Contents

Introduction

> *"Artificial beings are unnatural creatures constructed by enchantments. Composed of virtually any element or substance, they have no inherent soul. Instead, their spirit is a gift or a temporary lodger. Their bodies would not 'live' but for the incantations that unite them with a wandering soul or part of the maker's own spirit."*

From arcane workshops issue forth hulking golems, roughly sculpted from stone, deadly humanoid constructs, formed from myriad metal scales, and animated machines. In sorcerous laboratories, misshapen parodies and soulless simulacra of living beasts and men are shaped and molded. And in the secret places of the world, the mightiest alchemists tamper with life itself to create terrifying new monsters and savage races – abominations of the natural order, which will endanger the free peoples for future millennia.

Your world may never be the same again.

1.1
WHAT'S IN CONSTRUCT COMPANION?

Construct Companion is a fantasy role-playing sourcebook on artificial entities and magical machines of every kind. It expands on the material available in *Creatures & Monsters* and *Treasure Companion*, and represents a total revision and unification of the fragmented resources found in previous editions of *Rolemaster.*

The myths and fiction of our own Earth are populated with uncanny creatures, created by forgotten alchemy and lost magic. History is replete with instances of intriguing machines and toys devised by ingenious artificers or cunning tricksters to entertain the elite throughout the centuries. *Construct Companion* will delve into this treasure trove to reveal the most interesting beasts and artifacts.

In addition to the perennial favorites of constructs and golems, *Construct Companion* will introduce four new categories of artificial entities and unnatural lifeforms, namely the automaton, the amalgam, the simulacrum, and the changeling, and provide ready-made examples of each. *Construct Companion* will detail the spells, rituals and processes needed to create artificial beings and automata of each type, and show how the standard creations can be enhanced with mechanical contraptions and magical abilities. With these rules, the boldest alchemists will be able to persuade or compel eldritch beings to place shards of their souls within newly animated entities, granting them intelligence. Others will mimic or mock the divine by fashioning whole new hybrid species.

Construct Companion will reveal how members of the existing *Rolemaster* professions can become masters of creative magics, and explore their motivations and methods. From a handful of individual entities crafted by isolated sages to vast artificial armies produced by mage guilds, creators and created alike will have a proportionate impact on the setting – *Construct Companion* will help gamemasters (GMs) to meld them into their stories, as player-characters, as non-player-characters, and as sources for adventure.

1.2
USING CONSTRUCT COMPANION

Construct Companion is wholly compatible with *Rolemaster Fantasy Role-Playing.* Much of the material in this book can also be used without modification with earlier editions of *Rolemaster.*

Construct Companion is also a modular sourcebook. Gamemasters may choose to use some or all of the material without fear of upsetting delicate game balances. In some campaigns, only certain types of artificial beings may be created – each is an individual masterwork of the art and the result of a lifetime (or more) of dedicated magical research. In other worlds, creation magic is black magic and the province of evil spell users; heroes battle golems, constructs and abominations and seek to rid the world of their blasphemous makers. In yet other settings, automata and artificial entities may be commonplace as non-human slaves, ever-vigilant guardians, and utterly loyal warriors – with a magical "Industrial Revolution" imminent in the most advanced societies. Whether artificial beings are peripheral or central to the setting, *Construct Companion* has all the answers.

1.3
AUTHOR'S NOTE

The author would like to thank Alison Mitchell for undertaking much of the early research into historical automata and literary monsters. Her efforts assisted greatly in the writing of this book. Any errors introduced into the text are my fault.

Construct Companion has also benefited from the suggestions and critiques of an elite and international cadre of playtesters – David Bate, Andrew Ferguson, Patrick Farley, Peter Mork, Marian Münch, and Dave Prince. Many kudos to these heroes.

As always, thanks for keeping me sane in the face of the word count go to my veteran group of gamers – David "Demetrios" Bate, Quinton "Etain" Carroll, Andy "Sabas" Davies, Matt "Uther" Fitzgerald, Keith "Markus" Grainge, Sean "Bertran" Miller, Dave "Anna" Prince, and Stephen "Leon" Watts.

Artificial Entities and Automata in Myth, History and Fiction

Legend, literature and history are replete with examples of created and artificial entities. This chapter will look at a sample of the most famous and interesting as a prelude to implementing similar creations in *Rolemaster*.

2.1 AUTOMATA

2.1.1 ANCIENT AUTOMATA

As early as 2000 B.C., the ancient Egyptians possessed figurines with movable limbs while puppets dangling on strings or operated by sticks from beneath were made by the Greeks in the first millennium B.C. "Talking statues" (where a human priest hidden nearby spoke on the god's behalf) and "moving" idols (where the motion was achieved by mechanical contrivances) have appeared in many religions from antiquity onwards.

True automata, in the sense of mechanical objects which are relatively self-operating once set in motion, appeared in profusion in the third and second centuries B.C. Sand, mercury, and especially water were used by the later Egyptians and the classical Greeks as the motive forces for their devices. Hero of Alexandria, living in the second century B.C., described the construction of apparatus employing water, falling weights, and steam. As one of the leading mechanicians of the era, his discoveries in hydraulic, pneumatic, and mechanical action helped him to construct a series of automata from singing birds and moving tableaux to a fully automatic miniature theatre. Philo of Byzantium staged a full five-act play – "The Tale of Nauplius" – including ships being launched, "sailed", and shipwrecked using one of these theatres.

Even in Greco-Roman legend, automata are present. Homer mentions Vulcan's mobile tripods and the smith god was assisted in his endeavors by a score of golden

handmaidens. Daedalus, before his aerial escape on waxed wings, was supposed to have fashioned moving statues, animating them with mercury.

2.1.2 ARAB AND MEDIEVAL AUTOMATA

The King of Persia gave an elaborate water clock, or clepsydra, to Charlemagne in 807 AD as a gift. On the stroke of each hour, one of twelve doors on its dial would open and little balls (in number equal to the hour) would fall out onto a brass drum. At twelve o'clock, a troop of miniature cavalrymen would ride out and moving round the dial shut all the doors!

From the ninth century onwards, beautiful automata graced the courts of Islamic rulers – one caliph had a golden tree with silver leaves and mechanical singing birds resting in its branches. In the early 13th century, Ibn Al-Razzazz Al-Jazari compiled his own (and others') designs for graceful constructs in the "Book of Knowledge of Ingenious Mechanical Devices". His own specialty was water-operated devices, such as moving and ornate peacocks, some for ritual washing, others as royal cupbearers.

In Christian Europe, elementary decorative automata appeared in medieval churches. Hand-operated crucifixes oozed blood, Madonnas shed tears, and even up to 1647, the celebration of the Assumption in Dieppe in France included artificial angels, which flapped their wings and blew trumpets.

While such artifice to instruct and awe the ordinary folk was not discouraged by the Church, more conservative churchmen could construe revolutionary ideas from its own scholars as diabolical heresies. In the 13th century, Albertus Magnus (Saint Albert the Great or "Doctor Universalis"), Dominican theologian and proto-scientist, was considered by some contemporaries and later fabulists to be a master of magic. Albertus is credited variously with creating an iron man or a mechanical brass man able to move and speak. Supposedly his disciple, St Thomas Aquinas, destroyed the brass man believing it to be a work of the Devil.

Around the same time, Roger Bacon ("Doctor Mirabilis"), the English Franciscan philosopher, studied and conducted experiments in mathematics, astronomy, optics, and alchemy. He described spectacles, optical phenomena such as reflection, refraction, and aberration, and detailed the process for making gunpowder. He envisioned machines such that ships without rowers might be both propelled and steered by a single individual, carriages needing no horses or other draught animals, and flying machines where a man seated in the middle need only turn a device to make the wings flap and ascend into the air. His fame led to him being associated with prodigies and wonders – legends assert that he constructed a talking head of bronze. It was supposedly made so that he might discern the necessary magic to create a wall of brass to surround and protect England. Sadly for Roger Bacon, his fellow friars suspected his teachings of containing dangerous "novelties" and he spent his last decade imprisoned for heresy.

Less fanciful and more useful constructs were the *Jaquemarts* or "clock jacks" which appeared on clock towers and churches from the fourteenth century. Mechanical figures would move on turntables, entering and exiting doors, and striking bells with the strokes of the hour. The mechanisms used extremely heavy leaden weights, laboriously raised each day by hand. Fashions in such clock constructs became more ornate and complex over the next three centuries.

2.1.3 RENAISSANCE AND ENLIGHTENMENT AUTOMATA

With the advent of the Renaissance, automata began to enjoy a new reputation as ingenious products of artifice rather than the creation of magic. Some inventors amused their overlords with flying birds, miniature horsemen, and musicians. In the early 16th century, Leonardo da Vinci fashioned an automatic lion, capable of moving some paces forward on its *wheels* and then opening its chest to reveal heraldic symbols. Contemporary biographers reported that he made animals from a wax paste – when inflated, these constructs flew through the air.

The cities of Augsburg and Nuremburg in southern Germany became the world centers for advances in clockwork. Formerly clocks used heavy weights revolving around a barrel wound around with chain or rope to drive the wheels. Now coiled tempered-steel springs could be employed, making smaller and more portable clocks and watches practical. For noble banquets, clockwork *nefs* (coasters on wheels carrying wines and condiments) traversed long tables servicing and entertaining diners in equal measure. Other "drinking clocks" would race along the table with every guest required to down his glass before they halted – one in the shape of a centaur fired small arrows at unlucky drinkers who were then forced to pay a forfeit. Some constructs were capable of producing music by simulating keyboard and wind instruments with plucked strings and bellows respectively.

During the 18th century, academicians in the French Academy of Sciences considered the whole spectrum of mechanical invention from practical pumps, mills, and bridges to novel calculating machines, weapons, and automata. Designs for the latter included chariots (moved by handles connected to cogs driving the back wheels rather than horse-drawn), artificial swans and seahorses (using paddle feet for motion), a life-size paddle-operated gondola, and even a cart and its mechanical horse. In 1779, their colleagues in St. Petersburg even organized a competition for the best "speaking head" – the winning entry was able to utter a few words. Industrious inventors made mechanical and electric paddleboats, automatic carriages and walking animals as well as curiosities such as self-locking boxes, self-extinguishing lamps, and self-firing guns.

Wealthy merchants and minor princes bankrolled gadgeteers to fill their sheltered gardens and specially constructed grottos with intricate automata arranged in artistic poses or capturing rustic scenes. In one grotto at Hellbrun near Salzburg, a mechanical theatre consisting of over 200 miniature figures was built in 1752. The 113 automata, operated by a water turbine, and their static counterparts, simulate the life of an 18th-century town. Toscani, a Polish stage magician exhibited a more mobile *theatrum mundi* (an automaton with many figures) from 1744 to 1748. His figures were animated either by primitive electrics or magnetics rather than wires. Flockton's theatre, displayed in 1800, had as many as 500 figures.

Among the masters of the art of automata during the Enlightenment were Jacques de Vaucanson, the Knauss brothers (Ludwig and Friedrich), the Jaquet-Droz family (father (Pierre) and son (Henri-Louis)), and Wolfgang von Kempelen.

Vaucanson was expelled from a Jesuit training college for making automata in the form of flying angels. During the 1730s and 1740s, he fashioned a series of celebrated models variously exhibited in France (and by others elsewhere in Europe.) His creations included a grocer's stall with a mechanical shopkeeper able to rise, open and shut the stall's doors, and hand over items to the audience, life-size flute-players (with repertoires of ten or more tunes), and a life-size brass duck with realistic looking plumage, mobile head and wings, and the ability to "eat" from the contents of a bowl, "digest", and "excrete" the "food". In his later life, Vaucanson used his ingenuity to design and manufacture machines to weave brocade.

The Knauss brothers are most famous for their splendid automata clocks of the 1740s and 1750s, such as the *Ritterspieluhr* (Knight's Clock), which depicts a tourney with two armies of knights on horseback who joust as the clock strikes the hour, and the *Maria-Theresian Uhr*, depicting a symbolic procession to celebrate the coronation of Empress Maria Theresa. Friedrich Knauss also attempted to make "writing hands" and "speaking heads" – his experiments with the former led to a device capable of tracing cursive script on paper in response to signals from a keyboard operator.

The Swiss Jaquet-Droz inventors fashioned three truly exquisite automata among a series of lesser creations. The first is a Writer (completed in 1760), in form and size a curly-headed four-year-old seated at a small desk, holding a goose quill in his right hand and able to write any preset phrase of up to 40 letters. Interchangeable pegs placed on a disc form the phrase while an intricate series of clockwork mechanisms and internal cams transmit and translate the phrase into writing movements. The second was a Draughtsman (1773), which was similar to the Writer in form but able to draw one of four pictures. The final automaton, a Musician, took the form of a young woman playing a piano. Jean Leschot, a mechanic who assisted Pierre Jaquet-Droz, became famous for making articulated prosthetics for amputees.

The chess-playing Turk first exhibited by Wolfgang von Kempelen in 1770 is perhaps the most famous automaton of all. In shape, it was a cabinet on wheels behind which a life-size figure dressed in Turkish clothing and turban was seated. Atop the cabinet was a chessboard and chess pieces, which could be moved by the "Turk". The cabinet doors could be opened to reveal drawers and a complex arrangement of mechanical parts with unknown purposes. In 1809, Napoleon played a game with the "Turk" and lost! Unknown at the time, the "Turk" was not a real automaton – a skilled human player was actually concealed within the equipment.

Interest in automata slowly declined in the 19th century as rich patrons and skilled craftsmen dwindled.

2.1.4 ORIENTAL AUTOMATA

In China, the earliest mentions of automata are from the 3rd century BC when a mechanical orchestra was constructed for the then-Emperor. Automata were widespread by the 6th century AD, and remained popular with the ruling classes of the empire for a further five hundred years. Histories record flying birds, animals and humanoid automata. The tradition of construct building declined in the mid-fourteenth century. When the Jesuits led their missions to China in the early 1600s, they discovered and exploited the Chinese fascination with clockwork – later missionaries brought machinery and automata with them as gifts to placate and entertain the rulers. Some of the priests were skilled inventors in their own right, designing walking men and richly decorated clocks for the Emperors. Europeans, however, were required to maintain the machines.

Tipu Sultan, the fiercely independent 18th-century ruler of Mysore and enemy of the British in India, gave form to his hatred of European invaders with a clockwork tiger mauling a prostrate foreigner. Equipped with an organ, suitable bellows, and an air reservoir, the device is operated by a mechanical keyboard and handle. When wound up, the man's left arm flails ineffectually, the man screams, and the tiger roars.

The Japanese developed a tradition of automata, known as "karakuri", from the mid-17th century. Takeda Omi, originally a maker of "sand clocks" (elaborate hourglasses), diverged into the design and manufacture of clockwork and mechanical toys based loosely on European techniques. Granted permission to establish a public theatre to exhibit his inventions, Takeda Omi and his descendants (by blood and adoption) were at the forefront of automata creation for more than a hundred years. *Karakuri* became respectable additions to plays with human actors and *karakuri*-only performances were very popular. While *karakuri* entertained audiences, laborsaving devices were also created based on this technology – one rich and secretive miller had his mill equipped with three treadmills, each connected to three millstones. Each millstone normally required six workers or fifty-four in total. The treadmills' design only

required one man per treadmill. The *karakuri* industry declined in the mid-18th century, perhaps because workmanship had deteriorated or automata had become unfashionable, and the last *karakuri* theatre closed in 1772.

2.2
THE GOLEM

The golem is an artificial creature, made from clay, described in Jewish folklore and mystical traditions. Wise rabbis brought the golem to life by means of a combination of letters forming one of the sacred names of God. According to most golem stories, the letters were written onto a piece of parchment, which was then placed either in the creature's mouth or affixed to its head. Altering or removing the letters deactivated the golem.

The creation of golems (more properly "golemim") was not an uncommon process in Jewish legends, with the earliest references being to the golems fashioned by Enosh and Ben Sira in Biblical eras. Ben Sira was commanded to destroy his golem lest its seeming vitality delude the gullible into believing in the existence of false gods. Other sages, such as Rava (in the 4th century AD), Ibn Gabirol (11th century), and Ibn Ezra (12th century), were credited with making golems. They were not only created in human form – two rabbis regularly fashioned and animated a calf every Friday according to one account. The most famous golem of all was the masterwork of the 16th-century rabbi Judah Löw ben Bezulel, whose creation protected the Jews of the Prague ghettos from the persecutions of anti-Semitic Christians.

2.2.1 MAKING A GOLEM

The Kabbalah were and are the mystical and magical traditions of Judaism. According to its doctrines, divine power is inherent in the very letters of the sacred names of God. Texts such as the "Sefer Yetzirah" ("Book of Formation") specify diverse formulations of letters, with different permutations for different supernatural activities. Thus a scholar who has mastered this knowledge could potentially use the Kabbalah to obtain a dream vision or even create a golem. Knowledge is, however, insufficient. A true cabbalistic master will only invoke these magical energies after seeking the permission of God through prayer. To perform magic without divine sanction is black sorcery, which taps into the diabolical powers.

The tale of Rabbi Löw's golem creation is perhaps the most complete. In 1580, anxious to protect his people from persecution, Löw used his kabbalistic wisdom to seek divine guidance through a dream quest, placing a blank piece of paper under his pillow. On waking, the paper was inscribed with ten Hebraic words, the first letter of each word corresponding to the first ten letters of the Hebrew
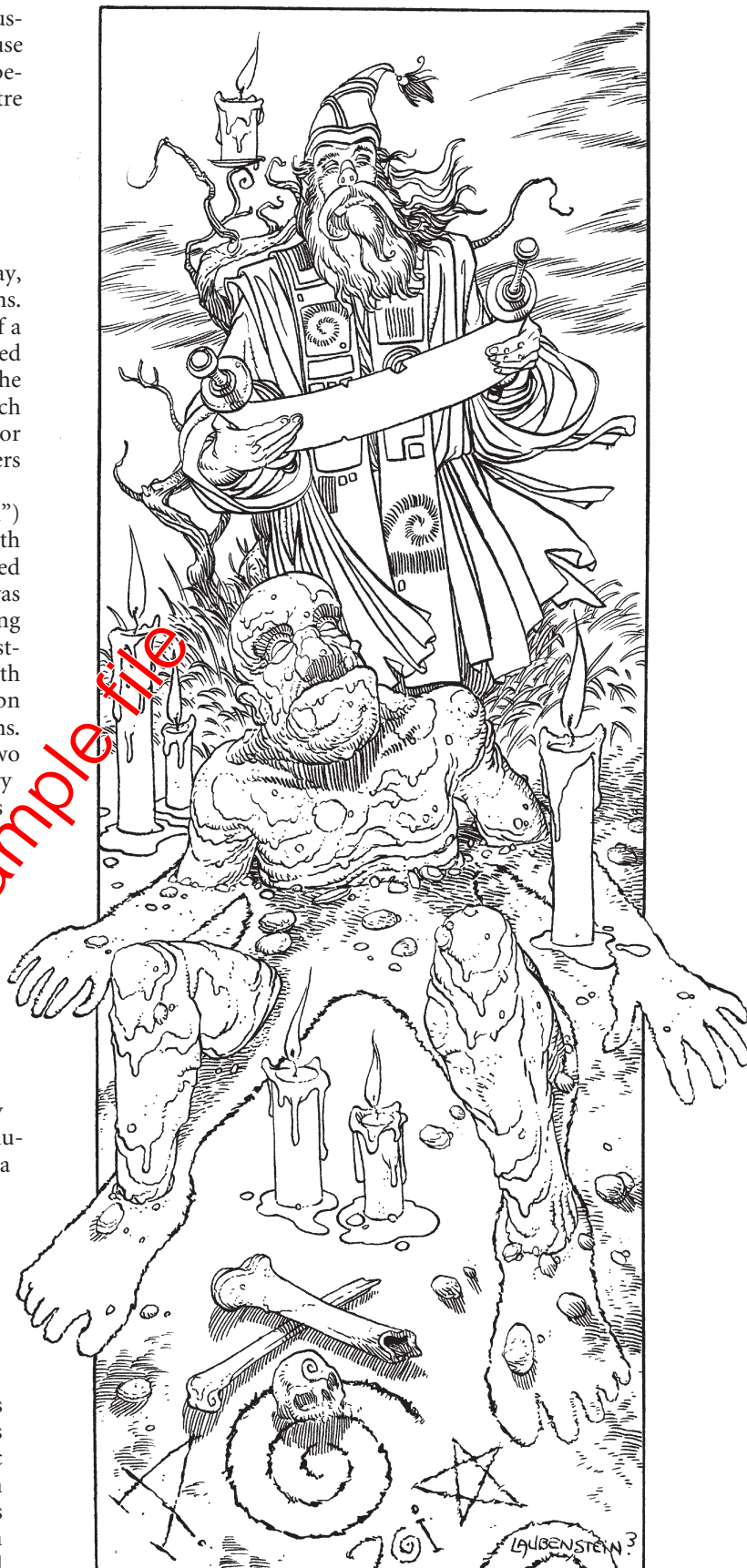
alphabet. (Loosely translated, the answer was "Ah, By Clay Destroy Evil Forces, Golem, Help Israel, justice"). The rabbi interpreted this as the necessary authority to make a golem and instructed two of his confidants to prepare themselves by a weeklong program of ritual purification.

After this period of preparation, Löw and his two disciples went at night to a nearby forest. Here Löw drew a human figure in the mud with his cane. His first disciple then walked around the figure seven times, starting at the feet and walking rightwards to its head and thence round the left side to its feet, chanting the proper formulation of the Divine Names. The figure now glowed with an inner fire, having been imbued by the disciple with the elemental essence of fire to add to its earth essence derived from its clay material. The second disciple followed the same procedure, but intoning a different incantation to imbue the figure with the essence of water, enabling it to separate itself from the ground. Löw then repeated the procedure, again with a different sequence of sacred words, drawing the essence of air into the golem and calling the demonic spirit of Yossef Sheida into its body. The three then recited a verse from the Biblical Book of Genesis, and the golem opened its eyes.

Löw ordered the golem to rise, had his colleagues dress it in normal clothing, and then explained to the golem, now called Yossef, its duties as the protector of the Jewish people. He also firmly demanded total obedience from Yossef in all matters. Then the four returned to Prague, where Löw claimed to his family and others that Yossef was a mute who had offered to become his servant.

2.2.2 CONTROLLING THE GOLEM

Other golem tales stress the importance of the sacred words in both making and controlling the entities. Traditionally the word "shem" meaning "name" was written on the parchment placed in the golem's mouth to give it life. On the forehead, the word "emeth" (meaning "truth") was inscribed to activate the golem. By removing the first letter, this inscription could be altered to "meth" (meaning "death"), temporarily deactivating the creature. In some accounts, the rabbis regularly deanimated their golems prior to the Sabbath lest they run amok on the holy day, restoring them on the next weekday.

According to Löw's explanations to his followers, two demonic spirits had appeared when he sought to draw a spirit into the golem. The spirits were named Yossef Sheida and Yonnassan Sheida. (The word "sheida" means demon.) The latter was unknown to Löw, whereas Yossef had a history of assisting Jewish scholars and so was chosen to inhabit the golem. Fear of being returned to incorporeality, to non-existence, rather than any good or evil inclination, was the principal motivation for the golem's total obedience. For Judaic demons, incarnation into such forms to assist the Jewish people offered them a hope of eventual purification and rebirth after the advent of the Messiah.

2.2.3 STRENGTHS AND WEAKNESSES

Size and strength were the obvious powers of the humanoid golem. They were fashioned as tall, large men, and had superhuman strength by virtue of their elemental essence. The Prague golem was claimed to be unstoppable and able to perform any task within fifteen feet above and below the ground. It was also invulnerable to injury or death from any weapon (magical or mundane), from fire and from drowning. Immune to disease, golems were also totally incapable of reproduction and lacked any sexual urges.

Through its inhabiting spirit and its created nature, golems possessed unerring time sense. It could also perceive other spiritual entities such as demons, spirits, and ghosts – in one story, the Prague golem even shepherded one erring ghost to its master. Golems could also be channels for divine communication, being able to reorder Kabbalistic letters to reveal the answers to a rabbi's questions, or even give voice to messages from angelic powers.

Unless possessed by a divine messenger, golems were unable to speak. Their creators were limited to imparting vitality and movement to these entities. They could not create an actual soul as this was forever beyond human ability, and so golems were always mute. All humanoid golems could communicate by gestures and some were able to respond to their masters occasionally by writing down their answers.

The intelligence of a golem in terms of its understanding was in direct proportion to the power of the imbedded spirit. More powerful spirits were better able to comprehend orders and missions. Even they could be dangerously literal in their interpretation of commands as golems were unable to reason independently from their instructions. A casually given command such as to fill barrels from a well could easily result in the golem filling the barrels to overflowing and continuing to do so while the whole area flooded. The wise creator gave exact instructions and supervised his golem.

2.2.4 THE GOLEM'S ROLE

The golem's role in Jewish legends changed down the centuries. In the earliest tales, the golem was employed as a perfect servant to cut wood and haul water, with its only fault being an overly literal or mechanical fulfillment of its master's orders.

In the medieval period, golems were made by sages to demonstrate their knowledge of the Kabbalah. As such, golems were considered as little higher than dumb animals, and returned to their natural elements at their creator's or another's whim. They could be fashioned or destroyed with impunity because they were not human, merely an intermediate stage of matter. Such casual displays of power hinted at arrogance and scholarly conceits that mortals could compete with God in creation.

In the 16th century, the golem took on a new character, that of defender of the Jews from religious

CONSTRUCT COMPANION

persecution. They were not to be used as slaves. Instead they were to be reserved for sacred purposes. The golem Yossef was created specifically to protect the Jews of Prague from the "blood libels." These monstrous accusations alleged that the Jews kidnapped and slaughtered Christian children, draining them of blood, and then used this blood in Passover rituals. Enemies of prominent Jews would plant a corpse near a Jewish residence, arrange for its "discovery", and then watch the mob execute their revenge. Löw sent Yossef on nightly patrols to prevent attacks on Jews and the desecration of graves as well as on missions to rescue kidnap victims and missing persons. The implacable Yossef was able to foil all the persecutors.

As belligerent protector, the golem could also be quite frightening. By the 17th century in German retellings of the legends, the golem was seen as a terror threatening society, which had to be destroyed for the common good.

2.2.5 UNMAKING THE GOLEM

As made creations, golems are not killed, rather they are unmade with their body returning to lifeless clay. Sometimes golems are unmade because they have gone berserk. Eliyahu of Chelm reputedly created a golem in the 16th century, which grew larger every day. Fearful that it might become uncontrollable, Eliyahu ripped the parchment from the golem's forehead. The mass of now inanimate clay collapsed upon the hapless scholar killing him.

The Prague golem was destroyed because it had fulfilled its task. To unmake their golem, Löw and his disciples reversed the rituals of creation and buried the body in an attic, banning anyone from ever entering the room.

2.3
THE HOMUNCULUS

In medieval and Renaissance Europe, the proper study of alchemists was to undertake a life-long quest to create or rediscover the Philosopher's Stone. With the Philosopher's Stone in its solid form (tincture), an alchemist could transmute base metals such as lead and iron into gold. In its elixir (liquid) form, an alchemist could brew a universal panacea, capable of curing any disease, or an elixir vitae, bestowing great longevity, even immortality, on the imbiber of the potion. Similarly these wonder-workers claimed to be able to create life itself, usually in the form of a homunculus – a "little man".

In the early sixteenth century, the physician, diviner and alleged black magician Philipus Aureolus Theophrastus Bombastus Paracelsus von Hohenheim published a formula to create an omnculus. A quantity of human sperm is first placed in a hermetically sealed glass container, and the jar buried in horse manure for some forty days. During this period, the area is appropriately "magnetized". The being takes shape as a tiny transparent and insubstantial human being. The creature must be fed with "arcanum sanguinis hominis" (magically enchanted human blood – possibly the mage's own blood?) for forty weeks – remaining within the container and buried in the dung, which must be maintained at an even temperature.

At the end of this maturation period, the entity will be a fully formed but tiny child, who may be raised and educated like any normal child. Paracelsus claimed that the creature would know secrets hidden from ordinary men and triumph over its enemies.

Several decades later, David Christianus published his method for creating a homunculus which involved replacing a tiny portion of the white of an egg from a black chicken with human sperm. The opening in the egg was then to be sealed with a piece of moist clean parchment and the egg placed in dung on the first day of the new moon in March. After thirty days, a tiny entity (in human shape) would leave the egg. This homunculus could then be fed on a diet of earthworms and lavender while it grew to a larger size. According to Christianus, its creator would enjoy happiness in all matters while it remained alive.

Even as late as the early nineteenth century, the mandragora (or mandrake) plant was considered an essential ingredient in creating artificial humans, as the mandrake's root resembled humanoid form in miniature. Magical practitioners believed that mandrake grew from the sperm of innocent men who had died by hanging. Once grown, the root had to be harvested by a black dog before dawn of a Friday. The root was then washed and nourished with milk, honey and (according to some authorities) blood. This process slowly transformed and matured the homunculus. Thereafter it could protect its master from harm.

Some practitioners were not satisfied with a single creature, but instead fashioned a series of entities in their "test tubes" – reputedly some of these entities were female, and some were designed to excel in certain crafts, trades, or professions from mining to architecture.

Such "histories" and legends played their part in the artificial creations of literature.

2.4
THE MONSTERS OF DOCTORS FRANKENSTEIN AND MOREAU

Written in 1818, Mary Shelley's novel, *Frankenstein*, draws upon the magical traditions of the alchemists and the scientific theories of the eighteenth and early nineteenth centuries. Benjamin Franklin had shown with his kite experiments that lightning was electricity. Luigi Galvani had revealed the ability of electricity to stimulate muscles, provoking convulsive movements, and theorized the existence of an innate force, dubbed "animal electricity". He conjectured that the brain secreted the "electric fluid" which flowed via the nerves and stimulated the muscles. Others experimented with electricity to stimulate paralyzed muscles.

There was a belief in the eighteenth-century in some medical and scientific circles that death was reversible and that the body was an essentially inert substance animated by a spirit which could depart, transferring itself and the life impulse to another – electricity was postulated as this spark of life and as a possible means of revivifying corpses.

In the eighteenth century, theories concerning the spontaneous generation of life from inanimate matter and the regeneration of animate matter were popular. John Needham believed that rotting matter, particularly if infused with animal or vegetable material, would generate microorganisms ("animalcules"), and conducted experiments to prove his theories. René Antoine Réaumur studied the ability of crustaceans such as crayfish to regenerate lost body parts. Abraham Trembley experimented with freshwater hydra, showing that a divided hydra could regenerate complete individuals from each part, and conversely that two individual polyps grafted together would form a single individual.

In *Frankenstein*, Doctor Victor Frankenstein creates his monster using a combination of esoteric knowledge and zealous experimentation. His monster is built from the body parts of corpses, reassembled into a patchwork whole by surgery, and somehow, animated. (Film versions of the novel have assumed electricity as the life-giving principle, taking their cue from Shelley's speculations in her prefaces to the book.) The resulting creature is eight feet tall and able to move faster than any normal human. Its face has watery dull yellow eyes, wrinkled yellow skin barely concealing the blood vessels, black lips, white teeth and long black hair. Although the monster seeks affection and understanding from its creator and others, its horrifying appearance engenders only loathing and it is abandoned by its master to fend for itself. It is driven through bitterness to violence against everyone it meets, especially Frankenstein and his family.

In HG Wells' 1896 novel, *The Island of Dr Moreau*, the scientist Moreau goes beyond Frankenstein's presumption by attempting to create new races rather than a single individual. Moreau's experiments aim to fashion new humanoids (or humanized animals) from animal species through vivisection and terrifying surgery. Despite Moreau's surgical procedures and his hypnotic methods of instilling a moral sense into the hybrids, the innate animal natures of the creatures slowly and gradually reassert themselves. Eventually they degenerate into mere animals in twisted bodies. "The Master" of Brian Aldiss' thematic sequel, *Moreau's Other Island*, builds upon the original experiments using drugs during pregnancy to alter the bodies and minds of animals and humans.

2.5
A MEDLEY OF MAGIC AND MONSTERS FROM FANTASY LITERATURE

In JRR Tolkien's *Middle-Earth*, the evil races and monstrous creatures are the results of the "breeding pits". Morgoth tortures and perverts captured Elves to form the cruel Orcs, mocks Ents with his brutish Trolls, and challenges the Giant Eagles with his fell beasts and Dragons. Sauron continues the experiments in turn producing Orcs and Trolls unharmed by sunlight, while the renegade wizard Saruman breeds Orcs with Men to create his own armies. On a smaller scale, the Woses (Druedain) have a magical tradition of shamans creating fierce-looking carvings of wood and stone, which animate at need to defend the hidden homesteads from Orcs and other invaders. If one of these statues suffers harm in protecting a Wose settlement, its creator suffers a similar but much less severe injury.

In Jack Vance's *Dying Earth* novels, magicians strive to create humans and other entities, growing their bodies from a single cell. The beings mature in vats of clear nutrient fluid bathed in an eldritch green light. When the magician judges the process complete, the liquid is drained off and the being roused to consciousness with an injection of a suitable drug. Failures are many – Turjan's unsuccessful experiments included an entity composed solely of eyes, a boneless being, and inside-out creatures, Mazirian's creatures are fully human in form but without intelligence, and even Pandelume's beautiful woman T'sais sees beauty as ugliness owing to a warp in her brain.

In Jack Vance's *Lyonesse* trilogy, the magicians create "alter egos" of themselves (often widely different in temperament and appearance) so that they may more discreetly interact with the mortal and faerie folk of the Elder Isles. These "scions" in time develop their own personalities and goals in addition to supporting their masters. The witch Desmëi sundered herself into three bodies – converting herself into a fluid "plasm", she distilled herself by deft tricks of time and magic into three forms – a beautiful woman (Melancthe), a man (Faude Carfilhiot), and a "demented squeaking creature" (which encapsulated all her undesirable attributes). The last, she slew, burning it in a furnace, although both of her scions inhaled some of its vapor.

In the Elder Isles, magic also allows the creation of hybrid entities. Murgen creates an agent to rescue a girl from the hostile plane of Tanjecterly. The process is complex – Murgen acquires the "constructive principles" (magical matrices embodying the form, personality, and mind of creatures) of a syaspic feroce and a near-human known as Kul the Killer. The two matrices reside in separate magical cabinets. To create the hybrid, Murgen joins the two cabinets together and lays a sheet of paper (cut into patterns) onto another similar sheet. After various magical workings, Murgen then opens the cabinet to reveal a new creature, which is a blend of the original beings. The fusion is then brought to full life by a transfusion of blood from the hero Aillas. This also instills loyalty and Aillas' human virtues into the creature, now named Kul. Although successful in its mission, Kul dies from the blood loss of accumulated wounds – once Aillas' blood is all spent, its life departs.

In the long-running *Xanth* series by Piers Anthony, love springs are responsible for the vast variety of humanoid and hybrid species in that kingdom. Any creature that drinks from such a spring immediately "falls in love" with the next creature of the opposite sex it sees, with the progeny of such matings taking on characteristics from both parents. The *Xanth* novels also feature the tiny loudmouthed golem, Grundy, enchanted such that he can communicate with any living plant or animal.

More traditional golems appear in Terry Pratchett's *Feet of Clay*. The Discworld golems are fired-clay red-eyed statues with a holy text written on a parchment "chem" and placed inside their heads (which have hinged tops). The golems are obedient but unable to harm or kill a living being. Mute, they communicate by writing, so carry some chalk and slates with them. Highly resistant to damage, they are tireless and need neither air nor nourishment. While the head is intact, a Discworld golem can be repaired, even by other golems. In *Feet of Clay*, the golems of Ankh-Morpork create a new golem from their own clay, but the golem becomes insane, as multiple "chems" have been given to him. Only one golem, Dorfl, has achieved free will and independence from the chem so far – by virtue of receiving a chem, that stated that Dorfl was his own master.

In Terry Pratchett's more recent Discworld novels such as *Carpe Jugulum*, the "Igors" of Überwald are the Discworld twist on Frankenstein's monster. Henchmen to the mad rulers of that gothic kingdom, the "Igors" are highly proficient surgeons and medical practitioners, expert in weird transplant surgery. "Igors" themselves are "patchworks" with organs and limbs reused from their relatives.

In Guy Gavriel Kay's historical fantasy duology, *The Sarantine Mosiac*, based loosely on Earth's Byzantine Empire, the alchemist Zoticus has learned how to make inanimate objects think, speak, and retain souls. He fashioned nine birds from metal and leather, ranging from sparrows to falcons in form. Performing a "defining ceremony" by the grave of a magistrate, Zoticus imbued the birds with the ability to speak – in the cultured tones of the dead patrician. Into the birds, Zoticus then imbedded the souls of nine maidens, who had been sacrificed in a pagan ritual to Ludan, an ancient forest god. His opinionated birds can speak, see, and hear – and can communicate telepathically with some people. Fearing persecution by the orthodox clergy and exploitation by secular rulers, Zoticus keeps his creations secret, giving one (Danis) to his daughter and another (Linon) to the mosaicist Crispin. En route to Sarantium, Linon is reclaimed by an avatar of Ludan, and Zoticus senses that he too must return the seven birds in his possession. In a forest grove, Ludan slays Zoticus and the girls' souls are freed.

In *The Heritage of Shannara* quartet by Terry Brooks, the faerie lord Uhl Belk and the Federation have access to the fearsome Creepers, fusions of metal and organic material, created to hunt and kill. Magical practitioners have harnessed earth magic and developed the ability to extract the essence from natural creatures and grow these essences with magic to create superior animal breeds and to combine them to form magical hybrids such as the Splinterscat (a porcupine / cat amalgam). Many of these beasts can think and speak as well as humans. The most daring used human blood and flesh in their creations, incorporating even emotions and memories, to create new people to serve as guardians. Flaws in the rituals and the tendency of magic to evolve transform the erstwhile guardians into "demons", living off earth magic and seeking to destroy their makers. In *The Voyage of the Jerle Shannara* trilogy, the malevolent entity Antrax creates "wronks" by melding captured humans with artificial mechanisms. The "wronks" can remember their former lives and experience unending anguish as they are compelled to use their skills at Antrax's bidding against former comrades.

Definitions

3.1
ANIMATED OBJECTS

By using relatively minor spells, a wizard can temporarily animate an object, such as a weapon, and whilst concentrating cause the object to move. Adept magicians can even wield a sword simply by the power of the mind. Once the wizard ceases to concentrate, however, the object loses its motive force and becomes wholly inanimate again, usually dropping to the floor.

Compared to the creations of the masters, such *animated objects* are mere fripperies appropriate only to an apprentice or a street conjuror. *Animated objects* are simply pre-existing items temporarily ensorcelled – genuine artificial beings are created according to exacting and esoteric formulae specifically to receive lasting enchantments of autonomy and awareness.

3.2
AUTOMATA

An Automaton (plural: automata or automatons) is the most basic of all autonomous permanent creations. In essence, an Automaton is a magical machine designed to accomplish one or more specific tasks. Like the machines fashioned by mundane engineers and craftsmen, an Automaton usually consists of dozens or even hundreds of small metal and wooden parts assembled into an intricate whole. Automata can be of any size or shape conceivable. Unlike ordinary machines, which rely on clockwork, water, or perhaps even steam to power their motion, Automata are powered by magic. Thus, unless the Automaton is commanded by its maker to stop or its enchantments are dispelled or malfunction, it can potentially function forever.

In addition to this permanency, automata have a further advantage over animated objects in that they do not require their maker (or their operator) to concentrate (in the **Rolemaster** sense of requiring 50% activity) to direct them in the execution of their tasks.

Automata, as a class, have three significant disadvantages. Firstly, they can only perform the specific tasks for which they were designed. Secondly, it is not possible to deliberately imbue an Automaton with any measure of sentience – these magical machines can never be intelligent. Thirdly, Automata can malfunction, requiring repair, or exhaust their fuel or other consumables, requiring replenishment.

3.3
GOLEMS

A Golem is composed of a single piece of a particular substance, which can be wood, clay, stone, crystal or metal. This piece is shaped, carved, or sculpted as necessary into a humanoid or beast form. The degree of resemblance varies according to the skill of the creator – although beast Golems are better imitations of their originals than their humanoid counterparts. Golems can be created in any size but materials cost discourages the use of precious substances for the larger entities.

Through potent magic (more powerful than that employed with animated objects or automata), Golems may be imbued with animation and purpose. Varying degrees of intelligence can be instilled from diverse sources. These enchantments may require regular renewal or involve the permanent imbedding of an (un)willing spirit or a shard of some extra-planar entity such as an elemental or a demon.

Due to the strength of their forms and their potential for self-awareness, Golems can perform simple tasks requiring brute force with ease. They may find tasks involving manual dexterity or agility problematic, as most beast Golems lack hands. Their substance usually endows them with high natural armor and resistance to damage, making them robust warriors. As they need no sleep, they can also be ever-vigilant sentries.

The major disadvantage of Golems is the difficulty in controlling them. If the bonds of obedience between a Golem and its maker (or a later controller) are broken, the Golem will frequently turn upon its oppressor and attempt to kill him and everyone else nearby. Intelligent Golems who go rogue may maintain a fiction of obedience while they wait for a better opportunity to destroy their hated master.

It is not possible to enhance Golems with mechanical contrivances (such as built-in dart throwers) as the being must be fashioned from a single piece of material. By dint of potent spells, Golems can be endowed with magical abilities.

Gargoyles represent a specific type of stone Golem. "Flesh Golems" are not in fact Golems as they are not composed of a single piece of material. Instead "flesh golems" are Amalgams (see below).

3.4
CONSTRUCTS

Constructs are artificial creatures, whose bodies consist of numerous separate, interlocking parts and sliding pieces, giving them an exterior appearance reminiscent of a suit of plate armor. Constructs are almost wholly made of metal, with the exception of their eyes, which are usually enchanted gems. A Construct has a metal framework covered with metal plates – their insides are mostly hollow cavities. Constructs can be of any size or shape with humanoid and magical beast forms predominating. Beast Constructs mimic their living models in appearance closely, but are almost always stronger, faster, and more dangerous than their organic models. Humanoid Constructs look like walking suits of plate mail, bristling with weapons. To support their frequent task as warriors and guardians, Constructs are designed with weapons built into their bodies – automatic loading crossbows mounted in chest cavities, wrist-mounted dart-throwers, blade-tipped fingers, spiked elbows and toes, arms terminating in weapons rather than hands, and so forth. Ammunition is stored in the body cavities.

Like Golems, Constructs may be magically enchanted to have animation, purpose, and intelligence. The process for instilling intelligence may require regular spell castings or involve the permanent imbedding of an (un)willing spirit or a shard of some extra-planar entity such as an elemental or a demon.

Their high armor type (from their metallic construction), their inherent weaponry, and their potential self-awareness makes them as fearsome as Golems in combat. Magical abilities can also be more easily incorporated into Constructs than Golems. However, the piecemeal nature and hollow nature of constructs makes them much less resilient to damage.

As with Golems, the key problem with Constructs is controlling them. Once the bonds of obedience are shattered, Constructs will turn on their masters sooner or later.

3.5
AMALGAMS

An Amalgam is created by assembling body parts from multiple corpses into a whole body. Electrical charges are used to revivify the nerves and grant the Amalgam a semblance of life. These Amalgams are sometimes erroneously called Flesh Golems.

More terrifying than Flesh Golems are the "Living Amalgams." These unfortunate individuals have had portions of their body removed and replaced with organic or metal transplants. The surgeon-mage can then control the Living Amalgam via their transplants.

Amalgams are much cheaper and faster to fashion than either Golems or Constructs, but lack the durability of the former, the mechanical contrivances of the latter,

and the spell-casting abilities of both. Worse, the animating intelligence of an Amalgam is essentially random, as it may be a wandering spirit, a Ghost, or even a soul fragment from one of the body donors. Compulsion spells are the only way of ensuring an Amalgam's obedience.

3.6
SIMULACRA

A Simulacrum (plural: simulacra) is an artificial being, fashioned and/or grown from a combination of inorganic and organic substances. As the entity takes shape, the creator gives it life by infusing its matter with generous libations of blood. If the creator uses his own flesh and blood, the final entity will possess some characteristics of its maker's personality, **and** will be eternally obedient. If instead the creator uses blood from others, **their** personalities will seep into the entity and compulsion spells may be required to command the Simulacrum. The greatest limitation is that the creator must have previously magically stored the Simulacrum's intended form or be prepared to spend many additional weeks in the creation process "warping a matrix" into the desired shape.

Simulacra may be created as mocking parodies of beasts and humanoids or as perfect duplicates of the living. Others are the nightmarish spawn of twisted evil imaginations, thankfully unique to a single creator. Among the better-known types of Simulacra are homunculi, eye entities, shards, solaars, and viles.

Homunculi are a special type of Simulacra, grown from the flesh and blood of a living being. A homunculus is an exact physical duplicate of the original being. Initially it will have a personality identical to that of its blood donor. Over time, this personality will become an individual through its life experiences. It is also possible to copy the mind and transfer the soul of the original being into the homunculus. Some mages have used this method to achieve a kind of immortality.

While Simulacra may emulate the living, they are essentially soul-less creations and are incapable of reproduction. They are made, not born.

CONSTRUCT COMPANION