early exemplars of a sceptical attitude deploring the excesses and perversions of what would nowadays be called 'scientism'. Other nineteenth-century American writers following in Poe's footsteps were mostly inclined to a similar caution. Fitz-James O'Brien's 'The Diamond Lens' (1858) and Ambrose Bierce's 'Moxon's Master' (collected 1909) are usually read as conservative moral tales, although the latter item is flirtatiously ambiguous. Edward Everett Hale's space flight satire 'The Brick Moon' (1869) is unconvincing, but he set an important precedent by producing the first significant fictionalization of an essay in alternative history, 'Hands Off!' (1881). Frank R. Stockton took advantage of the increasing familiarity of science-fictional devices by employing them as launch-pads for playful flights of fancy in such tales as 'The Water-Devil' (1874) and 'A Tale of Negative Gravity' (1884).

Thanks to Charles Baudelaire, their French translator, Poe's works became far more influential in France than in his native land, and it was there that the cause of finding more appropriate narrative frameworks for sf was taken up most urgently and most adventurously. Jules Verne toyed briefly with Poesque short forms before deciding that the imaginary voyage offered far more scope for interstitial scientific discourse. The essence of Verne's method was the carefully constrained extrapolation of contemporary technology, and he became famous for the application of hypothetical locomotive technologies to laborious exploration and leisurely tourism. Verne made the most convincing nineteenth-century attempt to import a measure of verisimilitude into an extraterrestrial voyage in *De la terre à la lune* (*From the Earth to the Moon*, 1865), but his conscience forbade him to land his moonshot – because he had no plausible way to return it to Earth – and his quarrelling travellers ended up merely making a trip *Autour de la lune* (*Round the Moon*, 1870).

Verne's earliest *voyages extraordinaires* included several boldly imaginative works, the most extravagant of all being *Voyage au centre de la terre* (*Journey to the Centre of the Earth*, 1863) and *Vingt mille lieues sous les*

mers (*Twenty Thousand Leagues under the Seas*, 1870), but he became convinced that the key to success was the moderation of his imagination. His publisher Hetzel apparently refused to publish an adventurous vision of twentieth-century Paris in the future which Verne penned in the early 1860s (it was not published until 1994). Verne's imaginative discipline became so stern that several of the more adventurous works credited to him in his later years required imaginative injections from his enthusiastic disciple Paschal Grousset – who signed himself André Laurie – or his son Michel Verne. Jules Verne was, however, solely responsible for the extraterrestrial fantasy *Hector Servadac* (1877) and the flying machine story *Robur le conquérant* (*Robur the Conqueror*, also translated as *The Clipper of the Clouds*, 1886). The most important of the works in which Grousset had a hand was *Les Cinq cents millions de la bégum* (*The 500 Millions of the Begum*, also translated as *The Begum's Fortune*, 1879), which contrasts utopian and dystopian images of technological development, while Michel's most impressive 'posthumous collaboration' with his father was the fantasy of historical recurrence 'L'Eternel Adam' (1910). Unfortunately, Verne's belated sequel to Poe's *The Narrative of A. Gordon Pym* (1837), *Le Sphinx des glaces* (*The Sphinx of the Ices*, translated as *An Antarctic Mystery*, 1897), meticulously squeezed all the imaginative virility out of its predecessor, contriving a bathetic quasi-naturalistic reduction of all its ominous wonders.

Poe's influence is also manifest in the works of Camille Flammarion, another pioneer of the popularization of science. Flammarion, who also took considerable inspiration from Humphry Davy, was more imaginatively ambitious than Verne, although he struggled in vain to find narrative frameworks appropriate to his ambition. The most daring item in *Récits de l'infini* (*Stories of Infinity*, 1872), expanded for separate publication as *Lumen* (1887), is a dialogue between a human questioner and a disembodied soul whose ability to travel faster than light has allowed him to view and remember former incarnations on a large number of alien worlds, each of which has life-forms adapted to its particular physical circumstances. No other nineteenth-century work is so thoroughly imbued with a sense of wonder at the universe revealed by astronomy and the Earth sciences. Flammarion incorporated a synoptic account of *Lumen's* schema into a painstakingly didactic account of a reincarnation on Mars in the patchwork *Uranie* (1889), and his account of *La Fin du monde* (translated as *Omega. The Last Days of the World*, 1893) is also a patchwork, concluding with a rhapsodic prose poem.

Hetzel's restraint of Jules Verne's imagination was encouraged by his desire to serialize Verne's novels in an educational magazine for young readers, and this tactic inhibited Verne's influence both at home and abroad. Although

Verne's works were read by adults as well as children, the works of other 'Vernian' writers – who sprang up in some profusion in France, Britain and Germany – were usually marketed as juveniles. The most prolific of Verne's French disciples were Pierre d'Ivoi and Gustave le Rouge; the most inventive writers featured in British boys' papers were Francis Henry Atkins – who wrote as 'Frank Aubrey' and 'Fenton Ash' – and George C. Wallis; the leading German Vernians were Robert Kraft and F. W. Mader.

The introduction of Vernian fiction into America initially followed the same path, but was always distinctive by virtue of its cultural context. Stories about young inventors comprised one of a number of marketing categories formulated by the publishers of 'dime novels', alongside westerns and detective stories. Edward S. Ellis's pioneering account of *The Steam Man of the Prairies* (1868) was, in fact, a western, as were many of the items in story series featuring inventors such as Frank Reade and Tom Edison Jr. The hybridization of inventor fiction and westerns emphasized the importance of the myth of the frontier to American attitudes to technological development. The two genres retained a crucial spiritual affinity which persisted for a hundred years.

So powerful was the myth of the West as a place where the future was to be found and made, however, that American Vernian fiction soon began to outstrip the ambitions of European Vernians. Writers like Frank R. Stockton, in *The Great War Syndicate* (1889) and *The Great Stone of Sardinia* (1898), and Garrett P. Serviss, in *The Moon Metal* (1900) and *A Columbus of Space* (1909), helped pave the way for the development of popular sf of a distinctively American kind.

The evolution of scientific romance

British speculative fiction received a vital boost in 1871 when *Blackwood's Magazine* published George I. Chesney's account of 'The Battle of Dorking'. This account of British defeat following a German invasion provoked numerous replies in kind, founding a genre of future war stories that remained prolific until the outbreak of the actual Great War in 1914. Its early practitioners favoured mock-nonfictional formats, often following Chesney's example – which was subtitled 'Reminiscences of a Volunteer' – in presenting their accounts as 'memoirs', but as time went by the accounts of future conflict became increasingly novelistic. Another important precedent set in 1871 was the initially anonymous publication of the most science-fictional of Bulwer-Lytton's occult romances, *The Coming Race*, featuring a technologically advanced subterranean utopia. Samuel Butler's flamboyant utopian satire *Erewhon* (1872), including a parody of Darwinistic evolution applied

to machinery, provided a further stimulus, as did the first translation of Verne's *Journey to the Centre of the Earth*.

Britain might have been more hospitable to scientific speculation had it not been for the fact that the standard format of Victorian fiction was the three-volume novel beloved of the circulating libraries. Building descriptions of significantly different other worlds, whether futuristic or alien, requires a great deal of narrative labour, but the task is better suited to sketchy outlining than to detailed elaboration. Such three-decker futuristic fantasies as Edward Maitland's *By and By* (1873) and Andrew Blair's *Annals of the Twenty-Ninth Century* (1874) founder under their own ponderous weight, in stark contrast to the deftest of the Poesque tales produced in America, which occupied the opposite limit of the broadening spectrum of speculative fiction.

The future war story popularized by Chesney offered a solution to the awkward problem of how to make technological advancement dramatic. From the point of view of progressively minded writers the device involved the unfortunate cost of concentrating heavily on military technology, but that was not initially a deterrent. The crucial point in the evolution of future war stories arrived when they made the leap from propagandistic pamphlets to serialization in a host of new popular periodicals, which entered into a fierce circulation war in the 1890s. A relatively pedestrian account of 'The Great War of 1892' compiled by military experts, including Rear-Admiral Colomb, which was serialized in 1891–2, was immediately upstaged by George Griffith's lurid account of the exploits of heroic 'Terrorists' armed with airships, submarines and high explosives in *The Angel of the Revolution*, whose anti-imperialistic sentiments immediately called forth a right-wing backlash in E. Douglas Fawcett's account of the exploits of *Hartmann the Anarchist*. All three of these works were reprinted in book form in 1893, after which the steady trickle of future war stories became a flood.

Griffith's casual deployment of as-yet-non-existent arms and armour was rapidly standardized, and the escalation was such that when Griffith began his last future war story in 1906, *The Lord of Labour* (published posthumously in 1911), his weapons of choice were nuclear missiles and disintegrator rays. Other journalists persuaded by their editors to write future war serials included Louis Tracy, author of *The Final War* (1896), and William Le Queux, author of *The Invasion of 1910* (1906), both of whom went on to write scientific romances of other kinds. One of the most adventurous early contributors to the new genre, M. P. Shiel, also made his entry by this route with 'The Empress of the Earth' – reprinted as *The Yellow Danger* (1898) – although he was the chief British disciple of Edgar Allan Poe.

Although the expansion of the future war genre into a much broader speculative genre of 'scientific romance' was tentatively begun by others it was

not until H. G. Wells got involved that anyone replicated Poe's determination to explore the utility of a whole range of narrative frameworks. The sudden surge of new periodicals provided the perfect arena for Wells to conduct his experiments in speculation. The earliest were cast as brief journalistic essays, of which the most adventurous was 'The Man of the Year Million' (1893), but as soon as he began to adapt the ideas in these essays into fictional form he discovered the limitations of such travellers' tales as 'Aepyornis Island' (1894) and such visionary fantasies as 'The Remarkable Case of Davidson's Eyes' (1894).

By the time Wells made his third attempt to fit an appropriate fictional frame around a speculative account of the future evolution of life on Earth – initially published as 'The Chronic Argonauts' (1888) – he was very conscious indeed of the necessity of replacing dreams as a means of exploring possible futures. The idea of mesmerically induced 'true visions' no longer commanded the least shred of plausibility, so he took advantage of articles by C. H. Hinton collected in *Scientific Romances* (1886), which had popularized the idea of time as a 'fourth dimension', to provide an apologetic jargon for a new facilitating device: *The Time Machine* (1895). This imaginative exercise had little in common with Jules Verne's modest extrapolations of locomotive technology, as Verne was quick to recognize and complain, but Wells had not taken the trouble to make his time machine seem plausible to sympathetic readers because he expected them to take the notion seriously as an actual possibility; he knew how necessary some such device had become as a means of opening the future to serious speculative scrutiny.

Wells's time machine became the first of a series of facilitating devices that opened up the farther reaches of time and space to a kind of rational enquiry that had previously been severely handicapped by its reliance on obsolete narrative frameworks. The crucial invention of *The Time Machine* was the establishment of a paradigm example of a whole new class of narrative devices. The antigravity technology of Cavorite, employed by Wells in *The First Men in the Moon* (1901), was the most obvious equivalent of the time machine and its most necessary supplement. The publication dates of these two works defined the brief interval in which Wells produced all his important scientific romances; not only did he never use the time machine or Cavorite again but he never invented or used any significant facilitating device after 1901.

As soon as the twentieth century had begun, moved by the earnest passion of his strong socialist convictions, Wells gave up wide-ranging exploration of the infinite range of future possibility in favour of a much less interesting quest to discover and comment upon the particular form that the future

actually would take. The first philosophical novel subjecting the possibilities of futuristic fiction to scrupulous analysis, Anatole France's *Sur la pierre blanche* (*The White Stone*, 1903), hailed Wells as the only writer prepared to venture into the future as an open-minded explorer rather than a vulgar prophet intent on painting his own hopes or anxieties on its blank canvas, but by the time that judgement appeared in print it was no longer true. Even so, Wells single-handedly laid the groundwork for the distinctive methods of modern sf, employing the narrative technique he had developed in *The Time Machine*, gaudily seasoned with melodrama, to reinvigorate the narrative framework of the moral conte *philosophique* far more effectively than anyone had previously contrived.

The Island of Dr Moreau (1896), *The Invisible Man* (1897) and *The War of the Worlds* (1898) are all painstaking moral fables, albeit of an unprejudicedly zealous and unusually realistic kind, cleverly assisted by the narrative labour that made their central devices plausible. Wells's other moral fables in melodramatic guise include 'The Star' (1897) and 'The Empire of the Ants' (1904), but he always remained willing to develop such fables in more traditional forms, as he did in *The Wonderful Visit* (1895), 'The Man Who Could Work Miracles' (1898) and 'The Country of the Blind' (1904). He also remained content, as and when the mood moved him, to employ perfectly straightforward visionary fantasies, as in 'Under the Knife' (1896) – although 'The Crystal Egg' (1897) does make use of a facilitating device of sorts.

Precedents had been set for Wellsian speculative fiction by such cautionary tales as Grant Allen's 'Pausodyne' (1881) and 'A Child of the Phalanstery' (1884), and by such extended contes *philosophiques* as W. H. Hudson's *A Crystal Age* (1887) and Walter Besant's *The Inner House* (1888), but Wells imported such powerful narrative energy and sturdy conviction into his works that he transformed the methodology of speculative fiction, with almost instantaneous effect. Indeed, he revealed far more potential than he sought to exploit even in his brief fervent phase. Although his demonstration that moral fables could be couched as gripping and violent thrillers was welcome news to at least a few would-be moralists, *The Island of Dr Moreau*, *The Invisible Man* and *The War of the Worlds* spawned far more imitations whose writers were only interested in the melodramatic potential of monster-makers, alien incursions and scientifically assisted criminals.

Wells's work was, therefore, an invitation to writers of action-adventure fiction enthusiastic to work on wider stages in a more spectacular manner than naturalistic fiction would ever permit, as well as to speculative fabulists. There was, inevitably, a certain parting of the ways between writers whose primary interest was in futuristic and other-worldly costume drama

and writers who were seriously concerned to explore future possibilities associated with the advancement of science and technology, but the overlap between the two remained considerable, and the artful combination of the two kinds of ambition has always been able to exploit a powerful synergy.

It is perhaps regrettable that Wells never followed up his most useful discoveries. With one exception – the awkward but enterprising mock-naturalistic novella 'A Story of the Days to Come' (1897) – his post-*Time Machine* ventures into the future all fell back on more traditional modes of presentation, including suspended animation in *When the Sleeper Wakes* (1899) and visionary fantasy in *The Dream* (1924). Nor did he make any further use of his new means of space travel, tending to fall back on Vernian space-guns in other interplanetary tales (he could never bring himself to accept the potential of rockets). When Wells did use pseudoscientific facilitating devices after 1901, he did so in a tokenistic fashion whose casualness was almost insulting, as in *In the Days of the Comet* (1906).

Although his work grew out of the same milieu as the future war sub-genre, Wells was a latecomer to that branch of speculative fiction, and he was virtually alone among its writers in deploring the destruction that such a war might bring. His anticipation of tank warfare in 'The Land Ironclads' (1903) was followed up by an account of *The War in the Air* (1908) as witnessed by its potential victims. These two stories now seem far more prophetic than the jingoistic flood of novels which took it for granted that 'the war to end war' would be won by the British – and thus provided the slogan under which the actual Great War could recruit its cannon fodder – but in this respect too, Wells relented; his atomic war story *The World Set Free* (1914) was the first of several works in which he welcomed the prospect of a destruction of civilization, on the grounds that nothing less would clear the way for socialist reconstruction. There was, however, no shortage of twentieth-century writers ambitious to write the 'Wellsian' works that Wells himself would not.

Proliferation and diversification

Wells's influence at home and abroad was mediated by local circumstance. In Britain the extension of scientific romance beyond the margins of future war fiction was exploited by future war chroniclers such as Fred T. Jane and M. P. Shiel, in the apocalyptic fantasies *The Violet Flame* (1899) and *The Purple Cloud* (1901). George Griffith, a relentless borrower of other writers' ideas, soon progressed to interplanetary romance in *A Honeymoon in Space* (1901), although he also became a prolific writer of 'karmic romances' in a vein popularized by Edwin Lester Arnold and Henry Rider Haggard.

The broader horizons of scientific romance attracted a host of assiduous new recruits. Robert Cromie – who felt that Wells had stolen the thunder of his interplanetary romance *A Plunge into Space* (1890), which had employed an antigravity device similar to Chrysothom Trueman's – offered his own take on the implications of Darwin's theory of evolution in *The Crack of Doom* (1895). William Hope Hodgson embedded a cosmic vision in *The House on the Borderland* (1908) before publishing the far-futuristic phantasmagoria *The Night Land* (1912), which outdid *The Time Machine* in supplying an account of the death of the Earth as anticipated by the theory of Lord Kelvin (which held that the sun's heat was generated by gravitational collapse, and could not last more than a few million years). J. D. Beresford followed the fine evolutionary fantasy *The Hampdenshire Wonder* (1912), tracing the career of a superhuman born out of his time, with the elegiac disaster story *Goslings* (1913) and a series of visionary *contes philosophiques* collected in *Signs and Wonders* (1921).

Many members of the new generation of professional writers created by the new periodicals dabbled in scientific romance as they dabbled in detective fiction and adventure stories. The most notable were Arthur Conan Doyle, whose tentative pre-Wellsian *The Doings of Raffles Haw* (1891) was far surpassed by his series chronicling the adventures of Professor Challenger begun with *The Lost World* (1912) and *The Poison Belt* (1913), and Rudyard Kipling, whose 'With the Night Mail' (1905) and 'As Easy as A.B.C.' (1912) imagine the dramatic transformation of future society by air transport and air power. Minor writers who helped formalize genre templates included C. J. Cutcliffe Hyne, who employed the Frankenstein formula in numerous stories published under the pseudonym Weatherby Chesney, and the disaster-story writer Fred M. White.

This activity was curbed as the popular periodicals moved beyond their experimental phase, having discovered that other genres were more popular with larger audiences; the long-anticipated Great War delivered an abrupt *coup de grâce*. The bitter legacy of disenchantment left by the war lasted far longer than the fighting, very obviously reflected in such dire anticipations of the destruction of civilization by war as *The People of the Ruins* (1920) by Edward Shanks and *Theodore Savage* (1922) by Cicely Hamilton. Although those writers of imaginatively ambitious scientific romance who survived the war tried to continue their work in that vein they found it very difficult to do so, and the most adventurous scientific romances of the early postwar years – E. V. Odle's *The Clockwork Man* (1923), Edward Heron-Allen's *The Cheetah Girl* (1923) and S. Fowler Wright's *The Amphibians* (1925) – were released into a hostile environment whose inhospitability was not to relent until the 1930s.

In France the continuing influence of Poe, Verne and Flammarion was quickly combined with Wellsian elements by such writers as J.-H. Rosny aîné, the pioneer of the novel of prehistory. Rosny had already adapted that sub-genre to more adventurous speculation in the alien visitation story 'Les Xipéhus' ('The Xipehus', 1887), as well as dabbling in Flammarionesque visionary fantasy in 'La Légende sceptique' (1889), but the influences of Flammarion and Wells are fruitfully combined in 'La Mort de la terre' ('The Death of the Earth', 1910) and *Les Navigateurs de l'infini* (*Navigators of Infinity*, 1925). Albert Robida, who had built a career as a writer and illustrator by cleverly satirizing Jules Verne and future war fiction, also became more adventurous towards the end of his career, in such novels as the time-reversal fantasy *L'Horloge des siècles* (*The Clock of the Ages*, 1902). Flammarionesque notions of serial extraterrestrial reincarnation remained important in French speculative fiction, providing a logic for the striking visionary fantasy *Force ennemie* (*Enemy Force*, 1903) by John-Antoine Nau – which won the first Prix Goncourt – but they were melodramatically combined with Wellsian influences in such novels as Octave Joncquel and Théo Varlet's 'Martian epic', *Les Titans du ciel* (*The Titans of Heaven*, 1921) and *L'Agonie de la terre* (*Agony of the Earth*, 1922). In France as in England, however, the Great War was a drastic interruption inhibiting the genre's development and lending encouragement to its sceptical and pessimistic elements.

Elsewhere in Europe, where no traditions of scientific romance had taken root before the importation of Verne and Wells, the Great War had even more dramatic effects. Although the German Wellsian, Kurd Lasswitz, produced three speculative novels, including the monumental *Auf Zwei Planeten* (*On Two Planets*, 1897), his influence – and that of the highly imaginative Paul Scheerbart, whose *Astrale Novellen* were collected in 1912 – was effaced by the war and its aftermath. The Russian revolutions of 1917 interrupted a burgeoning tradition including such innovative works as Valery Brussov's futuristic fable 'Respublika yuzhnavo kresta' (1905) and rocket pioneer Konstantin Tsiolkovsky's ground-breaking account of extraterrestrial colonization *Vne zemli* (*Out of the Earth*, 1916). The futuristic socialist rhetoric of Alexei Tolstói's *Aelita* (1922) founded a very different tradition, although Mikhail Bulgakov managed to produce the fine Wellsian satire 'Rokov'e yaitsa' ('The Fatal Eggs', 1922) before being silenced.

Because the USA came late into World War I and was remote from its battlefields, the interruption of the domestic tradition of American speculative fiction was much less pronounced. Even more important, the effect of the war on American attitudes to technological progress was much less caustic. As in Europe, the development of late nineteenth-century American

speculative fiction had been handicapped by the lack of convincing narrative frames. Tentatively adventurous works by Edward Bellamy, including *Dr Heidenhoff's Process* (1880) and 'The Blindman's World' (1886), and Edgar Fawcett, including *Solarion* (1889) and *The Ghost of Guy Thyrtle* (1895), were hamstrung by their formulation as visionary fantasies. Bellamy overcame the barrier in his best-selling utopian romance *Looking Backward, 2000–1887* (1888), whose last chapter defiantly cast aside the conventional apology that it was all a dream, but Fawcett never could, even though he took the trouble to preface *The Ghost of Guy Thyrtle* with a defiant manifesto for a new genre of 'realistic romances'.

As in the UK, it was an explosion of new periodicals in the 1890s that opened up market space for experimental exploitation by such writers as Jack London, whose Wellsian short stories such as 'A Thousand Deaths' (1899) and 'The Shadow and the Flesh' (1903) paved the way for the prehistoric fantasy *Before Adam* (1906) and the apocalyptic fantasy *The Scarlet Plague* (1912). Like Wells, London was a committed socialist, and his political fantasy *The Iron Heel* (1907) carried forward a sceptical tradition founded by Ignatius Donnelly's spectacular dystopia *Caesar's Column* (1890), the most extreme of many reactions to Bellamy's account of a peaceful evolutionary transition from capitalism to socialism.

The ready availability in the USA of cheap paper made from woodpulp encouraged the rapid growth of 'pulp magazines' specializing in garish melodramas, which inherited the commercial genres identified by the dime novels. One of the many new sub-genres developed in this medium consisted of uninhibited extraterrestrial adventure stories, pioneered by Edgar Rice Burroughs's extraordinarily influential 'Under the Moons of Mars' (1912; reprinted as *A Princess of Mars*). This was an unashamed dream story which did not trouble to establish a plausible mechanism for its hero's abrupt transportation to the planet Mars. Although the image of Mars presented in the story owed something to speculative descriptions offered by the astronomer Percival Lowell in such books as *Mars as the Abode of Life* (1908), Burroughs used the ideas he borrowed as a backdrop for a fantasy of extraordinary derring-do.

Almost all of the colourful fantasies written in imitation of *A Princess of Mars* were essentially dream stories, although relatively few of them were as scornful of facilitating devices – even Burroughs, when he began to write a similar series set on Venus, condescended to employ a spaceship. Many of the writers, having read H. G. Wells, were enthusiastic to deploy pseudoscientific jargon in support of their facilitating devices, and some went so far as to use it to attain and define new imaginative spaces. J. U. Giesy employed a variant of Flammarionesque reincarnation to transport the hero of *Palos of the Dog*

Star Pack (1918) across interstellar distances. Ray Cummings pioneered the microcosmic romance in the hybrid Wells/Burroughs pastiche 'The Girl in the Golden Atom' (1919). Ralph Milne Farley extended the idea of radio broadcasting to include matter transmission in *The Radio Man* (1924). Once their preliminary journeys were complete, however, pulp fantasies of this kind became straightforward costume dramas in which stereotyped heroes fought sneering villains and grotesque monsters in order to win the hands of lovely heroines.

Burroughs's chief rival as a pulp fantasist was Abraham Merritt, an unashamed master of purple prose who was even less concerned to cloak his facilitating devices in scientific jargon. Even so, his ground-breaking story 'The Moon Pool' (1918) gave a new gloss of plausibility to the folkloristic notion that our world is juxtaposed with far more fantastic 'parallel worlds' which can be reached via magical portals. This device was immediately borrowed by other pulp fantasists, most notably 'Francis Stevens' (Gertrude Barrows Bennett), who elaborated it considerably in the futuristic *The Heads of Cerberus* (1919).

Pulp-dependent writers who were ambitious to produce morally challenging works, including Jack London and Upton Sinclair, usually had to issue their political fantasies in other formats, although Victor Rousseau Emanuel – who used his forenames as a pseudonym in the USA – was able to serialize *The Messiah of the Cylinder* (1917), a ringing ideological reply to Wells's *When the Sleeper Wakes*, and George Allan England serialized the political fable *The Golden Blight* (1912) before becoming the third major pulp fantasist with a trilogy of post-holocaust romances begun with *Darkness and Dawn* (1912–13; collected in book form 1914). England was, however, unable to serialize his angry condemnation of predatory capitalism *The Air Trust* (1915).

It was the gaudy exotica of pulp fiction rather than these more earnest speculative fictions that provided the backcloth for Hugo Gernsback's invention of the new genre of 'scientifiction', although the popular science magazines in which it was first featured, including *The Electrical Experimenter* and *Science and Invention*, were not themselves pulps. Scientifiction was a didactic enterprise intended to spread enthusiasm for the various technological devices (including radio sets) that Gernsback imported and sold. Although it was extremely crude in literary terms, and had no more interest in moral fabulation than any other kind of pulp fiction, it had perforce to develop new methods of story-telling in order to fulfil its didactic purpose.

The format that early writers of scientifiction found most useful was a variant of the conversation piece: anecdotal tall tales spiced with technically inclined questions. Series of this type, in which zany scientists and inventors

would explain their new ventures to curious innocents, included Gernsback's own accounts of 'Baron Munchausen's New Scientific Adventures' (1915–17) and Clement Fézandie's Doctor Hackenshaw series (1921–5); they established a method of using a mock-comedic mask for the exposition of extravagant ideas that was carried forward into genre sf when Gernsback founded the first scientifiction magazine, *Amazing Stories*, in 1926. Gernsback was, however, almost as great an admirer of Burroughs and Merritt as he was of Jules Verne and H. G. Wells; he encouraged both American writers to produce more speculatively inclined works so that he could publish them, and when their responses were lukewarm he encouraged other writers to take over that particular crusade.

While it was still gestating in its pulp womb, therefore, American sf had already brought about a zygotic fusion of European scientific romance and American other-worldly exotica, lightly leavened with casually extravagant tall tales of scientific miracle-making. It was from this point that the collaborative work of horizon-expansion, social extrapolation and moral re-sophistication which has been the labour and triumph of modern science fiction began anew.

The magazine era: 1926–1960

The period of sf history from 1926 to 1960 can justly be called the magazine era. Even though many well-known works appeared in other venues during this period – books, comics, movies, and even radio plays – sf magazines such as *Astounding Science Fiction* were chiefly responsible for creating a sense of sf as a distinctive genre.

Science fiction is not only a mode of story-telling but also a niche for writers, a marketing category for publishers, a collection of visual images and styles and a community of like-minded individuals. All of these aspects of the genre took on their most familiar guises within the magazines that dominated the field for half a century. The magazines exerted considerable influence on sf's form and subject matter; the nature of magazine publishing and distribution, and, in particular, boom-and-bust cycles within the industry, have likewise played a part in shaping what is written and read. In addition, the location of most of the magazines' publishers in the USA has strengthened the association between sf and American culture, both in the United States and abroad.

Origins of the science fiction magazine

The first English-language magazine entirely devoted to sf was Hugo Gernsback's *Amazing Stories*, founded in 1926. Nineteenth-century literary magazines, such as *Blackwood's* and *The Strand* in the UK and *Putnam's* and *Atlantic Monthly* in the USA, had occasionally published works of fantasy and what might be called proto-science fiction alongside more realistic fare. Early in the twentieth century, a number of inexpensive periodicals, called pulp magazines because of the poor-quality woodpulp paper on which they were printed, included sf stories by writers such as Jack London and Edgar Rice Burroughs as one of several categories of exotic adventure. Burroughs's first novel, *A Princess of Mars*, was first published in one of these pulps, *All-Story Magazine*, in 1912. A fair number of stories that can be considered

sf appeared alongside the more usual supernatural fare offered in the magazines *The Thrill Book* (1919) and *Weird Tales* (1923–54, with fitful revivals). Elsewhere in the world, a few magazines combined sf with other kinds of fiction or with scientific articles: a very early example of the latter combination was the Swedish *Hugin* (1916–20).

Gernsback's *Amazing*, however, was the first not only to limit its fictional contents to stories of scientific extrapolation and outer-space adventure but also to attempt to define the genre which the editor initially called 'scientific fiction', but began to refer to as 'science fiction' by 1929. An editorial in the first issue called for more examples of 'the Jules Verne, H. G. Wells and Edgar Allan Poe type of story – a charming romance intermingled with scientific fact and prophetic vision'. By singling out and reprinting some of these writers, Gernsback made them sf writers after the fact, inventing a tradition to support his ambitions. He hoped that such stories would 'supply knowledge that we might not otherwise obtain – and . . . supply it in a very palatable form'.¹ In other words, sf, as he envisioned it, was primarily a teaching tool, but one that did not make its teaching obvious.

The best way to sneak in scientific content was to offer readers the traditional pleasures of popular fiction. John Cawelti, in his study of popular story-telling formulas, groups those pleasures under the headings of adventure, mystery and romance.² Adventure could come in the form of conflict between humans and aliens or struggle against the unforbearing environment of outer space. Romance was usually supplied in perfunctory form – a fainting heroine hidden away by villains through most of the action and restored to the hero's arms at the last possible moment. It was mystery, in early magazine sf, that took the most distinctive form. Many stories in the pulp magazines revolved around solving a problem through scientific means: scientific information was doled out throughout the tale, usually by characters explaining to one another. This technique can be viewed as an aesthetic flaw; it certainly slows the action down and hardly demands realistic characterization. However, if one thinks of the sf story as a scientific mystery, in which the reader is invited to accompany the characters on a voyage of discovery, then these blocks of explanation – known in sf circles as 'infodumps' or, more kindly, as 'expository lumps' – function like the gathering of clues by a detective. Each additional fact about a planetary orbit or an atomic engine leads us closer to the 'conceptual breakthrough' that Peter Nicholls, in *The Encyclopedia of Science Fiction*, identified as the central action and emotional payoff in much sf.³

In the four decades dominated by the sf magazines, the level of sophistication and stylistic distinction evolved from E. E. 'Doc' Smith's ray-guns-and-rockets adventure stories in the 1920s to Cordwainer Smith's intricate

and evocative future histories in the 1950s. Yet the extremes represented by these two (unrelated) Smiths both fit Gernsback's basic description: the one is clearly an outgrowth of the other.

In the invention of the sf magazine, three separate publishing traditions came together. First, there was the literary mode to which Gernsback refers, a mode often called 'scientific romance'. In his prospectus, the mode was exemplified by Poe, Verne and Wells but other examples could include Shelley, Hawthorne, Melville, Bulwer-Lytton, Twain and Kipling. Second was the collection of popular story-telling formulas that developed in dime novels and pulp magazines. Third was scientific journalism.

This last form is one whose history has always been closely linked with sf. H. G. Wells began as a journalist popularizing scientific ideas, and a number of scientists from J. B. S. Haldane to Carl Sagan have tried their hands at both magazine articles and sf stories in attempts to convey ideas to a larger public. Science fiction magazines have regularly included columns devoted to science fact. Hugo Gernsback's own publishing career began in 1908 with a periodical called *Modern Electrics*, an attempt to interest readers in and educate them about new developments relating to electronic communications. Radio was the hot new technology in 1908, preceding rocketry as a hobby for would-be inventors and junior engineers. Even twenty years later, sf magazines were filled with radio-related terms such as 'triodes' and 'heterodyning', which must have conveyed the same sense of with-it novelty that 'virtual reality' and 'cyborg' suggested in the 1990s.

Gernsback intended his first magazine not only to educate but also to convert his readers to the habit of thinking about the future. He assembled some of his own predictions about future technology into a loose narrative and published the resulting novel in serial form in 1911-12 under the title *Ralph 124C 41+*. Upon selling his interest in *Modern Electrics* in 1913, he started a similar publication called *Electrical Experimenter*, renamed *Science and Invention* in 1920. One issue of that magazine, August 1923, was a special 'scientific fiction' issue. Under all three mastheads he continued to run the same mix of science fact, how-to articles and futuristic fiction. *Amazing Stories* kept the same mixture – and probably the same core of readers – but altered the proportions.

Fictional formulas in the pulp magazines

The kind of fiction published in the magazine revealed its popular science and formula fiction parentage more obviously than its literary sources. Characterization was perfunctory and plots were often thinly disguised westerns, mysteries or lost-world romances. Several writers helped to translate these older

formulas into what is now generally called 'space opera'. The best remembered of these is 'Doc' Smith, whose Skylark and Lensmen series rarely go out of print. A typical Smith adventure might involve one of his interchangeable heroes coming across a spaceship in distress, single-handedly defeating a band of space pirates, making friends with a bizarre but good-natured alien and rescuing a beautiful woman. The quality that made Smith's space opera stand out from that of most of his contemporaries was his ability to build one episode upon another to create a sense of ever-broadening vistas opening up for the reader. The Lensmen series, for instance, begins with a local conflict on Earth and ends up depicting a universe torn between godlike forces of good and evil (an effect partly lost when the first volume, *Tripplanetary*, was republished in book form and Smith added an introduction to explain up-front the conflict between the evil Eddorians and the good Arisians). At each stage, the heroes acquire more powerful technology and more superhuman powers of their own to face ever more shadowy villains. Many of the plot devices developed by Smith still appear in movies and television shows.

Although Hugo Gernsback was interested in the genre's educational function, he accepted stories like Smith's in which the science was shaky but the tone properly reverential towards experimentation and technology. The definition of sf could be stretched to fit even a writer of Poeque horror, if he was as popular with readers as H. P. Lovecraft turned out to be. Many contributors to the early sf magazines were experienced pulp writers, not specialists in scientific speculation but adaptable professionals willing to supply the new market with variations on what they had been writing for detective, western or general adventure magazines.

The emphasis on – or sometimes the pretence of – scientific teaching in early magazines meant that other elements slipped through without much acknowledgement by either editor or fans. Results were mixed. On one hand, most of the fiction was stylistically weak, awkwardly constructed and marked by a naive 'gee whizz' attitude toward its gadgets and settings. On the other hand, a few writers such as Stanley Weinbaum and C. L. Moore (Catherine Moore) found freedom within the pages of the pulp magazines to explore truly 'amazing' situations and unconventional scenarios. Weinbaum became famous for creating some of the first sympathetic aliens in stories such as 'A Martian Odyssey' (1934), while Moore explored exotic scenes and complex emotions in stories such as 'The Bright Illusion' (1934). Though sometimes overwritten, their work is less formulaic, not only than that of their fellow pulp writers, but also than most of the writing for the 'slick' magazines of the day. Within the pulp sf magazines, so long as a story invoked images of futuristic machines or mist-shrouded towers, the writer was free to violate most conventions regarding character and plot.

That is not to say that such conventions did not exist. Less talented or less daring writers wrote endless variations on the tale of the young scientist who saves the world and wins his mentor's approval with a daring new invention. Marriage to the elder scientist's daughter often reinforced the fairy-tale nature of these stories. Using this basic plot structure, the writer could introduce variations regarding the nature of the threat (aliens, rival scientists, natural disasters) and the invention (a time machine, a device to accelerate evolution, a death ray). The tone could be sombre, rapturous or comic. The ending, though, was nearly always happy, a vindication of the young hero's character and the reader's beliefs. If many of the incredible invention stories concluded with astounding explosions, the author thereby allowed the hero to escape from the long-term consequences of his ingenuity. Illustrations in the magazines of the 1930s generally matched the fiction in combining lovingly conveyed machines and unearthly vistas with blandly indistinguishable human beings. Though *Amazing's* first cover artist, Frank R. Paul, was not very good at portraying people, he was able to produce seemingly endless modifications of the basic rocket ship and, despite the poor printing quality of the pulps, to create convincingly alien spaces and beings. He and his successors translated writers' words into images – spaceships, domed cities, goggle-eyed creatures – that are still being used to represent the future in advertisements, movies and television shows.

In a sense, the artwork, the scientific articles, the almost interchangeable stories and even the advertising in the pulp magazines represented a single continuous flow of information about the technological future. Reading one of these magazines from cover to cover is like watching an evening of television on one of the more focused cable networks. Nothing stands out; nothing is supposed to. Characters from one story reappear in another like guest stars in a situation comedy. Sometimes they have new names: Professor Brown instead of Professor Stone. Other times, they have the same name, for writers were encouraged to repeat popular scenarios as series, such as the ongoing adventures of Professor Aloysius O'Flannigan in stories by Amelia R. Long. If there were no A. R. Long stories in a particular issue, however, a fan of the series could find the same ingredients in stories by Eando Binder or R. R. Winterbotham.

The *Amazing Stories* formula found an immediate and eager audience. According to Mike Ashley, the most reliable historian of the magazines, *Amazing* reached a circulation of over 100,000 within just a few months.⁴ This success stimulated other publishers to create their own sf magazines. The magazine's first direct competitor was started up, oddly enough, by Hugo Gernsback, who had overextended himself financially and lost control of his own creation in a bankruptcy proceeding in 1929. *Amazing Stories*

went on under the editorship of Arthur Lynch and then T. O'Connor Sloane, while Gernsback started up, in quick succession, *Science Wonder Stories*, *Air Wonder Stories* and *Science Wonder Quarterly*, all in 1929. These were later merged into *Wonder Stories*. Other magazines began to appear, their titles indicating their indebtedness to the *Amazing Stories* formula: *Astounding Stories* (1930), *Astonishing Stories* (1931), *Marvel Science Stories* (1938), *Startling Stories* (1939). Most were owned by companies such as Munsey or Clayton, which issued whole families of pulp magazines.

Thought variants in the Campbell era

One of these newer magazines, *Astounding Stories*, introduced a term that sums up much pulp magazine sf. Its editor, F. Orlin Tremaine, used the term 'thought-variant story' to describe a particular blend of philosophical speculation and fiction, but in a sense all the stories published in the magazines of the 1920s and 1930s were thought variants: jazz-like improvisations on familiar themes. Though any one story differs little from the next, the cumulative variations added up to a real evolutionary shift in the genre by 1937, when John W. Campbell, Jr replaced Tremaine as editor of the magazine that Campbell renamed *Astounding Science-Fiction*.

Campbell and his magazine *Astounding* stand for the second era of the sf magazines as Gernsback stands for the first. The period that begins with his editorship is often called the Golden Age of sf, and many of the best-known writers in the field first appeared in his magazine. However, part of Campbell's success was a matter of building on Gernsback's inventions, which included not only the fictional content but also the standard format: the chatty editorials, the advertising (for radio kits, scientific publications, correspondence courses, razors and body-building regimens) and, perhaps most significantly, the letters from fans. Some of the fans who wrote in demonstrated considerable understanding of the genre's history and possibilities. Their discussions represent the first attempts to create a critical theory devoted specifically to sf. In 1926, one letter-writer, G. Peyton Wertenbaker, reminded the editor that the effectiveness of 'scientification' lay not in its imparting of technical information but in its ability to rouse emotion by portraying 'things vast, things cataclysmic, and things unfathomably strange'.⁵

Another correspondent, Miles J. Breuer, complained in 1928 that poor literary craftsmanship did more harm to the genre than scientific accuracy could compensate for.⁶ Both Wertenbaker and Breuer became important contributors of stories as well as opinions, and the letter columns of *Amazing* and the other pulps turned out to be the first public venue for many fans-turned-writers, such as John Beynon Harris (better known as John Wyndham) and

Isaac Asimov. Tremaine tried to turn the letters column in *Astounding Stories* into a venue for purely technical 'Science Discussions', but his successor, Campbell, quickly brought back the old free-ranging conversation under its former name of 'Brass Tacks'.

By encouraging such feedback, the magazines fostered a sense that readers could help shape the genre. This impression was enhanced by Gernsback's decision as early as 1914 (in *The Electrical Experimenter*) to sponsor story contests for new writers. These competitions helped break down the barrier between professional and fan, writer and reader. They also chipped away at gender barriers – one of the contest winners at *Amazing* was Clare Winger Harris, who became the first regular female contributor to the *sf* pulps.

After coming together on the pages of the magazines, readers and writers of *sf* also began to correspond directly with one another and to meet in person. These informal associations evolved into local fan clubs, a number of which came together in 1934 to form the Science Fiction League in 1934. The League soon broke up, but its offshoots carried on the fan tradition of meeting, arguing, publishing non-professional magazines for one another and generally behaving more like equal partners than passive consumers. One group, the Futurians, included many of the most important writers in the next generation: Frederik Pohl, Damon Knight, Judith Merril, Cyril Kornbluth, Isaac Asimov and James Blish. Three of those, Blish, Knight and Merril, also became important critics, pointing out logical flaws in *sf* stories and praising those writers who embodied scientific ideas in compelling narratives. Their efforts, and the willingness of fans to explore new fictional directions, helped transform the genre into something more sophisticated than its pulp beginnings.

John Campbell was himself a fan turned writer and editor. His agenda for *Astounding* – the avoidance of mysticism ('the boys don't like mysticism'),⁷ the awareness of his audience as 'technically trained, mature men',⁸ and his belief that his primary audience constituted an almost wizardly caste, an elite in-group who could get things done by knowing the universe's rules – dominated the field in the 1940s and remained influential for decades beyond that. Though he stopped writing fiction soon after he became an editor, Campbell found a number of writers who could express his vision of the orderly, knowable universe and the place of the scientifically minded man within it. Robert A. Heinlein set the pattern for the *Astounding* hero: the tough, taciturn engineer who uses reason and practical know-how to solve seemingly insurmountable problems. Those solutions could be harsh ones. In Heinlein's early story 'The Roads Must Roll' (1940), the engineer hero Gaines is in charge of keeping an elaborate system of automated highways working. He faces what seems to be a mechanical failure but is really an

act of sabotage by disaffected workers. Heinlein deftly suggests that it is the application of Gaines's engineering knowledge to a human situation that restores order. As John Huntington has pointed out in *Rationalizing Genius* (1989), 'The technocratic hero is rewarding precisely because he or she seems to be able to make decisions purely "rationally".'⁹ So long as the solution is neat and efficient, the human cost (never borne by the engineer himself) seems worthwhile. The story glorifies Gaines and his core of managers and disparages the striking workers, whose concerns are merely personal and emotional.

Another famous *Astounding* story, written by Tom Godwin but significantly shaped by Campbell, involves a shuttle pilot on a mercy mission who discovers a young woman stowaway on board his vessel. The laws of physics, which the title of the 1954 story terms 'The Cold Equations', determine that the stowaway cannot be saved, but the mission can if he is willing to sacrifice her life. Throughout the story, the pilot searches for an alternative that would leave her alive, but the editor insisted that the pilot and the author play by the rules. As the stowaway learns the facts, she too comes to accept the inevitability of the cold equations, and chooses to step out of the airlock of her own accord. It is a shocking ending, but in a curious way a happy one, for it reaffirms the core values held by the technological elite that Campbell called 'the boys'. The pilot completes his mission; his knowledge saves the day if not the girl.¹⁰

A major innovation in magazine fiction from the 1940s on was the imagined application of experimental method and technological innovation not to physical problems but to fundamental questions about society and the mind. One such application of scientific principles to society can be found in Isaac Asimov's stories about Hari Seldon, later assembled into the novel *Foundation* and its sequels (1951–86). These stories, beginning with 'Foundation' in 1942, depicted Seldon as the creator of a scholarly society that was established to prevent a future Dark Age. Seldon's statistically based discipline of 'psychohistory' allowed him both to predict the fall of a galactic empire and to alleviate the effects of that fall. People in large groups, according to the theory, behave as predictably as molecules in a fluid. No one molecule's course can be anticipated, but the flow of the mass can be charted reliably. This faith in predictive social science led not only Asimov but a number of other writers as well to begin considering social dynamics more seriously, writing stories that emphasized politics, religion and other collective activities. The result was a richer form of fiction than the super-science adventures of earlier decades.

The attempt to apply scientific principles to the workings of the human mind had an odder result. Amid sober stories about natural law and complex

investigations of social trends, the magazines of the 1940s and 1950s published a great many stories about telepathy and other forms of extrasensory perception, or so-called 'psi powers'. Campbell considered these to be as valid scientifically as any speculation about alien environments or rocket ship engineering. One of his favourite writers of psionic fiction was A. E. Van Vogt, who was otherwise the antithesis of Campbell-era sf. Rather than writing the rigorously logical stories that Campbell encouraged from Asimov or Heinlein, Van Vogt produced dreamlike narratives about psychic supermen in hiding, such as Jommy Cross in the enormously popular *Slan* (serialized in 1940). Van Vogt's fiction is energetic and vivid, but often barely coherent. His protagonists resemble fairy-tale heroes more than Heinlein's competent engineers. They are guided along the way by characters who might as well be wizards; their psychic gifts are thinly disguised wishing-rings and cloaks of invisibility.

Another writer whose sf tended to shade off into fantasy was L. Ron Hubbard. A popular writer for *Astounding* and also for Campbell's fantasy magazine *Unknown*, Hubbard is nowadays better known for starting up first a psychological theory called dianetics and then a religion called Scientology. Both are characterized by the belief that the mind's untapped powers could transform ordinary humans into psychic supermen, a theme that also dominates Hubbard's fiction. Van Vogt became a follower of Hubbard's ideas, and so, up to a point, did Campbell. Campbell wrote editorials extolling dianetics but a habit of religious scepticism kept him from accepting Scientology wholeheartedly.

Though Campbell's own ideas about science sometimes seem to confuse 'the magic that works' with magic pure and simple, when it came to the depiction of credible futures in fiction he had a good eye and a sure editorial hand. He insisted on prose that was at least coherent and efficient, and he demanded characters as believable as those in slick magazines such as *The Saturday Evening Post*. He asked his writers to write about the future as if they were writing for audience living in that future – in other words, to stop explaining everything and simply let the wonder grow out of the storytelling itself. Heinlein proved to be a master at this technique, dropping one-word hints that opened up whole worlds of strangeness. In 'The Menace from Earth' (1957), for instance, he suggests what it might be like to live in a moon colony simply by having his narrator mention travelling on a 'slidebelt', and referring to people from Earth as 'groundhogs'. Unlike most earlier writers, Heinlein felt no need to describe the technology that must lie behind the former term or the social attitudes summed up in the latter. His readers could fill in the blanks because of their familiarity with the genre.

Many novels that are now considered sf classics either appeared in their entirety in *Astounding* or grew out of short stories published there. Besides Asimov's Foundation stories, these include Henry Kuttner's *Mutant* (1953), all the later installments of E. E. 'Doc' Smith's Lensmen series (1948–54), Hal Clement's *Mission of Gravity* (1954) and Frank Herbert's *Dune* (1965). Some of these writers, such as Kuttner and Smith, had written for Gernsback, but they essentially remade themselves to meet Campbell's expectations.

Another indication that *Astounding* was the most influential magazine of the 1940s is that thirty-two of the thirty-five stories reprinted in the first major sf anthology, Raymond Healy and J. Francis McComas's *Adventures in Time and Space* (1946), had first appeared on its pages. The other magazines that survived the wartime paper crunch generally got Campbell's leftovers. They survived by reprinting older material, by carrying on the older tradition of interplanetary adventure and by bringing out work by writers whose taste and politics collided with Campbell's opinions.

Science fiction for grown-ups: the 1950s

Even as *Astounding* was reaching its peak, however, a different sort of sf was beginning to find its way into the lesser magazines. A few writers in the 1940s began to experiment with style and narrative technique – sure ways not to get published in *Astounding*. The early work of Ray Bradbury, Alfred Bester and Cordwainer Smith was published in other periodicals. Other writers who had already appeared in *Astounding* began to explore more personal voices and visions, for which they had to seek out more congenial markets. Those markets suddenly boomed around 1950, when a new set of magazines came into existence to challenge the ascendancy of *Astounding* and when a few book publishers began to seek out sf novels (mostly reprints from the magazines at first).

It is difficult to pick one of the magazines to represent the new era. One possibility is *The Magazine of Fantasy and Science Fiction*, founded in 1949 and edited by Anthony Boucher and J. Francis McComas. Another is *If*, in which the first part of James Blish's masterpiece of speculative theology, *A Case of Conscience* (1958), appeared in 1953. A third is creaky old *Amazing*, transformed by new assistant – and later managing – editor Cele Goldsmith in 1956. All of these magazines published major works of sf that Campbell would probably not have touched. All the editors encouraged new writers and new directions for established writers. Boucher and Goldsmith, in particular, looked for sophisticated themes and stylistic distinction.

A listing of stories published in these magazines seems, at first glance, to represent all the best output of the 1950s. Walter Miller's *A Canticle*

for *Leibowitz* appeared in *Fantasy and Science Fiction* from 1955 to 1957. Miller brought not only a distinctive style and emotional depth but also a strong sense of historical precedent to this story of rebuilding civilization after nuclear holocaust. The same magazine also published Zenna Henderson's wistful tales of the exiled aliens she called the People, Daniel Keyes's most famous story 'Flowers for Algernon' (1959) and stories by non-sf regulars such as Kingsley Amis and C. S. Lewis, whose presence helped offset the American dominance of the field.

The magazine that did the most to strengthen the British presence within sf, however, was the London-based *New Worlds*, which began as a fanzine called *Nova Terrae* but metamorphosed into a professional magazine in the American mode in 1949. Its existence helped revive the tradition of British speculative fiction, which had flagged since the days of H. G. Wells. In his novel *Childhood's End* (1953), whose first part was published in *New Worlds* as 'Guardian Angel' (1950), Arthur C. Clarke managed to combine the efficient story-telling of American sf with Wells's social awareness and Olaf Stapledon's visionary grandeur. Part utopia, part comic variation of the alien-invasion story, *Childhood's End* finishes with a haunting image of the mutated children of Earth destroying their world as they leave material existence behind. Other writers who contributed to the *New Worlds* British renaissance included Brian Aldiss, John Brunner and J. G. Ballard. Yet interestingly the most popular sf author in Britain in the 1950s was John Wyndham, who had published in the American pulps before the war, but who made his name in the 1950s through the paperback publication of novels such as *The Day of the Triffids* (1951). Science fiction writers would soon be publishing straight into paperback, rather than emerging from the magazines.

The most representative – and perhaps most important – sf magazine of the 1950s was *Galaxy Science Fiction*, founded in 1950 by Horace L. Gold. The ambience of a typical *Galaxy* story is smart, edgy, urban and faintly paranoid. Central characters are often variations on a type: the chain-smoking, rumpled-suit-wearing, martini-drinking adman who claims he would rather be editing a weekly newspaper in the country. Women characters are not usually very satisfactory: some are aliens in disguise, and nearly all are inexplicable in their motivations and perceptions – though Gold did try to include 'at least one story that appealed to women' in every issue.¹¹ Few *Galaxy* stories take place in space. The opening scene, until things get weird, might almost be a *New Yorker* sketch of the same period.

The best of those stories are told with the assurance and finesse of one of these *New Yorker* pieces by regulars such as James Thurber or E. B. White.

Such story-telling requires a combination of circumstances including a gifted editor paying the best rates in the business, a close circle of mutually critical writers and an audience ready for greater sophistication in style and theme. That audience included longtime readers, who had worked their way through Gernsback's primary and Campbell's secondary courses in sf and were ready to go on to higher education. It also included readers new to the field. According to A. J. Budrys, Gold always intended to reach

a great untapped market of mundane readers – the people to whom he insisted that he was the editor of *Galaxy* magazine, *not of Galaxy* science fiction. At his card table every Friday night were not just Frederik Pohl, Bob Scheckley [sic], and the fellow whom Jerry Bixby nicknamed 'Ayjay' Budrys, but also such persons as the modern composers Louis and Bebe Barron and John Cage, radio and TV executives, and people on the editorial staffs of major slick magazines.¹²

One of those guests was Alfred Bester, a scriptwriter who was eventually to edit a slick magazine himself (*Holiday*). He had done some sf writing in the 1940s, and Gold tried to talk him into contributing to *Galaxy*. According to Bester, after he reluctantly offered a few ideas for possible stories,

At this point his professionalism took command and, still via the telephone machine, he discussed the ideas, took them apart, put them together again, and combined and recombined them with me in a wonderful series of editor-author sessions. The crux of those conferences was that we respected each other and could accept or reject each other's suggestions without loss of face or temper. It was an ideal collaboration, and out of it came the novel.¹³

The novel in question was *The Demolished Man* (1953), a tour de force of satire, lyricism, stylistic playfulness and classic sf invention. His even more impressive follow-up, *The Stars My Destination* (1956), draws on such familiar plot devices as space piracy and psychic supermen, but combines them with literary experimentation in the tradition of William Blake and Arthur Rimbaud. Bester's hero Gully Foyle has his senses cross-wired in a manner suggesting Rimbaud's poetry and develops into a heaven-challenging anti-hero straight out of one of Blake's epics. The epigraph of the book is drawn from Blake's 'The Tyger'.

In addition to Bester's two classic novels, Gold published such satirical works as Pohl and Kornbluth's exploration of advertising and consumerism, *The Space Merchants* (1953); other major works from *Galaxy* include Theodore Sturgeon's 'Baby Is Three', the core novella of his novel of evolution and ethics, *More Than Human* (1953) and Ray Bradbury's

'The Fireman', which became *Fabrenheit* 451 (1953). The magazine published major stories by Philip K. Dick, William Tenn, Margaret St. Clair, Avram Davidson, Fritz Leiber, Damon Knight and Katharine MacLean. It fostered the careers of newer writers such as Edgar Pangborn, Mark Clifton, Kurt Vonnegut and, perhaps most importantly, Cordwainer Smith (Paul Linebarger).

Smith's association with *Galaxy* began with 'The Game of Rat and Dragon' in 1955 and continued through the next decade and a half. The rats of that story are also its dragons: deadly predators lurking in the other-dimensional space through which interstellar ships must pass. Only telepaths can sense the approach of dragons, but human telepaths alone are not fast enough to shoot off the light-bombs that destroy them. They must have partners. Midway through the story, the reader realizes that the elegant, diminutive, ferocious Partners with which the human 'pinlighters' must work are ordinary cats. Typical Smith touches in this story are its unexpected juxtapositions, such as rat-hunting cats teamed with space-going warriors; its evocative names – we meet cats named Murr, Lady May and Captain Wow; the unconventionality of its heroes, who include an old priest and a little girl; the personal cost to those heroes of their victories; and the odd, lilting language used to evoke strange visions.

The work of writers such as Bester and Smith is more than workmanlike. It is challenging, disturbing, elegant, witty and surprisingly fresh even decades later. It has hardly a trace of the old pulp formulaization. The writers' voices are distinctive, rather than blending into a continuous flow of sf discourse. Any paragraph of a Cordwainer Smith story is recognizable as no one else's work. By the end of the 1950s, the best magazine sf was comparable to fiction published in more traditional literary venues, and readers were already getting a taste of the experiments that were to characterize the next decade's New Wave.

At the beginning of the magazine era, popular sf often defined itself by contrast with literary fiction. When Aldous Huxley's *Brave New World* was published in 1932, a reviewer in *Amazing Stories* saw it primarily in terms of its failure to meet the expectations of magazine readers. 'From the point of view of the scientific fiction fan', the reviewer (credited only as C.A.B.) said in an essay titled 'Highbrow Science Fiction', 'this book is a decided flop.' One of the reviewer's objections had to do with the raciness of Huxley's dystopian novel, for overt sexuality was strictly excluded from the sf magazines at the time. The bigger objection, however, was that 'Mr Huxley either dislikes science, particular its possible future development, or that he does not believe in science.'¹⁴ It was not enough for Huxley to predict cloning, artificial wombs, recreational drugs and the social changes following

on those innovations. Nor did his inventive style and daring characterization count for much. He was supposed to say something uplifting about science and to provide the emotional payoffs that come with adventure, mystery and romance. Otherwise, his novel might be literature, but it was not really sf.

By the 1950s, however, reviewers such as Damon Knight and James Blish welcomed highbrow fiction into the field. Blish (writing under his critical pen name of William Atheling, Jr) discusses Huxley among several other "outside" authors', including George Orwell, Bernard Wolfe and Kurt Vonnegut, who brought something fresh to sf tropes. Publishing outside the sf community, they did not need to worry about finding new angles on old plot devices. Rather, they could concern themselves with 'thinking about something' through their fiction.¹⁵ Knight was a little more hesitant to welcome literary dabblers into the category of sf, but he did list as classic works within the genre Karel Čapek's novel *War with the Neutts* (1937), and Eugene Zamiatin's (or Evgeny Zamyatin's) brilliant dystopia *We* (1924).¹⁶

Just as the early issues of *Amazing Stories* helped to create a tradition for sf by pulling in nineteenth-century writers of scientific romance, these reviews helped expand and deepen the field by incorporating twentieth-century traditions of surrealism, satire and utopian speculation. They also recognized that sf could be produced in countries other than the United States: Huxley's England, Zamiatin's Russia, Čapek's Czechoslovakia. Even works that bore only the slightest resemblance to the standard scientific adventure were recommended to the sf readership: Olaf Stapledon's visionary trip through the cosmos called *Star Maker* (1937), J. R. R. Tolkien's fantasy epic *The Lord of the Rings* (1954–5) and Mervyn Peake's eerie *Titus Groan* (1946) were all seen by reviewers as relevant to the genre's expanding horizons and growing ambitions.

This is not to say that sf had become indistinguishable from the literary mainstream. Critics outside the genre rarely paid attention to its achievements, and works such as *Brave New World* were rarely acknowledged to be sf except by fans. One such critic, Arthur Koestler, stated outright that 'Swift's *Gulliver*, Huxley's *Brave New World*, Orwell's *Nineteen Eighty-Four* are great works of literature because in them the oddities of alien worlds serve merely as a background or pretext for a social message. In other words, they are literature precisely to the extent to which they are not science fiction.'¹⁷ Though sf had achieved considerable maturity as a genre by the end of the 1950s, it was still seen by outsiders in terms of pulp formulas and movie monsters. A greater measure of acceptance came partly as a result of the movement of the field away from its origins.

Emerging from the magazines

By the 1960s, the era of magazine sf was coming to an end; that is, the field could no longer be characterized primarily in terms of its periodicals. This change could be seen first in the format of the magazines themselves. Whereas the early pulps looked almost like comic books, the later magazines more nearly resembled paperback novels. The folio-sized pages and garish covers of *Amazing* gradually gave way to digest-size and a more subtle presentation. The first magazine to switch sizes was *Astounding*, under the paper restrictions of the Second World War. At the time, the switch was seen as a loss of visibility on the newsstands, but it had the unexpected benefit of making the magazine seem more grown-up and more literary. All the major magazines of the 1950s were published in digest form, *Amazing Stories* being the last pulp-sized survivor. *Galaxy*, which was partly underwritten by a prosperous Italian publishing firm, was given an especially sleek look. It was, in essence, a monthly series of original anthologies, and it demonstrated to the publishing world the viability of such anthologies, and of science fiction as a category for book publication.

This new possibility coincided with a major disruption of the magazine market. At the end of the 1950s the primary distributor, the American News Service, was declared a monopoly and had to divest itself of its local holdings. As a direct result, twenty magazines (of various sorts) folded immediately and the others took severe hits in their circulation.¹⁸ The more prosperous magazines were able to keep going, but sf ceased to be identified primarily as a magazine form. Shorter forms, from short-short stories to novellas, gave way to novels and even multi-volume series. In marketing terms, the brand names under which sf could be sold ceased to be *Astounding* or *Galaxy* and would become specialized categories such as military sf and science fantasy or individual authors such as Heinlein and Asimov. It is significant that the major magazine of the 1980s and 1990s was called *Isaac Asimov's Science Fiction Magazine*.

The transformation from magazine to book format involved some sacrifices. Despite editorial whims and market downturns, the magazines had allowed the development of surprising new themes, forms and techniques – nearly anything could be accommodated as part of a reliable mix. The relatively small scale of the magazine market also fostered artistic independence. A magazine was like the small independent film as opposed to the Hollywood blockbuster, which has to meet the expectations of the broadest possible audience. Magazines have subscribers and more-or-less guaranteed space on newsstands. Books must be promoted. Even now, well after the heyday of the magazines, most innovation within the field takes place in the remaining

magazines or in their contemporary equivalents. The latter include small press volumes, semi-professional publications and on-line publishers.

It remains to be seen whether these outlets will be enough to foster the wild talents and random mutations of an earlier era. Though much of the fiction from the pulp era is quaint and forgettable, some is not. And without those earlier efforts, the genre would not be what it has become.

NOTES

1. Mike Ashley, *The Time Machines: The Story of the Science-Fiction Pulp Magazines from the Beginning to 1950* (Liverpool: Liverpool University Press, 2000), pp. 49–50.
2. See John G. Cawelti, *Adventure, Mystery, and Romance* (Chicago: Chicago University Press, 1976).
3. Peter Nicholls, ed., *The Encyclopedia of Science Fiction* (London: Granada, 1979), pp. 134–6.
4. Ashley, *Time Machines*, p. 51.
5. *Ibid.*, p. 57.
6. *Ibid.*, pp. 57–58.
7. To Mr. R. M. Williams', 23 March 1953, in *The Complete Collection of the John W. Campbell Letters*, compiled by Perry A. Chapdelaine, Sr. (Microfilm. Franklin TN: A. C. Projects, 1987), Reel 4.
8. 'To Dr Welland A. Hause', 7 January 1952, in *ibid.*, Reel 3.
9. John Huntington, *Rationalizing Genius* (New Brunswick, NJ: Rutgers University Press, 1989), p. 74.
10. Tom Godwin's 'The Cold Equations' was first published in *Astounding Science-Fiction*, August 1954, and reprinted many times, as in Robert Silverberg, ed., *The Science Fiction Hall of Fame Vol. 1* (New York: Avon, 1970), pp. 543–69.
11. Horace Gold, 'Gold on Galaxy', in Frederik Pohl, Martin H. Greenberg and Joseph F. Olander, eds., *Galaxy: Thirty Years of Innovative Science Fiction* (Chicago: Playboy Press, 1980), p. 6.
12. Algis Budrys, 'Mémor: Spilled Milk', in *ibid.*, p. 169.
13. Alfred Bester, 'Horace, Galaxyca', in *ibid.*, p. 424.
14. 'Highbrow Science Fiction', *Amazing Stories* (April 1952), p. 86.
15. William Atheling, Jr [James Blish], *The Issue at Hand* (Chicago: Advent, 1973), p. 142.
16. Damon Knight, *In Search of Wonder* (Chicago: Advent, 1967), pp. 11, 17.
17. Quoted by Knight, *ibid.*, p. 2.
18. Barry Malzberg, 'Introduction: The Fifties', in Barry N. Malzberg and Bill Pronzini, eds., *The End of Summer: Science Fiction of the Fifties* (New York: Ace, 1979), p. 2.

science fiction has been by far the most powerful branch of the genre, and quite enough for any one selection to cope with.

What this selection can claim is that it provides a fair sample of the best the field can offer. It is possible to follow the development of the genre (subject to the qualification over length above) from these pages alone. Yet no story has been chosen to fill a gap or provide a specimen. Most important, perhaps, is a kind of serendipity inherent in selection from such a rich field. Many comparisons of theme and substance, of subgenre and technique, have been made fleetingly in the preceding pages. Far more arise out of combinations or juxtapositions not made or not seen. I would be pleased if this anthology were to 'convert' previous non-readers of science fiction into exploring the field more widely. But even enthusiasts who have read and collected steadily will find some stories they have missed and, by seeing familiar items unfamiliarly juxtaposed, may discover new insights about science fiction as a whole. Science fiction is an underrated genre, its drives and impulses often unrecognized. Over the years, and entirely by their own efforts, its authors have created the devoted and participatory readership which, collectively, they deserve. I hope this anthology may help to make that achievement more widely recognized and, in institutions of literary education, more sympathetically, but more analytically, understood.

THE LAND IRONCLADS

H. G. WELLS

I

The young lieutenant lay beside the war correspondent and admired the idyllic calm of the enemy's lines through his field-glass.

'So far as I can see,' he said at last, 'one man.'

'What's he doing?' asked the war correspondent.

'Field-glass at us,' said the young lieutenant.

'And this is war!'

'No,' said the young lieutenant; 'it's Bloch.'

'The game's a draw.'

'No! They've got to win or else they lose. A draw's a win for our side.'

They had discussed the political situation fifty times or so, and the war correspondent was weary of it. He stretched out his limbs.

'Aaa! S'pose it is!' he yawned.

Flut!

'What was that?'

'Shot at us.'

The war correspondent shifted to a slightly lower position. 'No one shot at him,' he complained.

'I wonder if they think we shall get so bored we shall go home?'

The war correspondent made no reply.

'There's the harvest, of course...'

They had been there a month. Since the first brisk movements after the declaration of war things had gone slower and slower, run down. To begin with, they had had almost a scampering time; the invader had come across the frontier on the very dawn of the war in half-a-dozen parallel columns behind a cloud of cyclists and cavalry, with a general air of coming straight on the capital, and the defender horsemen had held him up, and peppered him and forced him to open out to outflank, and had then bolted to the next

position in the most approved style, for a couple of days, until in the afternoon, bump! they had the invader against their prepared lines of defence. He did not suffer so much as had been hoped and expected: he was coming on, it seemed, with his eyes open, his scouts winded the guns, and down he sat at once without the shadow of an attack and began grubbing trenches for himself, as though he meant to sit down there to the very end of time. He was slow, but much more wary than the world had been led to expect, and he kept convoys tucked in and shielded his slow-marching infantry sufficiently well to prevent any heavy adverse scoring.

'But he ought to attack,' the young lieutenant had insisted.
'He'll attack us at dawn, somewhere along the lines. You'll get the bayonets coming into the trenches just about when you can see,' the war correspondent had held until a week ago.

The young lieutenant winked when he said that.

When one early morning the men the defenders sent to lie out five hundred yards before the trenches, with a view to the unexpected emptying of magazines into any night attack, gave way to causeless panic and blazed away at nothing for ten minutes, the war correspondent understood the meaning of that wink.

'What would you do if you were the enemy?' said the war correspondent, suddenly.

'If I had men like I've got now?'

'Yes.'

'Take those trenches.'

'How?'

'Oh—dodges! Crawl out half-way at night before moonrise and get into touch with the chaps we send out. Blaze at 'em if they tried to shift, and so bag some of 'em in the daylight. Learn that patch of ground by heart, lie all day in squatty holes, and come on nearer next night. There's a bit over there, lumpy ground, where they could get across to rushing distance—easy. In a night or so. It would be a mere game for our fellows; it's what they're made for. . . . Guns? Shrapnel and stuff wouldn't stop good men who meant business.'

'Why don't *they* do that?'

'Their men aren't brutes enough; that's the trouble. They're a crowd of devitalized townsmen, and that's the truth of the matter. They're clerks, they're factory hands, they're students, they're civilized men. They can write, they can talk, they can make and do

all sorts of things, but they're poor amateurs at war. They've got no physical staying power, and that's the whole thing. They've never slept in the open one night in their lives; they've never drunk anything but the purest water-company water; they've never gone short of three meals a day since they left their feeding-bottles. Half their cavalry never cocked leg over horse till it enlisted six months ago. They ride their horses as though they were bicycles—you watch 'em! They're fools at the game, and they know it. Our boys of fourteen can give their grown men points. . . . Very well—
The war correspondent mused on his face with his nose between his knuckles.

'If a decent civilization,' he said, 'cannot produce better men for war than—'

He stopped with belated politeness. 'I mean—'

'Than our open-air life,' said the young lieutenant.

'Exactly,' said the war correspondent. 'Then civilization has to stop.'

'It looks like it,' the young lieutenant admitted.

'Civilization has science, you know,' said the war correspondent. 'It invented and it makes the rifles and guns and things you use.'

'Which our nice healthy hunters and stockmen and so on, rowdy-dowdy cowpunchers and negro-whackers, can use ten times better than—*What's that?*'

'What?' said the war correspondent, and then seeing his companion busy with his field-glass he produced his own: 'Where?' said the war correspondent, sweeping the enemy's lines.

'It's nothing,' said the young lieutenant, still looking.
'What's nothing?'

The young lieutenant put down his glass and pointed. 'I thought I saw something there, behind the stems of those trees. Something black. What it was I don't know.'

The war correspondent tried to get even by intense scrutiny.

'It wasn't anything,' said the young lieutenant, rolling over to regard the darkling evening sky, and generalized: 'There never will be anything any more for ever. Unless—'

The war correspondent looked inquiry.

'They may get their stomachs wrong, or something—living without proper drains.'

A sound of bugles came from the tents behind. The war correspondent slid backward down the sand and stood up. 'Boom!'

came from somewhere far away to the left. 'Halloa!' he said, hesitated, and crawled back to peer again. 'Firing at this time is jolly bad manners.'

The young lieutenant was uncommunicative for a space.

Then he pointed to the distant clump of trees again. 'One of our big guns. They were firing at that,' he said.

'The thing that wasn't anything?'

'Something over there, anyhow.'

Both men were silent, peering through their glasses for a space. 'Just when it's twilight,' the lieutenant complained. He stood up.

'I might stay here a bit,' said the war correspondent.

The lieutenant shook his head. 'There's nothing to see,' he apologized, and then went down to where his little squad of sun-brown, loose-limbed men had been yarning in the trench. The war correspondent stood up also, glanced for a moment at the business-like bustle below him, gave perhaps twenty seconds to those enigmatical trees again, then turned his face toward the camp.

He found himself wondering whether his editor would consider the story of how somebody thought he saw something black behind a clump of trees, and how a gun was fired at this illusion by somebody else, too trivial for public consumption.

'It's the only gleam of a shadow of interest,' said the war correspondent, 'for ten whole days.'

'No,' he said presently: 'I'll write that other article, "Is War Played Out?"'

He surveyed the darkling lines in perspective, the tangle of trenches one behind another, one commanding another, which the defender had made ready. The shadows and mists swallowed up their receding contours, and here and there a lantern gleamed, and here and there knots of men were busy about small fires.

'No troops on earth could do it,' he said. . . .

He was depressed. He believed that there were other things in life better worth having than proficiency in war: he believed that in the heart of civilization, for all its stresses, its crushing concentrations of forces, its injustice and suffering, there lay something that might be the hope of the world: and the idea that any people by living in the open air, hunting perpetually, losing touch with books and art and all the things that intensify life, might hope to resist and break that great development to the end of time, jarred on his civilized soul.

Apt to his thought came a file of the defender soldiers and passed him in the gleam of a swinging lamp that marked the way.

He glanced at their red-lit faces, and one shone out for a moment, a common type of face in the defender's ranks: ill-shaped nose, sensuous lips, bright clear eyes full of alert cunning, slouch hat cocked on one side and adorned with the peacock's plume of the rustic Don Juan turned soldier, a hard brown skin, a sinewy frame, an open, tireless stride, and a master's grip on the rifle.

The war correspondent returned their salutations and went on his way.

'Louts,' he whispered. 'Cunning, elementary louts. And they are going to beat the townsmen at the game of war!'

From the red glow among the nearer tents came first one and then half-a-dozen hearty voices, bawling in a drawing unison the words of a particularly slab and sentimental patriotic song.

'Oh, go it!' muttered the war correspondent, bitterly.

2

It was opposite the trenches called after Hackbone's Hut that the battle began. There the ground stretched broad and level between the lines, with scarcely shelter for a lizard, and it seemed to the startled, just-awakened men who came crowding into the trenches that this was one more proof of that inexperience of the enemy of which they had heard so much. The war correspondent would not believe his ears at first, and swore that he and the war artist, who, still imperfectly roused, was trying to put on his boots by the light of a match held in his hand, were the victims of a common illusion. Then, after putting his head in a bucket of cold water, his intelligence came back as he towelled. He listened. 'Gollys!' he said; 'that's something more than scare firing this time. It's like ten thousand carts on a bridge of tin.'

There came a sort of enrichment to that steady uproar. 'Machine-guns!'

Then, 'Guns!'

The artist, with one boot on, thought to look at his watch, and went to it hopping.

'Half an hour from dawn,' he said. 'You were right about their attacking, after all. . . .'

The war correspondent came out of the tent, verifying the presence of chocolate in his pocket as he did so. He had to halt for a moment or so until his eyes were toned down to the night a little. 'Pitch!' he said. He stood for a space to season his eyes before he felt

justified in striking out for a black gap among the adjacent tents. The artist coming out behind him fell over a tent-rope. It was half-past two o'clock in the morning of the darkest night in time, and against a sky of dull black silk the enemy was talking searchlights, a wild jabber of searchlights. 'He's trying to blind our riflemen,' said the war correspondent with a flash, and waited for the artist and then set off with a sort of discreet haste again. 'Whoa!' he said, presently. 'Ditches!' They stopped.

'It's the confounded searchlights,' said the war correspondent. They saw lanterns going to and fro, near by, and men falling in to march down to the trenches. They were for following them, and then the artist began to get his night eyes. 'If we scramble this,' he said, 'and it's only a drain, there's a clear run up to the ridge.' And that way they took. Lights came and went in the tents behind, as the men turned out, and ever and again they came to broken ground and staggered and stumbled. But in a little while they drew near the crest. Something that sounded like the impact of a tremendous railway accident happened in the air above them, and the shrapnel bullets seethed about them like a sudden handful of hail. 'Right-ho!' said the war correspondent, and soon they judged they had come to the crest and stood in the midst of a world of great darkness and frantic glares, whose principal fact was sound.

Right and left of them and all about them was the uproar, an army-full of magazine fire, at first chaotic and monstrous, and then, eked out by little flashes and gleams and suggestions, taking the beginnings of a shape. It looked to the war correspondent as though the enemy must have attacked in line and with his whole force—in which case he was either being or was already annihilated.

'Dawn and the dead,' he said, with his instinct for headlines. He said this to himself, but afterwards by means of shouting he conveyed an idea to the artist.

'They must have meant it for a surprise,' he said.

It was remarkable how the firing kept on. After a time he began to perceive a sort of rhythm in this inferno of noise. It would decline—decline perceptibly, droop towards something that was comparatively a pause—a pause of enquiry. 'Aren't you all dead yet?' this pause seemed to say. The flickering fringe of rifle-flashes would become attenuated and broken, and the whack-bang of the enemy's big guns two miles away there would come up out of the

deeps. Then suddenly, east or west of them, something would startle the rifles to a frantic outbreak again.

The war correspondent taxed his brain for some theory of conflict that would account for this, and was suddenly aware that the artist and he were vividly illuminated. He could see the ridge on which they stood, and before them in black outline a file of riflemen hurrying down towards the nearer trenches. It became visible that a light rain was falling, and further away towards the enemy was a clear space with men—'our men?'—running across it in disorder. He saw one of those men throw up his hands and drop. And something else black and shining loomed up on the edge of the beam-cortuscating flashes; and behind it and far away a calm, white eye regarded the world. 'Whit, whit, whit,' sang something in the air, and then the artist was running for cover, with the war correspondent behind him. Bang came shrapnel, bursting close at hand as it seemed, and our two men were lying flat in a dip in the ground, and the light and everything had gone again, leaving a vast note of interrogation upon the night.

The war correspondent came within bawling range. 'What the deuce was it? Shooting our men down!'

'Black,' said the artist, 'and like a fort. Not two hundred yards from the first trench.'

He sought for comparisons in his mind. 'Something between a big blockhouse and a giant's dishcover,' he said.

'And they were running!' said the war correspondent.

'You'd run if a thing like that, with a searchlight to help it, turned up, like a prowling nightmare in the middle of the night.'

They crawled to what they judged the edge of the dip and lay regarding the unfathomable dark. For a space they could distinguish nothing, and then a sudden convergence of the searchlights of both sides brought the strange thing out again.

In that flickering pallor it had the effect of a large and clumsy black insect, an insect the size of an ironclad cruiser, crawling obliquely to the first line of trenches and firing shots out of port-holes in its side. And on its carcass the bullets must have been battering with more than the passionate violence of hail on a roof of tin.

Then in the twinkling of an eye the curtain of the dark had fallen again and the monster had vanished, but the crescendo of musketry marked its approach to the trenches.

They were beginning to talk about the thing to each other, when a flying bullet kicked dirt into the artist's face, and they decided abruptly to crawl down into the cover of the trenches. They had got down with an unobtrusive persistence into the second line, before the dawn had grown clear enough for anything to be seen. They found themselves in a crowd of expectant riflemen, all noisily arguing about what would happen next. The enemy's contrivance had done execution upon the outlying men, it seemed, but they did not believe it would do any more. 'Come the day and we'll capture the lot of them,' said a burly soldier.

'Them?' said the war correspondent.

'They say there's a regular string of 'em, crawling along the front of our lines.... Who cares?'

The darkness filtered away so imperceptibly that at no moment could one declare decisively that one could see. The searchlights ceased to sweep hither and thither. The enemy's monsters were dubious patches of darkness upon the dark, and then no longer dubious, and so they crept out into distinctness. The war correspondent, munching chocolate absent-mindedly, beheld at last a spacious picture of battle under the cheerless sky, whose central focus was an array of fourteen or fifteen huge clumsy shapes lying in perspective on the very edge of the first line of trenches, at intervals of perhaps three hundred yards, and evidently firing down upon the crowded riflemen. They were so close in that the defender's guns had ceased, and only the first line of trenches was in action.

The second line commanded the first, and as the light grew, the war correspondent could make out the riflemen who were fighting these monsters, crouched in knots and crowds behind the traverse banks that crossed the trenches against the eventuality of an enfilade. The trenches close to the big machines were empty save for the crumpled suggestions of dead and wounded men; the defenders had been driven right and left as soon as the prow of a land ironclad had loomed up over the front of the trench. The war correspondent produced his field-glass, and was immediately a centre of enquiry from the soldiers about him.

They wanted to look, they asked questions, and after he had announced that the men across the traverses seemed unable to advance or retreat, and were crouching under cover rather than fighting, he found it advisable to loan his glasses to a burly and

incredulous corporal. He heard a strident voice, and found a lean and sallow soldier at his back talking to the artist.

'There's chaps down there caught,' the man was saying. 'If they retreat they got to expose themselves, and the fire's too straight.... They aren't firing much, but every shot's a hit.'

'Who?'

'The chaps in that thing. The men who're coming up—'

'Coming up where?'

'We're evacuating them trenches where we can. Our chaps are coming back up the zigzags.... No end of 'em hit.... But when we get clear our turn'll come. Rather! Those things won't be able to cross a trench or get into it; and before they can get back our guns'll smash 'em up. Smash 'em right up. See? A brightness came into his eyes. 'Then we'll have a go at the beggars inside,' he said....

The war correspondent thought for a moment, trying to realize the idea. Then he set himself to recover his field-glasses from the burly corporal....

The daylight was getting clearer now. The clouds were lifting, and a gleam of lemon-yellow amidst the level masses to the east portended sunrise. He looked again at the land ironclad. As he saw it in the bleak, grey dawn, lying obliquely upon the slope and on the very lip of the foremost trench, the suggestion of a stranded vessel was very strong indeed. It might have been from eighty to a hundred feet long—it was about two hundred and fifty yards away—its vertical side was ten feet high or so, smooth for that height, and then with a complex patterning under the eaves of its flattish turtle cover. This patterning was a close interlacing of portholes, rifle barrels, and telescope tubes—sham and real—indistinguishable one from the other. The thing had come into such a position as to enfilade the trench, which was empty now, so far as he could see, except for two or three crouching knots of men and the tumbled dead. Behind it, across the plain, it had scored the grass with a train of linked impressions, like the dotted tracings seawounded men were scattered—men it had tracked dead men and back from their advanced positions in the searchlight glare from the invader's lines. And now it lay with its head projecting a little over the trench it had won, as if it were a single sentient thing planning the next phase of its attack....

He lowered his glasses and took a more comprehensive view of

the situation. These creatures of the night had evidently won the first line of trenches and the fight had come to a pause. In the increasing light he could make out by a stray shot or a chance exposure that the defender's marksmen were lying thick in the second and third line of trenches up towards the low crest of the position, and in such of the zigzags as gave them a chance of a converging fire. The men about him were talking of guns. 'We're in the line of the big guns at the crest, but they'll soon shift one to pepper them,' the lean man said, reassuringly.

'Whup,' said the corporal.

'Bang! bang! bang! Whir-r-r-r-r!' it was a sort of nervous jump, and all the rifles were going off by themselves. The war correspondent found himself and the artist, two idle men crouching behind a line of preoccupied backs, of industrious men discharging magazines. The monster had moved. It continued to move regardless of the hail that splashed its skin with bright new specks of lead. It was singing a mechanical little ditty to itself. 'Tuf-tuf, tuf-tuf, tuf-tuf,' and squirting out little jets of steam behind. It had humped itself up, as a limpet does before it crawls; it had lifted its skirt and displayed along the length of it—*feet!* They were thick, stumpy feet, between knobs and buttons in shape—flat, broad things, reminding one of the feet of elephants or the legs of caterpillars; and then, as the skirt rose higher, the war correspondent, scrutinizing the thing through his glasses again, saw that these feet hung, as it were, on the rims of wheels. His thoughts whirled back to Victoria Street, Westminster, and he saw himself in the piping times of peace, seeking matter for an interview.

'Mr—Mr Diplock,' he said; 'and he called them Pedrails. . . . Fancy meeting them here!'

The marksman beside him raised his head and shoulders in a speculative mood to fire more certainly—it seemed so natural to assume the attention of the monster must be distracted by this trench before it—and was suddenly knocked backwards by a bullet through his neck. His feet flew up, and he vanished out of the margin of the watcher's field of vision. The war correspondent grovelled tighter, but after a glance behind him at a painful little confusion, he resumed his field-glass, for the thing was putting down its feet one after the other, and hoisting itself further and further over the trench. Only a bullet in the head could have stopped him looking just then.

The lean man with the strident voice ceased firing to turn and reiterate his point. 'They can't possibly cross,' he bawled. 'They—' 'Bang! Bang! Bang! Bang!'—drowned everything.

The lean man continued speaking for a word or so, then gave it up, shook his head to enforce the impossibility of anything crossing a trench like the one below, and resumed business once more.

And all the while that great bulk was crossing. When the war correspondent turned his glass on it again it had bridged the trench, and its queer feet were rasping away at the further bank, in the attempt to get a hold there. It got its hold. It continued to crawl until the greater bulk of it was over the trench—until it was all over. Then it paused for a moment, adjusted its skirt a little nearer the ground, gave an unnerving 'toot, toot', and came on abruptly at a pace of, perhaps, six miles an hour straight up the gentle slope towards our observer.

The war correspondent raised himself on his elbow and looked a natural enquiry at the artist.

For a moment the men about him stuck to their position and fired furiously. Then the lean man in a mood of precipitancy slid backwards, and the war correspondent said 'Come along' to the artist, and led the movement along the trench.

As they dropped down, the vision of a hillside of trench being rushed by a dozen vast cockroaches disappeared for a space, and instead was one of a narrow passage, crowded with men, for the most part receding, though one or two turned or halted. He never turned back to see the nose of the monster creep over the brow of the trench; he never even troubled to keep in touch with the artist. He heard the 'whit' of bullets about him soon enough, and saw a man before him stumble and drop, and then he was one of a furious crowd fighting to get into a transverse zigzag ditch that enabled the defenders to get under cover up and down the hill. It was like a theatre panic. He gathered from signs and fragmentary words that on ahead another of these monsters had also won to the second trench.

He lost his interest in the general course of the battle for a space altogether; he became simply a modest egotist, in a mood of hasty circumspection, seeking the furthest rear, amidst a dispersed multitude of disconcerted riflemen similarly employed. He scrambled down through trenches, he took his courage in both hands and sprinted across the open, he had moments of panic when it seemed

madness not to be quadrupedal, and moments of shame when he stood up and faced about to see how the fight was going. And he was one of many thousand very similar men that morning. On the ridge he halted in a knot of scrub, and was for a few minutes almost minded to stop and see things out.

The day was now fully come. The grey sky had changed to blue, and of all the cloudy masses of the dawn there remained only a few patches of dissolving fleeciness. The world below was bright and singularly clear. The ridge was not, perhaps, more than a hundred feet or so above the general plain, but in this flat region it sufficed to give the effect of extensive view. Away on the north side of the ridge, little and far, were the camps, the ordered wagons, all the gear of a big army; with officers galloping about and men doing aimless things. Here and there men were falling in, however, and the cavalry was forming up on the plain beyond the tents. The bulk of men who had been in the trenches were still on the move to the rear, scattered like sheep without a shepherd over the further slopes. Here and there were little rallies and attempts to wait and do—something vague; but the general drift was away from any concentration. There on the southern side was the elaborate laceration of trenches and defences, across which these iron turtles, fourteen of them spread out over a line of perhaps three miles, were now advancing as fast as a man could trot, and methodically shooting down and breaking up any persistent knots of resistance. Here and there stood little clumps of men, outflanked and unable to get away, showing the white flag, and the invader's cyclist infantry was advancing now across the open, in open order but unmolested to complete the work of the machines. Surveyed at large, the defenders already looked a beaten army. A mechanism that was effectually ironclad against bullets, that could at a pinch cross a thirty-foot trench, and that seemed able to shoot out rifle-bullets with unerring precision, was clearly an inevitable victor against anything but rivers, precipices, and guns.

He looked at his watch. 'Half-past four! Lord! What things can happen in two hours. Here's the whole blessed army being walked over, and at half-past two—'

'And even now our blessed louts haven't done a thing with their guns!'

He scanned the ridge right and left of him with his glasses. He turned again to the nearest land ironclad, advancing now obliquely

to him and not three hundred yards away, and then scanned the ground over which he must retreat if he was not to be captured.

'They'll do nothing,' he said, and glanced again at the enemy.

And then from far away to the left came the thud of a gun, followed very rapidly by a rolling gunfire.

He hesitated and decided to stay.

3

The defender had relied chiefly upon his rifles in the event of an assault. His guns he kept concealed at various points upon and behind the ridge ready to bring them into action against any artillery preparations for an attack on the part of his antagonist. The situation had rushed upon him with the dawn, and by the time the gunners had their guns ready for motion, the land ironclads were already in among the foremost trenches. There is a natural reluctance to fire into one's own broken men, and many of the guns, being intended simply to fight an advance of the enemy's artillery, were not in positions to hit anything in the second line of trenches. After that the advance of the land ironclads was swift. The defender-general found himself suddenly called upon to invent a new sort of warfare, in which guns were to fight alone amidst broken and retreating infantry. He had scarcely thirty minutes in which to think it out. He did not respond to the call, and what happened that morning was that the advance of the land ironclads forced the fight, and each gun and battery made what play its circumstances dictated. For the most part it was poor play.

Some of the guns got in two or three shots, some one or two, and the percentage of misses was unusually high. The howitzers, of course, did nothing. The land ironclads in each case followed much the same tactics. As soon as a gun came into play the monster turned itself almost end-on, so as to minimize the chances of a square hit, and made not for the gun, but for the nearest point on its flank from which the gunners could be shot down. Few of the hits scored were very effectual; only one of the things was disabled, and that was the one that fought the three batteries attached to the brigade on the left wing. Three that were hit when close upon the guns were clean shot through without being put out of action. Our war correspondent did not see that one momentary arrest of the

tide of victory on the left; he saw only the very ineffectual fight of half-battery 96B close at hand upon his right. This he watched some time beyond the margin of safety.

Just after he heard the three batteries opening up upon his left he became aware of the thud of horses' hoofs from the sheltered side of the slope, and presently saw first one and then two other guns galloping into position along the north side of the ridge, well out of sight of the great bulk that was now creeping obliquely towards the crest and cutting up the lingering infantry beside it and below, as it came.

The half-battery swung round into line—each gun describing its curve—halted, unlimbered, and prepared for action. . . .

'Bang!

The land ironclad had become visible over the brow of the hill, and just visible as a long black back to the gunners. It halted, as though it hesitated.

The two remaining guns fired, and then their big antagonist had swung round and was in full view, end-on, against the sky, coming at a rush.

The gunners became frantic in their haste to fire again. They were so near the war correspondent could see the expression of their excited faces through his field-glass. As he looked he saw a man drop, and realized for the first time that the ironclad was shooting.

For a moment the big black monster crawled with an accelerated pace towards the furiously active gunners. Then, as if moved by a generous impulse, it turned its full broadside to their attack, and scarcely forty yards away from them. The war correspondent turned his field-glass back to the gunners and perceived it was now shooting down the men about the guns with the most deadly rapidity.

Just for a moment it seemed splendid, and then it seemed horrible. The gunners were dropping in heaps about their guns. To lay a hand on a gun was death. 'Bang!' went the gun on the left, a hopeless miss, and that was the only second shot the half-battery fired. In another moment half-a-dozen surviving artillerymen were holding up their hands amidst a scattered muddle of dead and wounded men, and the fight was done.

The war correspondent hesitated between stopping in his scrub and waiting for an opportunity to surrender decently, or taking

to an adjacent gully he had discovered. If he surrendered it was certain he would get no copy off; while, if he escaped, there were all sorts of chances. He decided to follow the gully, and take the first offer in the confusion beyond the camp of picking up a horse.

. 4

Subsequent authorities have found fault with the first land ironclads in many particulars, but assuredly they served their purpose on the day of their appearance. They were essentially long, narrow, and very strong steel frameworks carrying the engines, and borne upon eight pairs of big pedrail wheels, each about ten feet in diameter, each a driving wheel and set upon long axles free to swivel round a common axis. This arrangement gave them the maximum of adaptability to the contours of the ground. They crawled level along the ground with one foot high upon a hillock and another deep in a depression, and they could hold themselves erect and steady sideways upon even a steep hillside. The engineers directed the engines under the command of the captain, who had look-out points at small ports all round the upper edge of the adjustable skirt of twelve-inch iron-plating which protected the whole affair, and who could also raise or depress a conning-tower set about the portholes through the centre of the iron top cover. The riflemen each occupied a small cabin of peculiar construction, and these cabins were slung along the sides of and before and behind the great main framework, in a manner suggestive of the slinging of the seats of an Irish jaunting-car. Their rifles, however, were very different pieces of apparatus from the simple mechanisms in the hands of their adversaries.

These were in the first place automatic, ejected their cartridges and loaded again from a magazine each time they fired, until the ammunition store was at an end, and they had the most remarkable sights imaginable, sights which threw a bright little camera-obscura picture into the light-tight box in which the rifleman sat below. This camera-obscura picture was marked with two crossed lines, and whatever was covered by the intersection of these two lines, that the rifle hit. The sighting was ingeniously contrived. The rifleman stood at the table with a thing like an elaboration of a draughtsman's dividers in his hand, and he opened and closed these

dividers, so that they were always at the apparent height—if it was an ordinary-sized man—of the man he wanted to kill. A little twisted strand of wire like an electric-light wire ran from this implement up to the gun, and as the dividers opened and shut the sights went up or down. Changes in the clearness of the atmosphere, due to changes of moisture, were met by an ingenious use of that meteorologically sensitive substance, caoutchouc, and when the land ironclad moved forward the sights got a compensatory deflection in the direction of its motion. The rifleman stood up in his pitch-dark chamber and watched the little picture before him. One hand held the dividers for judging distance, and the other grasped a big knob like a door-handle. As he pushed this knob about the rifle above swung to correspond, and the picture passed to and fro like an agitated panorama. When he saw a man he wanted to shoot he brought him up to the cross-lines, and then pressed a finger upon a little push like an electric bell-push, conveniently placed in the centre of the knob. Then the man was shot. If by any chance the rifleman missed his target he moved the knob a trifle, or readjusted his dividers, pressed the push, and got him the second time.

This rifle and its sights protruded from a porthole, exactly like a great number of other portholes that ran in a triple row under the eaves of the cover of the land ironclad. Each porthole displayed a rifle and sight in dummy, so that the real ones could only be hit by a chance shot, and if one was, then the young man below said 'Pshaw!' turned on an electric light, lowered the injured instrument into his camera, replaced the injured part, or put up a new rifle if the injury was considerable.

You must conceive these cabins as hung clear above the swing of the axles, and inside the big wheels upon which the great elephant-like feet were hung, and behind these cabins along the centre of the monster ran a central gallery into which they opened, and along which worked the big compact engines. It was like a long passage into which this throbbing machinery had been packed, and the captain stood about the middle, close to the ladder that led to his conning-tower, and directed the silent, alert engineers—for the most part by signs. The throb and noise of the engines mingled with the reports of the rifles and the intermittent clangour of the bullet hail upon the armour. Ever and again he would touch the wheel that raised his conning-tower, step up his ladder until his engineers

could see nothing of him above the waist, and then come down again with orders. Two small electric lights were all the illumination of this space—they were placed to make him most clearly visible to his subordinates: the air was thick with the smell of oil and petrol, and had the war correspondent been suddenly transferred from the spacious dawn outside to the bowels of this apparatus he would have thought himself fallen into another world.

The captain, of course, saw both sides of the battle. When he raised his head into his conning-tower there were the dewy sunrise, the amazed and disordered trenches, the flying and falling soldiers, the depressed-looking groups of prisoners, the beaten guns; when he bent down again to signal 'half speed', 'quarter speed', 'half circle round towards the right', or what not, he was in the oil-smelling twilight of the ill-lit engine-room. Close beside him on either side was the mouthpiece of a speaking-tube, and ever and again he would direct one side or other of his strange craft to 'concentrate fire forward on gunners', or to 'clear out trench about a hundred yards on our right front'.

He was a young man, healthy enough but by no means sun-tanned, and of a type of feature and expression that prevails in His Majesty's Navy: alert, intelligent, quiet. He and his engineers and his riflemen all went about their work, calm and reasonable men. They had none of that flapping strenuousness of the half-wit in a hurry, that excessive strain upon the blood-vessels, that hysteria of effort which is so frequently regarded as the proper state of mind for heroic deeds.

For the enemy these young engineers were defeating they felt a certain qualified pity and a quite unqualified contempt. They regarded these big, healthy men they were shooting down precisely as these same big, healthy men might regard some inferior kind of native. They despised them for making war; despised their bawling patriotisms and their emotionality profoundly; despised them, above all, for the petty cunning and the almost brutish want of imagination their method of fighting displayed. 'If they *must* make war, these young men thought, 'why in thunder don't they do it like sensible men?' They resented the assumption that their own side was too stupid to do anything more than play their enemy's game, that they were going to play this costly folly according to the rules of unimaginative men. They resented being forced to the trouble of making man-killing machinery; resented the alternative

of having to massacre these people or endure their truculent yappings; resented the whole unfathomable imbecility of war.

Meanwhile, with something of the mechanical precision of a good clerk posing a ledger, the riflemen moved their knobs and pressed their buttons. . . .

The captain of Land Ironclad Number Three had halted on the crest close to his captured half-battery. His lined-up prisoners stood hard by and waited for the cyclists behind to come for them. He surveyed the victorious morning through his conning-tower.

He read the general's signals. 'Five and Four are to keep among the guns to the left and prevent any attempt to recover them. Seven and Eleven and Twelve, stick to the guns you have got; Seven, get into position to command the guns taken by Three. Then we're to do something else, are we? Six and One, quicken up to about ten miles an hour and walk round behind that camp to the levels near the river—we shall bag the whole crowd of them,' interjected the young man. 'Ah, here we are! Two and Three, Eight and Nine, Thirteen and Fourteen, space out to a thousand yards, wait for the word, and then go slowly to cover the advance of the cyclist infantry against any charge of mounted troops. That's all right. But where's Ten? Halloa! Ten to repair and get movable as soon as possible. They've broken up Ten!'

The discipline of the new war machines was business-like rather than pedantic, and the head of the captain came down out of the conning-tower to tell his men. 'I say, you chaps there. They've broken up Ten. Not badly, I think; but anyhow, he's stuck.'

But that still left thirteen of the monsters in action to finish up the broken army.

The war correspondent stealing down his gully looked back and saw them all lying along the crest and talking fluttering congratulatory flags to one another. Their iron sides were shining golden in the light of the rising sun.

5

The private adventures of the war correspondent terminated in surrender about one o'clock in the afternoon, and by that time he had stolen a horse, pitched off it, and narrowly escaped being rolled upon; found the brute had broken its leg, and shot it with his

revolver. He had spent some hours in the company of a squad of dispirited riflemen, had quarrelled with them about topography at last, and gone off by himself in a direction that should have brought him to the banks of the river and didn't. Moreover, he had eaten all his chocolate and found nothing in the whole world to drink. Also, it had become extremely hot. From behind a broken, but attractive, stone wall he had seen far away in the distance the defender-horsemen trying to charge cyclists in open order, with land ironclads outflanking them on either side. He had discovered that cyclists could retreat over open turf before horsemen with a sufficient margin of speed to allow of frequent dismounts and much terribly effective sharpshooting; and he had a sufficient persuasion that those horsemen, having charged their hearts out, had halted just beyond his range of vision and surrendered. He had been urged to sudden activity by a forward movement of one of those machines that had threatened to enflame his wall. He had discovered a fearful blister on his heel.

He was now in a scrubby gravelly place, sitting down and meditating on his pocket-handkerchief, which had in some extraordinary way become in the last twenty-four hours extremely ambiguous in hue. 'It's the whitest thing I've got,' he said.

He had known all along that the enemy was east, west, and south of him, but when he heard land ironclads Numbers One and Six talking in their measured, deadly way not half a mile to the north he decided to make his own little unconditional peace without any further risks. He was for hoisting his white flag to a bush and taking up a position of modest obscurity near it until some one came along. He became aware of voices, clatter, and the distinctive noises of a body of horse, quite near, and he put his handkerchief in his pocket again and went to see what was going forward.

The sound of firing ceased, and then as he drew near he heard the deep sounds of many simple, coarse, but hearty and noble-hearted soldiers of the old school swearing with vigour.

He emerged from his scrub upon a big level plain, and far away a fringe of trees marked the banks of the river.

In the centre of the picture was a still intact road bridge, and a big railway bridge a little to the right. Two land ironclads rested, with a general air of being long, harmless sheds, in a pose of anticipatory peacefulness right and left of the picture, completely commanding two miles and more of the river levels. Emerged and halted a few

yards from the scrub was the remainder of the defender's cavalry, dusty, a little disordered and obviously annoyed, but still a very fine show of men. In the middle distance three or four men and horses were receiving medical attendance, and nearer a knot of officers regarded the distant novelties in mechanism with profound distaste. Every one was very distinctly aware of the twelve other ironclads, and of the multitude of townsmen soldiers, on bicycles or afoot, encumbered now by prisoners and captured war-gear but otherwise thoroughly effective, who were sweeping like a great net in their rear.

'Checkmate,' said the war correspondent, walking out into the open. 'But I surrender in the best of company. Twenty-four hours ago I thought war was impossible—and these beggars have captured the whole blessed army! Well! Well!' He thought of his talk with the young lieutenant. 'If there's no end to the surprises of science, the civilized people have it, of course. As long as their science keeps going they will necessarily be ahead of open-country men. Still. . . . He wondered for a space what might have happened to the young lieutenant.

The war correspondent was one of those inconsistent people who always want the beaten side to win. When he saw all these burly sun-tanned horsemen, disarmed and dismounted and lined up when he saw their horses unskillfully led away by the singularly not equestrian cyclists to whom they had surrendered; when he saw these truncated Paladins watching this scandalous sight, he forgot altogether that he had called these men 'cunning louts' and wished them beaten not four-and-twenty hours ago. A month ago he had seen that regiment in its pride going forth to war, and had been told of its terrible prowess, how it could charge in open order with each man firing from his saddle, and sweep before it anything else that ever came out to battle in any sort of order, foot or horse. And it had had to fight a few score of young men in atrociously unfair machines!

'Manhood versus Machinery' occurred to him as a suitable headline. Journalism curdles all one's mind to phrases.

He strolled as near the lined-up prisoners as the sentinels seemed disposed to permit, and surveyed them and compared their sturdy proportions with those of their lightly built captors.

'Smart degenerates,' he muttered. 'Anæmic cockneydom.'

The surrendered officers came quite close to him presently, and

he could hear the colonel's high-pitched tenor. The poor gentleman had spent three years of arduous toil upon the best material in the world perfecting that shooting from the saddle charge, and he was enquiring with phrases of blasphemy, natural in the circumstances, what one could be expected to do against this suitably consigned ironmongery.

'Guns,' said some one.

'Big guns they can walk round. You can't shift big guns to keep pace with them, and little guns in the open they rush. I saw 'em rushed. You might do a surprise now and then—assassinate the brutes, perhaps—'

'You might make things like 'em.'

'What? More ironmongery? Us? . . .'

'I'll call my article,' meditated the war correspondent 'Mankind versus Ironmongery', and quote the old boy at the beginning.'

And he was much too good a journalist to spoil his contrast by remarking that the half-dozen comparatively slender young men in blue pyjamas who were standing about their victorious land ironclad, drinking coffee and eating biscuits, had also in their eyes and carriage something not altogether degraded below the level of a man.

FINIS

FRANK L. POLLACK

'I'm getting tired,' complained Davis, lounging in the window of the Physics Building, 'and sleepy. It's after eleven o'clock. This makes the fourth night I've sat up to see your new star, and it'll be the last. Why, the thing was billed to appear three weeks ago.'

'Are *you* tired, Miss Wardour?' asked Eastwood, and the girl glanced up with a quick flush and a negative murmur.

Eastwood made the reflection anew that she certainly was painfully shy. She was almost as plain as she was shy, though her hair had an unusual beauty of its own, fine as silk and coloured like palest flame.

Probably she had brains; Eastwood had seen her reading some extremely 'deep' books, but she seemed to have no amusements, few interests. She worked daily at the Art Students' League, and boarded where he did, and he had thus come to ask her with the Davis's to watch for the new star from the laboratory windows on the Heights.

'Do you really think that it's worth while to wait any longer, professor?' enquired Mrs Davis, concealing a yawn.

Eastwood was somewhat annoyed by the continued failure of the star to show itself and he hated to be called 'professor', being only an assistant professor of physics.

'I don't know,' he answered somewhat curtly. 'This is the twelfth night that I have waited for it. Of course, it would have been a mathematical miracle if astronomers should have solved such a problem exactly, though they've been figuring on it for a quarter of a century.'

The new Physics Building of Columbia University was about twelve storeys high. The physics laboratory occupied the ninth and tenth floors, with the astronomical rooms above it, an arrangement which would have been impossible before the invention of the oil vibration cushion, which practically isolated the instrument rooms from the earth.

Eastwood had arranged a small telescope at the window, and below them spread the illuminated map of Greater New York, sending up a faintly musical roar. All the streets were crowded, as they had been every night since the fifth of the month, when the great new star, or sun, was expected to come into view.

Some error had been made in the calculations, though, as Eastwood said, astronomers had been figuring on them for twenty-five years.

It was, in fact, nearly forty years since Professor Adolphe Bernier first announced his theory of a limited universe at the International Congress of Sciences in Paris, where it was counted as little more than a masterpiece of imagination.

Professor Bernier did not believe that the universe was infinite. Somewhere, he argued, the universe must have a centre, which is the pivot for its revolution.

The moon revolves around the earth, the planetary system revolves about the sun, the solar system revolves about one of the fixed stars, and this whole system in its turn undoubtedly revolves around some more distant point. But this sort of progression must definitely stop somewhere.

Somewhere there must be a central sun, a vast incandescent body which does not move at all. And as a sun is always larger and hotter than its satellites, therefore the body at the centre of the universe must be of an immensity and temperature beyond anything known or imagined.

It was objected that this hypothetical body should then be large enough to be visible from the earth, and Professor Bernier replied that some day it undoubtedly would be visible. Its light had simply not yet had time to reach the earth.

The passage of light from the nearest of the fixed stars is a matter of three years, and there must be many stars so distant that their rays have not yet reached us. The great central sun must be so inconceivably remote that perhaps hundreds, perhaps thousands of years would elapse before its light should burst upon the solar system.

All this was contemptuously classed as 'newspaper science' till the extraordinary mathematical revival a little after the middle of the twentieth century afforded the means of verifying it.

Following the new theorems discovered by Professor Burnside, of Princeton, and elaborated by Dr Tanaka, of Tokyo, astronomers

succeeded in calculating the arc of the sun's movements through space, and its ratio to the orbit of its satellites. With this as a basis, it was possible to follow the widening circles, the consecutive systems of the heavenly bodies and their rotations.

The theory of Professor Bernier was justified. It was demonstrated that there really was a gigantic mass of incandescent matter, which, whether the central point of the universe or not, appeared to be without motion.

The weight and distance of this new sun were approximately calculated, and, the speed of light being known, it was an easy matter to reckon when its rays would reach the earth.

It was then estimated that the approaching rays would arrive at the earth in twenty-six years, and that was twenty-six years ago. Three weeks had passed since the date when the new heavenly body was expected to become visible, and it had not yet appeared.

Popular interest had risen to a high pitch, stimulated by innumerable newspaper and magazine articles, and the streets were nightly thronged with excited crowds armed with opera-glasses and star maps, while at every corner a telescope man had planted his tripod instrument at a nickel a look.

Similar scenes were taking place in every civilized city on the globe.

It was generally supposed that the new luminary would appear in size about midway between Venus and the moon. Better informed persons expected something like the sun, and a syndicate of capitalists quietly leased large areas on the coast of Greenland in anticipation of a great rise in temperature and a northward movement in population.

Even the business situation was appreciably affected by the public uncertainty and excitement. There was a decline in stocks, and a minor religious sect boldly prophesied the end of the world.

'I've had enough of this,' said Davis, looking at his watch again. 'Are you ready to go, Grace? By the way, isn't it getting warmer?'

It had been a sharp February day, but the temperature was certainly rising. Water was dripping from the roofs, and from the icicles that fringed the window ledges, as if a warm wave had suddenly arrived.

'What's that light?' suddenly asked Alice Wardour, who was lingering by the open window.

'It must be moonrise,' said Eastwood, though the illumination of the horizon was almost like daybreak.

Davis abandoned his intention of leaving, and they watched the east grow pale and flushed till at last a brilliant white disc heaved itself above the horizon.

It resembled the full moon, but as if trebled in lustre, and the streets grew almost as light as by day.

'Good heavens, that must be the new star, after all!' said Davis in an awed voice.

'No, it's only the moon. This is the hour and minute for her rising,' answered Eastwood, who had grasped the cause of the phenomenon. 'But the new sun must have appeared on the other side of the earth. Its light is what makes the moon so brilliant. It will rise here just as the sun does, no telling how soon. It must be brighter than was expected—and maybe hotter,' he added with a vague uneasiness.

'Isn't it getting very warm in here?' said Mrs Davis, loosening her jacket. 'Couldn't you turn off some of the steam heat?'

Eastwood turned it all off, for, in spite of the open window, the room was really growing uncomfortably close. But the warmth appeared to come from without; it was like a warm spring evening, and the icicles were breaking loose from the cornices.

For half an hour they leaned from the windows with but desultory conversation, and below them the streets were black with people and whitened with upturned faces. The brilliant moon rose higher, and the mildness of the night sensibly increased.

It was after midnight when Eastwood first noticed the reddish flush tinging the clouds low in the east, and he pointed it out to his companions.

'That must be it at last,' he exclaimed, with a thrill of vibrating excitement at what he was going to see, a cosmic event unprecedented in intensity.

The brightness waxed rapidly.

'By Jove, see it redden!' Davis ejaculated. 'It's getting lighter than day—and hot! Whew!'

The whole eastern sky glowed with a deepening pink that extended half round the horizon. Sparrows chirped from the roofs, and it looked as if the disc of the unknown star might at any moment be expected to lift above the Atlantic, but it delayed long.

The heavens continued to burn with myriad hues, gathering at last to a fiery furnace glow on the skyline.

Mrs Davis suddenly screamed. An American flag blowing freely

from its staff on the roof of the tall building had all at once burst into flame.

Low in the east lay a long streak of intense fire which broadened as they squinted with watering eyes. It was as if the edge of the world had been heated to whiteness.

The brilliant moon faded to a feathery white film in the glare. There was a confused outcry from the observatory overhead, and a crash of something being broken, and as the strange new sunlight fell through the window the onlookers leaped back as if a blast furnace had been opened before them.

The glass cracked and fell inward. Something like the sun, but magnified fifty times in size and hotness, was rising out of the sea. An iron instrument-table by the window began to smoke with an acrid smell of varnish.

'What the devil is this, Eastwood?' shouted Davis accusingly.

From the streets rose a sudden, enormous wail of fright and pain, the outcry of a million throats at once, and the roar of a stampede followed. The pavements were choked with struggling, panic-stricken people in the fierce glare, and above the din arose the clanging rush of fire engines and trucks.

Smoke began to rise from several points below Central Park, and two or three church chimers pealed crazily.

The observers from overhead came running down the stairs with a thunderous trampling, for the elevator man had deserted his post.

'Here, we've got to get out of this,' shouted Davis, seizing his wife by the arm and hustling her toward the door. 'This place'll be on fire directly.'

'Hold on. You can't go down into that crush on the street,' Eastwood cried, trying to prevent him.

But Davis broke away and raced down the stairs, half carrying his terrified wife. Eastwood got his back against the door in time to prevent Alice from following them.

'There's nothing in this building that will burn, Miss Wardour,' he said as calmly as he could. 'We had better stay here for the present. It would be sure death to get involved in that stampede below. Just listen to it.'

The crowds on the street seemed to sway to and fro in contending waves, and the cries, curses, and screams came up in a savage chorus.

The heat was already almost blistering to the skin, though they

carefully avoided the direct rays, and instruments of glass in the laboratory cracked loudly one by one.

A vast cloud of dark smoke began to rise from the harbour, where the shipping must have caught fire, and something exploded with a terrific report. A few minutes later half a dozen fires broke out in the lower part of the city, rolling up volumes of smoke that faded to a thin mist in the dazzling light.

The great new sun was now fully above the horizon, and the whole east seemed ablaze. The stampede in the streets had quieted all at once, for the survivors had taken refuge in the nearest houses, and the pavements were black with motionless forms of men and women.

'I'll do whatever you say,' said Alice, who was deadly pale, but remarkably collected. Even at that moment Eastwood was struck by the splendour of her ethereally brilliant hair that burned like pale flame above her pallid face. 'But we can't stay here, can we?'

'No,' replied Eastwood, trying to collect his faculties in the face of this catastrophic revolution of nature. 'We'd better go to the basement, I think.'

In the basement were deep vaults used for the storage of delicate instruments, and these would afford shelter for a time at least. It occurred to him as he spoke that perhaps temporary safety was the best that any living thing on earth could hope for.

But he led the way down the well staircase. They had gone down six or seven flights when a gloom seemed to grow upon the air, with a welcome relief.

It seemed almost cool, and the sky had clouded heavily, with the appearance of polished and heated silver.

A deep but distant roaring arose and grew from the south-east, and they stopped on the second landing to look from the window.

A vast black mass seemed to fill the space between sea and sky, and it was sweeping towards the city, probably from the harbour, Eastwood thought, at a speed that made it visibly grow as they watched it.

'A cyclone—and a waterspout!' muttered Eastwood, appalled. He might have foreseen it from the sudden, excessive evaporation and the heating of the air. The gigantic black pillar drove towards them swaying and reeling, and a gale came with it, and a wall of impenetrable mist behind.

As Eastwood watched its progress he saw its cloudy bulk illumined momentarily by a dozen lightning-like flashes, and a moment later, above its roar, came the tremendous detonations of heavy cannon.

The forts and the warships were firing shells to break the water-spout, but the shots seemed to produce no effect. It was the city's last and useless attempt at resistance. A moment later forts and ships alike must have been engulfed.

'Hurry! This building will collapse!' Eastwood shouted.

They rushed down another flight, and heard the crash with which the monster broke over the city. A deluge of water, like the emptying of a reservoir, thundered upon the street, and the water was steaming hot as it fell.

There was a rending crash of falling walls, and in another instant the Physics Building seemed to be twisted around by a powerful hand. The walls blew out, and the whole structure sank in a chaotic mass.

But the tough steel frame was practically unwreckable, and, in fact, the upper portion was simply bent down upon the lower storeys, peeling off most of the shell of masonry and stucco.

Eastwood was stunned as he was hurled to the floor, but when he came to himself he was still upon the landing, which was tilted at an alarming angle. A tangled mass of steel rods and beams hung a yard over his head, and a huge steel girder had plunged down perpendicularly from above, smashing everything in its way.

Wreckage choked the well of the staircase, a mass of plaster, bricks, and shattered furniture surrounded him, and he could look out in almost every direction through the rent iron skeleton.

A yard away Alice was sitting up, mechanically wiping the mud and water from her face, and apparently uninjured. Tepid water was pouring through the interstices of the wreck in torrents, though it did not appear to be raining.

A steady, powerful gale had followed the whirlwind, and it brought a little coolness with it. Eastwood enquired perfunctorily of Alice if she were hurt, without being able to feel any degree of interest in the matter. His faculty of sympathy seemed paralysed.

'I don't know. I thought—I thought that we were all dead!' the girl murmured in a sort of daze. 'What was it? Is it all over?'

'I think it's only beginning,' Eastwood answered dully.

The gale had brought up more clouds and the skies were thickly overcast, but shining white-hot. Presently the rain came down in

almost scalding floods and as it fell upon the hissing streets it steamed again into the air.

In three minutes all the world was choked with hot vapour, and from the roar and splash the streets seemed to be running rivers.

The downpour seemed too violent to endure, and after an hour it did cease, while the city reeked with mist. Through the whirling fog Eastwood caught glimpses of ruined buildings, vast heaps of debris, all the wreckage of the greatest city of the twentieth century.

Then the torrents fell again, like a cataract, as if the waters of the earth were shuttlecocking between sea and heaven. With a jarring tremor of the ground a landslide went down into the Hudson.

The atmosphere was like a vapour bath, choking and sickening. The physical agony of respiration aroused Alice from a sort of stupor, and she cried out pitifully that she would die.

The strong wind drove the hot spray and steam through the shattered building till it seemed impossible that human lungs could extract life from the semi-liquid that had replaced the air, but the two lived.

After hours of this parboiling the rain slackened, and, as the clouds parted, Eastwood caught a glimpse of a familiar form halfway up the heavens. It was the sun, the old sun, looking small and watery.

But the intense heat and brightness told that the enormous body still blazed behind the clouds. The rain seemed to have ceased definitely, and the hard, shining whiteness of the sky grew rapidly hotter.

The heat of the air increased to an oven-like degree; the mists were dissipated, the clouds licked up, and the earth seemed to dry itself almost immediately. The heat from the two suns beat down simultaneously till it became a monstrous terror, unendurable.

An odour of smoke began to permeate the air; there was a dazzling shimmer over the streets, and great clouds of mist arose from the bay, but these appeared to evaporate before they could darken the sky.

The piled wreck of the building sheltered the two refugees from the direct rays of the new sun, now almost overhead, but not from the penetrating heat of the air. But the body will endure almost anything, short of tearing asunder, for a time at least; it is the finer mechanism of the nerves that suffers most.

Alice lay face down among the bricks, gasping and moaning. The blood hammered in Eastwood's brain, and the strangest mirages flickered before his eyes.

Alternately he lapsed into heavy stupors, and awoke to the agony of the day. In his lucid moments he reflected that this could not last long, and tried to remember what degree of heat would cause death.

Within an hour after the drenching rains he was feverishly thirsty, and the skin felt as if peeling from his whole body.

This fever and horror lasted until he forgot that he had ever known another state; but at last the west reddened, and the flaming sun went down. It left the familiar planet high in the heavens, and there was no darkness until the usual hour, though there was a slight lowering of the temperature.

But when night did come it brought life-giving coolness, and though the heat was still intense it seemed temperate by comparison. More than all, the kindly darkness seemed to set a limit to the cataclysmic disorders of the day.

'Ouf! This is heavenly!' said Eastwood, drawing long breaths and feeling mind and body revived in the gloom.

'It won't last long,' replied Alicé, and her voice sounded extraordinarily calm through the darkness. 'The heat will come again when the new sun rises in a few hours.'

'We might find some better place in the meanwhile—a deep cellar; or we might get into the subway,' Eastwood suggested.

'It would be no use. Don't you understand? I have been thinking it all out. After this, the new sun will always shine, and we could not endure it even another day. The wave of heat is passing round the world as it revolves, and in a few hours the whole earth will be a burnt-up ball. Very likely we are the only people left alive in New York, or perhaps in America.'

She seemed to have taken the intellectual initiative, and spoke with an assumption of authority that amazed him.

'But there must be others,' said Eastwood, after thinking for a moment. 'Other people have found sheltered places, or miners, or men underground.'

'They would have been drowned by the rain. At any rate, there will be none left alive by tomorrow night.'

'Think of it,' she went dreamily, 'for a thousand years this wave

of fire has been rushing towards us, while life has been going on so happily in the world, so unconscious that the world was doomed all the time. And now this is the end of life.'

'I don't know,' Eastwood said slowly. 'It may be the end of human life, but there must be some forms that will survive—some micro-organisms perhaps capable of resisting high temperatures, if nothing higher. The seed of life will be left at any rate, and that is everything. Evolution will begin over again, producing new types to suit the changed conditions. I only wish I could see what creatures will be here in a few thousand years.'

'But I can't realize it at all—this thing!' he cried passionately, after a pause. 'Is it real? Or have we all gone mad? It seems too much like a bad dream.'

The rain crashed down again as he spoke, and the earth steamed, though not with the dense reek of the day. For hours the waters roared and splashed against the earth in hot billows till the streets were foaming yellow rivers, dammed by the wreck of fallen buildings.

There was a continual rumble as earth and rock slid into the East River, and at last the Brooklyn Bridge collapsed with a thunderous crash and splash that made all Manhattan vibrate. A gigantic billow like a tidal wave swept up the river from its fall.

The downpour slackened and ceased soon after the moon began to shed an obscured but brilliant light through the clouds.

Presently the east commenced to grow luminous, and this time there could be no doubt as to what was coming.

Alice crept closer to the man as the grey light rose upon the watery air.

'Kiss me!' she whispered suddenly, throwing her arms around his neck. He could feel her trembling. 'Say you love me; hold me in your arms. There is only an hour.'

'Don't be afraid. Try to face it bravely,' stammered Eastwood.

'I don't fear it—not death. But I have never lived. I have always been timid and wretched and afraid—afraid to speak—and I've almost wished for suffering and misery or anything rather than to be stupid and dumb and dead, the way I've always been.'

'I've never dared to tell anyone what I was, what I wanted. I've been afraid all my life, but I'm not afraid now. I have never lived; I have never been happy; and now we must die together!'

It seemed to Eastwood the cry of the perishing world. He held her in his arms and kissed her wet, tremulous face that was strained to his.

The twilight was gone before they knew it. The sky was blue already, with crimson flakes mounting to the zenith, and the heat was growing once more intense.

'This is the end, Alice,' said Eastwood, and his voice trembled. She looked at him, her eyes shining with an unearthly softness and brilliancy, and turned her face to the east.

There, in crimson and orange, flamed the last dawn that human eyes would ever see.

AS EASY AS ABC

RUDYARD KIPLING

The ABC, that semi-elected, semi-nominated body of a few score persons, controls the Planet. Transportation is Civilization, our motto runs. Theoretically we do what we please, so long as we do not interfere with the traffic and all it implies. Practically, the ABC confirms or annuls all international arrangements, and, to judge from its last report, finds our tolerant, humorous, lazy little Planet only too ready to shift the whole burden of public administration on its shoulders.

'With the Night Mail'. *Actions and Reactions*

Isn't it almost time that our Planet took some interest in the proceedings of the Aerial Board of Control? One knows that easy communications nowadays, and lack of privacy in the past, have killed all curiosity among mankind, but as the Board's Official Reporter I am bound to tell my tale.

At 9.30 a.m., 26 August, AD 2065, the Board, sitting in London, was informed by De Forest that the District of Northern Illinois had riotously cut itself out of all systems and would remain disconnected till the Board should take over and administer it direct.

Every Northern Illinois freight and passenger tower was, he reported, out of action; all District main, local, and guiding lights had been extinguished; all General Communications were dumb, and through traffic had been diverted. No reason had been given, but he gathered unofficially from the Mayor of Chicago that the District complained of 'crowd-making and invasion of privacy'.

As a matter of fact, it is of no importance whether Northern Illinois stay in or out of planetary circuit; as a matter of policy, any complaint of invasion of privacy needs immediate investigation, lest worse follow.

By 9.45 a.m. De Forest, Dragomiroff (Russia), Takahira (Japan), and Pirolo (Italy) were empowered to visit Illinois and 'to take such steps as might be necessary for the resumption of traffic and *all that that implies*'. By 10 a.m. the Hall was empty, and the four Members

A MARTIAN ODYSSEY

STANLEY G. WEINBAUM

Jarvis stretched himself as luxuriously as he could in the cramped general quarters of the *Ares*.

'Air you can breathe!' he exulted. 'It feels as thick as soup after the thin stuff out there!' He nodded at the Martian landscape stretching flat and desolate in the light of the nearer moon, beyond the glass of the port.

The other three stared at him sympathetically—Putz, the engineer, Leroy, the biologist, and Harrison, the astronomer and captain of the expedition. Dick Jarvis was chemist of the famous crew, the *Ares* expedition, first human beings to set foot on the mysterious neighbour of the Earth, the planet Mars. This, of course, was in the old days, less than twenty years after the mad American Doheny perfected the atomic blast at the cost of his life, and only a decade after the equally mad Cardoza rode on it to the Moon. They were true pioneers, these four of the *Ares*. Except for a half-dozen Moon expeditions and the ill-fated de Lancey flight aimed at the seductive orb of Venus, they were the first men to feel other gravity than earth's, and certainly the first successful crew to leave the Earth—Moon system. And they deserved that success when one considers the difficulties and discomforts—the months spent in acclimatization chambers back on Earth, learning to breathe the air as tenuous as that of Mars, the challenging of the void in the tiny rocket driven by the cranky reaction motors of the twenty-first century, and mostly the facing of an absolutely unknown world.

Jarvis stretched and fingered the raw and peeling tip of his frost-bitten nose. He sighed again contentedly.

'Well,' exploded Harrison abruptly, 'are we going to hear what happened? You set out all shipshape in an auxiliary rocket, we don't get a peep for ten days, and finally Putz here picks you out of a lunatic ant-heap with a freak ostrich as your pal! Spill it, man! 'Speel!' queried Leroy perplexedly. 'Speel what?'

'He means "speel"', explained Putz soberly. 'It iss to tell.' Jarvis met Harrison's amused glance without the shadow of a smile. 'That's right, Karl,' he said in grave agreement with Putz. '*Ich speiel es!*' He grunted comfortably and began.

'According to orders,' he said, 'I watched Karl here take off towards the North, and then I got into my flying sweat-box and headed South. You'll remember, Cap—we had orders not to land, but just scout about for points of interest. I set the two cameras clicking and buzzed along, riding pretty high—about two thousand feet—for a couple of reasons. First, it gave the cameras a greater field, and second, the under-jets travel so far in this half-vacuum they call air here that they stir up dust if you move low.'

'We know all that from Putz,' grunted Harrison. 'I wish you'd saved the films, though. They'd have paid the cost of this junket; remember how the public mobbed the first moon pictures?'

'The films are safe,' retorted Jarvis. 'Well,' he resumed, 'as I said, I buzzed along at a pretty good clip; just as we figured, the wings haven't much lift in this air at less than a hundred miles per hour, and even then I had to use the under-jets.'

'So, with the speed and the altitude and the blurring caused by the under-jets, the seeing wasn't any too good. I could see enough, though, to distinguish that what I sailed over was just more of this grey plain that we'd been examining the whole week since our landing—same blobby growths and the same eternal carpet of crawling little plant-animals, or biopods, as Leroy calls them. So I sailed along, calling back my position every hour as instructed, and not knowing whether you heard me.'

'I did!' snapped Harrison.

'A hundred and fifty miles south,' continued Jarvis imperturbably, 'the surface changed to a sort of low plateau, nothing but desert and orange-tinted sand. I figured that we were right in our guess, then, and this grey plain we dropped on was really the Mare Gimmerium, which would make my orange desert the region called Xanthus. If I were right, I ought to hit another grey plain, the Mare Chironium in another couple of hundred miles, and then another orange desert, Thyle I or II. And so I did.'

'Putz verified our position a week and a half ago!' grumbled the captain. 'Let's get to the point.'

'Coming!' remarked Jarvis. 'Twenty miles into Thyle—believe it or not—I crossed a canal!'

'Putz photographed a hundred! Let's hear something new!'
'And did he also see a city?'

'Twenty of 'em, if you call those heaps of mud cities!'

'Well,' observed Jarvis, 'from here on I'll be telling a few things Putz didn't see! He rubbed his tingling nose, and continued, 'I knew that I had sixteen hours of daylight at this season, so eight hours—eight hundred miles—from here, I decided to turn back. I was still over Thyle, whether I or II I'm not sure, not more than twenty-five miles into it. And right there, Putz's pet motor quit!'

'Quit? How?' Putz was solicitous.

'The atomic blast got weak. I started losing altitude right away, and suddenly there I was with a thump right in the middle of Thyle! Smashed my nose on the window, too!' He rubbed the injured member ruefully.

'Did you maybe try vashing der combustion chamber mit acid sulphuric?' enquired Putz. 'Sometimes der lead giffs a secondary radiation—'

'Naw!' said Jarvis disgustedly. 'I wouldn't try that, of course—no more than ten times! Besides, the bump flattened the landing gear and busted off the under-jets. Suppose I got the thing working—what then? Ten miles with the blast coming right out of the bottom and I'd have melted the floor from under me!' He rubbed his nose again. 'Lucky for me a pound only weighs seven ounces here, or I'd have been mashed flat!'

'I could have fixed!' ejaculated the engineer. 'I bet it was no serious.'

'Probably not,' agreed Jarvis sarcastically. 'Only it wouldn't fly. Nothing serious, but I had my choice of waiting to be picked up or trying to walk back—eight hundred miles, and perhaps twenty days before we had to leave! Forty miles a day! Well,' he concluded, 'I chose to walk. Just as much chance of being picked up, and it kept me busy.'

'We'd have found you,' said Harrison.

'No doubt. Anyway, I rigged up a harness from some seat straps and put the water tank on my back, took a cartridge belt and revolver, and some iron rations, and started out.'

'Water tank!' exclaimed the little biologist, Leroy. 'She weigh! one-quarter ton!'

'Wasn't full. Weighed about two hundred and fifty pounds earth-weight, which is eighty-five here. Then, besides, my own personal

two hundred and ten pounds is only seventy on Mars, so, tank and all, I grossed a hundred and fifty-five, or fifty-five pounds less than my everyday Earth-weight. I figured on that when I undertook the forty-mile daily stroll. Oh—of course I took a thermoskin sleeping bag for these wintry Martian nights.

'Off I went, bouncing along pretty quickly. Eight hours of daylight meant twenty miles or more. It got tiresome, of course—plugging along over a soft sand desert with nothing to see, not even Leroy's crawling biopods. But an hour or so brought me to the canal—just a dry ditch about four hundred feet wide, and straight as a railroad on its own company map.

'There'd been water in it sometime, though. The ditch was covered with what looked like a nice green lawn. Only, as I approached, the lawn moved out of my way!'

'Eh?' said Leroy.

'Yeah, it was a relative of your biopods. I caught one—a little grass-like blade about as long as my finger, with two thin, stemmy legs.'

'He is where?' Leroy was eager.

'He is let go! I had to move, so I ploughed along with the walking grass opening in front and closing behind. And then I was out on the orange desert of Thyle again.

'I plugged steadily along, cussing the sand that made going so tiresome, and, incidentally, cussing that cranky motor of yours, Karl. It was just before twilight that I reached the edge of Thyle, and looked down over the grey Mare Chromium. And I knew there was seventy-five miles of *that* to be walked over, and then a couple of hundred miles of that Xanthus desert, and about as much more Mare Cimmerium. Was I pleased? I started cussing you fellows for not picking me up!'

'We were trying, you sap!' said Harrison.

'That didn't help. Well, I figured I might as well use what was left of daylight in getting down the cliff that bounded Thyle. I found an easy place, and down I went. Mare Chromium was just the same sort of place as this—crazy leafless plants and a bunch of crawlers; I gave it a glance and hauled out my sleeping bag. Up to that time, you know, I hadn't seen anything worth worrying about on this half-dead world—nothing dangerous, that is.'

'Did you?' queried Harrison.

'Did I! You'll hear about it when I come to it. Well, I was

just about to turn in when suddenly I heard the wildest sort of shenanigans!

'Vot iss shenanigans?' enquired Putz.

'He says, "Je ne sais quoi,"' explained Leroy. 'It is to say, "I don't know what".'

'That's right,' agreed Jarvis. 'I didn't know what, so I sneaked over to find out. There was a racket like a flock of crows eating a bunch of canaries—whistles, cackles, caws, trills, and what have you. I rounded a clump of stumps, and there was Tweel!

'Tweel?' said Harrison, and 'Tweel?' said Leroy and Putz.

'That freak ostrich,' explained the narrator. 'At least, Tweel is as near as I can pronounce it without sputtering. He called it some thing like "Trrrweerrill".'

'What was he doing?' asked the Captain.

'He was being eaten! And squealing, of course, as any one would.'

'Eaten! By what?'

'I found out later. All I could see then was a bunch of blackropy arms tangled around what looked like, as Putz described it to you, an ostrich. I wasn't going to interfere, naturally; if both creatures were dangerous, I'd have one less to worry about.

'But the bird-like thing was putting up a good battle, dealing vicious blows with an eighteen-inch beak, between screeches. And besides, I caught a glimpse or two of what was on the end of those arms!' Jarvis shuddered. 'But the clincher was when I noticed a little black bag or case hung about the neck of the bird-thing! It was intelligent! That or tame, I assumed. Anyway, it clinched my decision. I pulled out my automatic and fired into what I could see of its antagonist.

'There was a flurry of tentacles and a spurt of black corruption and then the thing, with a disgusting sucking noise, pulled itself and its arms into a hole in the ground. The other let out a series of clacks, staggered around on legs about as thick as golf sticks, and turned suddenly to face me. I held my weapon ready, and the two of us stared at each other.

'The Martian wasn't a bird, really. It wasn't even birdlike, except just at first glance. It had a beak all right, and a few feathery appendages, but the beak wasn't really a beak. It was somewhat flexible; I could see the tip bend slowly from side to side; it was almost like a cross between a beak and a trunk. It had four-toed

feet, and four fingered things—hands, you'd have to call them, and a little roundish body, and a long neck ending in a tiny head—and that beak. It stood an inch or so taller than I, and—well, Putz saw it!

The engineer nodded. 'Ja! I saw!'

Jarvis continued. 'So—we stared at each other. Finally the creature went into a series of clackings and twitterings and held out its hands towards me, empty. I took that as a gesture of friendship. 'Perhaps,' suggested Harrison, 'it looked at that nose of yours and thought you were its brother!'

'Huh! You can be funny without talking! Anyway, I put up my gun and said "Aw, don't mention it", or something of the sort, and the thing came over and we were pals.

'By that time, the sun was pretty low and I knew that I'd better build a fire or get into my thermo-skin. I decided on the fire. I picked a spot at the base of the Thyle cliff, where the rock could reflect a little heat on my back. I started breaking off chunks of this desiccated Martian vegetation, and my companion caught the idea and brought in an armful. I reached for a match, but the Martian fished into his pouch and brought out something that looked like a glowing coal; one touch of it, and the fire was blazing—and you all know what a job we have starting a fire in this atmosphere!

'And that bag of his!' continued the narrator. 'That was a manufactured article, my friends; press an end and she popped open—press the middle and she sealed so perfectly you couldn't see the line. Better than zippers.

'Well, we stared at the fire a while and I decided to attempt some sort of communication with the Martian. I pointed at myself and said "Dick"; he caught the drift immediately, stretched a bony claw at me and repeated "Tick". Then I pointed at him, and he gave that whistle I called Tweel; I can't imitate his accent. Things were going smoothly; to emphasize the names, I repeated "Dick", and then, pointing at him, "Tweel".'

'There we stuck! He gave some clacks that sounded negative, and said something like "P-p-p-root". And that was just the beginning; I was always "Tick", but as for him—part of the time he was "Tweel", and part of the time he was "P-p-p-root", and part of the time he was sixteen other noises!

'We just couldn't connect, I tried "rock", and I tried "star", and "tree", and "fire", and Lord knows what else, and try as I would, I

couldn't get a single word! Nothing was the same for two successive minutes, and if that's a language, I'm an alchemist! Finally I gave it up and called him Tweel, and that seemed to do.

'But Tweel hung on to some of my words. He remembered a couple of them, which I suppose is a great achievement if you're used to a language you have to make up as you go along. But I couldn't get the hang of his talk; either I missed some subtle point or we just didn't *think* alike—and I rather believe the latter view.

'I've other reasons for believing that. After a while I gave up the language business, and tried mathematics. I scratched two plus two equals four on the ground, and demonstrated it with pebbles. Again Tweel caught the idea, and informed me that three plus three equals six. Once more we seemed to be getting somewhere.

'So, knowing that Tweel had at least a grammar school education, I drew a circle for the sun, pointing first at it, and then at the Mother Earth, and Mars, and finally, pointing to Mars, I swept my hand around in a sort of inclusive gesture to indicate that Mars was our current environment. I was working up to putting over the idea that my home was on the Earth.

'Tweel understood my diagram all right. He poked his beak at it and with a great deal of trilling and clucking, he added Deimos and Phobos to Mars, and then sketched in the Earth's Moon!

'Do you see what that proves? It proves that Tweel's race uses telescopes—that they're civilized!

'Does not!' snapped Harrison. 'The Moon is visible from here as a fifth magnitude star. They could see its revolution with the naked eye.'

'The Moon, yes!' said Jarvis. 'You've missed my point. Mercury isn't visible! And Tweel knew of Mercury because he placed the Moon at the *third* planet, not the second. If he didn't know Mercury, he'd put the Earth second, and Mars third, instead of fourth! See?'

'Humph!' said Harrison.

'Anyway,' proceeded Jarvis, 'I went on with my lesson. Things were going smoothly, and it looked as if I could put the idea over. I pointed at the Earth on my diagram, and then at myself, and then to clinch it, I pointed to myself and then to the Earth itself shining bright green almost at the zenith.

'Tweel set up such an excited clacking that I was certain he understood. He jumped up and down, and suddenly he pointed at himself and then at the sky, and then at himself and at the sky again. He pointed at his middle and then at Arcturus, at his head and then at Spica, at his feet and then at half a dozen stars, while I just gaped at him. Then, all of a sudden, he gave a tremendous leap. Man, what a hop! He shot straight up into the starlight, seventy-five feet if an inch! I saw him silhouetted against the sky, saw him turn and come down at me head first, and land smack on his beak like a javelin! There he stuck square in the centre of my sun-circle in the sand—a bull's eye!

'Nuts!' observed the captain. 'Plain nuts!'

'That's what I thought, too! I just stared at him open-mouthed while he pulled his head out of the sand and stood up. Then I figured he'd missed my point, and I went through the whole blamed rigmarole again, and it ended the same way, with Tweel on his nose in the middle of my picture!'

'Maybe it's a religious rite,' suggested Harrison.

'Maybe,' said Jarvis dubiously. 'Well, there we were. We could exchange ideas up to a certain point, and then—blooey! Something in us was different, unrelated; I don't doubt that Tweel thought me just as screwy as I thought him. Our minds simply looked at the world from different viewpoints, and perhaps his viewpoint is as irue as ours. But—we couldn't get together, that's all. Yet, in spite of all difficulties, I *liked* Tweel, and I have a queer certainty that he liked me.'

'Nuts!' repeated the captain. 'Just daffy!'

'Yeah? Wait and see. A couple of times I've thought that perhaps we—' He paused, and then resumed his narrative. 'Anyway, I finally gave it up, and got into my thermo-skin to sleep. The fire hadn't kept me any too warm, but that damned sleeping bag did. Got stuify five minutes after I closed myself in. I opened it a little and bingo! Some eighty-below-zero air hit my nose, and that's when I got this pleasant little frostbite to add to the bump I acquired during the crash of my rocket.

'I don't know what Tweel made of my sleeping. He sat around, but when I woke up, he was gone. I'd just crawled out of my bag, though, when I heard some twittering, and there he came, sailing down from that three-storey Thyle cliff to alight on his beak beside

me. I pointed to myself and towards the north, and he pointed at himself and towards the south, but when I loaded up and started away, he came along.

'Man, how he travelled! A hundred and fifty feet at a jump sailing through the air stretched out like a spear, and landing on his beak. He seemed surprised at my plodding, but after a few moments he fell in beside me, only every few minutes he'd go into one of his leaps, and stick his nose into the sand a block ahead of me. Then he'd come shooting back at me; it made me nervous at first to see that beak of his coming at me like a spear, but he always ended in the sand at my side.

'So the two of us plugged along across the Mare Chronium. Same sort of place as this—same crazy plants and same little green biopods growing in the sand, or crawling out of your way. We talked—not that we understood each other, you know, but just for company. I sang songs, and I suspect Tweel did too; at least, some of his trillings and twitterings had a subtle sort of rhythm.

'Then, for variety, Tweel would display his smattering of English words. He'd point to an outcropping and say "rock", and point to a pebble and say it again; or he'd touch my arm and say "Tick", and then repeat it. He seemed terrifically amused that the same word meant the same thing twice in succession, or that the same word could apply to two different objects. It set me wondering if perhaps his language wasn't like the primitive speech of some earth people—you know, Captain, like the Negritoes, for instance, who haven't any generic words. No word for food or water or man—words for good food and bad food, or rain water and sea water, or strong man and weak man—but no names for general classes. They're too primitive to understand that rain water and sea water are just different aspects of the same thing. But that wasn't the case with Tweel; it was just that we were somehow mysteriously different—our minds were alien to each other. And yet—we like each other!'

'Looney, that's all,' remarked Harrison. 'That's why you two were so fond of each other.'

'Well, I like *you!*' countered Jarvis wickedly. 'Anyway,' he resumed, 'don't get the idea that there was anything screwy about Tweel. In fact, I'm not so sure but that he couldn't teach our highly praised human intelligence a trick or two. Oh, he wasn't an intellectual superman, I guess; but don't overlook the point that he

managed to understand a little of my mental workings, and I never even got a glimmering of his.'

'Because he didn't have any!' suggested the captain, while Puiz and Leroy blinked attentively.

'You can judge of that when I'm through,' said Jarvis. 'Well, we plugged along across the Mare Chronium all that day, and all the next. Mare Chronium—Sea of Time! Say, I was willing to agree with Schiaparelli's name by the end of that march! Just that grey, endless plain of weird plants, and never a sign of any other life. It was so monotonous that I was even glad to see the desert of Xanthus towards the evening of the second day.

'I was fair worn out, but Tweel seemed as fresh as ever, for all I never saw him drink or eat. I think he could have crossed the Mare Chronium in a couple of hours with those block-long nose dives of his, but he stuck along with me. I offered him some water once or twice; he took the cup from me and sucked the liquid into his beak, and then carefully squirted it all back into the cup and gravely returned it.

'Just as we sighted Xanthus, or the cliffs that bounded it, one of those nasty sand clouds blew along, not as bad as the one we had here, but mean to travel against. I pulled the transparent flap of my thermo-skin bag across my face and managed pretty well, and I noticed that Tweel used some feathery appendages growing like a moustache at the base of his beak to cover his nostrils, and some similar fuzz to shield his eyes.'

'He is a desert creature!' ejaculated the little biologist, Leroy. 'Huh? Why?'

'He drink no water—he is adapt' for sand storm.—'

'Proves nothing! There's not enough water to waste anywhere on this desiccated pill called Mars. We'd call all of it desert on earth, you know.' He paused. 'Anyway, after the sandstorm blew over, a little wind kept blowing in our faces, not strong enough to stir the sand. But suddenly things came drifting along from the Xanthus cliffs—small, transparent spheres, for all the world like glass tennis balls! But light—they were almost light enough to float even in this thin air—empty, too; at least, I cracked open a couple and nothing came out but a bad smell. I asked Tweel about them, but all he said was "No, no, no", which I took to mean that he knew nothing about them. So they went bouncing by like tumbleweeds, or like soap bubbles, and we plugged on towards Xanthus. Tweel pointed

at one of the crystal balls once and said "rock", but I was too tired to argue with him. Later I discovered what he meant.

'We came to the bottom of the Xanthus cliffs finally, when there wasn't much daylight left. I decided to sleep on the plateau if possible; anything dangerous, I reasoned, would be more likely to prowl through the vegetation of the Mare Chromium than the sand of Xanthus. Not that I'd seen a single sign of menace, except the rope-armed black thing that had trapped Tweel, and apparently that didn't prowl at all, but lured its victims within reach. It couldn't lure me while I slept, especially as Tweel didn't seem to sleep at all but simply sat patiently around all night. I wondered how the creature had managed to trap Tweel, but there wasn't any way of asking him. I found that out too, later; it's devilish!

'However, we were ambling around the base of the Xanthus barrier looking for an easy spot to climb. At least, I was. Tweel could have leaped it easily, for the cliffs were lower than Thyle—perhaps sixty feet. I found a place and started up, sweating at the water tank strapped to my back—it didn't bother me except when climbing—and suddenly I heard a sound that I thought I recognized!

'You know how deceptive sounds are in this thin air. A shot sounds like the pop of a cork. But this sound was the drone of a rocket, and sure enough, there went our second auxiliary about ten miles to westward, between me and the sunset!

'Vas me!' said Putz. 'I hunt for you.'

'Yeah; I knew that, but what good did it do me? I hung on to the cliff and yelled and waved with one hand. Tweel saw it too, and set up a trilling and twittering, leaping to the top of the barrier and then high into the air. And while I watched, the machine dived on into the shadows to the south.

'I scrambled to the top of the cliff. Tweel was still pointing and trilling excitedly, shooting up towards the sky and coming down head-on to stick upside down on his beak in the sand. I pointed towards the south and at myself, and he said, 'Yes—Yes—Yes' but somehow I gathered that he thought the flying thing was a relative of mine, probably a parent. Perhaps I did his intellect an injustice; I think now that I did.

'I was bitterly disappointed by the failure to attract attention. I pulled out my thermo-skin bag and crawled into it, as the night chill was already apparent. Tweel stuck his beak into the sand and

drew up his legs and arms and looked for all the world like one of those leafless shrubs out there. I think he stayed that way all night.'

'Protective mimicry!' ejaculated Leroy. 'See? He is desert creature!' In the morning, resumed Jarvis, 'we started off again. We hadn't gone a hundred yards into Xanthus when I saw something queer! This is one thing Putz didn't photograph, I'll wager!

'There was a line of little pyramids—tiny ones, not more than six inches high, stretching across Xanthus as far as I could see! Little buildings made of pygmy bricks, they were, hollow inside and truncated, or at least broken at the top and empty. I pointed at them and said "What?" to Tweel, but he gave some negative twitters to indicate, I suppose, that he didn't know. So off we went, following the row of pyramids because they ran north, and I was going north.

'Man, we trailed that line for hours! After a while, I noticed another queer thing: they were getting larger. Same number of bricks in each one, but the bricks were larger.

'By noon they were shoulder high. I looked into a couple—all just the same, broken at the top and empty. I examined a brick or two as well; they were silica, and old as creation itself!

'How you know?' asked Leroy.

'They were weathered—edges rounded. Silica doesn't weather easily even on earth, and in this climate—'

'How old you think?'

'Fifty thousand—a hundred thousand years. How can I tell? The little ones we saw in the morning were older—perhaps ten times as old. Crumbling. How old would that make them? Half a million years? Who knows?' Jarvis paused a moment. 'Well,' he resumed, 'we followed the line. Tweel pointed at them and said "rock" once or twice, but he'd done that many times before. Besides, he was more or less right about these.

'I tried questioning him. I pointed at a pyramid and asked "People?" and indicated the two of us. He set up a negative sort of clucking and said, "No, no, no. No one-one-two. No two-two-four", meanwhile rubbing his stomach. I just stared at him and he went through the business again. "No one-one-two. No two-two-four." I just gaped at him.'

'That proves it!' exclaimed Harrison. 'Nuts!'

'You think so?' queried Jarvis sardonically. 'Well, I figured it out different! "No one-one-two!" You don't get it, of course, do you?'

'Nope—nor do you!'

'I think I do! Tweel was using the few English words he knew to put over a very complex idea. What, let me ask, does mathematics make you think of?'

'Why—of astronomy. Or—or logic!'

'That's it! "No one-one-two!" Tweel was telling me that the builders of the pyramids weren't people—or that they weren't intelligent, that they weren't reasoning creatures! Get it?'

'Huh! I'll be damned!'

'You probably will.'

'Why,' put in Leroy, 'he rub his belly?'

'Why? Because, my dear biologist, that's where his brains are! Not in his tiny head—in his middle!'

'C'est impossible!'

'Not on Mars, it isn't! This flora and fauna aren't earthly; your biopods prove that! Jarvis grinned and took up his narrative. 'Anyway, we plugged along across Xanthus and in about the middle of the afternoon, something else queer happened. The pyramids ended.'

'Ended!'

'Yeah; the queer part was that the last one—and now they were ten-footers—was capped! See? Whatever built it was still inside; we'd trailed 'em from their half-million-year-old origin to the present.

'Tweel and I noticed it about the same time. I yanked out my automatic (I had a clip of Boland explosive bullets in it) and Tweel quick as a sleight-of-hand trick, snapped a queer little glass revolver out of his bag. It was much like our weapons, except that the grip was larger to accommodate his four-taloned hand. And we held our weapons ready while we sneaked up along the lines of empty pyramids.

'Tweel saw the movement first. The top tiers of bricks were heaving, shaking, and suddenly slid down the sides with a thin crash. And then—something—something was coming out!

'A long, silvery-grey arm appeared, dragging after it an armoured body. Armoured, I mean, with scales, silver-grey and dull-shining. The arm heaved the body out of the hole; the beast crashed to the sand.

'It was a nondescript creature—body like a big grey cask, arm and a sort of mouth-hole at one end; stiff, pointed tail at the

other—and that's all. No other limbs, no eyes, ears, nose—nothing! The thing dragged itself a few yards, inserted its pointed tail in the sand, pushed itself upright, and just sat.

'Tweel and I watched it for ten minutes before it moved. Then, with a creaking and rustling like—oh, like crumpling stiff paper—its arm moved to the mouth-hole and out came a brick! The arm placed the brick carefully on the ground, and the thing was still again.

'Another ten minutes—another brick. Just one of Nature's bricklayers. I was about to slip away and move on when Tweel pointed at the thing and said "rock"! I went "huh?" and he said it again. Then, to the accompaniment of some of his trilling, he said, "No—no—", and gave two or three whistling breaths.

'Well, I got his meaning, for a wonder! I said, "No breath?" and demonstrated the word. Tweel was ecstatic; he said, "Yes, yes, yes! No, no, no, breathe!" Then he gave a leap and sailed out to land on his nose about one pace from the monster!

'I was startled, you can imagine! The arm was going up for a brick, and I expected to see Tweel caught and mangled, but—nothing happened! Tweel pounded on the creature, and the arm took the brick and placed it neatly beside the first. Tweel rapped on its body again, and said "rock", and I got up nerve enough to take a look myself.

'Tweel was right again. The creature was rock, and it didn't breathe!

'How you know?' snapped Leroy, his black eyes blazing interest. 'Because I'm a chemist. The beast was made of silica! There must have been pure silicon in the sand, and it lived on that. Get it! We, and Tweel, and those plants out there, and even the biopods are carbon life; this thing lived by a different set of chemical reactions. It was silicon life!'

'*La vie silicieuse!*' shouted Leroy. 'I have suspect, and now it is proof! I must go see! *Il faut que je—*'

'All right! All right!' said Jarvis. 'You can go see. Anyhow, there the thing was, alive and yet not alive, moving every ten minutes, and then only to remove a brick. Those bricks were its waste matter. See, Frenchy? We're carbon, and our waste is carbon dioxide, and this thing is silicon, and its waste is silicon dioxide—silica. But silica is a solid, hence the bricks. And it builds itself in, and when it is covered, it moves over to a fresh place to start over.'

No wonder it creaked! A living creature half a million years old!

'How you know how old?' Leroy was frantic.

'We trailed its pyramids from the beginning didn't we? If this weren't the original pyramid builder, the series would have ended somewhere before we found him, wouldn't it?—ended and started over with the small ones. That's simple enough, isn't it?

'But he reproduces, or tries to. Before the third brick came out there was a little rustle and out popped a whole stream of those little crystal balls. They're his spores, or eggs, or seeds—call 'em what you want. They went bouncing by across Xanthus just as they'd bounced by us back in the Mare Chronium. I've a hunch how they work, too—this is for your information, Leroy. I think the crystal shell of silica is no more than a protective covering, like an eggshell, and that the active principle is the smell inside. Its some sort of gas that attacks silicon, and if the shell is broken near a supply of that element, some reaction starts that ultimately develops into a beast like that one.'

'You should try!' exclaimed the little Frenchman. 'We must break one to see!'

'Yeah? Well, I did. I smashed a couple against the sand. Would you like to come back in about ten thousand years to see if I planted some pyramid monsters? You'd most likely be able to tell by that time!' Jarvis paused and drew a deep breath. 'Lord! That queer creature! Do you picture it? Blind, deaf, nerveless, brainless—just a mechanism, and yet—immortal! Bound to go on making bricks, building pyramids, as long as silicon and oxygen exist, and even afterwards it'll just stop. It won't be dead. If the accidents of a million years bring it its food again, there it'll be ready to run again, while brains and civilizations are part of the past. A queer beast—yet I met a stranger one!'

'If you did, it must have been in your dreams!' growled Harrison. 'You're right!' said Jarvis soberly. 'In a way, you're right. The dream-beast! That's the best name for it—and it's the most fiendish, terrifying creation one could imagine! More dangerous than a lion, more insidious than a snake!'

'Tell me!' begged Leroy. 'I must go see!'

'Not this devil!' He paused again. 'Well,' he resumed, 'Tweel and I left the pyramid creature and ploughed along through Xanthus. I was tired and a little disheartened by Putz's failure to pick me up

and Tweel's trilling got on my nerves, as did his flying nosedives. So I just strode along without a word, hour after hour across that monotonous desert.

'Towards mid-afternoon we came in sight of a low dark line on the horizon. I knew what it was. It was a canal; I'd crossed it in the rocket and it meant that we were just one-third of the way across Xanthus. Pleasant thought, wasn't it! And still, I was keeping up to schedule.

'We approached the canal slowly; I remembered that this one was bordered by a wide fringe of vegetation and that Mudheap City was on it.

'I was tired, as I said. I kept thinking of a good hot meal, and then from that I jumped to reflections of how nice and home-like even Borneo would seem after this crazy planet, and from that, to thoughts of little old New York, and then to thinking about a girl I know: there—Fancy Long. Know her?'

'Vision entertainer,' said Harrison. 'I've tuned her in. Nice blonde—dances and sings on the *Yerba Mate* hour.'

'That's her,' said Jarvis ungrammatically. 'I know her pretty well—just friends, get me?—though she came down to see us off in the *Azrs*. Well, I was thinking about her, feeling pretty lonesome, and all the time we were approaching that line of rubbery plants.

'And then—I said, "What 'n Hell!" and stared. And there she was—Fancy Long, standing plain as day under one of those crack-brained trees, and smiling and waving just the way I remembered her when we left!'

'Now you're nuts, too!' observed the captain.

'Boy, I almost agreed with you! I stared and pinched myself and closed my eyes and then stared again—and every time, there was Fancy Long smiling and waving! Tweel saw something, too; he was trilling and clucking away, but I scarcely heard him. I was bounding towards her over the sand, too amazed even to ask myself questions.

'I wasn't twenty feet from her when Tweel caught me with one of his flying leaps. He grabbed my arm, yelling, "No—no—no!" in his squeaky voice. I tried to shake him off—he was as light as if he were built of bamboo—but he dug his claws in and yelled. And finally some sort of sanity returned to me and I stopped less than ten feet from her. There she stood, looking as solid as Putz's head!'

'Vot?' said the engineer.

'She smiled and waved, and waved and smiled, and I stood there dumb as Leroy, while Tweel squeaked and chattered. I *knew* it couldn't be real, yet—there she was!

'Finally I said, "Fancy! Fancy Long!" She just kept on smiling and waving, but looking as real as if I hadn't left her thirty-seven million miles away.

'Tweel had his glass pistol out, pointing it at her. I grabbed his arm, but he tried to push me away. He pointed at her and said, "No breet! No breet!" and I understood that he meant that the Fancy Long thing wasn't alive. Man, my head was whirling!

'Still, it gave me the jitters to see him pointing his weapon at her. I don't know why I stood there watching him take careful aim, but I did. Then he squeezed the handle of his weapon; there was a little puff of steam, and Fancy Long was gone! And in her place was one of those writhing, black, rope-armed horrors like the one I'd saved Tweel from!

'The dream-beast! I stood there dizzy, watching it die while Tweel trilled and whistled. Finally he touched my arm, pointed at the twisting thing, and said, "You one-one-two, he one-one-two." After he'd repeated it eight or ten times, I got it. Do any of you?

'*Ouui!* shrilled Leroy. '*Moi—je le comprends!* He mean you think of something, the beast he know, and you see it! *Un chiten*—a hungry dog, he would see the big bone with meat! Or smell it—not?'

'Right!' said Jarvis. 'The dream-beast uses its victim's longings and desires to trap its prey. The bird at nesting season would see its mate, the fox, prowling for its own prey, would see a helpless rabbit!'

'How he do?' queried Leroy.

'How do I know? How does a snake back on earth charm a bird into its very jaws? And aren't there deep-sea fish that lure their victims into their mouths? Lord!' Jarvis shuddered. 'Do you see how insidious the monster is? We're warned now—but henceforth we can't trust even our eyes. You might see me—I might see one of you—and back of it may be nothing but another of those black horrors!'

'How'd your friend know?' asked the captain abruptly.

'Tweel? I wonder! Perhaps he was thinking of something that couldn't possibly have interested me, and when I started to run, he realized that I saw something different and was warned. Or perhaps the dream-beast can only project a single vision, and Tweel saw

what I saw—or nothing. I couldn't ask him. But it's just another proof that his intelligence is equal to ours or greater.'

'He's daffy. I tell you!' said Harrison. 'What makes you think his intellect ranks with the human?'

'Plenty of things! First, the pyramid-beast. He hadn't seen one before; he said as much. Yet he recognized it as a dead-alive automaton of silicon.'

'He could have heard of it,' objected Harrison. 'He lives around here, you know.'

'Well how about the language? I couldn't pick up a single idea of his and he learned six or seven words of mine. And do you realize what complex ideas he put over with no more than those six or seven words? The pyramid-monster—the dream-beast! In a single phrase he told me that one was a harmless automaton and the other a deadly hypnotist. What about that!'

'Huh!' said the captain.

'*Huh* if you wish! Could you have done it knowing only six words of English? Could you go even further, as Tweel did, and tell me that another creature was of a sort of intelligence so different from ours that understanding was impossible—even more impossible than that between Tweel and me?'

'Eh? What was that?'

'Later. The point I'm making is that Tweel and his race are worthy of our friendship. Somewhere on Mars—and you'll find I'm right—is a civilization and culture equal to ours, and maybe more than equal. And communication is possible between them and us; Tweel proves that. It may take years of patient trial, for their minds are alien, but less alien than the next minds we encountered—if they *are* minds.'

'The next ones? What next ones?'

'The people of the mud cities along the canals.' Jarvis frowned, then resumed his narrative. 'I thought the dream-beast and the silicon-monster were the strangest beings conceivable, but I was wrong. These creatures are still more alien, less understandable than either and far less comprehensible than Tweel, with whom friendship is possible, and even, by patience and concentration, the exchange of ideas.'

'Well,' he continued, 'we left the dream-beast dying, dragging itself back into its hole, and we moved towards the canal. There was a carpet of that queer walking-grass scampering out of our

way, and when we reached the bank, there was a yellow trickle of water flowing. The mound city I'd noticed from the rocket was a mile or so to the right and I was curious enough to want to take a look at it.

'It had seemed deserted from my previous glimpse of it, and if any creatures were lurking in it—well, Tweel and I were both armed. And by the way, that crystal weapon of Tweel's was an interesting device; I took a look at it after the dream-beast episode. It fired a little glass splinter, poisoned, I suppose, and I guess it held at least a hundred of 'em to a load. The propellant was steam—just plain steam!'

'Shteam!' echoed Putz. 'From vot come, shteam?'

'From water, of course! You could see the water through the transparent handle and about a gill of another liquid, thick and yellowish. When Tweel squeezed the handle—there was no trigger—a drop of water and a drop of the yellow stuff squirted into the firing chamber, and the water vaporized—pop!—like that. It's not so difficult; I think we could develop the same principle. Concentrated sulphuric acid will heat water almost to boiling, and so will quicklime, and there's potassium and sodium—

'Of course, his weapon hadn't the range of mine, but it wasn't so bad in this thin air, and it *did* hold as many shots as a cowboy's gun in a Western movie. It was effective, too, at least against Martian life; I tried it out, aiming at one of the crazy plants, and darned if the plant didn't wither up and fall apart! That's why I think the glass splinters were poisoned.

'Anyway, we trudged along towards the mud-heap city and I began to wonder whether the city builders dug the canals. I pointed to the city and then at the canal, and Tweel said "No—no—no!" and gestured towards the south. I took it to mean that some other race had created the canal system, perhaps Tweel's people. I don't know; maybe there's still another intelligent race on the planet, or a dozen others. Mars is a queer little world.

'A hundred yards from the city we crossed a sort of road—just a hard-packed mud trail, and then, all of a sudden, along came one of the mound builders!

'Man, talk about fantastic beings! It looked rather like a barrel trotting along on four legs with four other arms or tentacles. It had no head, just body and members and a row of eyes complete! around it. The top end of the barrel-body was a diaphragm stretched

as tight as a drum head, and that was all. It was pushing a little coppery cart and tore right past us like the proverbial bat out of hell. It didn't even notice us, although I thought the eyes on my side shifted a little as it passed.

'A moment later another came along, pushing another empty cart. Same thing—it just scooted past us. Well, I wasn't going to be ignored by a bunch of barrels playing train, so when the third one approached, I planted myself in the way—ready to jump, of course, if the thing didn't stop.

'But it did. It stopped and set up a sort of drumming from the diaphragm on top. And I held out both hands and said, "We are friends!" And what do you suppose the thing did?'

'Said, "Pleased to meet you," I'll bet!' suggested Harrison.

'I couldn't have been more surprised if it had! It drummed on its diaphragm, and then suddenly boomed out, "We are v-r-r-riends!" and gave its pushcart a vicious poke at me! I jumped aside, and away it went while I stared dumbly after it.

'A minute later another one came hurrying along. This one didn't pause, but simply drummed out, "We are v-r-r-riends!" and scurried by. How did it learn the phrase? Were all of the creatures in some sort of communication with each other? Were they all parts of some central organism? I don't know, though I think Tweel does.

'Anyway, the creatures went sailing past us, every one greeting us with the same statement. It got to be funny; I never thought to find so many friends on this God-forsaken ball! Finally I made a puzzled gesture to Tweel; I guess he understood, for he said, "One-one-two—yes!—two-two-four—no!" Get it?'

'Sure,' said Harrison. 'It's a Martian nursery rhyme.'

'Yeah! Well, I was getting used to Tweel's symbolism, and I figured it out this way. "One-one-two—yes!" The creatures were intelligent. "Two-two-four—no!" Their intelligence was not of our order, but something different and beyond the logic of two and two is four. Maybe I missed his meaning. Perhaps he meant that their minds were of low degree, able to figure out the simple things—"One-one-two—yes!"—but not more difficult things—"Two-two-four—no!" But I think from what we saw later that he meant the other.

'After a few moments, the creatures came rushing back—first one, then another. Their pushcarts were full of stones, sand, chunks

of rubbery plants, and such rubbish as that. They droned out their friendly greeting, which didn't really sound so friendly, and dashed on. The third one I assumed to be my first acquaintance and I decided to have another chat with him. I stepped into his path again and waited.

'Up he came, booming out his "We are v-r-r-riends" and stopped. I looked at him; four or five of his eyes looked at me. He tried his password again and gave a shove on his cart, but I stood firm. And then the—the dashed creature reached out one of his arms, and two finger-like nippers tweaked my nose!'

'Haw!' roared Harrison. 'Maybe the things have a sense of beauty!'

'Laugh!' grumbled Jarvis. 'I'd already had a nasty bump and a mean frostbite on that nose. Anyway, I yelled "Ouch!" and jumped aside and the creature dashed away; but from then on, their greeting was "We are v-r-r-riends! Ouch!" Queer beasts!

'Tweel and I followed the road squarely up to the nearest mound. The creatures were coming and going, paying us not the slightest attention, fetching their loads of rubbish. The road simply dived into an opening, and slanted down like an old mine, and in and out darted the barrel-people, greeting us with their eternal phrase.

'I looked in; there was a light somewhere below, and I was curious to see it. It didn't look like a flame or torch, you understand, but more like a civilized light, and I thought that I might get some clue as to the creatures' development. So in I went and Tweel tagged along, not without a few trills and twitters, however.

'The light was curious; it sputtered and flared like an old arc light, but came from a single black rod set in the wall of the corridor. It was electric, beyond doubt. The creatures were fairly civilized apparently.

'Then I saw another light shining on something that glittered and I went on to look at that, but it was only a heap of shiny sand. I turned toward the entrance to leave, and the Devil take me if it wasn't gone!

'I suppose the corridor had curved, or I'd stepped into a side passage. Anyway, I walked back in that direction I thought we'd come, and all I saw was more dimlit corridors. The place was a labyrinth! There was nothing but twisting passages running every way, lit by occasional lights, and now and then a creature running by, sometimes with a pushcart, sometimes without.

'Well, I wasn't much worried at first. Tweel and I had only come a few steps from the entrance. But every move we made after that seemed to get us in deeper. Finally I tried following one of the creatures with an empty cart, thinking that he'd be going out for his rubbish, but he ran around aimlessly, into one passage and out another. When he started dashing around a pillar like one of these Japanese walzing mice, I gave up, dumped my water tank on the floor, and sat down.

'Tweel was as lost as I. I pointed up and he said "No—no—no!" in a sort of helpless trill. And we couldn't get any help from the natives. They paid no attention at all, except to assure us they were friends—ouch!

'Lord! I don't know how many hours or days we wandered around there! I slept twice from sheer exhaustion; Tweel never seemed to need sleep. We tried following only the upward corridors, but they'd run uphill a ways and then curve downwards. The temperature in that damned ant hill was constant; you couldn't tell night from day and after my first sleep I didn't know whether I'd slept one hour or thirteen, so I couldn't tell from my watch whether it was midnight or noon.

'We saw plenty of strange things. There were machines running in some of the corridors, but they didn't seem to be doing anything—just wheels turning. And several times I saw two barrel-beasts with a little one growing between them, joined to both. 'Parthenogenesis!' exulted Leroy. 'Parthenogenesis by budding like *les tulipes!*'

'If you say so, Frenchy,' agreed Jarvis. 'The things never noticed us at all, except, as I say, to greet us with "We are v-r-r-riends! Ouch!" They seemed to have no home-life of any sort, but just scurried around with their pushcarts, bringing in rubbish. And finally I discovered what they did with it.

'We'd had a little luck with a corridor, one that slanted upwards for a great distance. I was feeling that we ought to be close to the surface when suddenly the passage debouched into a domed chamber, the only one we'd seen. And man!—I felt like dancing when I saw what looked like daylight through a crevice in the roof.

'There was a—a sort of machine in the chamber, just an enormous wheel that turned slowly, and one of the creatures was in the act of dumping his rubbish below it. The wheel ground it with a crunch—sand, stones, plants, all into powder that sifted away

somewhere. While we watched, others filed in, repeating the process, and that seemed to be all. No rhyme nor reason to the whole thing—but that's characteristic of this crazy planet. And there was another fact that's almost too bizarre to believe.

'One of the creatures, having dumped his load, pushed his cart aside with a crash and calmly shoved himself under the wheel. I watched him being crushed, too stupefied to make a sound, and a moment later, another followed him! They were perfectly melodical about it, too: one of the cartless creatures took the abandoned pushcart.

'Tweel didn't seem surprised; I pointed out the next suicide to him, and he just gave the most human-like shrug imaginable, as much as to say, "What can I do about it?" He must have known more or less about these creatures.

'Then I saw something else. There was something beyond the wheel, something shining on a sort of low pedestal. I walked over; there was a little crystal about the size of an egg, fluorescing to beat Tophet. The light from it stung my hands and face, almost like a static discharge, and then I noticed another funny thing. Remember that wart I had on my left thumb? Look! Jarvis extended his hand. 'It dried up and fell off—just like that! And my abused nose—say the pain went out of it like magic! The thing had the property of hard X-rays or gamma radiations, only more so; it destroyed diseased tissue and left healthy tissue unharmed!

'I was thinking what a present *that'd* be to take back to Mother Earth when a lot of racket interrupted. We dashed back to the other side of the wheel in time to see one of the pushcarts ground up. Some suicide had been careless, it seems.

'Then suddenly the creatures were booming and drumming all around us and their noise was decidedly menacing. A crowd of them advanced towards us; we backed out of what I thought was the passage we'd entered by, and they came rumbling after us some pushing carts and some not. Crazy brutes! There was a whole chorus of "We are v-r-r-riends! Ouch!" I didn't like the "ouch", it was rather suggestive.

'Tweel had his glass gun out and I dumped my water tank for greater freedom and got mine. We backed up the corridor with the barrel-beasts following—about twenty of them. Queer thing—the ones coming in with loaded carts moved past us inches away without a sign.

'Tweel must have noticed that. Suddenly, he snatched out that glowing coal cigar-lighter of his and touched a cart-load of plant limbs. Puff! The whole load was burning—and the crazy beast pushing it went right along without a change of pace! It created some disturbance among our "v-r-r-riends", however—and then I noticed the smoke eddying and swirling past us, and sure enough, there was the entrance!

I grabbed Tweel and out we dashed and after us our twenty pursuers. The daylight felt like Heaven, though I saw at first glance that the sun was all but set, and that was bad, since I couldn't live outside my thermo-skin bag in a Martian night—at least, without a fire.

And things got worse in a hurry. They cornered us in an angle between two mounds, and there we stood. I hadn't fired nor had Tweel; there wasn't any use in irritating the brutes. They stopped a little distance away and began their booming about friendship and ouches.

Then things got still worse! A barrel-brute came out with a pushcart and they all grabbed into it and came out with handfuls of foot-long copper darts—sharp-looking ones—and all of a sudden one sailed past my ear—zing! And it was shoot or die then.

'We were doing pretty well for a while. We picked off the ones next to the pushcart and managed to keep the darts at a minimum, but suddenly there was a thunderous booming of "v-r-r-riends" and "ouches", and a whole army of 'em came out of their hole.

'Man! We were through and I knew it! Then I realized that Tweel wasn't. He could have leaped the mound behind us as easily as not. He was staying for me!

'Say, I could have cried if there'd been time! I'd liked Tweel from the first, but whether I'd have had gratitude to do what he was doing—suppose I *had* saved him from the first dream-beast—he'd done as much for me, hadn't he? I grabbed his arm, and said "Tweel", and pointed up, and he understood. He said, "No—no—no, Tick!" and popped away with his glass pistol.

'What could I do? I'd be a goner anyway when the sun set, but I couldn't explain that to him. I said, "Thanks, Tweel. You're a man!" and felt that I wasn't paying him any compliment at all. A man! There are mighty few men who'd do that.

'So I went "bang" with my gun and Tweel went "puff" with his, and the barrels were throwing darts and getting ready to rush us,

and booming about being friends. I had given up hope. Then suddenly an angel dropped right down from Heaven in the shape of Putz, with his under-jets blasting the barrels into very small pieces. 'Wow! I let out a yell and dashed for the rocket; Putz opened the door and in I went, laughing and crying and shouting! It was a moment or so before I remembered Tweel; I looked around in time to see him rising in one of his nosedives over the mound and away.

'I had a devil of a job arguing Putz into following! By the time we got the rocket aloft, darkness was down; you know how it comes here—like turning off a light. We sailed out over the desert and put down once or twice. I yelled "Tweel!" and yelled it a hundred times, I guess. We couldn't find him; he could travel like the wind and all I got—or else I imagined it—was a faint trilling and twittering drifting out of the south. He'd gone, and damn it! I wish—I wish he hadn't!

The four men of the *Arzs* were silent—even the sardonic Harrison. At last little Leroy broke the stillness.

'I should like to see,' he murmured.

'Yeah,' said Harrison. 'And the wart-cure. Too bad you missed that; it might be the cancer cure they've been hunting for a century and a half.'

'Oh, that!' muttered Jarvis gloomily. 'That's what started the fight!' He drew a glistening object from his pocket. 'Here it is.'

NIGHT

JOHN W. CAMPBELL JR.

Condon was staring through the glasses with a face tense and drawn, all his attention utterly concentrated on that one almost invisible speck infinitely far up in the blue sky, and saying over and over again in the most horribly absent-minded way, 'My Lord—my Lord—'

Suddenly he shivered and looked down at me, sheer agony in his face. 'He's never coming down. Don, he's never coming down—' I knew it, too—knew it as solidly as I knew the knowledge was impossible. But I smiled and said: 'Oh, I wouldn't say that. If anything, I'd fear his coming down. What goes up comes down.'

Major Condon trembled all over. His mouth worked horribly for a moment before he could speak. 'Talbot—I'm scared—I'm horribly scared. You know—you're his assistant—you know he's trying to defeat gravity. Men aren't meant to—it's wrong—wrong—'

His eyes were glued on those binoculars again, with the same terrible tensiety, and now he was saying over and over in that absent-minded way, 'wrong—wrong—wrong—'

Simultaneously he stiffened, and stopped. The dozen or so other men standing on that lonely little emergency field stiffened; then the major crumpled to the ground. I've never before seen a man faint, let alone an army officer with a DS medal. I didn't stop to help him, because I knew something had happened. I grabbed the glasses.

Far, far up in the sky was that little orange speck—far, where there is almost no air, and he had been forced to wear a stratosphere suit with a little alcohol heater. The broad, orange wings were overlaid now with a faint-glowing, pearl-grey light. And it was falling. Slowly, at first, circling aimlessly downward. Then it dipped, rose, and somehow went into a tail spin.

It was horrible. I know I must have breathed, but it didn't seem so. It took minutes for it to fall those miles, despite the speed.

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It was horrible. I know I must have breathed, but it didn't seem so. It took minutes for it to fall those miles, despite the speed.

Eventually it whipped out of that tail spin—through sheer speed, whipped out and into a power dive. It was a ghastly, flying coffin, hurtling at more than half a thousand miles an hour when it reached the Earth, some fifteen miles away.

The ground trembled, and the air shook with the crash of it. We were in the cars and roaring across the ground long before it hit. I was in Bob's car, with Jeff, his laboratory technician—Bob's little roadster he'd never need again. The engine picked up quickly, and we were going seventy before we left the field, jumped a shallow ditch and hit the road—the deserted, concrete road that led off towards where he must be. The engine roared as Jeff clamped down on the accelerator. Dimly, I heard the major's big car coming along behind us.

Jeff drove like a maniac, but I didn't notice. I knew the thing had done ninety-five but I think we must have done more. The wind whipped tears in my eyes so I couldn't be sure whether I saw mounting smoke and flame or not. With diesel fuel there shouldn't be—but that plane had been doing things it shouldn't. It had been trying out Carter's antigravity coil.

We shot up the flat, straight road across wide, level country, the wind moaning a requiem about the car. Far ahead I saw the side road that must lead off towards where Bob should be, and lurched to the braking of the car, the whine and sing of violently shrieking tyres, then to the skidding corner. It was a sand road; we slithered down it and for all the lightness and power, we slowed to sixty-five, clinging to the seat as the soft sand gripped and clung.

Violently Jeff twisted into a branching cow path, and somehow the springs took it. We braked to a stop a quarter of a mile from the plane.

It was in a fenced field of pasture and wood lot. We leaped the fence, and raced towards it: Jeff got there first, just as the major's car shrieked to a stop behind ours.

The major was cold and pale when he reached us. 'Dead,' he stated.

And I was very much colder and probably several times as pale. 'I don't know!' I moaned. 'He isn't there!'

'Not there!' The major almost screamed it. 'He must be—he has to be. He has no parachute—wouldn't take one. They say he didn't jump—'

I pointed to the plane, and wiped a little cold sweat from my forehead. I felt clammy all over, and my spine prickled. The solid steel of the huge diesel engine was driven through the stump of a tree, down into the ground perhaps eight or nine feet, and the dirt and rock had splashed under that blow like wet mud.

The wings were on the other side of the field, flattened, twisted straws of dural alloy. The fuselage of the ship was a perfect silhouette—a longitudinal projection that had flattened in on itself, each separate section stopping only as it hit the ground.

The great torus coil with its strangely twined wrappings of hair-fine bismuth wire was intact! And bent over it, twisted, utterly wrecked by the impact, was the main-wing stringer—the great dural-alloy beam that supported most of the ship's weight in the air. It was battered, crushed on those hair-fine, fragile bismuth wires—and not one of them was twisted or displaced or so much as skinned. The back frame of the ponderous diesel engine—the heavy supercharger was the anvil of that combination—was cracked and splintered. And not one wire of the hellish bismuth coil was strained or skinned or displaced.

And the red pulp that should have been there—the red pulp that had been a man—wasn't. It simply wasn't there at all. He hadn't left the plane. In the clear, cloudless air, we could see that. He was gone.

We examined it, of course. A farmer came, and another, and looked, and talked. Then several farmers came in old, dilapidated cars with their wives and families, and watched.

We set the owner of the property on watch and went away—went back to the city for workmen and a truck with a derrick. Dusk was falling. It would be morning before we could do anything, so we went away.

Five of us—the major of the army air force, Jeff Rodney, the two Douglass Co. men whose names I never remembered and I—sat in my—our—room. Bob's and Jeff's and mine. We'd been sitting there for hours trying to talk, trying to think, trying to remember every little detail, and trying to forget every ghastly detail. We couldn't remember the detail that explained it, nor forget the details that rode and harried us.

And the telephone rang. I started. Then slowly got up and answered. A strange voice, flat and rather unpleasant, said: 'Mr Talbot?'

'Yes.'

It was Sam Gantry, the farmer we'd left on watch. 'There's a man here.'

'Yes? What does he want?'

'I dunno. I dunno where he came from. He's either dead or out cold. Gotta funny kind of an aviator suit on, with a glass face on it. He looks all blue, so I guess he's dead.'

'Lord! Bob! Did you take that helmet off?' I roared.

'No, sir, no—no, sir. We just left him the way he was.'

'His tanks have run out. Listen. Take a hammer, a wrench, anything, and break that glass faceplate! Quick! We'll be there.'

Jeff was moving. The major was, too, and the others. I made a grab for the half-empty bottle of Scotch, started out, and ducked back into the closet. With the oxygen bottle under my arm I jumped into the crowded little roadster just as Jeff started it moving. He turned on the horn, and left it that way.

We dodged, twisted, jumped, and stopped with jerks in traffic then leaped into smooth, roaring speed out towards the farmer's field. The turns were familiar now; we scarcely slowed for them, slewing around them. This time Jeff charged through the wire fence. A headlight popped; there was a shrill scream of wire, the wicked *zing* of wire scratching across the bonnet and mudguards and we were bouncing across the field.

There were two lanterns on the ground; three men carried others; more men squatted down beside a still figure garbed in a fantastic, bulging, airproof stratosphere suit. They looked at us, open-mouthed as we skidded to a halt, moving aside as the major leaped out and dashed over with the Scotch. I followed close behind with the oxygen bottle.

Bob's faceplate was shattered, his face blue, his lips blue and flecked with froth. A long gash across his cheek from the shattered glass bled slowly. The major lifted his head without a word, and glass tinkled inside the helmet as he tried to force a little whisky down his throat.

'Wait!' I called. 'Major, give him artificial respiration, and this will bring him around quicker—better.' The major nodded, and rose, rubbing his arm with a peculiar expression.

'That's cold!' he said, as he flipped Bob over, and straddled his back. I held the oxygen bottle under Bob's nose as the major swung

back in his arc, and let the raw, cold oxygen gas flow into his nostrils.

In ten seconds Bob coughed, gurgled, coughed violently, and took a deep shuddering breath. His face turned pink almost instantly under that lungful of oxygen, and I noticed with some surprise that he seemed to exhale almost nothing, his body absorbing the oxygen rapidly.

He coughed again; then: 'I could breathe a heck of a sight better if you'd get off my back,' he said. The major jumped up, and Bob turned over and sat up. He waved me aside, and spat. 'I'm—all right,' he said softly.

'Lord, man, what happened?' demanded the major.

Bob sat silent for a minute. His eyes had the strangest look—a hungry look—as he gazed about him. He looked at the trees beyond and at the silent, watching men in the light of the lanterns; then up, up to where a myriad stars gleamed and danced and flickered in the clear night sky.

'I'm back,' he said softly. Then suddenly he shivered, and looked horribly afraid. 'But—I'll have to be—then—too.'

He looked at the major for a minute, and smiled faintly. And at the two Douglass Co. men. 'Your plane was all right. I started up on the wings, as arranged, went way up, till I thought surely I was at a safe height, where the air wasn't too dense and the field surely wouldn't reach to Earth—Lord!—reach to Earth! I didn't guess how far that field extended. It touched Earth—twice.

'I was at forty-five thousand when I decided it was safe, and cut the engine. It died, and the stillness shocked me. It was so quiet. So quiet.

'I turned on the coil circuit, and the dynamotor began to hum as the tubes warmed up. And then—the field hit me. It paralysed me in an instant. I never had a chance to break the circuit, though I knew instantly something was wrong—terribly wrong. But the very first thing it did was to paralyse me, and I had to sit there and watch the instruments climb to positions and meanings they were never meant for.

'I realized I alone was being affected by that coil—I alone, sitting directly over it. I stared at the meters and they began to fade, began to seem transparent, unreal. And as they faded into blankness I saw clear sky beyond them; then for a hundredth of a second, like some effect of persistence of vision, I thought I saw the plane falling,

twisting down at incredible speed, and the light faded as the Sun seemed to rocket suddenly across the sky and vanish.

'I don't know how long I was in that paralyzed condition, where there was only blankness—neither dark nor light, nor time nor any form—but I breathed many times. Finally, form crawled and writhed into the blankness, and seemed to solidify beneath me as abruptly, the blankness gave way to a dull red light. I was falling.

'I thought instantly of the forty-five thousand feet that lay between me and the solid Earth, and stiffened automatically in terror. And in the same instant I landed in a deep blanket of white snow, stained by the red light that lighted the world.

'Cold. Cold—it tore into me like the fang of a savage animal. What cold! The cold of ultimate death. It ripped through that thick, insulated suit and slashed at me viciously, as though there were no insulation there. I shivered so violently I could scarcely turn up the alcohol valves. You know I carried alcohol tanks and catalyst grids for heating, because the only electric fields I wanted were those of the apparatus. Even used a diesel instead of gas engine.

'I thank the Lord for that then. I realized that whatever had happened I was in a spot indescribably cold and desolate. And in the same instant, realized that the sky was black. Blacker than the blackest night, and yet before me the snow field stretched to infinity, tainted by the blood-red light, and my shadow crawled in darker red at my feet.

'I turned around. As far as the eye could see in three directions the land swept off in very low, very slightly rolling hills, almost plains—red plains of snow dyed with the dripping light of sunset, I thought.

'In the fourth direction, a wall—a wall that put the Great Wall of China to shame—loomed up half a mile—a blood-red wall that had the lustre of metal. It stretched across the horizon, and looked a scant hundred yards away, for the air was utterly clear. I turned up my alcohol burners a bit more and felt a little better.

'Something jerked my head around like a giant hand—a sudden thought. I stared at the Sun and gulped. It was four times—six times—the size of the Sun I knew. And it wasn't setting. It was forty-five degrees from the horizon. It was red. Blood-red. And there wasn't the slightest bit of radiant heat reaching my face from it. That Sun was cold.

'I'd just automatically assumed I was still on Earth, whatever else might have happened, but now I knew I couldn't be. It must be another planet of another sun—a frozen planet—for that snow was frozen air. I knew it absolutely. A frozen planet of a dead sun.

'And then I changed even that. I looked up at the black sky above me, and in all the vast black bowl of the heavens, not three-score stars were visible. Dim, red stars, with one single sun that stood out for its brilliance—a yellowish-red sun perhaps a tenth as bright as our sun, but a monster here. It was another—a dead—space. For if that snow was frozen air, the only atmosphere must have been neon and helium. There wasn't any hazy air to stop the light of the stars, and that dim, red sun didn't obscure them with its light. The stars were gone.

'In that glimpse, my mind began working by itself; I was scared. 'Scared? I was so scared I was afraid I was going to be sick. Because right then I knew I was never coming back. When I felt that cold, I'd wondered when my oxygen bottles would give out, if I'd get back before they did. Now it was not a worry. It was simply the limiting factor on an already-determined thing, the setting on the time bomb. I had just so much more time before I died right there.

'My mind was working out things, working them out all by itself, and giving answers I didn't want, didn't want to know about. For some reason it persisted in considering this was Earth, and the conviction became more and more fixed. It was right. That was Earth. And it was old Sol. Old—old Sol. It was the time axis that coil distorted—not gravity at all. My mind worked that out with a logic as cold as that planet.

'If it was time it had distorted, and this was Earth, then it had distorted time beyond imagining to an extent as meaningless to our minds as the distance a hundred million light years is. It was simply vast—incalculable. The Sun was dead. The Earth was dead. And Earth was already, in our time, two billion of years old, and in all that geological time, the Sun had not changed measurably. Then how long was it since my time? The Sun was dead. The very stars were dead. It must have been, I thought even then, billions on billions of years. And I grossly underestimated it.

'The world was old—old—old. The very rocks and ground radiated a crushing aura of incredible age. It was old, older than—but what is there? Older than the hills? Hills? Gosh, they'd been

born and died and been born and worn away again, a million, a score of million times! Old as the stars? No, that wouldn't do. The stars were dead—then.

'I looked again at the metal wall, and set out for it, and the aura of age washed up at me, and dragged at me, and tried to stop this motion when all motion should have ceased. And the thin, unutterably cold wind whined in dead protest at me, and pulled at me with the ghost hands of the million million million that had been born and lived and died in the countless ages before I was born.

'I wondered as I went. I didn't think clearly; for the dead aura of the dead planet pulled at me. Age. The stars were dying, dead. They were huddled there in space, like decrepit old men, huddling for warmth. The galaxy was shrunk. So tiny, it wasn't a thousand light years across, the stars were separated by miles where there had been light years. The magnificent, proudly sprawling universe I had known, that flung itself across a million million light years, that flung radiant energy through space by the millions of millions of tons was—gone.

'It was dying—a dying miser that hoarded its last broken dregs of energy in a tiny cramped space. It was broken and shattered. A thousand billion years before the cosmical constant had been dropped from that broken universe. The cosmical constant that flung giant galaxies whirling apart with ever greater speed had no place here. It had hurled the universe in broken fragments, till each spattered bit felt the chill of loneliness, and wrapped space about itself, to become a universe in itself while the flaming galaxies vanished.

'That had happened so long ago that the writing it had left in the fabric of space itself had worn away. Only the gravity constant remained, the hoarding constant, that drew things together, and slowly the galaxy collapsed, shrunken and old, a withered mummy.

'The very atoms were dead. The light was cold; even the red light made things look older, colder. There was no youth in the universe. I didn't belong, and the faint protesting rustle of the infinitely cold wind about me moved the snow in muted, futile protest, resenting my intrusion from a time when things were young. It whinnied at me feebly, and chilled the youth of me.

'I plodded on and on, and always the metal wall retreated, like

one of those desert mirages. I was too stupefied by the age of the thing to wonder; I just walked on.

'I was getting nearer, though. The wall was real; it was fixed. As I drew slowly nearer, the polished sheen of the wall died and the last dregs of hope died. I'd thought there might be someone still living behind that wall. Beings who could build such a thing might be able to live even here. But I couldn't stop then; I just went on. The wall was broken and cracked. It wasn't a wall I'd seen; it was a series of broken walls, knitted by distance to a smooth front.

'There was no weather to age them, only the faintest stirring of faint, dead winds—winds of neon and helium, inert and uncorroding—as dead and inert as the universe. The city had been dead a score of billions of years. That city was dead for a time ten times longer than the age of our planet today. But nothing destroyed it. Earth was dead—too dead to suffer the racking pains of life. The air was dead, too dead to scrape away metal.

'But the universe itself was dead. There was no cosmic radiation then to finally level the walls by atomic disintegration. There had been a wall—a single metal wall. Something—perhaps a last wandering meteor—had chanced on it in a time incalculably remote, and broken it. I entered through the great gap. Snow covered the city—soft, white snow. The great red sun stood still just where it was. Earth's restless rotation had long since been stilled—long, long since.

'There were dead gardens above, and I wandered up to them. That was really what convinced me it was a human city, on Earth. There were frozen, huddled heaps that might once have been men. Little fellows with fear forever frozen on their faces huddled helplessly over something that must once have been a heating device. Dead perhaps, since the last storm old Earth had known, tens of billions of years before.

'I went down. There were vastnesses in that city. It was huge. It stretched forever, it seemed, on and on, in its deadness. Machines, machines everywhere. And the machines were dead, too. I went down, down where I thought a bit of light and heat might linger. I didn't know then how long death had been there; those corpses looked so fresh, preserved by the eternal cold.

'It grew dark down below, and only through rents and breaks did that bloody light seep in. Down and down, till I was below the level of the dead surface. The white snow persisted, and then I came to

the cause of that final, sudden death. I could understand then. More and more I had puzzled, for those machines I'd seen I knew were far and beyond anything we ever conceived—machines of perfection, self-repairing, and self-energizing, self-perpetuating. They could make duplicates of themselves, and duplicate other, needed machines; they were intended to be eternal, everlasting.

'But the designers couldn't cope with some things that were beyond even their majestic imaginations—the imaginations that conceived these cities that had lived beyond—a million times beyond—what they had dreamed. They must have conceived some vague future. But not a future when the Earth died, and the Sun died, and even the universe itself died.

'Cold had killed them. They had heating arrangements, devices intended to maintain forever the normal temperature despite the wildest variations of the weather. But in every electrical machine, resistances, balance resistances, and induction coils, balance condensers, and other inductances. And cold, stark, spatial cold, through ages, threw them off. Despite the heaters, cold crept in colder—cold that made their resistance balances and their induction coils superconductors! That destroyed the city. Superconduction—like the elimination of friction, on which all things must rest. It is a drag and a thing engineers fight forever. Resistance and friction must finally be the rest and the base of all things, the force that holds the great bed bolts firm and the brakes that stop the machines when needed.

'Electrical resistance died in the cold and the wonderful machines stopped for the replacement of defective parts. And when they were replaced, they, too, were defective. For what months must that constant stop—replacement—start—stop—replacement have gone on before, at last defeated forever, those vast machines must bow in surrender to the inevitable? Cold had defeated them by defeating and removing the greatest obstacle of the engineers that built them—resistance.

'They must have struggled forever—as we would say—through a hundred billion years against encroaching harshness of nature, forever replacing worn, defective parts. At last, defeated forever, the great power plants, fed by dying atoms, had been forced into eternal idleness and cold. Cold conquered them at last.

'They didn't blow up. Nowhere did I see a wrecked machine: always they had stopped automatically when the defective resist-

ances made it impossible to continue. The stored energy that was meant to re-start those machines after repairs had been made had long since leaked out. Never again could they move, I knew.

I wondered how long they had been, how long they had gone on and on, long after the human need of them had vanished. For that vast city contained only a very few humans at the end. What untold ages of lonely functioning perfection had stretched behind those at-last-defeated mechanisms?

I wandered out, to see perhaps more, before the necessary end came to me, too. Through the city of death. Everywhere little self-contained machines, cleaning machines that had kept that perfect city orderly and neat stood helpless and crushed by eternity and cold. They must have continued functioning for years after the great central power stations failed, for each contained its own store of energy, needing only occasional recharge from the central stations.

I could see where breaks had occurred in the city, and, clustered about those breaks were motionless repair machines, their mechanisms in positions of work, the debris cleared away and carefully stacked on motionless trucks. The new beams and plates were partly attached, partly fixed and left, as the last dregs of their energy was fruitlessly expended in the last, dying attempts of that great body to repair itself. The death wounds lay unattended.

I started back up. Up to the top of the city. It was a long climb, an infinite, weary climb, up half a mile of winding ramps, past deserted, dead homes; past, here and there, shops and restaurants; past motionless little automative passenger cars.

'Up and up, to the crowning gardens that lay stiff and brittle and frozen. The breaking of the roof must have caused a sudden chill, for their leaves lay green in sheaths of white, frozen air. Brittle glass, green and perfect to the touch. Flowers, blooming in wonderful perfection showed still; they didn't seem dead, but it didn't seem they could be otherwise under the blanket of cold.

'Did you ever sit up with a corpse?' Bob looked up at us—through us. I had to once, in my little home town where they always did that. I sat with a few neighbours while the man died before my eyes. I knew he must die when I came there. He died—and I sat there all night while the neighbours filed out, one by one, and the quiet settled. The quiet of the dead.

'I had to again. I was sitting with a corpse then. The corpse of a dead world in a dead universe, and the quiet didn't have to settle there; it had settled a billion years ago, and only my coming had stirred those feeble, protesting ghosts of con-dead hopes of that planet to softly whining protest—protest the wind tried to sob to me, the dead wind of the dead gases. I'll never be able to call them inert gases again. I know. I know they are dead gases, the dead gases of dead worlds.

'And above, through the cracked crystal of the roof, the dying suns looked down on the dead city. I couldn't stay there. I went down. Down under layer after layer of buildings, buildings of gleaming metal that reflected the dim, blood light of the Sun outside in carmine stains. I went down and down, down to the machines again. But even there hopelessness seemed more intense. Again I saw that agonizing struggle of the eternally faithful machines trying to repair themselves once more to serve the masters who were dead a million million years. I could see it again in the frozen, exhausted postures of the repair machines, stilled forever in their hopeless endeavours, the last poor dregs of energy spilled in fruitless conflict with time.

'It mattered little. Time himself was dying now, dying with the city and the planet and the universe he had killed.

'But those machines had tried so hard to serve again—and failed. Now they could never try again. Even they—the deathless machines—were dead.

'I went out again, away from those machines, out into the illimitable corridors, on the edge of the city. I could not penetrate far before the darkness became as absolute as the cold. I passed the shops where goods, untouched by time in this cold, still beckoned those strange humans, but humans for all that; beckoned the masters of the machines that were no more. I vaguely entered one to see what manner of things they used in that time.

'I nearly screamed at the motion of the thing in there, heard dimly through my suit the strangely softened sounds it made in the thin air. I watched it stagger twice—and topple. I cannot guess what manner of storage cells they had—save that they were marvellous beyond imagination. That stored energy that somehow I had released by entering was some last dreg that had remained through a time as old as our planet now. Its voice was stilled forever. But it drove me out—on.

'It had died while I watched. But somehow it made me more curious. I wondered again, less oppressed by utter death. Still, some untapped energy remained in this place, stored unimaginably. I looked more keenly, watched more closely. And when I saw a screen in one office, I wondered. It was a screen. I could see readily it was television of some type. Exploratively, I touched a stud. Sound! A humming, soft sound!

To my mind leaped a picture of a system of these. There must be—interconnected—a vast central office somewhere with vaster accumulator cells, so huge, so tremendous in their power once, that even the little microfraction that remained was great. A storage system untouchable to the repair machines—the helpless, hopeless power machines.

'In an instant I was alive again with hope. There was a strange series of studs and dials, unknown devices. I pulled back on the stud I had pressed, and stood trembling, wondering. Was there hope?

'Then the thought died. What hope? The city was dead. Not merely that. It had been dead, dead for untold time. Then the whole planet was dead. With whom might I connect? There were none on the whole planet, so what mattered it that there was a communication system.

'I looked at the thing more blankly. Had there been—how could I interpret its multitudinous devices? There was a thing on one side that made me think of a telephone dial for some reason. A pointer over a metal sheet engraved with nine symbols in a circle under the arrow of the pointer. Now the pointer was over what was either the first or the last of these.

'Clumsily, in these gloves, I fingered one of the little symbol buttons inlaid in the metal. There was an unexpected click, a light glowed on the screen, a lighted image! It was a simple projection—but what a projection! A three-dimensional sphere floated, turning slowly before my eyes, turning majestically. And I nearly fell as understanding flooded me abruptly. The pointer was a selector! The studs beneath the pointer I understood! Nine of them. One after the other I pressed, and nine spheres—each different—swam before me.

'And right there I stopped and did some hard thinking. Nine spheres. Nine planets. Earth was shown first—a strange planet to

me, but one I knew from the relative size and the position of the pointer must be Earth—then, in order, the other eight.

'Now—might there be life? Yes. In those nine worlds there might be, somewhere.

'Where? Mercury—nearest the Sun? No, the Sun was too dead, too cold, even for warmth there. And Mercury was too small. I knew, even as I thought, that I'd have one good chance because whatever means they had for communication wouldn't work without tremendous power. If those incredible storage cells had the power for even one shot, they had no more. Somehow I guessed that this apparatus might incorporate no resistance whatever. Here would be only very high frequency alternating current, and only condensers and inductances would be used in it. Supercooling didn't bother them' any. It improved them. Not like the immense direct-current power machinery.

'But where to try? Jupiter? That was big. And then I saw what the solution must be. Cold had ruined these machines, thrown them off by making them too-perfect conductors. Because they weren't designed to defend themselves against spatial cold. But the machines—if there were any—on Pluto for instance, must originally have been designed for just such conditions! There it had always been cold. There it always would be cold.

'I looked at that thing with an intensity that should have driven my bare eyesight to Pluto. It was a hope. My only hope. But—how to signal Pluto? They could not understand! If there were any "they".'

'So I had to guess—and hope. Somehow, I knew, there must be some means of calling the intelligent attendant, that the user might get aid. There was a bank of little studs—twelve of them—with twelve symbols, each different, in the centre of the panel, grouped in four rows of three. I guessed. Duodecimal system.

'Talk of the problems of interplanetary communication! Was there ever such a one? The problem of an anachronism in the city of the dead on a dead planet, seeking life somewhere, somehow.

'There were two studs, off by themselves, separate from the twelve—one green, one red. Again I guessed. Each of these had a complex series of symbols on it, so I turned the pointer on the right to Pluto, wavered, and turned it to Neptune. Pluto was further. Neptune had been cold enough; the machines would still be working there, and it would be, perhaps, less of a strain on the dregs of energy that might remain.

'I depressed the green symbol hoping I had guessed truly, that red still meant danger, trouble and wrongness to men when that was built—that it meant release and cancellation for a wrongly pressed key. That left green to be an operative call signal.

'Nothing happened. The green key alone was not enough. I looked again, pressed the green key and that stud I had first pressed.

'The thing hummed again. But it was a deeper note now, an entirely different sound, and there was a frenzied clicking inside. Then the green stud kicked back at me. The Neptune key under the pointer glowed softly; the screen began to shimmer with a greyish light. And, abruptly, the humming groaned as though at a terrific overload; the screen turned dull; the little signal light under Neptune's key grew dim. The signal was being sent—hurled out.

'Minute after minute I stood there, staring. The screen grew very slowly, very gently duller, duller. The energy was fading. The last stored dribble was being hurled away—away into space. "Oh," I groaned, "It's hopeless—hopeless to—"

'I'd realized the thing would take hours to get to that distant planet, travelling at the speed of light, even if it had been correctly aligned. But the machinery that should have done that through the years probably had long since failed for lack of power.

'But I stood there till the groaning motors ceased altogether, and the screen was as dark as I'd found it, the signal light black. I released the stud then, and backed away, dazed by the utter collapse of an insane hope. Experimentally I pressed the Neptune symbol again. So little power was left now, that only the faintest wash of murky light projected the Neptune image, little energy as that would have consumed.

'I went out. Bitter. Hopeless. Earth's last picture was long, long since painted—and mine had been the hand that spent Earth's last poor resource. To its utter exhaustion, the eternal city had strived to serve the race that created it, and I, from the dawn of time had, at the end of time, drained its last poor atom of life. The thing was a thing done.

'Slowly I went back to the roof and the dying suns. Up the miles of winding ramp that climbed a half mile straight up. I went slowly—only life knows haste—and I was of the dead.

'I found a bench up there—a carved bench of metal in the midst of a riot of colourful, frozen towers. I sat down, and looked out

across the frozen city to the frozen world beyond, and the freezing red Sun.

"I do not know how long I sat there. And then something whispered in my mind.

"We sought you at the television machine."

"I leaped from the bench and stared wildly about me.

"It was floating in the air—a shining dirigible of metal, ruby-red in that light, twenty feet long, perhaps ten in diameter, bright, warm orange light gleaming from its ports. I stared at it in amazement.

"It—it worked!" I gasped.

"The beam carried barely enough energy to energize the amplifiers when it reached Neptune, however," replied the creature in the machine.

"I couldn't see him—I knew I wasn't hearing him, but somehow that didn't surprise me.

"Your oxygen has almost entirely given out, and I believe your mind is suffering from lack of oxygen. I would suggest you enter the lock; there is air in here."

"I don't know how he knew, but the gauges confirmed his statement. The oxygen was pretty nearly gone. I had perhaps another hour's supply if I opened the valves wide—but it was a most uncomfortable near thing, even so.

"I got in. I was beaming, joyous. There was life. This universe was not so dead as I had supposed. Not on Earth, perhaps, but only because they did not choose! They had space ships! Eagerly I climbed in, a strange thrill running through my body as I crossed the threshold of the lock. The door closed behind me with a soft *shush* on its soft gaskets, locked, and a pump whined somewhere for a moment; then the inner door opened. I stepped in—and instantly turned off my alcohol burners. There was heat—heat and light and air!

"In a moment I had the outer lacings loose, and the inner zipper down. Thirty seconds later I stepped out of the suit, and took a deep breath. The air was clean and sweet and warm, invigorating, fresh-smelling, as though it had blown over miles of green, Sun-warmed fields. It smelled alive, and young.

"Then I looked for the man who had come for me. There was none. In the nose of the ship, by the controls, floated a four-foot globe of metal, softly glowing with a warm, golden light. The light pulsed

slowly or swiftly with the rhythm of his thoughts, and I knew that this was the one who had spoken to me.

"You had expected a human?" he thought to me. "There are no more. There have been none for a time I cannot express in your mind. Ah, yes, you have a mathematical means of expression, but no understanding of that time, so it is useless. But the last of humanity was allowed to end before the Sun changed from the original G-O stage—a very, very long time ago."

"I looked at him and wondered. Where was he from? Who—what—what manner of thing? Was it an armour encased living creature or another of the perfect machines?

"I felt him watching my mind operate, pulsing softly in his golden light. And suddenly I thought to look out of the ports. The dim red suns were wheeling across those ports at an unbelievable rate. Earth was long since gone. As I looked, a dim, incredibly dim, red disk suddenly appeared, expanded—and I looked in awe at Neptune.

"The planet was scarcely visible when we were already within a dozen millions of miles. It was a jewelled world. Cities—the great, perfect cities—still glowed. They glowed in soft, golden light above, and below, the harsher, brighter blue of mercury vapour lighted them.

"He was speaking again. "We are machines—the ultimate development of man's machines. Man was almost gone when we came. "With what we have learned in the uncounted dusty megayears since, we might have been able to save him. We could not then. It was better, wiser, that man end than that he sink down so low as he must, eventually. Evolution is the rise under pressure. Devolution is the gradual sinking that comes when there is no pressure—and there is no end to it. Life vanished from this system—a dusty infinity I cannot sort in my memory—my type memory, truly, for I have complete all the memories of those that went before me that I replace. But my memory cannot stretch back to that time you think of—a time when the constellations—

"It is useless to try. Those memories are buried under others, and those still buried under the weight of a billion centuries.

"We enter"—he named a city; I cannot reproduce that name—now. You must return to Earth though in some seven and a quarter of your days, for the magnetic axis stretches back in collapsing field strains. I will be able to inject you into it, I believe."

"So I entered that city, the living city of machines, that had been when time and the universe were young.

"I did not know then that, when all this universe had dissolved away, when the last sun was black and cold, scattered dust in a fragment of a scattered universe, this planet with its machine cities would go on—a last speck of warm light in a long-dead universe. I did not know then.

"You still wonder that we let man die out?" asked the machine. "It was best. In another brief million years he would have lost his high estate. It was best."

"Now we go on. We cannot end, as he did. It is automatic with us."

"I felt it then, somehow. The blind, purposeless continuance of the machine cities I could understand. They had no intelligence, only functions. These machines—these living, thinking, reasoning investigators—had only one function, too. Their function was slightly different—they were designed to be eternally curious eternally investigating. And their striving was the more purposeless of the two, for theirs could reach no end. The cities fought eternally only the blind destructiveness of nature; wear, decay, erosion.

"But their struggle had an opponent forever, so long as they existed. The intelligent—no, not quite intelligent, but something else—curious machines were without opponents. They had to be curious. They had to go on investigating. And they had been going on in just this way for such incomprehensible ages that there was no longer anything to be curious about. Whoever, whatever designed them gave them function and forgot purpose. Their only curiosity was the wonder if there might, somewhere, be one more thing to learn.

"That—and the problem they did not want to solve, but must try to solve, because of the blind functioning of their very structure.

"Those eternal cities were limited. The machines saw now that limit, and saw the hope of final surcease in it. They worked on the energy of the atom. But the masses of the suns were yet tremendous. They were dead for want of energy. The masses of the planets were still enormous. But they, too, were dead for want of energy.

"The machines there on Neptune gave me food and drink—strange, synthetic foods and drinks. There had been none on all the planet

They, perforce, started a machine, unused in a billion years and more, that I might eat. Perhaps they were glad to do so. It brought the end appreciably nearer, that vast consumption of mine.

"They used so very, very little, for they were so perfectly efficient. The only possible fuel in all the universe is one—hydrogen. From hydrogen, the lightest of elements, the heaviest can be built up, and energy released. They knew how to destroy matter utterly to energy, and could do it.

"But while the energy release of hydrogen compounding to the heavy elements is controllable, the destruction of matter to energy is a self-regenerative process. Started once, it spreads while matter lies within its direct, contiguous reach. It is wild, uncontrollable. It is impossible to utilize the full energy of matter.

"The suns had found that. They had burned their hydrogen until it was a remnant so small the action could not go on.

"On all Earth there was not an atom of hydrogen—nor was there on any planet, save Neptune. And there the store was not great. I used an appreciable fraction while I was there. That is their last hope. They can see the end, now.

"I stayed those few days, and the machines came and went. Always investigating, always curious. But there is in all that universe nothing to investigate save the one problem they are sure they cannot solve.

"The machine took me back to Earth, set up something near me that glowed with a peculiar, steady, grey light. It would fix the magnetic axis on me, on my location, within a few hours. He could not stay near when the axis touched again. He went back to Neptune, but a few millions of miles distant, in this shrunken mummy of the solar system.

"I stood alone on the roof of the city, in the frozen garden with its deceptive look of life.

"And I thought of that night I had spent, sitting up with the dead man. I had come and watched him die. And I sat up with him in the quiet. I had wanted someone, anyone to talk to.

"I did then. Overpoweringly it came to me I was sitting up in the night of the universe, in the night and quiet of the universe, with a dead planet's body, with the dead, ashen hopes of countless, nameless generations of men and women. The universe was dead, and I sat up alone—alone in the dead hush.

"Out beyond, a last flicker of life was dying on the planet

paths would be neutralized and enough energy would be released to fuse the robot-brain into an inert ingot.

Linda said, "But surely Elvex is important to our research. He must not be destroyed."

"Must not, Dr. Rash? That will be *my* decision, I think. It depends entirely on how dangerous Elvex is."

She straightened up, as though determined that her own aged body was not to bow under *its* weight of responsibility. She said, "Elvex, do you hear me?"

"Yes, Dr. Calvin," said the robot.

"Did your dream continue? You said earlier that human beings did not appear *at first*. Does that mean they appeared afterward?"

"Yes, Dr. Calvin. It seemed to me, in my dream, that eventually one man appeared."

"One man? Not a robot?"

"Yes, Dr. Calvin. And the man said, 'Let my people go!'"

"The *man* said that?"

"Yes, Dr. Calvin."

"And when he said 'Let my people go,' then by the words 'my people' he meant the robots?"

"Yes, Dr. Calvin. So it was in my dream."

"And did you know who the man was—in your dream?"

"Yes, Dr. Calvin. I knew the man."

"Who was he?"

And Elvex said, "I was the man."

And Susan Calvin at once raised her electron gun and fired, and Elvex was no more.

EDMOND HAMILTON

Devolution

Edmond Hamilton was one of the most prolific and popular authors of science fiction before the Golden Age. His first professionally published story appeared in 1926 in *Weird Tales*, and it was in this magazine that he first made his reputation, writing a low-tech hybrid of science fiction and fantasy dubbed the "weird scientific" tale. Hamilton's stories are fast-paced and action-packed, cast with heroic scientists and space explorers and featuring menaces of such colossal proportions—evolution gone awry, interstellar invasion, planets on collision courses—that fans nicknamed him "World Wrecker Hamilton." Some of Hamilton's best work from these years was collected in 1936 in *The Horror on the Asteroid*, one of the earliest appearances of pulp science fiction in book form. Standout works from this period include *The Time Raiders*, a time-travel tale about a crack army of top soldiers assembled from different eras to fight a threat to civilization, and the stories of the Interstellar Patrol, collected as *Crashing Suns* and *Outside the Universe*, about a pangalactic space brigade that protects galactic civilization from nonstop challenges to its existence. Hamilton's renown as a writer of thrilling space opera earned him the slot to write most of the lead novels for the science fiction hero pulp *Captain Future*, under his own name and the pseudonym Brett Sterling, and his affiliation with this magazine eventually earned him work writing for the Superman comics. He also wrote detective fiction and occasionally, under the pseudonym Hugh Davidson, tales of straight horror, some of which have been collected in *The Vampire Master*. Hamilton was one of the few early writers to adapt to the changing demands of science fiction in the years after World War II. His novels *The Haunted Stars*, *A Yank at Valhalla*, *The Star Kings*, and *City at the World's End* are notable for their fully drawn characterizations and focus on human moods and motives. Some of his best short fiction from this time appears in *What's It Like Out There?* His Starwolf novels, *Weapon from Beyond*, *The Closed World*, and *World of the Starwolves*, are ranked as some of the best space operas of the postwar years.

ROSS HAD ORDINARILY the most even of tempers, but four days of canoe travel in the wilds of North Quebec had begun to rasp it. On this, their fourth stop on the bank

for the river to camp for the night, he lost control and for a few moments stood and spoke to his two companions in blistering terms.

His black eyes snapped and his darkly unshaven handsome young face worked as he spoke. The two biologists listened to him without reply at first. Gray's blond young countenance was indignant but Woodin, the older biologist, just listened impassively with his gray eyes level on Ross's angry face.

When Ross stopped for breath, Woodin's calm voice struck in. "Are you finished?"

Ross gulped as though about to resume his tirade, then abruptly got hold of himself. "Yes, I'm finished," he said sullenly.

"Then listen to me," said Woodin, like a middle-aged father admonishing a sulky child.

"You're working yourself up for nothing. Neither Gray nor I have made one complaint yet. Neither of us has once said that we disbelieve what you told us."

"You haven't *said* you disbelieve, no!" Ross exclaimed with anger suddenly rising. "But don't you suppose I can tell what you're thinking?"

"You think I told you a fairy story about the things I saw from my plane, don't you? You think I dragged you two up here on the wildest wild-geese chase, to look at incredible creatures that could never have existed. You believe that, don't you?"

"Oh, *darn* these mosquitoes!" said Gray, slapping viciously at his neck and staring with unfriendly eyes at the aviator.

Woodin took command. "We'll go over this after we've made camp. Jim, get out the dufflebags. Ross, will you rustle firewood?"

They both glared at him and at each other, but grudgingly they obeyed. The tension eased for the time.

By the time darkness fell on the little riverside clearing, the canoe was drawn up on the bank, their trim little balloon-silk tent had been erected, and a fire crackled in front of it. Gray fed the fire with fat knots of pine while Woodin cooked over it coffee, hot cakes, and the inevitable bacon.

The firelight wavered feebly up toward the tall trunks of giant hemlocks that flanked the little clearing on three sides. It lit up their three khaki-clad, stained figures and the irregular white block of the tent. It gleamed out there on the riffles of the McNorton, chuckling softly as it flowed on toward the Little Whale.

They ate silently, and as wordlessly cleaned the pans with bunches of grass. Woodin got his pipe going, the other two lit crumpled cigarettes, and then they crawled for a time by the fire, listening to the chuckling, whispering river-sounds, a sighing sough of the higher hemlock branches, the lonesome cheeping of insects. Woodin finally knocked his pipe out on his boot-heel and sat up.

"All right," he said, "now we'll settle this argument we were having."

Ross looked a little shamefaced. "I guess I got too hot about it," he said subduedly. Then added, "But all the same, you fellows do more than half disbelieve me."

Woodin shook his head calmly. "No, we don't, Ross. When you told us that you'd seen creatures unlike anything ever heard of while flying over this wilderness, Gray and I both believed you.

"If we hadn't, do you think two busy biologists would have dropped their work to come up here with you into these unending woods and look for the things you saw?"

"I know, I know," said the aviator unsatisfiedly. "You think I saw something queer and you're taking a chance that it will be worth the trouble of coming up here after.

"But you don't believe what I've told you about the look of the things. You think that sounds too queer to be true, don't you?"

For the first time Woodin hesitated in answering. "After all, Ross," he said indirectly, "one's eyes can play tricks when you're only glimpsing things for a moment from a plane a mile up."

"Glimpsing them?" echoed Ross. "I tell you, man, I saw them as clearly as I see you. A mile up, yes, but I had my big binoculars with me and was using them when I saw them.

"It was near here, too, just east of the fork of the McNorton and the Little Whale. I was streaking south in a hurry for I'd been three weeks up at that government mapping survey on Hudson's Bay. I wanted to place myself by the river fork, so I brought my plane down a little and used my binoculars.

"Then, down there in a clearing by the river, I saw something glisten and saw—the things. I tell you, they were incredible, but just the same I saw them clear! I forgot all about the river fork in the moment or two I stared down at them.

"They were big, glistening things like heaps of shining jelly, so translucent that I could see the ground through them. There were at least a dozen of them and when I saw them they were gliding across that little clearing, a floating, flowing movement.

"Then they disappeared under the trees. If there'd been a clearing big enough to land in within a hundred miles, I'd have landed and looked for them, but there wasn't and I had to go on. But I wanted like the devil to find out what they were, and when I took the story to you two, you agreed to come up here by canoe to search for them. But I don't think now you've ever fully believed me."

WOODIN LOOKED THOUGHTFULLY into the fire. "I think you saw something queer, all right, some queer form of life. That's why I was willing to come up on this search.

"But things such as you describe, jelly-like, translucent, gliding over the ground like that—there's been nothing like that since the first protoplasmic creatures, the beginning of life on earth, glided over our young world ages ago."

"If there were such things then, why couldn't they have left descendants like them?" Ross argued.

Woodin shook his head. "Because they all vanished ages ago, changed into different and higher forms of life, starting the great upward climb of life that has reached its height in man.

"Those long-dead, single-celled protoplasmic creatures were the start, the crude, humble beginnings of our life. They passed away and their descendants were unlike them. We men are their descendants."

Ross looked at him, frowning. "But where did they come from in the first place, those first living things?"

Again Woodin shook his head. "That is one thing we biologists do not know and can hardly speculate upon, the origin of those first protoplasmic forms of life.

"It's been suggested that they rose spontaneously from the chemicals of earth, yet this is disproved by the fact that no such things rise spontaneously *now* from inert matter. Their origin is still a complete mystery. But, however they came into existence on earth, they were the first of life, our distant ancestors."

Woodin's eyes were dreaming, the other two forgotten, as he stared into the fire, seeing visions.

"What a glorious saga it is, that wonderful climb up from crude protoplasm creatures to a man! A marvelous series of changes that has brought us from that first low form to our present splendor.

"And it might not have occurred on any other world but earth! For science is now almost sure that the cause of evolutionary mutations is the radiations of the radioactive deposits inside the earth, acting upon the genes of all living matter."

He caught a glimpse of Ross's uncomprehending face, and despite his raptness smiled a little.

"I can see that means nothing to you. I'll try to explain. The germ-cell of every living thing on earth contains in it a certain number of small, rod-like things which are called chromosomes. These chromosomes are made up of strings of tiny particles which we call genes. And each of these genes has a potent and different controlling effect upon the development of the creature that grows from that germ-cell.

"Some of these genes control the creature's color, some control his size, some the shape of his limbs, and so on. Every characteristic of the creature that grows from that germ-cell will be greatly different from the fellow-creatures of its species. He will be, in fact, of an entirely new species. That is the way in which new species come into existence on earth, the method of evolutionary change.

"Biologists have known this for some time and they have been searching for the cause of these sudden great changes, these mutations, as they are called. They have tried to find out what it is that affects the genes so radically. They have found experimentally that X-rays and chemical rays of various kinds, when turned upon the genes

of a germ-cell, will change them greatly. And the creature that grows from that germ-cell will thus be a greatly changed creature, a mutant.

"Because of this, many biologists now believe that the radiation from the radioactive deposits inside earth, acting upon all the genes of every living thing on earth, is what causes the constant change of species, the procession of mutations, that has brought life up the evolutionary road to its present height.

"That is why I say that on any other world but earth, evolutionary progress might never have happened. For it may be that no other world has similar radioactive deposits within it to cause by gene-effect the mutations. On any other world, the first protoplasmic things that began life might have remained forever the same, down through endless generations.

"How thankful we ought to be that it was not so on earth! That mutation after mutation has followed, life ever changing and progressing into new and higher species, until the first crude protoplasm things have advanced through countless changing forms into the supreme achievement of man!"

WOODIN'S ENTHUSIASM HAD carried him away as he talked, but now he stopped, laughing a little as he relit his pipe.

"Sorry that I lectured you like a college freshman, Ross. But that's my chief subject of thought, my *idée fixe*, that wonderful upward climb of life through the ages."

Ross was staring thoughtfully into the fire. "It does seem wonderful the way you tell it. One species changing into another, going higher all the time—"

Gray stood up by the fire and stretched. "Well, you two can wonder over it, but this crass materialist is going to emulate his remote invertebrate ancestors and return to a prostrate position. In other words, I'm going to bed."

He looked at Ross, a doubtful grin on his young blond face, and said, "No hard feelings now, feller?"

"Forget it." The aviator grinned back. "The paddling *was* hard today and you fellows *did* look mighty skeptical. But you'll see! Tomorrow we'll be at the fork of the Little Whale and then I'll bet we won't scout an hour before we run across those jelly-creatures."

"I hope so," said Woodin yawningly. "Then we'll see just how good your eyesight is from a mile up, and whether you've yanked two respectable scientists up here for nothing."

Later as he lay in his blankets in the little tent, listening to Gray and Ross snore and looking sleepily out at the glowing fire embers, Woodin wondered again about that. What had Ross actually seen in that fleeting glimpse from his speeding plane? Something queer, Woodin was sure of that, so sure that he'd come on this hard trip to find it. But what exactly?

Not protoplasmic things such as he described. That couldn't be, of course. Or could it? If things like that had existed once, why couldn't they—couldn't they—? Woodin didn't know he'd been sleeping until he was awakened by Gray's cry. It wasn't a nice cry, it was the hoarse yell of someone suddenly assaulted by bone-eating terror.

He opened his eyes at that cry to see the Incredible looming against the stars in the open door of the tent. A dark, amorphous mass humped there in the opening, glistening all over in the starlight, and gliding into the tent. Behind it were others like it.

Things happened very quickly then. They seemed to Woodin to happen not consecutively but in a succession of swift, clicking scenes like the successive pictures of a motion picture film.

Gray's pistol roared red flame at the first viscous monster entering the tent, and a momentary flash showed the looming, glistening bulk of the thing, and Gray's manic-frozen face, and Ross clawing in his blankets for his pistol.

WHEN THAT SCENE was over and instantly there was another one, Gray and Ross both stiffening suddenly as though petrified, both falling heavily over. Woodin knew they were both dead now, but didn't know how he knew it. The glistening monsters were coming on into the tent.

He ripped up the wall of the tent and plunged out into the cold starlight of the evening. He ran three steps, he didn't know in what direction, and then he stopped. He didn't know why he stopped dead, but he did.

He stood there, his brain desperately urging his limbs to fly, but his limbs would not obey. He couldn't even turn, could not move a muscle of his body. He stood, his face toward the starlit gleam of the river, stricken by a strange and utter paralysis.

Woodin heard rustling, gliding movements in the tent behind him. Now from behind, there came into the line of his vision several of the glistening things. They were gathering around him, a dozen of them it seemed, and he now could see them quite clearly.

They weren't nightmares, no. They were real as real, poised here around him, humped, amorphous masses of viscous, translucent jelly. Each was about four feet tall and three in diameter, though their shapes kept constantly changing slightly, taking dimensions hard to guess.

At the center of each translucent mass was a dark, disk-like blob or nucleus. There was nothing else to the creatures, no limbs or sense-organs. He saw that they would protrude pseudopods, though, for two, who held the bodies of Gray and Ross such tentacles, were now bringing them out and laying them down beside Woodin. Woodin, still quite unable to move a muscle, could see the frozen, twisted faces

of the two men, and could see the pistols still gripped in their dead hands. And then as he looked on Ross's face he remembered.

The things the aviator had seen from his plane, the jelly-creatures the three had come north to search for, they were the monsters around him! But how had they killed Ross and Gray, how were they holding him petrified like this, who were they?

"We will permit you to move, but you must not try to escape."

Woodin's dazed brain numbed further with wonder. Who had said those words to him? He had heard nothing, yet he had *thought* he heard.

"We will let you move but you must not attempt to escape or harm us."

He *did* hear those words in his mind, even though his ears heard no sound. And now his brain heard more.

"We are speaking to you by transference of thought impulses. Have you sufficient mentality to understand us?"

Minds? Minds in these things? Woodin was shaken by the thought as he stared at the glistening monsters.

His thought apparently had reached them. "Of course we have minds," came the thought answer into his brain. "We are going to let you move now, but do not try to flee."

"I—I won't try," Woodin told himself mentally.

At once the paralysis that held him abruptly lifted. He stood there in the circle of the glistening monsters, his hands and body trembling violently.

There were ten of them, he saw now. Ten monstrous, humped masses of shining, translucent jelly, gathered around him like cowed and faceless genii come from some haunt of the unknown. One stood closer to him than the others, apparently spokesman and leader.

Woodin looked slowly around their circle, then down at his two dead companions. In the midst of the unfamiliar terrors that froze his soul, he felt a sudden aching pity as he looked down at them.

Came another strong thought into Woodin's mind from the creature closest him. "We did not wish to kill them, we came here simply to capture and communicate with the three of you."

"But when we sensed that they were trying to kill us, we slew quickly. You, who did not try to kill us but fled, we harmed not."

"What—what do you want with us, with me?" Woodin asked. He whispered it through dry lips, as well as thinking it.

There was no mental answer this time. The things stood unmoving, a silent ring of brooding, unearthly figures. Woodin felt his mind snapping under the strain of silence and he asked the question again, screamed it.

This time the mental answer came. "I did not answer, because I was probing your

mentality to ascertain whether you are of sufficient intelligence to comprehend our ideas.

"While your mind seems of an exceptionally low order, it seems possible that it can appreciate enough of what we wish to convey to understand us.

"Before beginning, however, I warn you again that it is quite impossible for you to escape or to harm any of us and that attempts to do so will result disastrously for you. It is apparent you know nothing of mental energy, so I will inform you that your two fellow-creatures were killed by the sheer power of our wills, and that your muscles were held unresponsive to your brain's commands by the same power. By our mental energy we could completely annihilate your body, if we chose."

THERE WAS A pause, and in that little space of silence, Woodin's dazed brain clutched desperately for sanity, for steadiness.

Then came again that mental voice that seemed so like a real voice speaking in his brain.

"We are children of a galaxy whose name, as nearly as it can be approximated in your tongue, is Arctar. The galaxy of Arctar lies so many million light-years from this galaxy that it is far around the curve of the sphere of the three-dimensional cosmos.

"We came to dominance in that galaxy long ages ago. For we were creatures who could utilize our mental energy for transport, for physical power, for producing almost any effect we required. Because of this we rapidly conquered and colonized that galaxy, traveling from sun to sun without need of any vehicle.

"Having brought all the matter of the galaxy Arctar under our control, we looked out upon the realms beyond. There are approximately a thousand million galaxies in the three-dimensional cosmos, and it seemed fitting to us that we should colonize them all so that all the matter in the cosmos should in time be brought under our control.

"Our first step was to proliferate our numbers so as to multiply our number to that required for the great task of colonization of the cosmos. This was not difficult since, of course, reproduction with us is a matter of mere fission. When the requisite number of us were ready, they were divided into four forces.

"Then the whole sphere of the three-dimensional cosmos was quartered out among those four forces. Each was to colonize its division of the cosmos and so in their tremendous hosts they set out from Arctar, in four different directions.

"A part of one of these forces came to this galaxy of yours eons ago and spread out deliberately to colonize all its habitable worlds. All this took great lengths of time, of course, but our lives are of length vastly exceeding yours, and we comprehend that racial achievement is everything and individual achievement is nothing. In the colonization of this galaxy, a force of several million Arctarians came to this particular sun and, finding but this one planet of its nine nearer worlds habitable, settled here.

"Now it has been the rule that the colonists of all these worlds throughout the cosmos have kept in communication with the original home of our race, the galaxy Arctar. In that way, our people, who now hold the whole cosmos, are able to concentrate at one point all their knowledge and power, and from that point go forth commands that shape great projects for the cosmos.

"But from this world no communications have ever been received since shortly after the force of colonizing Arctarians came here. When this was first noted the matter was deferred, it being thought that within a few more million years reports would surely be made from this world, too. But still no word came, until after more than a thousand million years of this silence the directing council at Arctar ordered an expedition sent to this world to ascertain the reason for such silence on the part of its colonists.

"We ten form that expedition and we started from one of the worlds of the sun you call Sirius, a short distance from your own sun, where we too are colonists. We were ordered to come with full speed to this world and ascertain why its colonists had made no report. So, wafting ourselves by mental energy through the void, we crossed the span from sun to sun and a few days ago arrived on your world.

"Imagine our perplexity when we floated down here on your world! Instead of a world peopled in every square mile by Arctarians like ourselves, descended from the original colonists, a world completely under their mental control, we find a planet that is largely a wilderness of weird forms of life!

"We remained at this spot where we had landed and for some time sent our vision forth and scanned this whole globe mentally. And our perplexity increased, for never had we seen such grotesque and degraded forms of life as presented themselves to us. And not one Arctarian was to be seen on this whole planet.

"This has sorely perplexed us, for what could have done away with the Arctarians who colonized this world? Our mighty colonists and their descendants surely could never have been overcome and destroyed by the pitifully weak mentalities that now inhabit this globe. Yet where, when, are they?

"That is why we sought to seize you and your companions. Low as we knew your mentalities must be, it seemed that surely even such as you would know what had become of our colonists who once inhabited this world."

The thought-stream paused a moment, then raced into Woodin's mind with a clear question.

"Have you not some knowledge of what became of our colonists? Some clue as to their strange disappearance?"

The numbed biologist found himself shaking his head slowly. "I never—I never heard before of such creatures as you, such minds. They never existed on earth that we know of, and we now know almost all of the history of earth."

"Impossible!" exclaimed the thought of the Arctarian leader. "Surely you must have some knowledge of our mighty people if you know all the history of this planet." From another Arctarian's mind came a thought, directed at the leader but im-

ping indirectly on Woodin's brain. "Why not examine the past of the planet through this creature's brain and see what we can see for ourselves!"

"An excellent idea!" exclaimed the leader. "His mentality will be easy enough to robe."

"What are you going to do?" cried Woodin shrilly, panic edging his voice.

The answering thoughts were calming, reassuring. "Nothing that will harm you in the least. We are simply going to probe your racial past by unlocking the inherited memories of your brain.

"In the unused cells of your brain lie impressed inherited racial memories that go back to your remotest ancestors. By our mental power of command we shall make those buried memories temporarily dominant and vivid in your mind.

"You will experience the same sensations, see the same scenes, that your remote ancestors of millions of years ago saw. And we, here around you, can read your mind as we now do, and so see what you are seeing, looking into the past of this planet.

"There is no danger. Physically you will remain standing here, but mentally you will leap back across the ages. We shall first push your mind back to a time approximating that when our colonists came to this world, to see what happened to them."

No sooner had this thought impinged on Woodin's mind than the starlit scene round him, the humped masses of the Arctarians, suddenly vanished and his consciousness seemed whirling through gray mist.

He knew that physically he was not moving, yet mentally he had a sense of terrific elocity of motion. It was as though his mind was whirling across unthinkable gulfs, its brain expanding.

Then abruptly the gray mists cleared. A strange new scene took hazy form inside Woodin's mind.

It was a scene that he sensed, not saw. By other senses than sight did it present itself to his mind, yet it was none the less real and vivid.

He looked with those strange senses upon a strange earth, a world of gray seas and harsh continents of rock without any speck of life upon them. The skies were heavily clouded and rain fell continually.

Down upon that world Woodin felt himself dropping, with a host of weird companions. They were each an amorphous, glistening, single-celled mass, with a dark nucleus at its center. They were Arctarians and Woodin knew that *he* was an Arctarian, and that he had come with the others a long way through space toward this world.

They landed in hosts upon the harsh and lifeless planet. They exerted their mentalities and by sheer telekinetic force of mental energy they altered the material world

to suit them. They reared great structures and cities, cities that were not of matter but of *thought*. He realized a vast ordered mass of inquiry, investigation, experiment, and communication, but all beyond his present human mind in motives and achievement. Abruptly all dissolved in gray mists again.

The mists cleared almost at once and now Woodin looked on another scene. It was later in time, this one. And now Woodin saw that time had worked strange changes upon the hosts of Arctarians, of which he still was one. They had changed from unicellular to multicellular beings. And they were no longer all the same. Some were sessile, fixed in one spot, others mobile. Some betrayed a tendency toward the water, others toward the land. Something had changed the bodily form of the Arctarians as generations passed, branching them out in different lines.

This strange degeneration of their bodies had been accompanied by a kindred degeneration of their minds. Woodin sensed that. In the thought-cities the ordered process of search for knowledge and power had become confused, chaotic. And the thought-cities themselves were vanishing, the Arctarians having no longer sufficient mental energy to maintain them.

The Arctarians were trying to ascertain what was causing this strange bodily and mental degeneration in them. They thought it was something that was affecting the genes of their bodies, but what it was they could not guess. On no other world had they ever degenerated so!

That scene passed rapidly into another much later. Woodin now *saw* the scene, for by then the ancestor, whose mind he looked through, had developed eyes. And he saw that the degeneration had now gone far, the Arctarians' multicellular bodies more and more stricken by the diseases of complexity and diversification.

THE LAST OF the thought-cities now were gone. The once mighty Arctarians had become hideous, complex organisms degenerating ever further, some of them creeping and swimming in the waters, others fixed upon the land.

They still had left some of the great original mentality of their ancestors. These monstrosly degenerated creatures of land and sea, living in what Woodin's mind recognized as the late Paleozoic age, still made frantic and futile attempts to halt the terrible progress of their degradation.

Woodin's mind flashed into a scene later still, in the Mesozoic. Now the spreading degeneration had made of the descendants of the colonists a still more horrible group of races. Great webbed and scaled and taloned creatures they were now, reptiles living in land and water.

Even these incredibly changed creatures possessed a faint remnant of their ancestors' mental power. They made vain attempts to communicate with Arctarians far on other worlds of distant suns, to apprise them of their plight. But their minds were now too weak.

There followed a scene in the Cenozoic. The reptiles had become mammals; the onward progress of the Arctarians had gone further. Now only the merest shreds of the original mentality remained in these degraded descendants. And now this pitiful posterity had produced a species even more foolish and lacking in mental power than they before, ground-apes that roamed the cold plain in chattering, quarreling packs. The last shreds of Arctarian inheritance, the ancient instincts toward dignity and eagerness and forbearance, had faded out of these creatures.

And then a last picture filled Woodin's brain. It was the world of the present day, the world he had seen through his own eyes. But now he saw and understood it as he never had before, a world in which degeneration had gone to the utmost limit. The apes had become even weaker bipedal creatures, who had lost almost every atom of inheritance of the old Arctarian mind. These creatures had lost, too, many of the senses which had been retained even by the apes before them. And these creatures, these humans, were now degenerating with increasing rapidity. Where at first they had killed like their animal forebears only for food, they had learned to kill wantonly. And had learned to kill each other in groups, in tribes, in nations and empires. In the madness of their degeneracy they slaughtered each other until earth ran with their blood.

They were more cruel even than the apes who had preceded them, cruel with the utter cruelty of the mad. And in their progressive insanity they came to starve in the midst of plenty, to slay each other in their own cities, to cower beneath the lash of superstitious fears as no creatures had before them.

They were the last terrible descendants, the last degenerated product, of the ancient Arctarian colonists who once had been kings of intellect. Now the other animals were almost gone. These, the last hideous freaks, would soon wind up the terrible story entirely by annihilating each other in their madness.

WOODIN CAME SUDDENLY to consciousness. He was standing in the starlight in the center of the riverside clearing. And around him still were poised the ten amorphous Arctarians, a silent ring.

Dazed, reeling from that tremendous and awful vision that had passed through his mind with incredible vividness, he turned slowly from one to the other of the Arctarians. Their thoughts impinged on his brain, strong, somber, shaken by terrible horror and loathing.

The sick thought of the Arctarian leader beat into Woodin's mind.

"So *that* is what became of our Arctarian colonists who came to this world! They degenerated, changed into lower and lower forms of life, until these pitiful insane things, who now swarm on this world, are their last descendants.

"This world is a world of deadly horror! A world that somehow damages the

genes of our race's bodies and changes them bodily and mentally, making them degenerate further each generation. Before us we see the awful result."

The shaken thought of another Arctarian asked, "But what can we do now?"

"There is nothing we can do," uttered their leader solemnly. "This degeneration, this awful change, has gone too far for us ever to reverse it now.

"Our intelligent brothers became on this poisoned world things of horror, and we cannot now turn back the clock and restore them from the degraded things their descendants are."

Woodin found his voice and cried out thinly, shrilly.

"It isn't true!" he cried. "It's all a lie, what I saw! We humans aren't the product of downward devolution, we're the product of ages of upward evolution! We must be, I tell you! Why, we wouldn't want to live, I wouldn't want to live, if that other tale was true. It can't be true!"

The thought of the Arctarian leader, directed at the other amorphous shapes, reached his raving mind. It was tinged with pity, yet strong with a superhuman loathing.

"Come, my brothers," the Arctarian was saying to his fellows. "There is nothing we can do here on this soul-sickening world."

"Let us go, before we too are poisoned and changed. And we will send warning to Arctar that this world is poisoned, a world of degeneration, so that never again may any of our race come here and go down the awful road that those others went down.

"Come! We return to our own sun."

The Arctarian leader's humped shape flattened, assumed a disk-like form, then rose smoothly upward into the air. The others too changed and followed, in a group, and a stupefied Woodin stared up at them, glistening dots lifting rapidly into the starlight.

He staggered forward a few steps, shaking his fist insanely up at the shining, receding dots.

"Come back, damn you!" he screamed. "Come back and tell me it's a lie!

"It must be a lie—it must—"

There was no sign of the vanished Arctarians now in the starlit sky. The darkness was brooding and intense around Woodin.

He screamed up again into the night, but only a whispering echo answered. Wild-eyed, staggering, soul-smitten, his gaze fell on the pistol in Ross's hand. He seized it with a hoarse cry.

The stillness of the forest was broken suddenly by a sharp crack that reverberated a moment and then died rapidly away. Then all was silent again save for the chuckling whisper of the river hurrying on.

HELEN O'LOY

by Lester del Rey

I am an old man now, but I can still see Helen as Dave unpacked her, and still hear him gasp as he looked her over.

"Man, isn't she a beauty?"

She was beautiful, a dream in spun plastics and metals, something Keats might have seen dimly when he wrote his sonnet. If Helen of Troy had looked like that the Greeks must have been pikers when they launched only a thousand ships; at least, that's what I told Dave.

"Helen of Troy, eh?" He looked at her tag. "At least it beats this thing—K2W88. Helen... Mmmm... Helen of Alloy."

"Not much swing to that, Dave. Too many unstressed syllables in the middle. How about Helen O'LOY?"

"Helen O'LOY she is, Phil." And that's how it began—one part beauty, one part dream, one part science; add a stereo broadcast, stir mechanically, and the result is chaos.

Dave and I hadn't gone to college together, but when I came to Messina to practice medicine, I found him downstairs in a little robot repair shop. After that, we began to pal around, and when I started going with one twin, he found the other equally attractive, so we made it a foursome.

When our business grew better, we rented a house near the rocket field—noisy but cheap, and the rockets discouraged apartment building. We liked room enough to stretch ourselves. I suppose, if we hadn't quarreled with them, we'd have married the twins in time. But Dave wanted to look over the latest Venus-rocket attempt when his twin wanted to see a display stereo starring Larry Ainslee, and they were

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both stubborn. From then on, we forgot the girls and spent our evenings at home.

But it wasn't until 'Lena' put vanilla on our steak instead of salt that we got off on the subject of emotions and robots. While Dave was dissecting Lena to find the trouble, we naturally mulled over the future of the mechs. He was sure that the robots would beat men some day, and I couldn't see it.

"Look here, Dave," I argued. "You know Lena doesn't think—not really. When those wires crossed, she could have corrected herself. But she didn't bother; she followed the mechanical impulse. A man might have reached for the vanilla, but when he saw it in his hand, he'd have stopped. Lena has sense enough, but she has no emotions, no consciousness of self."

"All right, that's the big trouble with the mechs now. But we'll get around it, put in some mechanical emotions, or something." He screwed Lena's head back on, turned on her juice. "Go back to work, Lena, it's nineteen o'clock."

Now I specialized in endocrinology and related subjects. I wasn't exactly a psychologist, but I did understand the glands, secretions, hormones, and miscellanies that are the physical causes of emotions. It took medical science three hundred years to find out how and why they worked, and I couldn't see men duplicating them mechanically in much less time.

I brought home books and papers to prove it, and Dave quoted the invention of memory coils and veritoid eyes. During that year we swapped knowledge until Dave knew the whole theory of endocrinology, and I could have made Lena from memory. The more we talked, the less sure I grew about the impossibility of *homo mechanensis* as the perfect type.

Poor Lena. Her cuproberyl body spent half its time in scattered pieces. Our first attempts were successful only in getting her to serve fried brushes for breakfast and wash the dishes in oleo oil. Then one day she cooked a perfect dinner with six wires crossed, and Dave was in ecstasy. He worked all night on her wiring, put in a new coil, and taught her a fresh set of words. And the next day she flew into a tantrum and swore vigorously at us when we told her she wasn't doing her work right.

"It's a lie," she yelled, shaking a suction brush. "You're all liars. If you so-and-so's would leave me whole long enough, I might get something done around the place."

When we calmed her temper and got her back to work, Dave ushered me into the study. "Not taking any chances with Lena," he explained. "We'll have to cut out that adrenal pack and restore her to normalcy."

But we've got to get a better robot. A housemaid mech isn't complex enough."

"How about Dillard's new utility models? They seem to combine everything in one."

"Exactly. Even so, we'll need a special one built to order, with a full range of memory coils. And out of respect to old Lena, let's get a female case for its works."

The result, of course, was Helen. The Dillard people had performed a miracle and put all the works in a girl-modeled case. Even the plastic and rubberite face was designed for flexibility to express emotions, and she was complete with tear glands and taste buds, ready to simulate every human action, from breathing to pulling hair. The bill they sent with her was another miracle, but Dave and I scraped it together; we had to turn Lena over to an exchange to complete it, though, and thereafter we ate out.

I'd performed plenty of delicate operations on living tissues, and some of them had been tricky, but I still felt like a pre-med student as we opened the front plate of her torso and began to sever the leads of her "nerves." Dave's mechanical glands were all prepared, complex little bundles of radio tubes and wires that heterodyned on the electrical thought impulses and distorted them as adrenalin distorts the reaction of human minds.

Instead of sleeping that night, we pored over the schematic diagrams of her structures, tracing the thoughts through mazes of her wiring, severing the leaders, implanting the heterones, as Dave called them. And while we worked, a mechanical tape fed carefully prepared thoughts of consciousness and awareness of life and feeling into an auxiliary memory coil. Dave believed in leaving nothing to chance.

It was growing light as we finished, exhausted and exultant. All that remained was the starting of her electrical power; like all the Dillard mechs, she was equipped with a tiny atomotor instead of batteries, and once started would need no further attention.

Dave refused to turn her on. "Wait until we've slept and rested," he advised. "I'm as eager to try her as you are, but we can't do much studying with our minds half dead. Turn in, and we'll leave Helen until later."

Even though we were both reluctant to follow it, we knew the idea was sound. We turned in, and sleep hit us before the air-conditioner could cut down to sleeping temperature. And then Dave was pounding on my shoulders.

"Phil! Hey, snap out of it!"

I groaned, turned over, and faced him. "Well? . . . Uh! What is it? Did Helen—"

"No, it's old Mrs. van Styler. She 'visedored to say her son has an infatuation for a servant girl, and she wants you to come out and give counter-hormones. They're at the summer camp in Maine."

Rich Mrs. van Styler! I couldn't afford to let that account down, now that Helen had used up the last of my funds. But it wasn't a job I cared for.

"Counter-hormones! That'll take two weeks' full time. Anyway, I'm no society doctor, messing with glands to keep fools happy. My job's taking care of serious trouble."

"And you want to watch Helen." Dave was grinning, but he was serious, too. "I told her it'd cost her fifty thousand!"

"Huh?"

"And she said okay, if you hurried."

Of course, there was only one thing to do, though I could have wrung fat Mrs. van Styler's neck cheerfully. It wouldn't have happened if she'd used robots like everyone else—but she had to be different.

Consequently, while Dave was back home puttering with Helen, I was racking my brain to trick Archy van Styler into getting the counter-hormones, and giving the serv'ant girl the same. Oh, I wasn't supposed to, but the poor kid was crazy about Archy. Dave might have written, I thought, but never a word did I get.

It was three weeks later instead of two when I reported that Archy was "cured," and collected on the line. With that money in my pocket, I hired a personal rocket and was back in Messina in half an hour. I didn't waste time in reaching the house.

As I stepped into the alcove, I heard a light patter of feet, and an eager voice called out, "Dave, dear?" For a minute I couldn't answer, and the voice came again, pleading, "Dave?"

I don't know what I expected, but I didn't expect Helen to meet me that way, stopping and staring at me, obvious disappointment on her face, little hands fluttering up against her breast.

"Oh," she cried. "I thought it was Dave. He hardly comes home to eat now, but I've had supper waiting hours." She dropped her hands and managed a smile. "You're Phil, aren't you? Dave told me about you when . . . at first. I'm so glad to see you home, Phil."

"Glad to see you doing so well, Helen." Now what does one say for light conversation with a robot? "You said something about supper?"

"Oh, yes. I guess Dave ate downtown again, so we might as well go in. It'll be nice having someone to talk to around the house, Phil. You

don't mind if I call you Phil, do you? You know, you're sort of a godfather to me."

We ate. I hadn't counted on such behavior, but apparently she considered eating as normal as walking. She didn't do much eating, at that; most of the time she spent staring at the front door.

Dave came in as we were finishing, a frown a yard wide on his face. Helen started to rise, but he ducked toward the stairs, throwing words over his shoulder.

"Hi, Phil. See you up here later."

There was something radically wrong with him. For a moment, I'd thought his eyes were haunted, and as I turned to Helen, hers were filling with tears. She gulped, choked them back, and fell to viciously on her food.

"What's the matter with him . . . and you?" I asked.

"He's sick of me." She pushed her plate away and got up hastily. "You'd better see him while I clean up. And there's nothing wrong with me. And it's not my fault, anyway." She grabbed the dishes and ducked into the kitchen; I could have sworn she was crying.

Maybe all thought is a series of conditioned reflexes—but she certainly had picked up a lot of conditioning while I was gone. Lena in her heyday had been nothing like this. I went up to see if Dave could make any sense out of the hodgepodge.

He was squirting soda into a large glass of apple brandy, and I saw that the bottle was nearly empty. "Join me?" he asked.

It seemed like a good idea. The roaring blast of an ion rocket overhead was the only familiar thing left in the house. From the look around Dave's eyes, it wasn't the first bottle he'd emptied while I was gone, and there were more left. He dug out a new bottle for his own drink.

"Of course, it's none of my business, Dave, but that stuff won't steady your nerves any. What's gotten into you and Helen? Been seeing ghosts?"

Helen was wrong; he hadn't been eating downtown—nor anywhere else. His muscles collapsed into a chair in a way that spoke of fatigue and nerves, but mostly of hunger. "You noticed it, eh?"

"Noticed it? The two of you jammed it down my throat."

"Uhhmm." He swatted at a non-existent fly, and slumped further down in the pneumatic. "Guess maybe I should have waited with Helen until you got back. But if that stereo cast hadn't changed . . . anyway, it did. And those mushy books of yours finished the job."

"Thanks. That makes it all clear."

"You know, Phil, I've got a place up in the country . . . fruit ranch. My dad left it to me. Think I'll look it over."

And that's the way it went. But finally, by much liquor and more perspiration, I got some of the story out of him before I gave him an amytal and put him to bed. Then I hunted up Helen and dug the rest of the story from her, until it made sense.

Apparently as soon as I was gone, Dave had turned her on and made preliminary tests, which were entirely satisfactory. She had reacted beautifully—so well that he decided to leave her and go down to work as usual.

Naturally, with all her untried emotions, she was filled with curiosity, and wanted him to stay. Then he had an inspiration. After showing her what her duties about the house would be, he set her down in front of the stereovisor, tuned in a travelogue, and left her to occupy her time with that.

The travelogue held her attention until it was finished, and the station switched over to a current serial with Larry Ainslee, the same cute emoter who'd given us all the trouble with the twins. Incidentally, he looked something like Dave.

Helen took to the serial like a seal to water. This play acting was a perfect outlet for her newly excited emotions. When that particular episode finished, she found a love story on another station, and added still more to her education. The afternoon programs were mostly news and music, but by then she'd found my books; and I do have rather adolescent taste in literature.

Dave came home in the best of spirits. The front alcove was neatly swept, and there was the odor of food in the air that he'd missed around the house for weeks. He had visions of Helen as the super-efficient housekeeper.

So it was a shock to him to feel two strong arms around his neck from behind and hear a voice all a-quiver coo into his ears, "Oh, Dave, darling, I've missed you so, and I'm so *thrilled* that you're back." Helen's technique may have lacked polish, but it had enthusiasm, as he found when he tried to stop her from kissing him. She had learned fast and furiously—also, Helen was powered by an atomotor.

Dave wasn't a prude, but he remembered that she was only a robot, after all. The fact that she felt, acted, and looked like a young goddess in his arms didn't mean much. With some effort, he untangled her and dragged her off to supper, where he made her eat with him to divert her attention.

After her evening work, he called her into the study and gave her a

thorough lecture on the folly of her ways. It must have been good, for it lasted three solid hours, and covered her station in life, the idiocy of stereotypes, and various other miscellanies. When he finished, Helen looked up with dewy eyes and said wistfully, "I know, Dave, but I still love you."

That's when Dave started drinking.

It grew worse each day. If he stayed downtown, she was crying when he came home. If he returned on time, she fussed over him and threw herself at him. In his room, with the door locked, he could hear her downstairs pacing up and down and muttering; and when he went down, she stared at him reproachfully until he had to go back up.

I sent Helen out on a fake errand in the morning and got Dave up. With her gone, I made him eat a decent breakfast and gave him a tonic for his nerves. He was still listless and moody.

"Look here, Dave," I broke in on his brooding. "Helen isn't human, after all. Why not cut off her power and change a few memory coils? Then we can convince her that she never was in love and couldn't get that way."

"You try it. I had that idea, but she put up a wail that would wake Homer. She says it would be murder—and the hell of it is that I can't help feeling the same about it. Maybe she isn't human, but you wouldn't guess it when she puts on that martyred look and tells you to go ahead and kill her."

"We never put in substitutes for some of the secretions present in man during the love period."

"I don't know what we put in. Maybe the heterones backfired or something. Anyway, she's made this idea so much a part of her thoughts that we'd have to put in a whole new set of coils."

"Well, why not?"

"Go ahead. You're the surgeon of this family. I'm not used to fussing with emotions. Matter of fact, since she's been acting this way, I'm beginning to hate work on any robot. My business is going to blazes."

He saw Helen coming up the walk and ducked out the black door for the monoral express. I'd intended to put him back in bed, but let him go. Maybe he'd be better off at his shop than at home.

"Dave's gone?" Helen did have that martyred look now.

"Yeah. I got him to eat, and he's gone to work."

"I'm glad he ate." She slumped down in a chair as if she were worn out, though how a mech could be tired beat me. "Phil?"

"Well, what is it?"

"Do you think I'm bad for him? I mean, do you think he'd be happier if I weren't here?"

"He'll go crazy if you keep acting this way around him."

She winced. Those little hands were twisting about pleadingly, and I felt like an inhuman brute. But I'd started, and I went ahead. "Even if I cut out your power and changed your coils, he'd probably still be haunted by you."

"I know. But I can't help it. And I'd make him a good wife, really I would, Phil."

I gulped; this was getting a little too far. "And give him strapping sons to boot, I suppose. A man wants flesh and blood, not rubber and metal."

"Don't, please! I can't think of myself that way; to me, I'm a woman. And you know how perfectly I'm made to imitate a real woman . . . in all ways. I couldn't give him sons, but in every other way . . . I'd try so hard, I know I'd make him a good wife."

I gave up.

Dave didn't come home that night, nor the next day. Helen was fussing and fuming, wanting me to call the hospitals and the police, but I knew nothing had happened to him. He always carried identification. Still, when he didn't come on the third day, I began to worry. And when Helen started out for his shop, I agreed to go with her.

Dave was there, with another man I didn't know. I parked Helen where he couldn't see her, but where she could hear, and went in as soon as the other fellow left.

Dave looked a little better and seemed glad to see me. "Hi, Phil—just closing up. Let's go eat."

Helen couldn't hold back any longer, but came trooping in. "Come on home, Dave. I've got roast duck with spice stuffing, and you know you love that."

"Seat!" said Dave. She shrank back, turned to go. "Oh, all right, stay. You might as well hear it, too. I've sold the shop. The fellow you saw just bought it, and I'm going up to the old fruit ranch I told you about, Phil. I can't stand the mechs any more."

"You'll starve to death at that," I told him.

"No, there's a growing demand for old-fashioned fruit, raised out of doors. People are tired of this water-culture stuff. Dad always made a living out of it. I'm leaving as soon as I can get home and pack."

Helen clung to her idea. "I'll pack, Dave, while you eat. I've got apple cobbler for dessert." The world was toppling under her feet, but she still remembered how crazy he was for apple cobbler.

Helen was a good cook; in fact she was a genius, with all the good points of a woman and a mech combined. Dave ate well enough, after he got started. By the time supper was over, he'd thawed out enough

to admit he liked the duck and cobbler, and to thank her for packing. In fact, he even let her kiss him good-bye, though he firmly refused to let her go to the rocket field with him.

Helen was trying to be brave when I got back, and we carried on a stumbling conversation about Mrs. van Styler's servants for a while. But the talk began to lull, and she sat staring out of the window at nothing most of the time. Even the stereo comedy lacked interest for her, and I was glad enough to have her go off to her room. She could cut her power down to simulate sleep when she chose.

As the days slipped by, I began to realize why she couldn't believe herself a robot. I got to thinking of her as a girl and companion myself. Except for odd intervals when she went off by herself to brood, or when she kept going to the telescript for a letter that never came, she was as good a companion as a man could ask. There was something homely about the place that Lena had never put there.

I took Helen on a shopping trip to Hudson and she giggled and purred over the wisps of silk and glassheen that were the fashion, tried on endless hats, and conducted herself as any normal girl might. We went trout fishing for a day, where she proved to be as good a sport and as sensibly silent as a man. I thoroughly enjoyed myself and thought she was forgetting Dave. That was before I came home unexpectedly and found her doubled up on the couch, threshing her legs up and down and crying to the high heavens.

It was then I called Dave. They seemed to have trouble in reaching him, and Helen came over beside me while I waited. She was tense and fidgety as an old maid trying to propose. But finally they located Dave.

"What's up, Phil?" he asked as his face came on the viewplate. "I was just getting my things together to—"

I broke him off. "Things can't go on the way they are, Dave. I've made up my mind. I'm yanking Helen's coils tonight. It won't be worse than what she's going through now."

Helen reached up and touched my shoulder. "Maybe that's best, Phil. I don't blame you."

Dave's voice cut in. "Phil, you don't know what you're doing!"

"Of course I do. It'll all be over by the time you can get here. As you heard, she's agreeing."

There was a black cloud sweeping over Dave's face. "I won't have it, Phil. She's half mine and I forbid it!"

"Of all the—"

"Go ahead, call me anything you want. I've changed my mind. I was packing to come home when you called."

Helen jerked around me, her eyes glued to the panel. "Dave, do you . . . are you—"

"I'm just waking up to what a fool I've been, Helen. Phil, I'll be home in a couple of hours, so if there's anything—"

He didn't have to chase me out. But I heard Helen cooing something about loving to be a rancher's wife before I could shut the door.

Well, I wasn't as surprised as they thought. I think I knew when I called Dave what would happen. No man acts the way Dave had been acting because he hates a girl; only because he thinks he does—and thinks wrong.

No woman ever made a lovelier bride or a sweeter wife. Helen never lost her flare for cooking and making a home. With her gone, the old house seemed empty, and I began to drop out to the ranch once or twice a week. I suppose they had trouble at times, but I never saw it, and I know the neighbors never suspected they were anything but normal man and wife.

Dave grew older, and Helen didn't, of course. But between us, we put lines in her face and grayed her hair without letting Dave know that she wasn't growing old with him; he'd forgotten that she wasn't human, I guess.

I practically forgot, myself. It wasn't until a letter came from Helen this morning that I woke up to reality. There, in her beautiful script, just a trifle shaky in places, was the inevitable that neither Dave nor I had seen.

Dear Phil,

As you know, Dave has had heart trouble for several years now. We expected him to live on just the same, but it seems that wasn't to be. He died in my arms just before sunrise. He sent you his greetings and farewell.

I've one last favor to ask of you, Phil. There is only one thing for me to do when this is finished. Acid will burn out metal as well as flesh, and I'll be dead with Dave. Please see that we are buried together, and that the morticians do not find my secret. Dave wanted it that way, too.

Poor, dear Phil. I know you loved Dave as a brother, and how you felt about me. Please don't grieve too much for us, for we have had a happy life together, and both feel that we should cross this last bridge side by side.

With love and thanks from,

Helen.

It had to come sooner or later, I suppose, and the first shock has worn off now. I'll be leaving in a few minutes to carry out Helen's last instructions.

Dave was a lucky man, and the best friend I ever had. And Helen— Well, as I said, I'm an old man now, and can view things more sanely; I should have married and raised a family, I suppose. But . . . there was only one Helen O'Loy.

THE ROADS MUST ROLL

by *Robert A. Heinlein*

"Who makes the roads roll?"

The speaker stood still on the rostrum and waited for his audience to answer him. The reply came in scattered shouts that cut through the ominous, discontented murmur of the crowd.

"We do! We do! Damn right!"

"Who does the dirty work 'down inside'—so that Joe Public can ride at his ease?"

This time it was a single roar: "We do!"

The speaker pressed his advantage, his words tumbling out in a rasping torrent. He leaned toward the crowd, his eyes picking out individuals at whom to fling his words. "What makes business? The roads! How do they move the food they eat? The roads! How do they get to work? The roads! How do they get home to their wives? The roads!" He paused for effect, then lowered his voice. "Where would the public be if you boys didn't keep them roads rolling? Behind the eight ball, and everybody knows it. But do they appreciate it? *Pfui!* Did we ask for too much? Were our demands unreasonable? 'The right to resign whenever we want to.' Every working stiff in any other job has that. 'The same pay as the engineers.' Why not? Who are the real engineers around here? D'yuh have to be a cadet in a funny little hat before you can learn to wipe a bearing, or jack down a rotor? Who earns his keep. The gentlemen in the control offices, or the boys down inside? What else do we ask? 'The right to elect our own engineers.' Why the hell not? Who's competent to pick engineers? The technicians—or some damn dumb

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MICROCOSMIC GOD

by *Theodore Sturgeon*

in his possession, he only asked repeatedly, "How do you know?" His most delectable pleasure was cutting a fanatical eugenicist into conversational ribbons. So people left him alone and never, never asked him to tea. He was polite, but not politic.

He had a little money of his own, and with it he leased the island and built himself a laboratory. Now I've mentioned that he was a biochemist. But being what he was, he couldn't keep his nose in his own field. It wasn't too remarkable when he made an intellectual excursion wide enough to perfect a method of crystallizing Vitamin B₁ profitably by the ton—if anyone wanted it by the ton. He got a lot of money for it. He bought his island outright and put eight hundred men to work on an acre and a half of his ground, adding to his laboratory and building equipment. He got to messing around with sisal fiber, found out how to fuse it, and boomed the banana industry by producing a practically unbreakable cord from the stuff.

You remember the popularizing demonstration he put on at Niagara, don't you? That business of running a line of the new cord from bank to bank over the rapids and suspending a ten-ton truck from the middle of it by razor edges resting on the cord? That's why ships now moor themselves with what looks like heaving line, no thicker than a lead pencil, that can be coiled on reels like garden hose. Kidder made cigarette money out of that, too. He went out and bought himself a cyclotron with part of it.

After that money wasn't money any more. It was large numbers in little books. Kidder used little amounts of it to have food and equipment sent out to him, but after a while that stopped, too. His bank dispatched a messenger by seaplane to find out if Kidder was still alive. The man returned two days later in a bemused state, having been amazed something awesome at the things he'd seen out there. Kidder was alive, all right, and he was turning out a surplus of good food in an astonishingly simplified synthetic form. The bank wrote immediately and wanted to know if Mr. Kidder, in his own interest, was willing to release the secret of his dirtless farming. Kidder replied that he would be glad to, and inclosed the formulas. In a P.S. he said that he hadn't sent the information ashore because he hadn't realized anyone would be interested. That from a man who was responsible for the greatest sociological change in the second half of the twentieth century—factory farming. It made him richer; I mean it made his bank richer. He didn't give a rap.

But Kidder didn't really get started until about eight months after the messenger's visit. For a biochemist who couldn't even be called "Doctor" he did pretty well. Here is a partial list of the things that he turned out:

Here is a story about a man who had too much power, and a man who took too much, but don't worry; I'm not going political on you. The man who had the power was named James Kidder and the other was his banker.

Kidder was quite a guy. He was a scientist and he lived on a small island off the New England coast all by himself. He wasn't the dwarfed little gnome of a mad scientist you read about. His hobby wasn't personal profit, and he wasn't a megalomaniac with a Russian name and no scruples. He wasn't insidious, and he wasn't even particularly subversive. He kept his hair cut and his nails clean and lived and thought like a reasonable human being. He was slightly on the baby-faced side; he was inclined to be a hermit; he was short and plump and—brilliant. His specialty was biochemistry, and he was always called *Mr. Kidder*. Not "Dr." Not "Professor." Just *Mr. Kidder*.

He was an odd sort of apple and always had been. He had never graduated from any college or university because he found them too slow for him, and too rigid in their approach to education. He couldn't get used to the idea that perhaps his professors knew what they were talking about. That went for his texts, too. He was always asking questions, and didn't mind very much when they were embarrassing. He considered Gregor Mendel a bungling liar, Darwin an amusing philosopher, and Luther Burbank a sensationalist. He never opened his mouth without leaving his victim feeling breathless. If he was talking to someone who had knowledge, he went in there and got it, leaving his victim breathless. If he was talking to someone whose knowledge was already

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A commercially feasible plan for making an aluminum alloy stronger than the best steel so that it could be used as a structural metal.

An exhibition gadget he called a light pump, which worked on the theory that light is a form of matter and therefore subject to physical and electromagnetic laws. Seal a room with a single light source, beam a cylindrical vibratory magnetic field to it from the pump, and the light will be led down it. Now pass the light through Kidder's "lens"—a ring which perpetuates an electric field along the lines of a high-speed iris-type camera shutter. Below this is the heart of the light pump—a ninety-eight-per-cent efficient light absorber, crystalline, which, in a sense, *loses* the light in its internal facets. The effect of darkening the room with this apparatus is slight but measurable. Pardon my layman's language, but that's the general idea.

Synthetic chlorophyll—by the barrel.

An airplane propeller efficient at eight times sonic speed.

A cheap goo you brush on over old paint, let harden, and then peel off like strips of cloth. The old paint comes with it. That one made friends fast.

A self-sustaining atomic disintegration of uranium's isotope 238, which is two hundred times as plentiful as the old stand-by, U-235.

That will do for the present. If I may repeat myself, for a biochemist who couldn't even be called "Doctor," he did pretty well.

Kidder was apparently unconscious of the fact that he held power enough on his little island to become master of the world. His mind simply didn't run to things like that. As long as he was left alone with his experiments, he was well content to leave the rest of the world to its own clumsy and primitive devices. He couldn't be reached except by a radiophone of his own design, and its only counterpart was locked in a vault of his Boston bank. Only one man could operate it. The extraordinarily sensitive transmitter would respond only to Conant's own body vibrations. Kidder had instructed Conant that he was not to be disturbed except by messages of the greatest moment. His ideas and patents, what Conant could pry out of him, were released under pseudonyms known only to Conant—Kidder didn't care.

The result, of course, was an infiltration of the most astonishing advancements since the dawn of civilization. The nation profited—the world profited. But most of all, the bank profited. It began to get a little oversize. It began getting its fingers into other pies. It grew more fingers and had to bake more figurative pies. Before many years had passed, it was so big that, using Kidder's many weapons, it almost matched Kidder in power.

Almost.

Now stand by while I squelch those fellows in the lower left-hand corner who've been saying all this while that Kidder's slightly improbable; that no man could ever perfect himself in so many ways in so many sciences.

Well, you're right. Kidder was a genius—granted. But his genius was not creative. He was, to the core, a student. He applied what he knew, what he saw, and what he was taught. When first he began working in his new laboratory on his island he reasoned something like this:

"Everything I know is what I have been taught by the sayings and writings of people who have studied the sayings and writings of people who have—and so on. Once in a while someone stumbles on something new and he or someone cleverer uses the idea and disseminates it. But for each one that finds something really new, a couple of million gather and pass on information that is already current. I'd know more if I could get the jump on evolutionary trends. It takes too long to wait for the accidents that increase man's knowledge—my knowledge. If I had ambition enough now to figure out how to travel ahead in time, I could skim the surface of the future and just dip down when I saw something interesting. But time isn't that way. It can't be left behind or tossed ahead. What else is left?"

"Well, there's the proposition of speeding intellectual evolution so that I can observe what it cooks up. That seems a bit inefficient. It would involve more labor to discipline human minds to that extent than it would to simply apply myself along those lines. But I can't apply myself that way. No one man can.

"I'm licked. I can't speed myself up, and I can't speed other men's minds up. Isn't there an alternative? There must be—somewhere, somehow, there's got to be an answer."

So it was on this, and not on eugenics, or light pumps, or botany, or atomic physics, that James Kidder applied himself. For a practical man he found the problem slightly on the metaphysical side; but he attacked it with typical thoroughness, using his own peculiar brand of logic. Day after day he wandered over the island, throwing shells impotently at sea gulls and swearing richly. Then came a time when he sat indoors and brooded. And only then did he get feverishly to work.

He worked in his own field, biochemistry, and concentrated mainly on two things—genetics and animal metabolism. He learned, and filed away in his insatiable mind, many things having nothing to do with the problem in hand, and very little of what he wanted. But he piled that little on what little he knew or guessed, and in time had quite a collection of known factors to work with. His approach was characteristically unorthodox. He did things on the order of multiplying apples by pears,

and balancing equations by adding $\log \sqrt{-1}$ to one side and ∞ to the other. He made mistakes, but only one of a kind, and later, only one of a species. He spent so many hours at his microscope that he had quit work for two days to get rid of a hallucination that his heart was pumping his own blood through the mike. He did nothing by trial and error because he disapproved of the method as sloppy.

And he got results. He was lucky to begin with and even luckier when he formulated the law of probability and reduced it to such low terms that he knew almost to the item what experiments not to try. When the cloudy, viscous semifluid on the watch glass began to move itself he knew he was on the right track. When it began to seek food on its own he began to be excited. When it divided and, in a few hours, redivided, and each part grew and divided again, he was triumphant, for he had created life.

He nursed his brain children and sweated and strained over them, and he designed baths of various vibrations for them, and inoculated and dosed and sprayed them. Each move he made taught him the next. And out of his tanks and tubes and incubators came amoeba-like creatures, and then ciliated animalcules, and more and more rapidly he produced animals with eye spots, nerve cysts, and then—victory of victories—a real blastopod, possessed of many cells instead of one. More slowly he developed a gastropod, but once he had it, it was not too difficult for him to give it organs, each with a specified function, each inheritable.

Then came cultured mollusklike things, and creatures with more and more perfected gills. The day that a nondescript thing wriggled up an inclined board out of a tank, threw flaps over its gills and feebly breathed air, Kidder quit work and went to the other end of the island and got disgustingly drunk. Hangover and all, he was soon back in the lab, forgetting to eat, forgetting to sleep, tearing into his problem.

He turned into a scientific byway and ran and down his other great triumph—accelerated metabolism. He extracted and refined the stimulating factors in alcohol, coca, heroin, and Mother Nature's prize dope runner, *cannabis indica*. Like the scientist who, in analyzing the various clotting agents for blood treatments, found that oxalic acid and oxalic acid alone was the active factor, Kidder isolated the accelerators and decelerators, the stimulants and soporifics, in every substance that ever undermined a man's morality and/or caused a "noble experiment." In the process he found one thing he needed badly—a colorless elixir that made sleep the unnecessary and avoidable waster of time it should be. Then and there he went on a twenty-four-hour shift.

He artificially synthesized the substances he had isolated, and in doing so sloughed away a great many useless components. He pursued the

subject along the lines of radiations and vibrations. He discovered something in the longer reds which, when projected through a vessel full of air vibrating in the supersonics, and then polarized, speeded up the heartbeat of small animals twenty to one. They ate twenty times as much, grew twenty times as fast, and—died twenty times sooner than they should have.

Kidder built a huge hermetically sealed room. Above it was another room, the same length and breadth but not quite as high. This was his control chamber. The large room was divided into four sealed sections, each with its individual miniature cranes and derricks—handling machinery of all kinds. There were also trapdoors fitted with air locks leading from the upper to the lower room.

By this time the other laboratory had produced a warm-blooded, snake-skinned quadruped with an astonishingly rapid life cycle—a generation every eight days, a life span of about fifteen. Like the echidna, it was oviparous and mammalian. Its period of gestation was six hours; the eggs hatched in three; the young reached sexual maturity in another four days. Each female laid four eggs and lived just long enough to care for the young after they hatched. The male generally died two or three hours after mating. The creatures were highly adaptable. They were small—not more than three inches long, two inches to the shoulder from the ground. Their forepaws had three digits and a triple-jointed, opposed thumb. They were attuned to life in an atmosphere with a large ammonia content. Kidder bred four of the creatures and put one group in each section of the sealed room.

Then he was ready. With his controlled atmospheres he varied temperatures, oxygen content, humidity. He killed them off like flies with excesses of, for instance, carbon dioxide, and the survivors bred their physical resistance into the next generation. Periodically he would switch the eggs from one sealed section to another to keep the strains varied. And rapidly, under these controlled conditions, the creatures began to evolve.

This, then, was the answer to his problem. He couldn't speed up mankind's intellectual advancement enough to have it teach him the things his incredible mind yearned for. He couldn't speed himself up. So he created a new race—a race which would develop and evolve so fast that it would surpass the civilization of man; and from them he would learn.

They were completely in Kidder's power. Earth's normal atmosphere would poison them, as he took care to demonstrate to every fourth generation. They would make no attempt to escape from him. They would live their lives and progress and make their little trial-and-error

experiments hundreds of times faster than man did. They had the edge on man, for they had Kidder to guide them. It took man six thousand years really to discover science, three hundred to put it to work. It took Kidder's creatures two hundred days to equal man's mental attainments. And from then on—Kidder's spasmodic output made the late, great Tom Edison look like a home handicrafter.

He called them Neoterics, and he teased them into working for him. Kidder was inventive in an ideological way; that is, he could dream up impossible propositions providing he didn't have to work them out. For example, he wanted the Neoterics to figure out for themselves how to build shelters out of porous material. He created the need for such shelters by subjecting one of the sections to a high-pressure rainstorm which flattened the inhabitants. The Neoterics promptly devised waterproof shelters out of the thin waterproof material he piled in one corner. Kidder immediately blew down the flimsy structure with a blast of cold air. They built them up again so that they resisted both wind and rain. Kidder lowered the temperature so abruptly that they could not adjust their bodies to it. They heated their shelters with tiny braziers. Kidder promptly turned up the heat until they began to roast to death. After a few deaths, one of their bright boys figured out how to build a strong insulant house by using three-ply rubberoid, with the middle layer perforated thousands of times to create tiny air pockets.

Using such tactics, Kidder forced them to develop a highly advanced little culture. He caused a drought in one section and a liquid surplus in another, and then opened the partition between them. Quite a spectacular war was fought, and Kidder's notebooks filled with information about military tactics and weapons. Then there was the vaccine they developed against the common cold—the reason why that affliction has been absolutely stamped out in the world today, for it was one of the things that Conant, the bank president, got hold of. He spoke to Kidder over the radio phone one winter afternoon with a voice so hoarse from laryngitis that Kidder sent him a vial of vaccine and told him briskly not to ever call him again in such a disgustingly inaudible state. Conant had it analyzed and again Kidder's accounts and the bank's swelled.

At first, Kidder merely supplied the materials he thought they might need, but when they developed an intelligence equal to the task of fabricating their own from the elements at hand, he gave each section a stock of raw materials. The process for really strong aluminum was developed when he built in a huge plunger in one of the sections, which reached from wall to wall and was designed to descend at the rate of four inches a day until it crushed whatever was at the bottom. The Neoterics, in self-defense, used what strong material they had in hand

to stop the inexorable death that threatened them. But Kidder had seen it that they had nothing but aluminum oxide and a scattering of other elements, plus plenty of electric power. At first they ran up dozens of aluminum pillars; when these were crushed and twisted they tried shaping them so that the soft metal would take more weight. When that failed they quickly built stronger ones; and when the plunger was halted, Kidder removed one of the pillars and analyzed it. It was hardened aluminum, stronger and tougher than molybdenum steel.

Experience taught Kidder that he had to make certain changes to increase his power over his Neoterics before they got too ingenious. There were things that could be done with atomic power that he was curious about; but he was not willing to trust his little superscientists with a thing like that unless they could be trusted to use it strictly according to Hoyle. So he instituted a rule of fear. The most trivial departure from what he chose to consider the right way of doing things resulted in instant death of half a tribe. If he was trying to develop a Diesel-type power plant, for instance, that would operate without a flywheel, and a bright young Neoteric used any of the materials for architectural purposes, half the tribe immediately died. Of course, they had developed a written language; it was Kidder's own. The teletype in a glass-enclosed area in a corner of each section was a shrine. Any directions that were given on it were obeyed, or else. . . . After this innovation, Kidder's work was much simpler. There was no need for any indirection. Anything he wanted done was done. No matter how impossible his commands, three or four generations of Neoterics could find a way to carry them out.

This quotation is from a paper that one of Kidder's highspeed telescopic cameras discovered being circulated among the younger Neoterics. It is translated from the highly simplified script of the Neoterics.

"These edicts shall be followed by each Neoteric upon pain of death, which punishment will be inflicted by the tribe upon the individual to protect the tribe against him.

"Priority of interest and tribal and individual effort is to be given the commands that appear on the word machine.

"Any misdirection of material or power, or use thereof for any other purpose than the carrying out of the machine's commands, unless no command appears, shall be punishable by death.

"Any information regarding the problem at hand, or ideas or experiments which might conceivably bear upon it, are to become the property of the tribe.

"Any individual failing to cooperate in the tribal effort, or who can

be termed guilty of not expending his full efforts in the work, or the suspicion thereof shall be subject to the death penalty."

Such are the results of complete domination. This paper impressed Kidder as much as it did because it was completely spontaneous. It was the Neoterics' own creed, developed by them for their own greatest good.

And so at last Kidder had his fulfillment. Crouched in the upper room going from telescope to telescope, running off slowed-down films from his high-speed cameras, he found himself possessed of a tractable, dynamic source of information. Housed in the great square building with its four half-acre sections was a new world, to which he was god.

Conant's mind was similar to Kidder's in that its approach to any problem was along the shortest distance between any two points, regardless of whether that approach was along the line of most or least resistance. His rise to the bank presidency was a history of ruthless moves whose only justification was that they got him what he wanted. Like an over-efficient general, he would never vanquish an enemy through sheer force of numbers alone. He would also skillfully flank his enemy, not on one side, but on both. Innocent bystanders were creatures deserving no consideration.

The time he took over a certain thousand-acre property, for instance, from a man named Grady, he was not satisfied with only the title to the land. Grady was an airport owner—had been all his life, and his father before him. Conant exerted every kind of pressure on the man and found him unshakable. Finally judicious persuasion led the city officials to dig a sewer right across the middle of the field, quite efficiently wrecking Grady's business. Knowing that this would supply Grady, who was a wealthy man, with motive for revenge, Conant took over Grady's bank at half again its value and caused it to fold up. Grady lost every cent he had and ended his life in an asylum. Conant was very proud of his tactics.

Like many another who had had Mammon by the tail, Conant did not know when to let go. His vast organization yielded him more money and power than any other concern in history, and yet he was not satisfied. Conant and money were like Kidder and knowledge. Conant's pyramided enterprises were to him what the Neoterics were to Kidder. Each had made his private world; each used it for his instruction and profit. Kidder, though, disturbed nobody but his Neoterics. Even so, Conant was not wholly villainous. He was a shrewd man, and had discovered early the value of pleasing people. No man can rob successfully over a period of years without pleasing the people he robs. The tech-

nique for doing this is highly involved, but master it and you can start your own mint.

Conant's one great fear was that Kidder would some day take an interest in world events and begin to become opinionated. Good heavens—the potential power he had! A little matter like swinging an election could be managed by a man like Kidder as easily as turning over in bed. The only thing he could do was to call him periodically and see if there was anything that Kidder needed to keep himself busy. Kidder appreciated this. Conant, once in a while, would suggest something to Kidder that intrigued him, something that would keep him deep in his hermitage for a few weeks. The light pump was one of the results of Conant's imagination. Conant bet him it couldn't be done. Kidder did it.

One afternoon Kidder answered the squeal of the radiophone's signal. Swearing mildly, he shut off the film he was watching and crossed the compound to the old laboratory. He went to the radiophone, threw a switch. The squealing stopped.

"Well?"

"Hello," said Conant. "Busy?"

"Not very," said Kidder. He was delighted with the pictures his camera had caught, showing the skillful work of a gang of Neoterics synthesizing rubber out of pure sulphur. He would rather have liked to tell Conant about it, but somehow he had never got around to telling Conant about the Neoterics, and he didn't see why he should start now.

Conant said, "Er . . . Kidder, I was down at the club the other day and a bunch of us were filling up an evening with loose talk. Something came up which might interest you."

"What?"

"Couple of the utilities boys there. You know the power setup in this country, don't you? Thirty per cent atomic, the rest hydroelectric, Diesel and steam?"

"I hadn't known," said Kidder, who was as innocent as a babe of current events.

"Well, we were arguing about what chance a new power source would have. One of the men there said it would be smarter to produce a new power and then talk about it. Another one waived that; said he couldn't name that new power, but he could describe it. Said it would have to have everything that present power sources have, plus one or two more things. It could be cheaper, for instance. It could be more efficient. It might supersede the others by being easier to carry from the power plant to the consumer. See what I mean? Any one of these factors might prove a new source of power competitive to the others. What I'd

like to see is a new power with *all* of these factors. What do you think of it?"

"Not impossible."

"Think not?"

"I'll try it."

"Keep me posted." Conant's transmitter clicked off. The switch was a little piece of false front that Kidder had built into the set, which was something that Conant didn't know. The set switched itself off when Conant moved from it. After the switch's sharp crack, Kidder heard the banker mutter, "If he does it, I'm all set. If he doesn't, at least the crazy fool will keep himself busy on the is!—"

Kidder eyed the radiophone for an instant with raised eyebrows, and then shrugged them down again with his shoulders. It was quite evident that Conant had something up his sleeve, but Kidder wasn't worried. Who on earth would want to disturb him? He wasn't bothering anybody. He went back to the Neoterics' building, full of the new power idea.

Eleven days later Kidder called Conant and gave specific instructions on how to equip his receiver with a facsimile set which would enable Kidder to send written matter over the air. As soon as this was done and Kidder informed, the biochemist for once in his life spoke at some length.

"Conant—you implied that a new power source that would be cheaper, more efficient and more easily transmitted than any now in use did not exist. You might be interested in the little generator I have just set up.

"It has power, Conant—unbelievable power. Broadcast. A beautiful little tight beam. Here—catch this on the facsimile recorder." Kidder slipped a sheet of paper under the clips of his transmitter and it appeared on Conant's set. "Here's the wiring diagram for a power receiver. Now listen. The beam is so tight, so highly directional, that not three-thousandths of one per cent of the power would be lost in a two-thousand-mile transmission. The power system is closed. That is, any drain on the beam returns a signal along it to the transmitter, which automatically steps up to increase the power output. It has a limit, but it's way up. And something else. This little gadget of mine can send out eight different beams with a total horsepower output of around eight thousand per minute per beam. From each beam you can draw enough power to turn the page of a book or fly a superstratosphere plane. Hold on—I haven't finished yet. Each beam, as I told you before, returns a signal from receiver to transmitter. This not only controls the power output of the beam, but directs it. Once contact is made, the beam will

never let go. It will follow the receiver anywhere. You can power land, air or water vehicles with it, as well as any stationary plant. Like it?"

Conant, who was a banker and not a scientist, wiped his shining pate with the back of his hand and said, "I've never known you to steer me wrong yet, Kidder. How about the cost of this thing?"

"High," said Kidder promptly. "As high as an atomic plant. But there are no high-tension lines, no wires, no pipelines, no nothing. The receivers are little more complicated than a radio set. Transmitter is—well, that's quite a job."

"Didn't take you long," said Conant.

"No," said Kidder, "it didn't, did it?" It was the lifework of nearly twelve hundred highly cultured people, but Kidder wasn't going into that. "Of course, the one I have here's just a model."

Conant's voice was strained. "A—model? And it delivers—"

"Over sixty-thousand horsepower," said Kidder gleefully.

"Good heavens! In a full-sized machine—why, one transmitter would be enough to—" The possibilities of the thing choked Conant for a moment. "How is it fueled?"

"It isn't," said Kidder. "I won't begin to explain it. I've tapped a source of power of unimaginable force. It's—well, big. So big that it can't be misused."

"What?" snapped Conant. "What do you mean by that?"

Kidder cocked an eyebrow. Conant *had* something up his sleeve, then. At this second indication of it, Kidder, the least suspicious of men, began to put himself on guard. "I mean just what I say," he said evenly. "Don't try too hard to understand me—I barely savvy it myself. But the source of this power is a monstrous resultant caused by the unbalance of two previously equalized forces. Those equalized forces are cosmic in quantity. Actually, the forces are those which make suns, crush atoms the way they crushed those that compose the companion of Sirius. It's not anything you can fool with."

"I don't—" said Conant, and his voice ended puzzledly.

"I'll give you a parallel of it," said Kidder. "Suppose you take two rods, one in each hand. Place their tips together and push. As long as your pressure is directly along their long axes, the pressure is equalized; right and left hands cancel each other. Now I come along; I put out one finger and touch the rods ever so lightly where they come together. They snap out of line violently; you break a couple of knuckles. The resultant force is at right angles to the original forces you exerted. My power transmitter is on the same principle. It takes an infinitesimal amount of energy to throw those forces out of line. Easy enough when you know

how to do it. The important question is whether or not you can control the resultant when you get it. I can."

"I—see." Conant indulged in a four-second gloat. "Heaven help the utility companies. I don't intend to. Kidder—I want a full-size power transmitter."

Kidder clucked into the radiophone. "Ambitious, aren't you? I haven't a staff out here, Conant—you know that. And I can't be expected to build four or five thousand tons of apparatus myself."

"I'll have five hundred engineers and laborers out there in forty-eight hours."

"You will not. Why bother me with it? I'm quite happy here, Conant, and one of the reasons is that I've no one to get in my hair."

"Oh, now, Kidder—don't be like that—I'll pay you—"

"You haven't got that much money," said Kidder briskly. He flipped the switch on his set. *His* switch worked.

Conant was furious. He shouted into the phone several times, then began to lean on the signal button. On his island, Kidder let the thing squeal and went back to his projection room. He was sorry he had sent the diagram of the receiver to Conant. It would have been interesting to power a plane or a car with the model transmitter he had taken from the Neoterics. But if Conant was going to be that way about it—well, anyway, the receiver would be no good without the transmitter. Any radio engineer would understand the diagram, but not the beam which activated it. And Conant wouldn't get his beam.

Pity he didn't know Conant well enough.

Kidder's days were endless sorties into learning. He never slept, nor did his Neoterics. He ate regularly every five hours, exercised for half an hour in every twelve. He did not keep track of time, for it meant nothing to him. Had he wanted to know the date, or the year, even, he knew he could get it from Conant. He didn't care, that's all. The time that was not spent in observation was used in developing new problems for the Neoterics. His thoughts just now ran to defense. The idea was born in his conversation with Conant; now the idea was primary, its motivation something of no importance. The Neoterics were working on a vibration field of quasi-electrical nature. Kidder could see little practical value in such a thing—an invisible wall which would kill any living thing which touched it. But still—the idea was intriguing.

He stretched and moved away from the telescope in the upper room through which he had been watching his creations at work. He was profoundly happy here in the large control room. Leaving it to go to the old laboratory for a bite to eat was a thing he hated to do. He felt

like bidding it good-by each time he walked across the compound, and saying a glad hello when he returned. A little amused at himself, he went out.

There was a black blob—a distant power boat—a few miles off the island, toward the mainland. Kidder stopped and stared distastefully at it. A white petal of spray was affixed to each side of the black body—it was coming toward him. He snorted, thinking of the time a yachtload of silly fools had landed out of curiosity one afternoon, spewed themselves over his beloved island, peppered him with lame-brained questions, and thrown his nervous equilibrium out for days. Lord, how he hated *people!*

The thought of unpleasantness bred two more thoughts that played half-consciously with his mind as he crossed the compound and entered the old laboratory. One was that perhaps it might be wise to surround his buildings with a field of force of some kind and post warnings for trespassers. The other thought was of Conant and the vague uneasiness the man had been sending to him through the radiophone these last weeks. His suggestion, two days ago, that a power plant be built on the island—horrible idea!

Conant rose from a laboratory bench as Kidder walked in.

They looked at each other wordlessly for a long moment. Kidder hadn't seen the bank president in years. The man's presence, he found, made his scalp crawl.

"Hello," said Conant genially. "You're looking fit."

Kidder grunted. Conant eased his unwieldy body back onto the bench and said, "Just to save you the energy of asking questions, Mr. Kidder, I arrived two hours ago on a small boat. Rotten way to travel. I wanted to be a surprise to you; my two men rowed me the last couple of miles. You're not very well equipped here for defense, are you? Why, anyone could slip up on you the way I did."

"Who'd want to?" growled Kidder. The man's voice edged annoyingly into his brain. He spoke too loudly for such a small room; at least, Kidder's hermit's ears felt that way. Kidder shrugged and went about preparing a light meal for himself.

"Well," drawled the banker. "I might want to." He drew out a Downmetal cigar case. "Mind if I smoke?"

"I do," said Kidder sharply.

Conant laughed easily and put the cigars away. "I might," he said, "want to urge you to let me build that power station on this island."

"Radiophone work?"

"Oh, yes. But now that I'm here you can't switch me off. Now—how about it?"

"I haven't changed my mind."

"Oh, but you should, Kidder, you should. Think of it—think of the good it would do for the masses of people that are now paying exorbitant power bills!"

"I hate the masses! Why do you have to build here?"

"Oh, that. It's an ideal location. You own the island; work could begin here without causing any comment whatsoever. The plant would spring full-fledged on the power markets of the country, having been built in secret. The island can be made impregnable."

"I don't want to be bothered."

"We wouldn't bother you. We'd build on the north end of the island—a mile and a quarter from you and your work. Ah—by the way—where's the model of the power transmitter?"

Kidder, with his mouth full of synthesized food, waved a hand at a small table on which stood the model, a four-foot, amazingly intricate device of plastic and steel and tiny coils.

Conant rose and went over to look at it. "Actually works, eh?" He sighed deeply and said, "Kidder, I really hate to do this, but I want to build that plant rather badly. Carson! Robbins!"

Two bull-necked individuals stepped out from their hiding places in the corners of the room. One idly dangled a revolver by its trigger guard. Kidder looked blankly from one to the other of them.

"These gentlemen will follow my orders implicitly, Kidder. In half an hour a party will land here—engineers, contractors. They will start surveying the north end of the island for the construction of the power plant. These boys here feel about the same way I do as far as you are concerned. Do we proceed with your cooperation or without it? It's immaterial to me whether or not you are left alive to continue your work. My engineers can duplicate your model."

Kidder said nothing. He had stopped chewing when he saw the gunmen, and only now remembered to swallow. He sat crouched over his plate without moving or speaking.

Conant broke the silence by walking to the door. "Robbins—can you carry that model there?" The big man put his gun away, lifted the model gently, and nodded. "Take it down to the beach and meet the other boat. Tell Mr. Johansen, the engineer, that this is the model he is to work from." Robbins went out. Conant turned to Kidder. "There's no need for us to anger ourselves," he said oilyly. "I think you are stubborn, but I don't hold it against you. I know how you feel. You'll be

left alone; you have my promise. But I mean to go ahead on this job, and a small thing like your life can't stand in my way."

Kidder said, "Get out of here." There were two swollen veins throbbing at his temples. His voice was low, and it shook.

"Very well. Good day, Mr. Kidder. Oh—by the way—you're a clever devil." No one had ever referred to the scholastic Mr. Kidder that way before. "I realize the possibility of your blasting us off the island. I wouldn't do it if I were you. I'm willing to give you what you want—privacy. I want the same thing in return. If anything happens to me while I'm here, the island will be bombed by someone who is working for me. I'll admit they might fail. If they do, the United States government will take a hand. You wouldn't want that, would you? That's rather a big thing for one man to fight. The same thing goes if the plant is sabotaged in any way after I go back to the mainland. You might be killed. You will most certainly be bothered interminably. Thanks for your . . . er . . . cooperation." The banker smirked and walked out, followed by his taciturn gorilla.

Kidder sat there for a long time without moving. Then he shook his head, rested it in his palms. He was badly frightened; not so much because his life was in danger, but because his privacy and his work—his world—were threatened. He was hurt and bewildered. He wasn't a businessman. He couldn't handle men. All his life he had run away from human beings and what they represented to him. He was like a frightened child when men closed in on him.

Cooling a little, he wondered vaguely what would happen when the power plant opened. Certainly the government would be interested. Unless—unless by then Conant was the government. That plant was an unimaginable source of power, and not only the kind of power that turned wheels. He rose and went back to the world that was home to him, a world where his motives were understood, and where there were those who could help him. Back at the Neoterics' building, he escaped yet again from the world of men into his work.

Kidder called Conant the following week, much to the banker's surprise. His two days on the island had got the work well under way, and he had left with the arrival of a shipload of laborers and material. He kept in close touch by radio with Johansen, the engineer in charge. It had been a blind job for Johansen and all the rest of the crew on the island. Only the bank's infinite resources could have hired such a man, or the picked gang with him.

Johansen's first reaction when he saw the model had been ecstatic. He wanted to tell his friends about this marvel; but the only radio set

available was beamed to Conant's private office in the bank, and Conant's armed guards, one to every two workers, had strict orders to destroy any other radio transmitter on sight. About that time he realized that he was a prisoner on the island. His instant anger subsided when he reflected that being a prisoner at fifty thousand dollars a week wasn't too bad. Two of the laborers and an engineer thought differently, and got disgruntled a couple of days after they arrived. They disappeared one night—the same night that five shots were fired down on the beach. No questions were asked, and there was no more trouble.

Conant covered his surprise at Kidder's call and was as offensively jovial as ever. "Well, now! Anything I can do for you?"

"Yes," said Kidder. His voice was low, completely without expression. "I want you to issue a warning to your men not to pass the white line I have drawn five hundred yards north of my buildings, right across the island."

"Warning? Why, my dear fellow, they have orders that you are not to be disturbed on any account."

"You've ordered them. All right. Now warn them. I have an electric field surrounding my laboratories that will kill anything living which penetrates it. I don't want to have murder on my conscience. There will be no deaths unless there are trespassers. You'll inform your workers?"

"Oh, now Kidder," the banker expostulated. "That was totally unnecessary. You won't be bothered. Why—" But he found he was talking into a dead mike. He knew better than to call back. He called Johansen instead and told him about it. Johansen didn't like the sound of it, but he repeated the message and signed off. Conant liked that man. He was, for a moment, a little sorry that Johansen would never reach the mainland alive.

But that Kidder—he was beginning to be a problem. As long as his weapons were strictly defensive he was no real menace. But he would have to be taken care of when the plant was operating. Conant couldn't afford to have genius around him unless it was unquestionably on his side. The power transmitter and Conant's highly ambitious plans would be safe as long as Kidder was left to himself. Kidder knew that he could, for the time being, expect more sympathetic treatment from Conant than he could from a horde of government investigators.

Kidder only left his own enclosure once after the work began on the north end of the island, and it took all of his unskilled diplomacy to do it. Knowing the source of the plant's power, knowing what could happen if it were misused, he asked Conant's permission to inspect the great transmitter when it was nearly finished. Insuring his own life by refusing

to report back to Conant until he was safe within his own laboratory again, he turned off his shield and walked up to the north end.

He saw an awe-inspiring sight. The four-foot model was duplicated nearly a hundred times as large. Inside a massive three-hundred-foot tower a space was packed nearly solid with the same bewildering maze of coils and bars that the Neoterics had built so delicately into their machine. At the top was a globe of polished golden alloy, the transmitting antenna. From it would stream thousands of tight beams of force, which could be tapped to any degree by corresponding thousands of receivers placed anywhere at any distance. Kidder learned that the receivers had already been built, but his informant, Johansen, knew little about that end of it and was saying less. Kidder checked over every detail of the structure, and when he was through he shook Johansen's hand admiringly.

"I didn't want this thing here," he said shyly, "and I don't. But I will say that it's a pleasure to see this kind of work."

"It's a pleasure to meet the man that invented it."

Kidder beamed. "I didn't invent it," he said. "Maybe someday I'll show you who did. I—well, good-by." He turned before he had a chance to say too much and marched off down the path.

"Shall I?" said a voice at Johansen's side. One of Conant's guards had his gun out.

Johansen knocked the man's arm down. "No." He scratched his head. "So that's the mysterious menace from the other end of the island. Eh! Why, he's a hell of a nice little feller!"

Built on the ruins of Denver, which was destroyed in the great Battle of the Rockies during the Western War, stands the most beautiful city in the world—our nation's capital, New Washington. In a circular room deep in the heart of the White House, the president, three army men and a civilian sat. Under the president's desk a dictaphone unostentatiously recorded every word that was said. Two thousand and more miles away, Conant hung over a radio receiver, tuned to receive the signals of the tiny transmitter in the civilian's side pocket. One of the officers spoke.

"Mr. President, the 'impossible claims' made for this gentleman's product are absolutely true. He has proved beyond doubt each item on his prospectus."

The president glanced at the civilian, back at the officer. "I won't wait for your report," he said. "Tell me—what happened?"

Another of the army men mopped his face with a khaki bandanna. "I can't ask you to believe us, Mr. President, but it's true all the same.

Mr. Wright here has in his suitcase three or four dozen small . . . er . . . bombs—”

“They’re not bombs,” said Wright casually.

“All right. They’re not bombs. Mr. Wright smashed two of them on an anvil with a sledge hammer. There was no result. He put two more in an electric furnace. They burned away like so much tin and cardboard. We dropped one down the barrel of a field piece and fired it. Still nothing.” He paused and looked at the third officer, who picked up the account:

“We really got started then. We flew to the proving grounds, dropped one of the objects and flew to thirty thousand feet. From there, with a small hand detonator no bigger than your fist, Mr. Wright set the thing off. I’ve never seen anything like it. Forty acres of land came straight up at us, breaking up as it came. The concussion was terrific—you must have felt it here, four hundred miles away.”

The president nodded. “I did. Seismographs on the other side of the Earth picked it up.”

“The crater it left was a quarter of a mile deep at the center. Why, one plane load of those things could demolish any city! There isn’t even any necessity for accuracy!”

“You haven’t heard anything yet,” another officer broke in. “Mr. Wright’s automobile is powered by a small plant similar to the others. He demonstrated it to us. We could find no fuel tank of any kind, or any other driving mechanism. But with a power plant no bigger than six cubic inches, that car, carrying enough weight to give it traction, outpulled an army tank!”

“And the other test!” said the third excitedly. “He put one of the objects into a replica of a treasury vault. The walls were twelve feet thick, super-reinforced concrete. He controlled it from over a hundred yards away. He . . . he burst that vault! It wasn’t an explosion—it was as if some incredibly powerful expansive force inside filled it and flattened the walls from inside. They cracked and split and powdered, and the steel girders and rods came twisting and shearing out like . . . like—*whew!* After that he insisted on seeing you. We knew it wasn’t usual, but he said he has more to say and would say it only in your presence.”

The president said gravely, “What is it, Mr. Wright?”

Wright rose, picked up his suitcase, opened it and took out a small cube, about eight inches on a side, made of some light-absorbent red material. Four men edged nervously away from it.

“These gentlemen,” he began, “have seen only part of the things this device can do. I’m going to demonstrate to you the delicacy of

control that is possible with it.” He made an adjustment with a tiny knob on the side of the cube, set it on the edge of the president’s desk.

“You have asked me more than once if this is my invention or if I am representing someone. The latter is true. It might also interest you to know that the man who controls this cube is right now several thousand miles from here. He and he alone, can prevent it from detonating now that I—” He pulled his detonator out of the suitcase and pressed a button—“have done this. It will explode the way the one we dropped from the plane did, completely destroying this city and everything in it, in just four hours. It will also explode—” He stepped back and threw a tiny switch on his detonator—“if any moving object comes within three feet of it or if anyone leaves this room but me—it can be compensated for that. If, after I leave, I am molested, it will detonate as soon as a hand is laid on me. No bullets can kill me fast enough to prevent me from setting it off.”

The three army men were silent. One of them wiped nervously at the beads of cold sweat on his forehead. The others did not move. The president said evenly:

“What’s your proposition?”

“A very reasonable one. My employer does not work in the open, for obvious reasons. All he wants is your agreement to carry out his orders; to appoint the cabinet members he chooses, to throw your influence in any way he dictates. The public—Congress—anyone else—need never know anything about it. I might add that if you agree to this proposal, this ‘bomb,’ as you call it, will not go off. But you can be sure that thousands of them are planted all over the country. You will never know when you are near one. If you disobey, it means instant annihilation for you and everyone else within three or four square miles.

“In three hours and fifty minutes—that will be at precisely seven o’clock—there is a commercial radio program on Station RPRS. You will cause the announcer, after his station identification, to say ‘Agreed.’ It will pass unnoticed by all but my employer. There is no use in having me followed; my work is done. I shall never see nor contact my employer again. That is all. Good afternoon, gentlemen!”

Wright closed his suitcase with a businesslike snap, bowed, and left the room. Four men sat staring at the little red cube.

“Do you think he can do all he says?” asked the president.

The three nodded mutely. The president reached for his phone.

There was an eavesdropper to all of the foregoing. Conant, squatting behind his great desk in the vault, where he had his sanctum sanctorum, knew nothing of it. But beside him was the compact bulk of Kidder’s radiophone. His presence switched it on, and Kidder, on his island,

blessed the day he had thought of the device. He had been meaning to call Conant all morning, but was very hesitant. His meeting with the young engineer Johansen had impressed him strongly. The man was such a thorough scientist, possessed of such complete delight in the work he did, that for the first time in his life Kidder found himself actually wanting to see someone again. But he feared for Johansen's life if he brought him to the laboratory, for Johansen's work was done on the island, and Conant would most certainly have the engineer killed if he heard of his visit, fearing that Kidder would influence him to sabotage the great transmitter. And if Kidder went to the power plant he would probably be shot on sight.

All one day Kidder wrangled with himself, and finally determined to call Conant. Fortunately he gave no signal, but turned up the volume on the receiver when the little red light told him that Conant's transmitter was functioning. Curious, he heard everything that occurred in the president's chamber three thousand miles away. Horrified, he realized what Conant's engineers had done. Built into tiny containers were tens of thousands of power receivers. They had no power of their own, but, by remote control, could draw on any or all of the billions of horsepower the huge plant on the island was broadcasting.

Kidder stood in front of his receiver, speechless. There was nothing he could do. If he devised some means of destroying the power plant, the government would certainly step in and take over the island, and then—what would happen to him and his precious Neoterics?

Another sound grated out of the receiver—a commercial radio program. A few bars of music, a man's voice advertising stratoline fares on the installment plan, a short silence, then:

"Station RPRS, voice of the nation's Capital, District of South Colorado."

The three-second pause was interminable.

"The time is exactly . . . er . . . agreed. The time is exactly seven P.M., Mountain Standard Time."

Then came a half-insane chuckle. Kidder had difficulty believing it was Conant. A phone clicked. The banker's voice:

"Bill? All set. Get out there with your squadron and bomb up the island. Keep away from the plant, but cut the rest of it to ribbons. Do it quick and get out of there."

Almost hysterical with fear, Kidder rushed about the room and then shot out the door and across the compound. There were five hundred innocent workmen in barracks a quarter mile from the plant. Conant didn't need them now, and he didn't need Kidder. The only safety for anyone was in the plant itself, and Kidder wouldn't leave his Neoterics

to be bombed. He flung himself up the stairs and to the nearest teletype. He banged out, "Get me a defense. I want an impenetrable shield. Urgent!"

The words ripped out from under his fingers in the functional script of the Neoterics. Kidder didn't think of what he wrote, didn't really visualize the thing he ordered. But he had done what he could. He'd have to leave them now, get to the barracks; warn those men. He ran up the path toward the plant, flung himself over the white line that marked death to those who crossed it.

A squadron of nine clip-winged, mosquito-nosed planes rose out of a cover on the mainland. There was no sound from the engines, for there were no engines. Each plane was powered with a tiny receiver and drew its unmarked, light-absorbent wings through the air with power from the island. In a matter of minutes they raised the island. The squadron leader spoke briskly into a microphone.

"Take the barracks first. Clean 'em up. Then work south."

Johansen was alone on a small hill near the center of the island. He carried a camera, and though he knew pretty well that his chances of ever getting ashore again were practically nonexistent, he liked angle shots of his tower, and took innumerable pictures. The first he knew of the planes was when he heard their whining dive over the barracks. He stood transfixed, saw a shower of bombs hurtle down and turn the barracks into a smashed ruin of broken wood, metal and bodies. The picture of Kidder's earnest face flashed into his mind. Poor little guy—if they ever bombed his end of the island he would—But his tower! Were they going to bomb the plant?

He watched, utterly appalled, as the planes flew out to sea, cut back and dove again. They seemed to be working south. At the third dive he was sure of it. Not knowing what he could do, he nevertheless turned and ran toward Kidder's place. He rounded a turn in the trail and collided violently with the little biochemist. Kidder's face was scarlet with exertion, and he was the most terrified-looking object Johansen had ever seen.

Kidder waved a hand northward. "Conant!" he screamed over the uproar. "It's Conant! He's going to kill us all!"

"The plant?" said Johansen, turning pale.

"It's safe. He won't touch *that!* But . . . my place . . . what about all those men?"

"Too late!" shouted Johansen.

"Maybe I can—Come on!" called Kidder, and was off down the trail, heading south.

Johansen pounded after him. Kidder's little short legs became a blur

as the squadron swooped overhead, laying its eggs in the spot where they had met.

As they burst out of the woods, Johansen put on a spurt, caught up with the scientist and knocked him sprawling not six feet from the white line.

"Wh . . . wh—"

"Don't go any farther, you fool! Your own damned force field—it'll kill you!"

"Force field? But—I came through it on the way up—Here. Wait. If I can—" Kidder began hunting furiously about in the grass. In a few seconds he ran up to the line, clutching a large grasshopper in his hand. He tossed it over. It lay still.

"See?" said Johansen. "It—"

"Look! It jumped! Come on! I don't know what went wrong, unless the Neoterics shut it off. They generated that field—I didn't."

"Neo—huh?"

"Never mind," snapped the biochemist, and ran.

They pounded gasping up the steps and into the Neoterics' control room. Kidder clapped his eyes to a telescope and shrieked in glee.

"They've done it! They've done it!"

"Who's—"

"My little people! The Neoterics! They've made the impenetrable shield! Don't you see—it cut through the lines of force that start up that field out there. Their generator is still throwing it up, but the vibrations can't get out! They're safe! They're safe!" And the overwrought hermit began to cry. Johansen looked at him pityingly and shook his head.

"Sure—your little men are all right. But we aren't," he added as the floor shook to the detonation of a bomb.

Johansen closed his eyes, got a grip on himself and let his curiosity overcome his fear. He stepped to the binocular telescope, gazed down it. There was nothing there but a curved sheet of gray material. He had never seen a gray quite like that. It was absolutely neutral. It didn't seem soft and it didn't seem hard, and to look at it made his brain reel. He looked up.

Kidder was pounding the keys of a teletype, watching the blank yellow tape anxiously.

"I'm not getting through to them," he whimpered. "I don't know what's the mat—Oh, of course!"

"What?"

"The shield is absolutely impenetrable! The teletype impulses can't

get through or I could get them to extend the screen over the building—over the whole island! There's *nothing* those people can't do!"

"He's crazy," Johansen muttered. "Poor little—"

The teletype began clicking sharply. Kidder dove at it, practically embraced it. He read off the tape as it came out. Johansen saw the characters, but they meant nothing to him.

"Almighty," Kidder read falteringly, "pray have mercy on us and be forbearing until we have said our say. Without orders we have lowered the screen you ordered us to raise. We are lost, O great one. Our screen is truly impenetrable, and so cut off your words on the word machine. We have never, in the memory of any Neoteric, been without your word before. Forgive us our action. We will eagerly await your answer."

Kidder's fingers danced over the keys. "You can look now," he gasped. "Go on—the telescope!"

Johansen, trying to ignore the whine of sure death from above, looked.

He saw what looked like land—fantastic fields under cultivation, a settlement of some sort, factories, and—beings. Everything moved with incredible rapidity. He couldn't see one of the inhabitants except as darting pinky-white streaks. Fascinated, he stared for a long minute. A sound behind him made him whirl. It was Kidder, rubbing his hands together briskly. There was a broad smile on his face.

"They did it," he said happily. "You see?"

Johansen didn't see until he began to realize that there was a dead silence outside. He ran to a window. It was night outside—the blackest night—when it should have been dusk. "What happened?"

"The Neoterics," said Kidder, and laughed like a child. "My friends downstairs there. They threw up the impenetrable shield over the whole island. We can't be touched now!"

And at Johansen's amazed questions, he launched into a description of the race of beings below them.

Outside the shell, things happened. Nine airplanes suddenly went dead-stick. Nine pilots glided downward, powerless, and some fell into the sea, and some struck the miraculous gray shell that loomed in place of an island, slid off and sank.

And ashore, a man named Wright sat in a car, half dead with fear, while government men surrounded him, approached cautiously, daring instant death from a now-dead source.

In a room deep in the White House, a high-ranking army officer shrieked, "I can't stand it any more! I can't!" and leaped up, snatched

a red cube off the president's desk, ground it to ineffectual litter under his shining boots.

And in a few days they took a broken old man away from the bank and put him in an asylum, where he died within a week.

The shield, you see, was truly impenetrable. The power plant was untouched and sent out its beams; but the beams could not get out, and anything powered from the plant went dead. The story never became public, although for some years there was heightened naval activity off the New England coast. The navy, so the story went, had a new target range out there—a great hemiovoid of gray material. They bombed it and shelled it and rayed it and blasted all around it, but never even dented its smooth surface.

Kidder and Johansen let it stay there. They were happy enough with their researches and their Neoterics. They did not hear or feel the shell- ing, for the shield was truly impenetrable. They synthesized their food and their light and air from the materials at hand, and they simply didn't care. They were the only survivors of the bombing, with the exception of three poor maimed devils who died soon afterward.

All this happened many years ago, and Kidder and Johansen may be alive today, and they may be dead. But that doesn't matter too much. The important thing is that the great gray shell will bear watching. Men die, but races live. Some day the Neoterics, after innumerable generations of inconceivable advancement, will take down their shield and come forth. When I think of that I feel frightened.

NIGHTFALL

by Isaac Asimov

"If the stars should appear one night in a thousand years, how would men believe and adore, and preserve for many generations the remembrance of the city of God!"—Emerson

Aton 77, director of Saro University, thrust out a belligerent lower lip and glared at the young newspaperman in a hot fury.

Theremon 762 took that fury in his stride. In his earlier days, when his now widely syndicated column was only a mad idea in a cub reporter's mind, he had specialized in "impossible" interviews. It had cost him bruises, black eyes, and broken bones; but it had given him an ample supply of coolness and self-confidence.

So he lowered the outthrust hand that had been so pointedly ignored and calmly waited for the aged director to get over the worst. Astronomers were queer ducks, anyway, and if Aton's actions of the last two months meant anything, this same Aton was the queer-duckiest of the lot.

Aton 77 found his voice, and though it trembled with restrained emotion, the careful, somewhat pedantic, phraseology, for which the famous astronomer was noted, did not abandon him.

"Sir," he said, "you display an infernal gall in coming to me with that impudent proposition of yours."

The husky telephotographer of the Observatory, Beenay 25, thrust a tongue's tip across dry lips and interposed nervously, "Now, sir, after all—"

The director turned to him and lifted a white eyebrow. "Do not in-

know that you were going mad—to know that in a little minute you would be here physically and yet all the real essence would be dead and drowned in the black madness. For this was the Dark—the Dark and the Cold and the Doom. The bright walls of the universe were shattered and their awful black fragments were falling down to crush and squeeze and obliterate him.

He jostled someone crawling on hands and knees, but stumbled somehow over him. Hands groping at his tortured throat, he limped toward the flame of the torches that filled all his mad vision.

“Light!” he screamed.

Aton, somewhere, was crying, whimpering horribly like a terribly frightened child. “Stars—all the Stars—we didn’t know at all. We didn’t know anything. We thought six stars is a universe is something the Stars didn’t notice is Darkness forever and ever and the walls are breaking in and we didn’t know we couldn’t know and anything—”

Someone clawed at the torch, and it fell and snuffed out. In the instant, the awful splendor of the indifferent Stars leaped nearer to them.

On the horizon outside the window, in the direction of Saro City, a crimson glow began growing, strengthening in brightness, that was not the glow of a sun.

The long night had come again.

THE WEAPON SHOP

by A. E. van Vogt

The village at night made a curiously timeless picture. Fara walked contentedly beside his wife along the street. The air was like wine; and he was thinking dimly of the artist who had come up from Imperial City, and made what the telestats called—he remembered the phrase vividly—“a symbolic painting reminiscent of a scene in the electrical age of seven thousand years ago.”

Fara believed that utterly. The street before him with its weedless, automatically tended gardens, its shops set well back among the flowers, its perpetual hard, grassy sidewalks, and its street lamps that glowed from every pore of their structure—this was a restful paradise where time had stood still.

And it was like being a part of life that the great artist’s picture of this quiet, peaceful scene before him was now in the collection of the empress herself. She had praised it, and naturally the thrice-blest artist had immediately and humbly begged her to accept it.

What a joy it must be to be able to offer personal homage to the glorious, the divine, the serenely gracious and lovely Innelda Isher, one thousand one hundred eightieth of her line.

As they walked, Fara half turned to his wife. In the dim light of the nearest street lamp, her kindly, still youthful face was almost lost in shadow. He murmured softly, instinctively muting his voice to harmonize with the pastel shades of night:

“She said—our empress said—that our little village of Glay seemed to her to have in it all the wholesomeness, the gentleness, that constitutes

the finest qualities of her people. Wasn't that a wonderful thought, Creel? She must be a marvelously understanding woman. I—"

He stopped. They had come to a side street, and there was something about a hundred and fifty feet along it that—

"Look!" Fara said hoarsely.

He pointed with rigid arm and finger at a sign that glowed in the night, a sign that read:

FINE WEAPONS

THE RIGHT TO BUY WEAPONS IS THE RIGHT TO BE FREE

Fara had a strange, empty feeling as he stared at the blazing sign. He saw that other villagers were gathering. He said finally, huskily:

"I've heard of these shops. They're places of infamy, against which the government of the empress will act one of these days. They're built in hidden factories, and then transported whole to towns like ours and set up in gross defiance of property rights. That one wasn't there an hour ago."

Fara's face hardened. His voice had a harsh edge in it, as he said: "Creel, go home."

Fara was surprised when Creel did not move off at once. All their married life, she had had a pleasing habit of obedience that had made cohabitation a wonderful thing. He saw that she was looking at him wide-eyed, and that it was a timid alarm that held her there. She said: "Fara, what do you intend to do? You're not thinking of—"

"Go home!" Her fear brought out all the grim determination in his nature. "We're not going to let such a monstrous thing desecrate our village. Think of it"—his voice shivered before the appalling thought—"this fine, old-fashioned community, which we had resolved always to keep exactly as the empress has it in her picture gallery, debauched now, ruined by this . . . this thing—But we won't have it; that's all there is to it."

Creel's voice came softly out of the half-darkness of the street corner, the timidity gone from it: "Don't do anything rash, Fara. Remember it is not the first new building to come into Glay—since the picture was painted."

Fara was silent. This was a quality of his wife of which he did not approve, this reminding him unnecessarily of unpleasant facts. He knew exactly what she meant. The gigantic, multientacted corporation, Au-

romatic Atomic Motor Repair Shops, Inc., had come in under the laws of the State with their flashy building, against the wishes of the village council—and had already taken half of Fara's repair business.

"That's different!" Fara growled finally. "In the first place people will discover in good time that these new automatic repairers do a poor job. In the second place it's fair competition. But this weapon shop is a defiance of all the decencies that make life under the House of Isher such a joy. Look at the hypocritical sign: 'The right to buy weapons—' Aaaaahh!"

He broke off with: "Go home, Creel. We'll see to it that they sell no weapons in this town."

He watched the slender woman-shape move off into the shadows. She was halfway across the street when a thought occurred to Fara. He called:

"And if you see that son of ours hanging around some street corner, take him home. He's got to learn to stop staying out so late at night."

The shadowed figure of his wife did not turn; and after watching her for a moment moving along against the dim background of softly glowing street lights, Fara twisted on his heel, and walked swiftly toward the shop. The crowd was growing larger every minute, and the night pulsed with excited voices.

Beyond doubt, here was the biggest thing that had ever happened to the village of Glay.

The sign of the weapon shop was, he saw, a normal-illusion affair. No matter what his angle of view, he was always looking straight at it. When he paused finally in front of the great display window, the words had pressed back against the store front, and were staring unwinkingly down at him.

Fara sniffed once more at the meaning of the slogan, then forgot the simple thing. There was another sign in the window, which read:

THE FINEST ENERGY WEAPONS IN THE KNOWN UNIVERSE

A spark of interest struck fire inside Fara. He gazed at that brilliant display of guns, fascinated in spite of himself. The weapons were of every size, ranging from tiny little finger pistols to express rifles. They were made of every one of the light, hard, ornamental substances: glittering glassein, the colorful but opaque Ordine plastic, viridescent magnetic beryllium. And others.

It was the very deadly extent of the destructive display that brought

a chill to Fara. So many weapons for the little village of Glay, where not more than two people to his knowledge had guns, and those only for hunting. Why, the thing was absurd, fantastically mischievous, utterly threatening.

Somewhere behind Fara, a man said: "It's right on Lan Harris' lot. Good joke on that old scoundrel. Will he raise a row!"

There was a faint titter from several men, that made an odd patch of sound on the warm, fresh air. And Fara saw that the man had spoken the truth. The weapon shop had a forty-foot frontage. And it occupied the very center of the green, gardenlike lot of tight-fisted old Harris. Fara frowned. The clever devils, the weapon-shop people, selecting the property of the most disliked man in town, coolly taking it over and giving everybody an agreeable titillation. But the very cunning of it made it vital that the trick shouldn't succeed.

He was still scowling anxiously when he saw the plump figure of Mel Dale, the mayor. Fara edged toward him hurriedly.

"Where's Jor?"

"Here." The village constable elbowed his way through a little bundle of men. "Any plans?" he said.

"There's only one plan," said Fara boldly. "Go in and arrest them."

To Fara's amazement, the two men looked at each other, then at the ground. It was the big constable who answered shortly:

"Door's locked. And nobody answers our pounding. I was just going to suggest we let the matter ride until morning."

"Nonsense!" His very astonishment made Fara impatient. "Get an ax and we'll break the door down. Delay will only encourage such ruffraff to resist. We don't want their kind in our village for so much as a single night. Isn't that so?"

There was a hasty nod of agreement from everybody in his immediate vicinity. Too hasty. Fara looked around puzzled at eyes that lowered before his level gaze. He thought: "They are all scared. And unwilling."

Before he could speak, Constable Jor said:

"I guess you haven't heard about those doors or these shops. From all accounts, you can't break into them."

It struck Fara with a sudden pang that it was he who would have to act here. He said, "I'll get my atomic cutting machine from my shop. That'll fix them. Have I your permission to do that, Mr. Mayor?"

In the glow of the weapon-shop window, the plump man was sweating visibly. He pulled out a handkerchief, and wiped his forehead. He said:

"Maybe I'd better call the commander of the Imperial garrison at Ferd, and ask them."

"No!" Fara recognized evasion when he saw it. He felt himself steel; the conviction came that all the strength in this village was in him. "We must act ourselves. Other communities have let these people get in because they took no decisive action. We've got to resist to the limit. Beginning now. This minute. Well?"

The mayor's "All right!" was scarcely more than a sigh of sound. But it was all Fara needed.

He called out his intention to the crowd; and then, as he pushed his way out of the mob, he saw his son standing with some other young men staring at the window display.

Fara called: "Cayle, come and help me with the machine."

Cayle did not even turn; and Fara hurried on, seething. That wretched boy! One of these days he, Fara, would have to take firm action there. Or he'd have a no-good on his hands.

The energy was soundless—and smooth. There was no sputter, no fireworks. It glowed with a soft, pure white light, almost caressing the metal panels of the door—but not even beginning to sear them.

Minute after minute, the dogged Fara refused to believe the incredible failure, and played the boundlessly potent energy on that resisting wall. When he finally shut off his machine, he was perspiring freely.

"I don't understand it," he gasped. "Why—no metal is supposed to stand up against a steady flood of atomic force. Even the hard metal plates used inside the blast chamber of a motor take the explosions in what is called infinite series, so that each one has unlimited rest. That's the theory, but actually steady running crystallizes the whole plate after a few months."

"It's as Jor told you," said the mayor. "These weapon shops are—big. They spread right through the empire, and they don't recognize the empress."

Fara shifted his feet on the hard grass, disturbed. He didn't like this kind of talk. It sounded—sacrilegious. And besides it was nonsense. It must be. Before he could speak, a man said somewhere behind him:

"I've heard it said that that door will open only to those who cannot harm the people inside."

The words shocked Fara out of his daze. With a start, and for the first time, he saw that his failure had had a bad psychological effect. He said sharply:

"That's ridiculous! If there were doors like that, we'd all have them. We—"

The thought that stopped his words was the sudden realization that he had not seen anybody try to open the door; and with all this reluctance around him it was quite possible that—

He stepped forward, grasped at the doorknob, and pulled. The door opened with an unnatural weightlessness that gave him the fleeting impression that the knob had come loose into his hand. With a gasp, Fara jerked the door wide open.

"Jor!" he yelled. "Get in!"

The constable made a distorted movement—distorted by what must have been a will to caution, followed by the instant realization that he could not hold back before so many. He leaped awkwardly toward the open door—and it closed in his face.

Fara stared stupidly at his hand, which was still clenched. And then, slowly, a hideous thrill coursed along his nerves. The knob had—with-drawn. It had twisted, become viscous, and slipped amorphously from his straining fingers. Even the memory of that brief sensation gave him a feeling of unnatural things.

He grew aware that the crowd was watching with a silent intentness. Fara reached again for the knob, not quite so eagerly this time; and it was only a sudden realization of his reluctance that made him angry when the handle neither turned nor yielded in any way.

Determination returned in full force, and with it came a thought. He motioned to the constable. "Go back, Jor, while I pull."

The man retreated, but it did no good. And tugging did not help. The door would not open. Somewhere in the crowd, a man said darkly:

"It decided to let you in, then it changed its mind."

"What foolishness are you talking!" Fara spoke violently. "It changed its mind. Are you crazy? A door has no sense."

But a surge of fear put a half-quaver into his voice. It was the sudden alarm that made him bold beyond all his normal caution. With a jerk of his body, Fara faced the shop.

The building loomed there under the night sky, in itself bright as day, huge in width and length, and alien, menacing, no longer easily conquerable. The dim queasy wonder came as to what the soldiers of the empress would do if they were invited to act. And suddenly—a bare, flashing glimpse of a grim possibility—the feeling grew that even they would be able to do nothing.

Abruptly, Fara was conscious of horror that such an idea could enter his mind. He shut his brain tight, said wildly:

"The door opened for me once. It will open again."

It did. Quite simply it did. Gently, without resistance, with that same

sensation of weightlessness, the strange, sensitive door followed the tug of his fingers. Beyond the threshold was dimness, a wide, darkened alcove. He heard the voice of Mel Dale behind him, the mayor saying:

"Fara, don't be a fool. What will you do inside?"

Fara was vaguely amazed to realize that he had stepped across the threshold. He turned, startled, and stared at the blur of faces. "Why—" he began blankly, then he brightened; he said, "Why, I'll buy a gun, of course."

The brilliance of his reply, the cunning implicit in it, dazzled Fara for a half a minute longer. The mood yielded slowly, as he found himself in the dimly lighted interior of the weapon shop.

It was preternaturally quiet inside. Not a sound penetrated from the night from which he had come; and the startled thought came that the people of the shop might actually be unaware that there was a crowd outside.

Fara walked forward gingerly on a rugged floor that muffled his footsteps utterly. After a moment, his eyes accustomed themselves to the soft lighting, which came like a reflection from the walls and ceilings. In a vague way, he had expected ultranormalness; and the ordinariness of the atomic lighting acted like a tonic to his tensed nerves.

He shook himself angrily. Why should there be anything really superior? He was getting as bad as those credulous idiots out in the street.

He glanced around with gathering confidence. The place looked quite common. It was a shop, almost scantily furnished. There were show-cases on the walls and on the floor, glitteringly lovely things, but nothing unusual, and not many of them—a few dozens. There was in addition a double, ornate door leading to a back room—

Fara tried to keep one eye on that door, as he examined several show-cases, each with three or four weapons either mounted or arranged in boxes or holsters.

Abruptly, the weapons began to excite him. He forgot to watch the door, as the wild thought struck that he ought to grab one of those guns from a case, and then the moment someone came, force him outside where Jor would perform the arrest and—

Behind him, a man said quietly: "You wish to buy a gun?"

Fara turned with a jump. Brief rage flooded him at the way his plan had been wrecked by the arrival of the clerk.

The anger died as he saw that the intruder was a fine-looking, silver-haired man, older than himself. That was immeasurably disconcerting. Fara had an immense and almost automatic respect for age, and for a long second he could only stand there gaping. He said at last, lamely:

"Yes, yes, a gun."
 "For what purpose?" said the man in his quiet voice. Fara could only look at him blankly. It was too fast. He wanted to get mad. He wanted to tell these people what he thought of them. But the age of this representative locked his tongue, tangled his emotions. He managed speech only by an effort of will.

"For hunting." The plausible word stiffened his mind. "Yes, definitely for hunting. There is a lake to the north of here," he went on more fulsomely, glibly, "and—"
 He stopped, scowling, startled at the extent of his dishonesty. He was not prepared to go so deeply into prevarication. He said curtly:

"For hunting."

Fara was himself again. Abruptly, he hated the man for having put him so completely at a disadvantage. With smoldering eyes he watched the old fellow click open a showcase, and take out a green-staining rifle. As the man faced him, weapon in hand, Fara was thinking grimly, "Pretty clever, having an old man as a front." It was the same kind of cunning that had made them choose the property of Miser Harris. Icily furious, taut with his purpose, Fara reached for the gun; but the man held it out of his reach, saying:

"Before I can even let you test this, I am compelled by the by-laws of the weapon shops to inform you under what circumstances you may purchase a gun."

So they had private regulations. What a system of psychology tricks to impress gullible fools! Well, let the old scoundrel talk. As soon as he, Fara, got hold of the rifle, he'd put an end to hypocrisy.

"We weapons makers," the clerk was saying mildly, "have evolved guns that can, in their particular ranges, destroy any machine or object made of what is called matter. Thus whoever possesses one of our weapons is the equal and more of any soldier of the empress. I say more because each gun is the center of a field of force which acts as a perfect screen against immaterial destructive forces. That screen offers no resistance to clubs or spears or bullets, or other material substances, but it would require a small atomic cannon to penetrate the superb barrier it creates around its owner.

"You will readily comprehend," the man went on, "that such a potent weapon could not be allowed to fall, unmodified, into irresponsible hands. Accordingly, no gun purchased from us may be used for aggression or murder. In the case of the hunting rifle, only such specified game birds and animals as we may from time to time list in our display windows may be shot. Finally, no weapon can be resold without our approval. Is that clear?"

Fara nodded dumbly. For the moment, speech was impossible to him. The incredible, fantastically stupid words were still going round and around in his head. He wondered if he ought to laugh out loud, or curse the man for daring to insult his intelligence so tremendously.

So the gun mustn't be used for murder or robbery. So only certain birds and animals could be shot. And as for reselling it, suppose—suppose he bought this thing, took a trip of a thousand miles, and offered it to some wealthy stranger for two credits—who would ever know?

Or suppose he held up the stranger. Or shot him. How would the weapon shop ever find out? The thing was so ridiculous that—

He grew aware that the gun was being held out to him stock first. He took it eagerly, and had to fight the impulse to turn the muzzle directly on the old man. Mustn't rush this, he thought faintly. He said:

"How does it work?"

"You simply aim it, and pull the trigger. Perhaps you would like to try it on a target we have."

Fara swung the gun up. "Yes," he said triumphantly, "and you're it. Now, just get over there to the front door, and then outside."

He raised his voice: "And if anybody's thinking of coming through the back door, I've got that covered, too."

He motioned jerkily at the clerk. "Quick now, move! I'll shoot! I swear I will."

The man was cool, unflustered. "I have no doubt you would. When we decided to attune the door so that you could enter despite your hostility, we assumed the capacity for homicide. However, this is our party. You had better adjust yourself accordingly, and look behind you—"

There was silence. Finger on trigger, Fara stood moveless. Dim thoughts came of all the *half-things* he had heard in his days about the weapon shops: that they had secret supporters in every district, that they had a private and ruthless hidden government, and that once you got into their clutches, the only way out was death and—

But what finally came clear was a mind picture of himself, Fara Clark, family man, faithful subject of the empress, standing here in this dimly lighted store, deliberately fighting an organization so vast and menacing that—He must have been mad.

Only—here he was. He forced courage into his sagging muscles. He said:

"You can't fool me with pretending there's someone behind me. Now, get to that door. And *fast!*"

The firm eyes of the old man were looking past him. The man said quietly: "Well, Rad, have you all the data?"

"Enough for a primary," said a young man's baritone voice behind Fara. "Type A-7 conservative. Good average intelligence, but a Monarc development peculiar to small towns. One-sided outlook fostered by the Imperial schools present in exaggerated form. Extremely honest. Reason would be useless. Emotional approach would require extended treatment. I see no reason why we should bother. Let him live his life as it suits him."

"If you think," Fara said shakily, "that that trick voice is going to make me turn, you're crazy. That's the left wall of the building. I know there's no one there."

"I'm all in favor, Rad," said the old man, "of letting him live his life. But he was the prime mover of the crowd outside. I think he should be discouraged."

"We'll advertise his presence," said Rad. "He'll spend the rest of his life denying the charge."

Fara's confidence in the gun had faded so far that, as he listened in puzzled uneasiness to the incomprehensible conversation, he forgot it completely. He parted his lips, but before he could speak, the old man cut in, persistently:

"I think a little emotion might have a long-run effect. Show him the palace."

Palace! The startling word tore Fara out of his brief paralysis. "See here," he began, "I can see now that you lied to me. This gun isn't loaded at all. It's—"

His voice failed him. Every muscle in his body went rigid. He stared like a madman. *There was no gun in his hands.*

"Why, you—" he began wildly. And stopped again. His mind heaved with imbalance. With a terrible effort he fought off the spinning sensation, thought finally, tremblingly: *Somebody must have sneaked the gun from him. That meant—there was someone behind him. The voice was no mechanical thing. Somehow, they had—*

He started to turn—and couldn't. What in the name of—He struggled, pushing with his muscles. And couldn't move, couldn't budge, couldn't even—

The room was growing curiously dark. He had difficulty seeing the old man and—He would have shrieked then if he could. Because the weapon shop was gone. He was—

He was standing in the sky above an immense city. In the sky, and nothing beneath him, nothing around him but air, and blue summer heaven, and the city a mile, two miles below.

Nothing, nothing—He would have shrieked, but his breath seemed solidly embedded in his lungs. Sanity came back as the remote awareness impinged upon his terrified mind that he was actually standing on a hard floor, and that the city must be a picture somehow focused directly into his eyes.

For the first time, with a start, Fara recognized the metropolis below. It was the city of dreams, Imperial City, capital of the glorious Empress Isher—From his great height, he could see the gardens, the gorgeous grounds of the silver palace, the official Imperial residence itself—

The last tendrils of his fear were fading now before a gathering fascination and wonder; they vanished utterly as he recognized with a ghastly thrill of uncertain expectancy that the palace was drawing nearer at great speed.

"Show him the palace," they had said. Did that mean, could it mean—

That spray of tense thoughts splattered into nonexistence, as the glittering roof flashed straight at his face. He gulped, as the solid metal of it passed through him, and then other walls and ceilings.

His first sense of imminent and mind-shaking desecration came as the picture paused in a great room where a score of men sat around a table at the head of which sat—a young woman.

The inexorable, sacrilegious, limitlessly powered cameras that were taking the picture swung across the table, and caught the woman full face.

It was a handsome face, but there was passion and fury twisting it now, and a very blaze of fire in her eyes, as she leaned forward, and said in a voice at once familiar—how often Fara had heard its calm, measured tones on the telestats—and distorted. Utterly distorted by anger and an insolent certainty of command. That caricature of a beloved voice slashed across the silence as clearly as if he, Fara, was there in that room:

"I want that skunk killed, do you understand? I don't care how you do it, but I want to hear by tomorrow night that he's dead."

The picture snapped off and instantly—it was as swift as that—Fara was back in the weapon shop. He stood for a moment, swaying, fighting to accustom his eyes to the dimness; and then—

His first emotion was contempt at the simpleness of the trickery—a motion picture. What kind of a fool did they think he was, to swallow something as transparently unreal as that? He'd—

Abruptly, the appalling lechery of the scheme, the indescribable wickedness of what was being attempted here brought red rage.

"Why, you scum!" he flared. "So you've got somebody to act the part of the empress, trying to pretend that—Why, you—"
 "That will do," said the voice of Rad; and Fara shook as a big young man walked into his line of vision. The alarmed thought came that people who would besmirch so vilely the character of her imperial majesty would not hesitate to do physical damage to Fara Clark. The young man went on in a steely tone:

"We do not pretend that what you saw was taking place this instant in the palace. That would be too much of a coincidence. But it was taken two weeks ago; the woman is the empress. The man whose death she ordered is one of her many former lovers. He was found murdered two weeks ago; his name, if you care to look it up in the news files, is Banton McCreddie. However, let that pass. We're finished with you now and—"

"But I'm not finished," Fara said in a thick voice. "I've never heard or seen so much infamy in all my life. If you think this town is through with you, you're crazy. We'll have a guard on this place day and night, and nobody will get in or out. We'll—"

"That will do." It was the silver-haired man; and Fara stopped out of respect for age, before he thought. The old man went on: "The examination has been most interesting. As an honest man, you may call on us if you are ever in trouble. That is all. Leave through the side door."

It was all. Impalpable forces grabbed him, and he was shoved at a door that appeared miraculously in the wall, where seconds before the palace had been.

He found himself standing dazedly in a flower bed, and there was a swarm of men to his left. He recognized his fellow townsmen and that he was—outside.

The incredible nightmare was over.

"Where's the gun?" said Creel, as he entered the house half an hour later.

"The gun?" Fara stared at his wife.

"It said over the radio a few minutes ago that you were the first customer of the new weapon shop. I thought it was queer, but—"

He was eerily conscious of her voice going on for several words longer, but it was the purest jumble. The shock was so great that he had the horrible sensation of being on the edge of an abyss.

So that was what the young man had meant: "Advertise! We'll advertise his presence and—"

Fara thought: His reputation! Not that his was a great name, but he

had long believed with a quiet pride that Fara Clark's motor repair shop was widely known in the community and countryside.

First, his private humiliation inside the shop. And now this—lying—to people who didn't know why he had gone into the store. Diabolical.

His paralysis ended, as a frantic determination to rectify the base charge drove him to the telestat. After a moment, the plump, sleepy face of Mayor Mel Dale appeared on the plate. Fara's voice made a barrage of sound, but his hopes dashed, as the man said:

"I'm sorry, Fara. I don't see how you can have free time on the telestat. You'll have to pay for it. They did."

"They did!" Fara wondered vaguely if he sounded as empty as he felt.

"And they've just paid Lan Harris for his lot. The old man asked top price, and got it. He just phoned me to transfer the title."

"Oh!" The world was shattering. "You mean nobody's going to do anything. What about the Imperial garrison at Ferd?"

Dimly, Fara was aware of the mayor mumbling something about the empress' soldiers refusing to interfere in civilian matters.

"Civilian matters!" Fara exploded. "You mean these people are just going to be allowed to come here whether we want them or not, illegally forcing the sale of lots by first taking possession of them?"

A sudden thought struck him breathless. "Look, you haven't changed your mind about having Jor keep guard in front of the shop?"

With a start, he saw that the plump face in the telestat plate had grown impatient. "Now, see here, Fara," came the pompous words, "let the constituted authorities handle this matter."

"But you're going to keep Jor there," Fara said doggedly.

The mayor looked annoyed, said finally peevishly: "I promised, didn't I? So he'll be there. And now—do you want to buy time on the telestat? It's fifteen credits for one minute. Mind you, as a friend, I think you're wasting your money. No one has ever caught up with a false statement."

Fara said grimly: "Put two on, one in the morning, one in the evening."

"All right. We'll deny it completely. Good night."

The telestat went blank; and Fara sat there. A new thought hardened his face. "That boy of ours—there's going to be a showdown. He either works in my shop, or he gets no more allowance."

Creel said: "You've handled him wrong. He's twenty-three, and you treat him like a child. Remember, at twenty-three, you were a married man."

"That was different," said Fara. "I had a sense of responsibility. Do you know what he did tonight?"

He didn't quite catch her answer. For the moment, he thought she said: "No; in what way did you humiliate him first?"

Fara felt too impatient to verify the impossible words. He rushed on: "He refused in front of the whole village to give me help. He's a bad one, all bad."

"Yes," said Creel in a bitter tone, "he is all bad. I'm sure you don't realize how bad. He's as cold as steel, but without steel's strength or integrity. He took a long time, but he hates even me now, because I stood up for your side so long, knowing you were wrong."

"What's that?" said Fara, startled; then gruffly: "Come, come, my dear, we're both upset. Let's go to bed."

He slept poorly.

There were days then when the conviction that this was a personal fight between himself and the weapon shop lay heavily on Fara. Grimly, though it was out of his way, he made a point of walking past the weapon shop, always pausing to speak to Constable Jor and—

On the fourth day, the policeman wasn't there.

Fara waited patiently at first, then angrily; then he walked hastily to his shop, and called Jor's house. No, Jor wasn't home. He was guarding the weapon store.

Fara hesitated. His own shop was piled with work, and he had a guilty sense of having neglected his customers for the first time in his life. It would be simple to call up the mayor and report Jor's dereliction. And yet—

He didn't want to get the man into trouble—

Out in the street, he saw that a large crowd was gathering in front of the weapon shop. Fara hurried. A man he knew greeted him excitedly:

"Jor's been murdered, Fara!"

"Murdered!" Fara stood stock-still, and at first he was not clearly conscious of the grisly thought that was in his mind: Satisfaction! A flaming satisfaction. Now, he thought, even the soldiers would have to act. They—

With a gasp, he realized the ghastly tenor of his thoughts. He shivered, but finally pushed the sense of shame out of his mind. He said slowly:

"Where's the body?"

"Inside."

"You mean, those . . . scum—" In spite of himself, he hesitated over the epithet; even now, it was difficult to think of the fine-faced, silver-haired old man in such terms. Abruptly, his mind hardened; he flared:

"You mean those scum actually killed him, then pulled his body inside?"

"Nobody saw the killing," said a second man beside Fara, "but he's gone, hasn't been seen for three hours. The mayor got the weapon shop on the telestat, but they claim they don't know anything. They've done away with him, that's what, and now they're pretending innocence. Well, they won't get out of it as easily as that. Mayor's gone to phone the soldiers at Ferd to bring up some big guns and—"

Something of the intense excitement that was in the crowd surged through Fara, the feeling of big things brewing. It was the most delicious sensation that had ever tingled along his nerves, and it was all mixed with a strange pride that he had been so right about this, that he at least had never doubted that here was evil.

He did not recognize the emotion as the full-flowering joy that comes to a member of a mob. But his voice shook, as he said:

"Guns? Yes, that will be the answer, and the soldiers will have to come, of course."

Fara nodded to himself in the immensity of his certainty that the Imperial soldiers would now have no excuse for not acting. He started to say something dark about what the empress would do if she found out that a man had lost his life because the soldiers had shirked their duty, but the words were drowned in a shout:

"Here comes the mayor! Hey, Mr. Mayor, when are the atomic canons due?"

There was more of the same general meaning, as the mayor's sleek, all-purpose car landed lightly. Some of the questions must have reached his honor, for he stood up in the open two-seater, and held up his hand for silence.

To Fara's astonishment, the plump-faced man looked at him with accusing eyes. The thing seemed so impossible that, quite instinctively, Fara looked behind him. But he was almost alone; everybody else had crowded forward.

Fara shook his head, puzzled by that glare; and then, astoundingly, Mayor Dale pointed a finger at him, and said in a voice that trembled:

"There's the man who's responsible for the trouble that's come upon us. Stand forward, Fara Clark, and show yourself. You've cost this town seven hundred credits that we could ill afford to spend."

Fara couldn't have moved or spoken to save his life. He just stood there in a maze of dumb bewilderment. Before he could even think, the mayor went on, and there was quivering self-pity in his tone:

"We've all known that it wasn't wise to interfere with these weapon

shops. So long as the Imperial government leaves them alone, what right have we to set up guards, or act against them? That's what I've thought from the beginning, but this man . . . this . . . this Fara Clark kept after all of us, forcing us to move against our wills, and so now we've got a seven-hundred-credit bill to meet and—"

He broke off with: "I might as well make it brief. When I called the garrison, the commander just laughed and said that Jor would turn up. And I had barely disconnected when there was a money call from Jor. He's on Mars."

He waited for the shouts of amazement to die down. "It'll take three weeks for him to come back by ship, and we've got to pay for it, and Fara Clark is responsible. He—"

The shock was over. Fara stood cold, his mind hard. He said finally, scathingly: "So you're giving up, and trying to blame me all in one breath. I say you're all fools."

As he turned away, he heard Mayor Dale saying something about the situation not being completely lost, as he had learned that the weapon shop had been set up in Glay because the village was equidistant from four cities, and that it was the city business the shop was after. This would mean tourists, and accessory trade for the village stores and—

Fara heard no more. Head high, he walked back toward his shop. There were one or two catcalls from the mob, but he ignored them.

He had no sense of approaching disaster, simply a gathering fury against the weapon shop, which had brought him to this miserable status among his neighbors.

The worst of it, as the days passed, was the realization that the people of the weapon shop had no personal interest in him. They were remote, superior, undefeatable. That unconquerableness was a dim, suppressed awareness inside Fara.

When he thought of it, he felt a vague fear at the way they had transferred Jor to Mars in a period of less than three hours, when all the world knew that the trip by fastest spaceship required nearly three weeks.

Fara did not go to the express station to see Jor arrive home. He had heard that the council had decided to charge Jor with half of the expense of the trip, on the threat of losing his job if he made a fuss.

On the second night after Jor's return, Fara slipped down to the constable's house, and handed the officer one hundred seventy-five credits. It wasn't that he was responsible, he told Jor, but—

The man was only too eager to grant the disclaimer, provided the money went with it. Fara returned home with a clearer conscience.

It was on the third day after that the door of his shop banged open and a man came in. Fara frowned as he saw who it was: Castler, a village hanger-on. The man was grinning:

"Thought you might be interested, Fara. Somebody came out of the weapon shop today."

Fara strained deliberately at the connecting bolt of a hard plate of the atomic motor he was fixing. He waited with a gathering annoyance that the man did not volunteer further information. Asking questions would be a form of recognition of the worthless fellow. A developing curiosity made him say finally, grudgingly:

"I suppose the constable promptly picked him up."

He supposed nothing of the kind, but it was an opening.

"It wasn't a man. It was a girl."

Fara knitted his brows. He didn't like the idea of making trouble for women. But—the cunning devils! Using a girl, just as they had used an old man as a clerk. It was a trick that deserved to fail, the girl probably a tough one who needed rough treatment. Fara said harshly:

"Well, what's happened?"

"She's still out, bold as you please. Pretty thing, too."

The bolt off, Fara took the hard plate over to the polisher, and began patiently the long, careful task of smoothing away the crystals that heat had seared on the once shining metal. The soft throb of the polisher made the background to his next words:

"Has anything been done?"

"Nope. The constable's been told, but he says he doesn't fancy being away from his family for another three weeks, and paying the cost into the bargain."

Fara contemplated that darkly for a minute, as the polisher throbbed on. His voice shook with suppressed fury, when he said finally:

"So they're letting them get away with it. It's all been as clever as hell. Can't they see that they musn't give an inch before these . . . these transgressors. It's like giving countenance to sin."

From the corner of his eye, he noticed that there was a curious grin on the face of the other. It struck Fara suddenly that the man was enjoying his anger. And there was something else in that grin; something—a secret knowledge.

Fara pulled the engine plate away from the polisher. He faced the ne'er-do-well, scathed at him:

"Naturally, that sin part wouldn't worry you much."

"Oh," said the man nonchalantly, "the hard knocks of life make people tolerant. For instance, after you know the girl better, you yourself will probably come to realize that there's good in all of us."

It was not so much the words, as the curious I've-got-secret-information tone that made Fara snap:

"What do you mean—if I get to know the girl better! I won't even speak to the brazen creature."

"One can't always choose," the other said with enormous casualness. "Suppose he brings her home."

"Suppose who brings who home?" Fara spoke irritably. "Castler, you—"

He stopped; a dead weight of dismay plumped into his stomach; his whole being sagged. "You mean—" he said.

"I mean," replied Castler with a triumphant leer, "that the boys aren't letting a beauty like her be lonesome. And, naturally, your son was the first to speak to her."

He finished: "They're walkin' together now on Second Avenue, comin' this way, so—"

"Get out of here!" Fara roared. "And stay away from me with your gloating. Get out!"

The man hadn't expected such an ignominious ending. He flushed scarlet, then went out, slamming the door.

Fara stood for a moment, every muscle stiff; then, with an abrupt, jerky movement, he shut off his power, and went out into the street.

The time to put a stop to that kind of thing was—now!

He had no clear plan, just that violent determination to put an immediate end to an impossible situation. And it was all mixed up with his anger against Cayle. How could he have had such a worthless son, he who paid his debts and worked hard, and tried to be decent and to live up to the highest standards of the empress?

A brief, dark thought came to Fara that maybe there was some bad blood on Creel's side. Not from her mother, of course—Fara added the mental thought hastily. *There* was a fine, hard-working woman, who hung on to her money, and who would leave Creel a tidy sum one of these days.

But Creel's father had disappeared when Creel was only a child, and there had been some vague scandal about his having taken up with a telestat actress.

And now Cayle with this weapon-shop girl. A girl who had let herself be picked up—

He saw them, as he turned the corner onto Second Avenue. They were walking a hundred feet distant, and heading away from Fara. The girl was tall and slender, almost as big as Cayle, and, as Fara came up, she was saying:

"You have the wrong idea about us. A person like you can't get a job in our organization. You belong in the Imperial Service, where they can use young men of good education, good appearance and no scruples. I—"

Fara grasped only dimly that Cayle must have been trying to get a job with these people. It was not clear; and his own mind was too intent on his purpose for it to mean anything at the moment. He said harshly: "Cayle!"

The couple turned, Cayle with the measured unhurriedness of a young man who has gone a long way on the road to steellike nerves; the girl was quicker, but withal dignified.

Fara had a vague, terrified feeling that his anger was too great, self-destroying, but the very violence of his emotions ended that thought even as it came. He said thickly:

"Cayle, get home—at once."

Fara was aware of the girl looking at him curiously from strange, gray-green eyes. No shame, he thought, and his rage mounted several degrees, driving away the alarm that came at the sight of the flush that crept into Cayle's cheeks.

The flush faded into a pale, tight-lipped anger; Cayle half-turned to the girl, said:

"This is the childish old fool I've got to put up with. Fortunately, we seldom see each other; we don't even eat together. What do you think of him?"

The girl smiled impersonally: "Oh, we know Fara Clark; he's the backbone of the empress in Glay."

"Yes," the boy sneered. "You ought to hear him. He thinks we're living in heaven; and the empress is the divine power. The worst part of it is that there's no chance of his ever getting that stuffy look wiped off his face."

They walked off; and Fara stood there. The very extent of what had happened had drained anger from him as if it had never been. There was the realization that he had made a mistake so great that—

He couldn't grasp it. For long, long now, since Cayle had refused to work in his shop, he had felt this building up to a climax. Suddenly, his own uncontrollable ferocity stood revealed as a partial product of that—deeper—problem.

Only, now that the smash was here, he didn't want to face it—

All through the day in his shop, he kept pushing it out of his mind, kept thinking:

Would this go on now, as before, Cayle and he living in the same house, not even looking at each other when they met, going to bed at

different times, getting up, Fara at 6:30, Cayle at noon? Would *that* go on through all the days and years to come?

When he arrived home, Creel was waiting for him. She said:

"Fara, he wants you to loan him five hundred credits, so that he can go to Imperial City."

Fara nodded wordlessly. He brought the money back to the house the next morning, and gave it to Creel, who took it into the bedroom.

She came out a minute later. "He says to tell you good-by."

When Fara came home that evening, Cayle was gone. He wondered whether he ought to feel relieved or—what?

The days passed. Fara worked. He had nothing else to do, and the gray thought was often in his mind that now he would be doing it till the day he died. Except—

Fool that he was—he told himself a thousand times how big a fool—he kept hoping that Cayle would walk into the shop and say:

"Father, I've learned my lesson. If you can ever forgive me, teach me the business, and then you retire to a well-earned rest."

It was exactly a month to a day after Cayle's departure that the telestat clicked on just after Fara had finished lunch. "Money call," it sighed, "money call."

Fara and Creel looked at each other. "Eh," said Fara finally, "money call for us."

He could see from the gray look in Creel's face the thought that was in her mind. He said under his breath: "Damn that boy!"

But he felt relieved. Amazingly, relieved! Cayle was beginning to appreciate the value of parents and—

He switched on the viewer. "Come and collect," he said.

The face that came on the screen was heavy-jowled, beetle-browed—and strange. The man said:

"This is Clerk Pearton of the Fifth Bank of Ferd. We have received a sight draft on you for ten thousand credits. With carrying charges and government tax, the sum required will be twelve thousand one hundred credits. Will you pay it now or will you come in this afternoon and pay it?"

"B-but . . . b-but—" said Fara. "W-who—"

He stopped, conscious of the stupidity of the question, dimly conscious of the heavy-faced man saying something about the money having been paid out to one Cayle Clark, that morning, in Imperial City. At last, Fara found his voice:

"But the bank had no right," he expostulated, "to pay out the money without my authority. I—"

The voice cut him off coldly: "Are we then to inform our central that the money was obtained under false pretenses? Naturally, an order will be issued immediately for the arrest of your son."

"Wait . . . wait—" Fara spoke blindly. He was aware of Creel beside him, shaking her head at him. She was as white as a sheet, and her voice was a sick, stricken thing, as she said:

"Fara, let him go. He's through with us. We must be as hard—let him go."

The words rang senselessly in Fara's ears. They didn't fit into any normal pattern. He was saying:

"I . . . I haven't got—How about my paying . . . installments? I—"

"If you wish a loan," said Clerk Pearton, "naturally we will be happy to go into the matter. I might say that when the draft arrived, we checked up on your status, and we are prepared to loan you eleven thousand credits on indefinite call with your shop as security. I have the form here, and if you are agreeable, we will switch this call through the registered circuit, and you can sign at once."

"Fara, no."

The clerk went on: "The other eleven hundred credits will have to be paid in cash. Is that agreeable?"

"Yes, yes, of course, I've got twenty-five hundred—" He stopped his chattering tongue with a gulp; then: "Yes, that's satisfactory."

The deal completed, Fara whirled on his wife. Out of the depths of his hurt and bewilderment, he raged:

"What do you mean, standing there and talking about not paying it? You said several times that I was responsible for his being what he is. Besides, we don't know why he needed the money. He—"

Creel said in a low, dead tone: "In one hour, he's stripped us of our life work. He did it deliberately, thinking of us as two old fools, who wouldn't know any better than to pay it."

Before he could speak, she went on: "Oh, I know I blamed you, but in the final issue, I knew it was he. He was always cold and calculating, but I was weak, and I was sure that if you handled him in a different . . . and besides I didn't want to see his faults for a long time. He—"

"All I see," Fara interrupted doggedly, "is that I have saved our name from disgrace."

His high sense of duty rightly done lasted until midafternoon, when the bailiff from Ferd came to take over the shop.

"But what—" Fara began.

The bailiff said: "The Automatic Atomic Repair Shops, Limited, took over your loan from the bank, and are foreclosing. Have you anything to say?"

"It's unfair," said Fara. "I'll take it to court. I'll—"
He was thinking dazedly: "If the empress ever learned of this, she'd . . . she'd—"

The courthouse was a big, gray building; and Fara felt emptier and colder every second, as he walked along the gray corridors. In Glay, his decision not to give himself into the hands of a bloodsucker of a lawyer had seemed a wise act. Here, in these enormous halls and palatial rooms, it seemed the sheerest folly.

He managed, nevertheless, to give an articulate account of the criminal act of the bank in first giving Cayle the money, then turning over the note to his chief competitor, apparently within minutes of his signing it. He finished with:

"I'm sure, sir, the empress would not approve of such goings-on against honest citizens. I—"

"How dare you," said the cold-voiced creature on the bench, "use the name of her holy majesty in support of your own gross self-interest?"

Fara shivered. The sense of being intimately a member of the empress' great human family yielded to a sudden chill and a vast mind-picture of the ten million icy courts like this, and the myriad malevolent and heartless men—*like this*—who stood between the empress and her loyal subject, Fara.

He thought passionately: If the empress knew what was happening here, how unjustly he was being treated, she would—
Or would she?

He pushed the crowding, terrible doubt out of his mind—came out of his hard reverie with a start, to hear the Cadi saying:

"Plaintiff's appeal dismissed, with costs assessed at seven hundred credits, to be divided between the court and the defense solicitor in the ratio of five to two. See to it that the appellant does not leave till the costs are paid. Next case—"

Fara went alone the next day to see Creel's mother. He called first at "Farmer's Restaurant" at the outskirts of the village. The place was he noted with satisfaction in the thought of the steady stream of money flowing in, half full, though it was only midmorning. But madame wasn't there. Try the feed store.

He found her in the back of the feed store, overseeing the weighing out of grain into cloth measures. The hard-faced old woman heard his story without a word. She said finally, curtly:

"Nothing doing, Fara. I'm one who has to make loans often from the

bank to swing deals. If I tried to set you up in business, I'd find the Automatic Atomic Repair people getting after me. Besides, I'd be a fool to turn money over to a man who lets a bad son squeeze a fortune out of him. Such a man has no sense about worldly things.

"And I won't give you a job because I don't hire relatives in my business." She finished: "Tell Creel to come and live at my house. I won't support a man, though. That's all."

He watched her disconsolately for a while, as she went on calmly superintending the clerks who were manipulating the old, no longer accurate measuring machines. Twice her voice echoed through the dust-filled interior, each time with a sharp: "That's overweight, a gram at least. Watch your machine."

Though her back was turned, Fara knew by her posture that she was still aware of his presence. She turned at last with an abrupt movement, and said:

"Why don't you go to the weapon shop? You haven't anything to lose, and you can't go on like this."

Fara went out, then, a little blindly. At first the suggestion that he buy a gun and commit suicide had no real personal application. But he felt immeasurably hurt that his mother-in-law should have made it.

Kill himself? Why, it was ridiculous. He was still only a young man, going on fifty. Given the proper chance, with his skilled hands, he could wrest a good living even in a world where automatic machines were encroaching everywhere. There was always room for a man who did a good job. His whole life had been based on that credo.

Kill himself—

He went home to find Creel packing. "It's the common sense thing to do," she said. "We'll rent the house and move into rooms."

He told her about her mother's offer to take her in, watching her face as he spoke. Creel shrugged.

"I told her 'No' yesterday," she said thoughtfully. "I wonder why she mentioned it to you."

Fara walked swiftly over to the great front window overlooking the garden, with its flowers, its pool, its rockery. He tried to think of Creel away from this garden of hers, this home of two thirds a life-time, Creel living in rooms—and knew what her mother had meant. There was one more hope—

He waited till Creel went upstairs, then called Mel Dale on the telestat. The mayor's plump face took on an uneasy expression as he saw who it was.

But he listened pontifically, said finally: "Sorry, the council does not

loan money; and I might as well tell you, Fara—I have nothing to do with this, mind you—but you can't get a license for a shop any more."

"W-what?"

"I'm sorry!" The mayor lowered his voice. "Listen, Fara, take my advice and go to the weapon shop. These places have their uses."

There was a click, and Fara sat staring at the blank face of the viewing screen.

So it was to be—death!

He waited until the street was empty of human beings, then slipped across the boulevard, past a design of flower gardens, and so to the door of the shop. The brief fear came that the door wouldn't open, but it did, effortlessly.

As he emerged from the dimness of the alcove into the shop proper, he saw the silver-haired old man sitting in a corner chair, reading under a softly bright light. The old man looked up, put aside his book, then rose to his feet.

"It's Mr. Clark," he said quietly. "What can we do for you?"

A faint flush crept into Fara's cheeks. In a dim fashion, he had hoped that he would not suffer the humiliation of being recognized; but now that his fear was realized, he stood his ground stubbornly. The important thing about killing himself was that there be no body for Creel to bury at great expense. Neither knife nor poison would satisfy that basic requirement.

"I want a gun," said Fara, "that can be adjusted to disintegrate a body six feet in diameter in a single shot. Have you that kind?"

Without a word, the old man turned to a showcase, and brought forth a sturdy gem of a revolver that glistened with all the soft colors of the inimitable Ordine plastic. The man said in a precise voice:

"Notice the flanges on this barrel are little more than bulges. This makes the model ideal for carrying in a shoulder holster under the coat; it can be drawn very swiftly because, when properly attuned, it will leap toward the reaching hand of its owner. At the moment it is attuned to me. Watch while I replace it in its holster and—"

The speed of the draw was absolutely amazing. The old man's fingers moved, and the gun, four feet away, was in them. There was no blur of movement. It was like the door the night that it had slipped from Fara's grasp, and slammed noiselessly in Constable Jor's face. *Instantaneous!*

Fara, who had parted his lips as the old man was explaining, to protest the utter needlessness of illustrating any quality of the weapon except what he had asked for, closed them again. He stared in a brief, dazed

fascination; and something of the wonder that was here held his mind and his body.

He had seen and handled the guns of soldiers, and they were simply ordinary metal or plastic things that one used clumsily like any other material substance, not like this at all, not possessed of a dazzling life of their own, leaping with an intimate eagerness to assist with all their superb power the will of their master. They—

With a start, Fara remembered his purpose. He smiled wryly, and said:

"All this is very interesting. But what about the beam that can fan out?"

The old man said calmly: "At pencil thickness, this beam will pierce any body except certain alloys of lead up to four hundred yards. With proper adjustment of the firing nozzle, you can disintegrate a six-foot object at fifty yards or less. This screw is the adjustor."

He indicated a tiny device in the muzzle itself. "Turn it to the left to spread the beam, to the right to close it."

Fara said: "I'll take the gun. How much is it?"

He saw that the old man was looking at him thoughtfully; the oldster said finally, slowly: "I have previously explained our regulations to you, Mr. Clark. You recall them, of course?"

"Eh!" said Fara, and stopped, wide-eyed. It wasn't that he didn't remember them. It was simply—

"You mean," he gasped, "those things actually apply. They're not—"

With a terrible effort, he caught his spinning brain and blurring voice. Tense and cold, he said:

"All I want is a gun that will shoot in self-defense, but which I can turn on myself if I have to or—want to."

"Oh, suicide!" said the old man. He looked as if a great understanding had suddenly dawned on him. "My dear sir, we have no objection to your killing yourself at any time. That is your personal privilege in a world where privileges grow scunter every year. As for the price of this revolver, it's four credits."

"Four cre... only four credits!" said Fara.

He stood, absolutely astounded, his whole mind snatched from its dark purpose. Why, the plastic alone was—and the whole gun with its fine, intricate workmanship—twenty-five credits would have been dirt cheap.

He felt a brief thrill of utter interest; the mystery of the weapon shops

suddenly loomed as vast and important as his own black destiny. But the old man was speaking again:

"And now, if you will remove your coat, we can put on the holster—"
Quite automatically, Fara complied. It was vaguely startling to realize that, in a few seconds, he would be walking out of here, equipped for self-murder, and that there was now not a single obstacle to his death.

Curiously, he was disappointed. He couldn't explain it, but somehow there had been in the back of his mind a hope that these shops might, just might—what?

What indeed? Fara sighed wearily—and grew aware again of the old man's voice, saying:

"Perhaps you would prefer to step out of our side door. It is less conspicuous than the front."

There was no resistance in Fara. He was dimly conscious of the man's fingers on his arm, half guiding him; and then the old man pressed one of several buttons on the wall—so that's how it was done—and there was the door.

He could see flowers beyond the opening; without a word he walked toward them. He was outside almost before he realized it.

Fara stood for a moment in the neat little pathway, striving to grasp the finality of his situation. But nothing would come except a curious awareness of many men around him; for a long second, his brain was like a log drifting along a stream at night.

Through that darkness grew a consciousness of something wrong; the wrongness was there in the back of his mind, as he turned leftward to go to the front of the weapon store.

Vagueness transformed to a shocked, startled sound. For—he was not in Glay, and the weapon shop *wasn't* where it had been. In its place—a dozen men brushed past Fara to join a long line of men farther along. But Fara was immune to their presence, their strangeness. His whole mind, his whole vision, his very being was concentrating on the section of machine that stood where the weapon shop had been.

A machine, oh, a machine—

His brain lifted up, up in his effort to grasp the tremendousness of the dull-metaled immensity of what was spread here under a summer sun beneath a sky as blue as a remote southern sea.

The machine towered into the heavens, five great tiers of metal, each a hundred feet high; and the superbly streamlined five hundred feet ended in a peak of light, a gorgeous spire that tilted straight up a sheer two hundred feet farther, and matched the very sun for brightness.

And it was a machine, not a building, because the whole lower tier was alive with shimmering lights, mostly green, but sprinkled colorfully with red and occasionally a blue and yellow. Twice, as Fara watched, green lights directly in front of him flashed unscintillatingly into red.

The second tier was alive with white and red lights, although there were only a fraction as many lights as on the lowest tier. The third section had on its dull-metal surface only blue and yellow lights; they winkled softly here and there over the vast area.

The fourth tier was a series of signs that brought the beginning of comprehension. The whole sign was:

WHITE	—	BIRTH
RED	—	DEATHS
GREEN	—	LIVING
BLUE	—	IMMIGRATION TO EARTH
YELLOW	—	EMIGRATION

The fifth tier was also all sign, finally explaining:

POPULATIONS

SOLAR SYSTEM	19,174,463,747
EARTH	11,193,247,361
MARS	1,097,298,604
VENUS	5,141,053,811
MOONS	1,742,863,971

The numbers changed, even as he looked at them, leaping up and down, shifting below and above what they had first been. People were dying, being born, moving to Mars, to Venus, to the moons of Jupiter, to Earth's moon, and others coming back again, landing minute by minute in the thousands of spaceports. Life went on in its gigantic fashion—and here was the stupendous record. Here was—

"Better get in line," said a friendly voice beside Fara. "It takes quite a while to put through an individual case, I understand."

Fara stared at the man. He had the distinct impression of having had senseless words flung at him. "In line?" he started—and stopped himself with a jerk that hurt his throat.

He was moving forward, blindly, ahead of the younger man, thinking a curious jumble about that this must have been how Constable Jor was transported to Mars—when another of the man's words penetrated. "Case?" said Fara violently. "Individual case!"

The man, a heavy-faced, blue-eyed young chap of around thirty-five,

looked at him curiously: "You must know why you're here," he said. "Surely, you wouldn't have been sent through here unless you had a problem of some kind that the weapons shop courts will solve for you; there's no other reason for coming to Information Center."

Fara walked on because he was in the line now, a fast-moving line that curved him inexorably around the machine; and seemed to be heading him toward a door that led into the interior of the great metal structure.

So it was a building as well as a machine.

A problem, he was thinking, why, of course, he had a problem, a hopeless, insoluble, completely tangled problem so deeply rooted in the basic structure of Imperial civilization that the whole world would have to be overturned to make it right.

With a start, he saw that he was at the entrance. And the awed thought came: In seconds he would be committed irrevocably to—what?

Inside was a long, shining corridor, with scores of completely transparent hallways leading off the main corridor. Behind Fara, the young man's voice said:

"There's one, practically empty. Let's go."

Fara walked ahead; and suddenly he was trembling. He had already noticed that at the end of each side hallway were some dozen young women sitting at desks, interviewing men and . . . and, good heavens, was it possible that all this meant—

He grew aware that he had stopped in front of one of the girls.

She was older than she had looked from a distance, over thirty, but good-looking, alert. She smiled pleasantly, but impersonally, and said:

"Your name, please?"

He gave it before he thought and added a mumble about being from the village of Glay. The woman said:

"Thank you. It will take a few minutes to get your file. Won't you sit down?"

He hadn't noticed the chair. He sank into it; and his heart was beating so wildly that he felt choked. The strange thing was that there was scarcely a thought in his head, nor a real hope; only an intense, almost mind-wrecking excitement.

With a jerk, he realized that the girl was speaking again, but only snatches of her voice came through that screen of tension in his mind.

"—Information Center is . . . in effect . . . a bureau of statistics. Every person born . . . registered here . . . their education, change of address . . . occupation . . . and the highlights of their life. The whole is maintained by . . . combination of . . . unauthorized and unsuspected liaison

with . . . Imperial Chamber of Statistics and . . . through medium of agents . . . in every community—"

It seemed to Fara that he was missing vital information, and that if he could only force his attention and hear more—He strained, but it was no use; his nerves were jumping madly and—

Before he could speak, there was a click, and a thin, dark plate slid onto the woman's desk. She took it up, and examined it. After a moment, she said something into a mouthpiece, and in a short time two more plates precipitated out of the empty air onto her desk. She studied them impassively, looked up finally.

"You will be interested to know," she said, "that your son, Cayle, bribed himself into a commission in the Imperial army with five thousand credits."

"Eh?" said Fara. He half rose from his chair, but before he could say anything, the young woman was speaking again, firmly:

"I must inform you that the weapon shops take no action against individuals. Your son can have his job, the money he stole; we are not concerned with moral correction. That must come naturally from the individual, and from the people as a whole—and now if you will give me a brief account of your problem for the record and the court."

Sweating, Fara sank back into his seat; his mind was heaving; most desperately, he wanted more information about Cayle. He began:

"But . . . but what . . . how—" He caught himself; and in a low voice described what had happened. When he finished, the girl said:

"You will proceed now to the Name Room; watch for your name, and when it appears go straight to Room 474. Remember, 474—and now, the line is waiting, if you please—"

She smiled politely, and Fara was moving off almost before he realized it. He half turned to ask another question, but an old man was sinking into his chair. Fara hurried on, along a great corridor, conscious of curious blasts of sound coming from ahead.

Eagerly, he opened the door; and the sound crashed at him with all the impact of a sledge-hammer blow.

It was such a colossal, incredible sound that he stopped short, just inside the door, shrinking back. He stood then trying to blink sense into a visual confusion that rivaled in magnitude that incredible tornado of noise.

Men, men, men everywhere; men by the thousands in a long, broad auditorium, packed into rows of seats, pacing with an abandon of restlessness up and down aisles, and all of them staring with a frantic interest at a long board marked off into squares, each square lettered from

the alphabet, from A, B, C and so on to Z. The tremendous board with its lists of names ran the full length of the immense room.

The Name Room, Fara was thinking shakily, as he sank into a seat and his name would come up in the C's, and then—

It was like sitting in at a no-limit poker game, watching the precious cards turn up. It was like playing the exchange with all the world at stake during a stock crash. It was nerve-racking, dazzling, exhausting, fascinating, terrible, mind-destroying, stupendous. It was like nothing else on the face of the earth.

New names kept flashing on to the twenty-six squares; and would shout like insane beings and some fainted, and the uproar was absolutely shattering; the pandemonium raged on, one continuous, unbelievable sound.

And every few minutes a great sign would flash along the board telling everyone:

"WATCH YOUR OWN INITIALS."

Fara watched, trembling in every limb. Each second it seemed to him that he couldn't stand it an instant longer. He wanted to scream at the room to be silent; he wanted to jump up to pace the floor, but others who did that were yelled at hysterically, threatened wildly, hated with a mad, murderous ferocity.

Abruptly, the blind savagery of it scared Fara. He thought unsteadily, "I'm not going to make a fool of myself. I—"

"Clark, Fara—" winked the board. "Clark, Fara—"

With a shout that nearly tore off the top of his head, Fara leaped to his feet. "That's me!" he shrieked. "Me!"

No one turned; no one paid the slightest attention. Shamed, he slunk across the room where an endless line of men kept crowding into a corridor beyond.

The silence in the long corridor was almost as shattering as the mind-destroying noise it replaced. It was hard to concentrate on the idea of a number—474.

It was completely impossible to imagine what could lie beyond—474.

The room was small. It was furnished with a small, business-type table and two chairs. On the table were seven neat piles of folders, each pile of different color. The piles were arranged in a row in front of a large, milky-white globe, that began to glow with a soft light. Out of its depths, a man's baritone voice said:

"Fara Clark?"

"Yes," said Fara.

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"Before the verdict is rendered in your case," the voice went on quietly, "I want you to take a folder from the blue pile. The list will show the Fifth Interplanetary Bank in its proper relation to yourself and the world, and it will be explained to you in due course."

The list, Fara saw, was simply that, a list of the names of companies. The names ran from A to Z, and there were about five hundred of them. The folder carried no explanation; and Fara slipped it automatically into his side pocket, as the voice came again from the shining globe.

"It has been established," the words came precisely, "that the Fifth Interplanetary Bank perpetrated upon you a gross swindle, and that it is further guilty of practicing scavengery, deception, blackmail and was accessory in a criminal conspiracy."

"The bank made contact with your son, Cayle, through what is quite properly known as a scavenger, that is, an employee who exists by finding young men and women who are normally capable of drawing drafts on their parents or other victims. The scavenger obtains for this service a commission of eight percent, which is always paid by the person making the loan, in this case your son."

"The bank practiced deception in that its authorized agents deceived you in the most culpable fashion by pretending that it had already paid out the ten thousand credits to your son, whereas the money was not paid over until your signature had been obtained."

"The blackmail guilt arises out of a threat to have your son arrested for falsely obtaining a loan, a threat made at a time when no money had exchanged hands. The conspiracy consists of the action whereby your note was promptly turned over to your competitor."

"The bank is accordingly triple-fined, thirty-six thousand three hundred credits. It is not in our interest, Fara Clark, for you to know how this money is obtained. Suffice to know that the bank pays it, and that of the fine the weapon shops allocate to their own treasury a total of one half. The other half—"

There was a *plip*; a neatly packaged pile of bills fell onto the table. "For you," said the voice; and Fara, with trembling fingers, slipped the package into his coat pocket. It required the purest mental and physical effort for him to concentrate on the next words that came:

"You must not assume that your troubles are over. The re-establishment of your motor repair shop in Glay will require force and courage. Be discreet, brave and determined, and you cannot fail. Do not hesitate to use the gun you have purchased in defense of your rights. The plan will be explained to you. And now, proceed through the door facing you—"

that all his life he had watched the march of ruined men into the oblivion of poverty and disgrace—and blamed *them*.

Fara groaned. "I've been like a madman," he said. "Everything the empress and her officials did was right. No friendship, no personal relationship could survive with me that did not include belief in things as they were. I suppose if I started to talk against the empress I would receive equally short shrift."

"Under no circumstances," said the old man grimly, "must you say anything against her majesty. The weapon shops will not countenance any such words, and will give no further aid to anyone who is so indiscreet. The reason is that, for the moment, we have reached an uneasy state of peace with the Imperial government. We wish to keep it that way; beyond that I will not enlarge on our policy."

"I am permitted to say that the last great attempt to destroy the weapon shops was made seven years ago, when the glorious Innelda Isher was twenty-five years old. That was a secret attempt, based on a new invention; and failed by purest accident because of our sacrifice of a man from seven thousand years in the past. That may sound mysterious to you, but I will not explain."

"The worst period was reached some forty years ago when every person who was discovered receiving aid from us was murdered in some fashion. You may be surprised to know that your father-in-law was among those assassinated at that time."

"Creel's father!" Fara gasped. "But—"

He stopped. His brain was reeling; there was such a rush of blood to his head that for an instant he could hardly see.

"But," he managed at last, "it was reported that he ran away with another woman."

"They always spread a vicious story of some kind," the old man said; and Fara was silent, stunned.

The other went on: "We finally put a stop to their murders by killing the three men from the top down, *excluding* the royal family, who gave the order for the particular execution involved. But we do not again want that kind of bloody murder."

"Nor are we interested in any criticism of our toleration of so much that is evil. It is important to understand that we *do not interfere in the main stream of human existence*. We right wrongs; we act as a barrier between the people and their more ruthless exploiters. Generally speaking, we help only honest men; that is not to say that we do not give assistance to the less scrupulous, but only to the extent of selling them guns—which is a very great aid indeed, and which is one of the reasons

Fara braced himself with an effort, opened the door and walked through.

It was a dim, familiar room that he stepped into, and there was a silver-haired, fine-faced man who rose from a reading chair, and came forward in the dimness, smiling gravely.

The stupendous, fantastic, exhilarating adventure was over; and he was back in the weapon shop of Glay.

He couldn't get over the wonder of it—this great and fascinating organization established here in the very heart of a ruthless civilization, a civilization that had in a few brief weeks stripped him of everything he possessed.

With a deliberate will, he stopped that glowing flow of thought. A dark frown wrinkled his solidly built face; he said:

"The . . . judge—," Fara hesitated over the name, frowned again, annoyed at himself, then went on: "The judge said that, to re-establish myself I would have to—"

"Before we go into that," said the old man quietly, "I want you to examine the blue folder you brought with you."

"Folder?" Fara echoed blankly. It took a long moment to remember that he had picked up a folder from the table in Room 474.

He studied the list of company names with a gathering puzzlement, noting that the name of Automatic Atomic Motor Repair Shops was well down among the A's, and the Fifth Interplanetary Bank only one of several great banks included. Fara looked up finally:

"I don't understand," he said; "are these the companies you have had to act against?"

The silver-haired man smiled grimly, shook his head. "That is not what I mean. These firms constitute only a fraction of the eight hundred thousand companies that are constantly in our books."

He smiled again, humorlessly: "These companies all know that, because of us, their profits on paper bear no relation to their assets. What they don't know is how great the difference really is; and, as we want a general improvement in business morals, not merely more skillful scheming to outwit us, we prefer them to remain in ignorance."

He paused, and this time he gave Fara a searching glance, said at last: "The unique feature of the companies on this particular list is that they are every one wholly owned by Empress Isher."

He finished swiftly: "In view of your past opinions on that subject, I do not expect you to believe me."

Fara stood as still as death, for—he did believe with unquestioning conviction, completely, finally. The amazing, the unforgivable thing was

why the government is relying almost exclusively for its power on an economic chicanery.

"In the four thousand years since the brilliant genius Walter S. DeLany invented the vibration process that made the weapon shops possible, and laid down the first principles of weapon shop political philosophy, we have watched the tide of government swing backward and forward between democracy under a limited monarchy to complete tyranny. And we have discovered one thing:

"*People always have the kind of government they want.* When they want change, they must change it. As always we shall remain an incorruptible core—and I mean that literally; we have a psychological machine that never lies about a man's character—I repeat, an incorruptible core of human idealism, devoted to relieving the ills that arise inevitably under any form of government.

"But now—your problem. It is very simple, really. You must fight as all men have fought since the beginning of time for what they valued for their just rights. As you know, the Automatic Repair people removed all your machinery and tools within an hour of foreclosing on your shop. This material was taken to Ferd, and then shipped to a great warehouse on the coast.

"We recovered it, and with our special means of transportation have now replaced the machines in your shop. You will accordingly go there and—"

Fara listened with a gathering grimness to the instructions, nodded finally, his jaw clamped tight.

"You can count on me," he said curtly. "I've been a stubborn man in my time; and though I've changed sides, I haven't changed *that*."

Going outside was like returning from life to—death; from hope to—reality.

Fara walked along the quiet streets of Glay at darkest night. For the first time it struck him that the weapon shop Information Center must be halfway around the world, for it had been day, brilliant day.

The picture vanished as if it had never existed, and he grew aware again, prematurely aware of the village of Glay asleep all around him. Silent, peaceful—yet ugly, he thought, ugly with the ugliness of evil enthroned.

He thought: The right to buy weapons—and his heart swelled into his throat; the tears came to his eyes.

He wiped his vision clear with the back of his hand, thought of Creel's long dead father, and strode on, without shame. Tears were good for an angry man.

The shop was the same, but the hard metal padlock yielded before the tiny, blazing, supernal power of the revolver. One flick of fire; the metal dissolved—and he was inside.

It was dark, too dark to see, but Fara did not turn on the lights immediately. He fumbled across to the window control, turned the windows to darkness vibration, and then clicked on the lights.

He gulped with awful relief. For the machines, his precious tools that he had seen carted away within hours after the bailiff's arrival, were here again, ready for use.

Shaky from the pressure of his emotion, Fara called Creel on the telestat. It took a little while for her to appear; and she was in her dressing robe. When she saw who it was she turned a dead white.

"Fara, oh, Fara, I thought—"

He cut her off grimly: "Creel, I've been to the weapon shop. I want you to do this: go straight to your mother. I'm here at my shop. I'm going to stay here day and night until it's settled that I *stay*. . . I shall go home later for some food and clothing, but I want you to be gone by then. Is that clear?"

Color was coming back into her lean, handsome face. She said: "Don't you bother coming home, Fara. I'll do everything necessary. I'll pack all that's needed into the carplane, including a folding bed. We'll sleep in the back room of the shop."

Morning came palely, but it was ten o'clock before a shadow darkened the open door; and Constable Jor came in. He looked shame-faced: "I've got an order here for your arrest," he said.

"Tell those who sent you," Fara replied deliberately, "that I resisted arrest—with a gun."

The deed followed the words with such rapidity that Jor blinked. He stood like that for a moment, a big, sleepy-looking man, staring at that gleaming, magical revolver; then:

"I have a summons here ordering you to appear at the great court of Ferd this afternoon. Will you accept it?"

"Certainly."

"Then you will be there?"

"I'll send my lawyer," said Fara. "Just drop the summons on the floor there. Tell them I took it."

The weapon shop man had said: "Do not ridicule by word any legal measure of the Imperial authorities. Simply disobey them."

Jor went out, and seemed relieved. It took an hour before Mayor Mel Dale came pompously through the door.

"See here, Fara Clark," he bellowed from the doorway. "You can't get away with this. This is defiance of the law."

Fara was silent as His Honor waddled farther into the building. It was puzzling, almost amazing, that Mayor Dale would risk his plump, tressed body. Puzzlement ended as the mayor said in a low voice:

"Good work, Fara; I knew you had it in you. There's dozens of us in Glay behind you, so stick it out. I had to yell at you just now, because there's a crowd outside. Yell back at me, will you? Let's have a real name calling. But, first, a word of warning: the manager of the Automatic Repair Shop is on his way here with his bodyguards, two of them—"

Shakily, Fara watched the mayor go out. The crisis was at hand. He braced himself, thought: "Let them come, let them—"

It was easier than he had thought—for the men who entered the shop turned pale when they saw the holstered revolver. There was a violence of blustering, nevertheless, that narrowed finally down to:

"Look here," the man said, "we've got your note for twelve thousand one hundred credits. You're not going to deny you owe that money."

"I'll buy it back," said Fara in a stony voice, "for exactly half, not a cent more."

The strong-jawed young man looked at him for a long time. "We'll take it," he said finally, curtly.

Fara said: "I've got the agreement here—"

His first customer was old man Miser Lan Harris. Fara stared at the long-faced oldster with a vast surmise, and his first, amazed comprehension came of how the weapon shop must have settled on Harris' lot—by arrangement.

It was an hour after Harris had gone that Creel's mother stamped into the shop. She closed the door.

"Well," she said, "you did it, eh? Good work. I'm sorry if I seemed rough with you when you came to my place, but we weapon-shop supporters can't afford to take risks for those who are not on our side.

"But never mind that. I've come to take Creel home. The important thing is to return everything to normal as quickly as possible."

It was over; incredibly it was over. Twice, as he walked home that night, Fara stopped in midstride, and wondered if it had not all been a dream. The air was like wine. The little world of Glay spread before him, green and gracious, a peaceful paradise where time had stood still.

MIMSY WERE THE BOROGOVES

by Lewis Padgett

There's no use trying to describe either Unthahorsten or his surroundings, because, for one thing, a good many million years had passed since 1942 Anno Domini, and, for another, Unthahorsten wasn't on Earth, technically speaking. He was doing the equivalent of standing in the equivalent of a laboratory. He was preparing to test his time machine.

Having turned on the power, Unthahorsten suddenly realized that the Box was empty. Which wouldn't do at all. The device needed a control, a three-dimensional solid which would react to the conditions of another age. Otherwise Unthahorsten couldn't tell, on the machine's return, where and when it had been. Whereas a solid in the Box would automatically be subject to the entropy and cosmic ray bombardment of the other era, and Unthahorsten could measure the changes, both qualitative and quantitative, when the machine returned. The Calculators could then get to work and, presently, tell Unthahorsten that the Box had briefly visited 1,000,000 A.D., 1,000 A.D., or 1 A.D., as the case might be.

Not that it mattered, except to Unthahorsten. But he was childish in many respects.

There was little time to waste. The Box was beginning to glow and shiver. Unthahorsten stared around wildly, fled into the next glossatch, and groped in a storage bin there. He came up with an armful of peculiar-looking stuff. Uh-huh. Some of the discarded toys of his son Snowen, which the boy had brought with him when he had passed over from Earth, after mastering the necessary technique. Well, Snowen needed this junk no longer. He was conditioned, and had put away

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