

SPACE

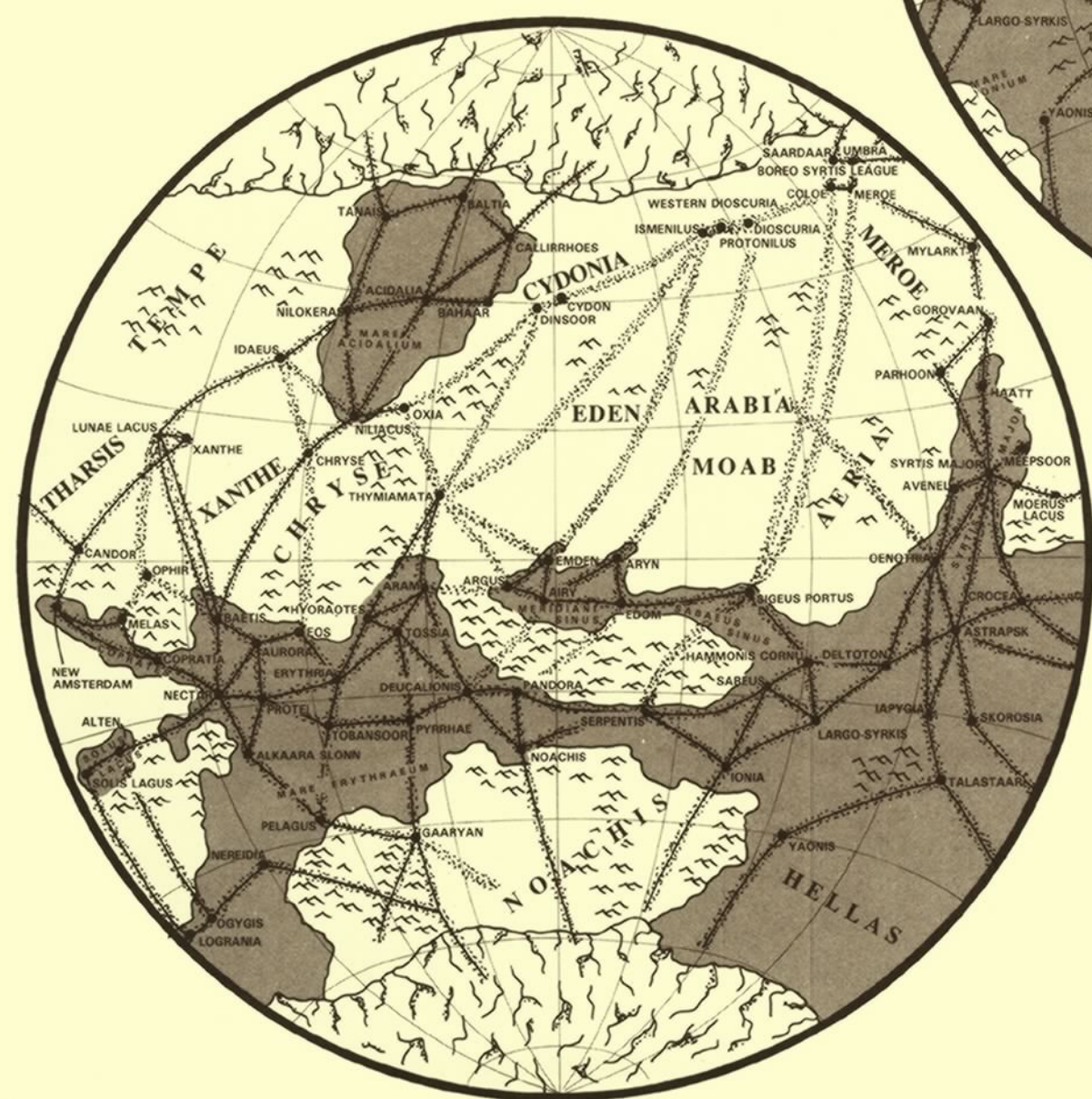
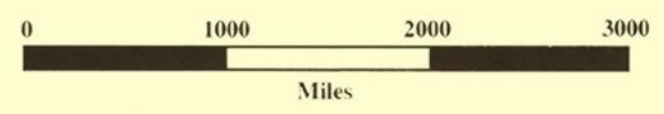
1889



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GDW

The Three Faces Of MARS



FRANK CHADWICK

SPACE

1889

GDW

TO TESSA,

Who believed in the ether from the beginning.



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A catalog of **Space 1889** products
is available from GDW. Just write
and ask.

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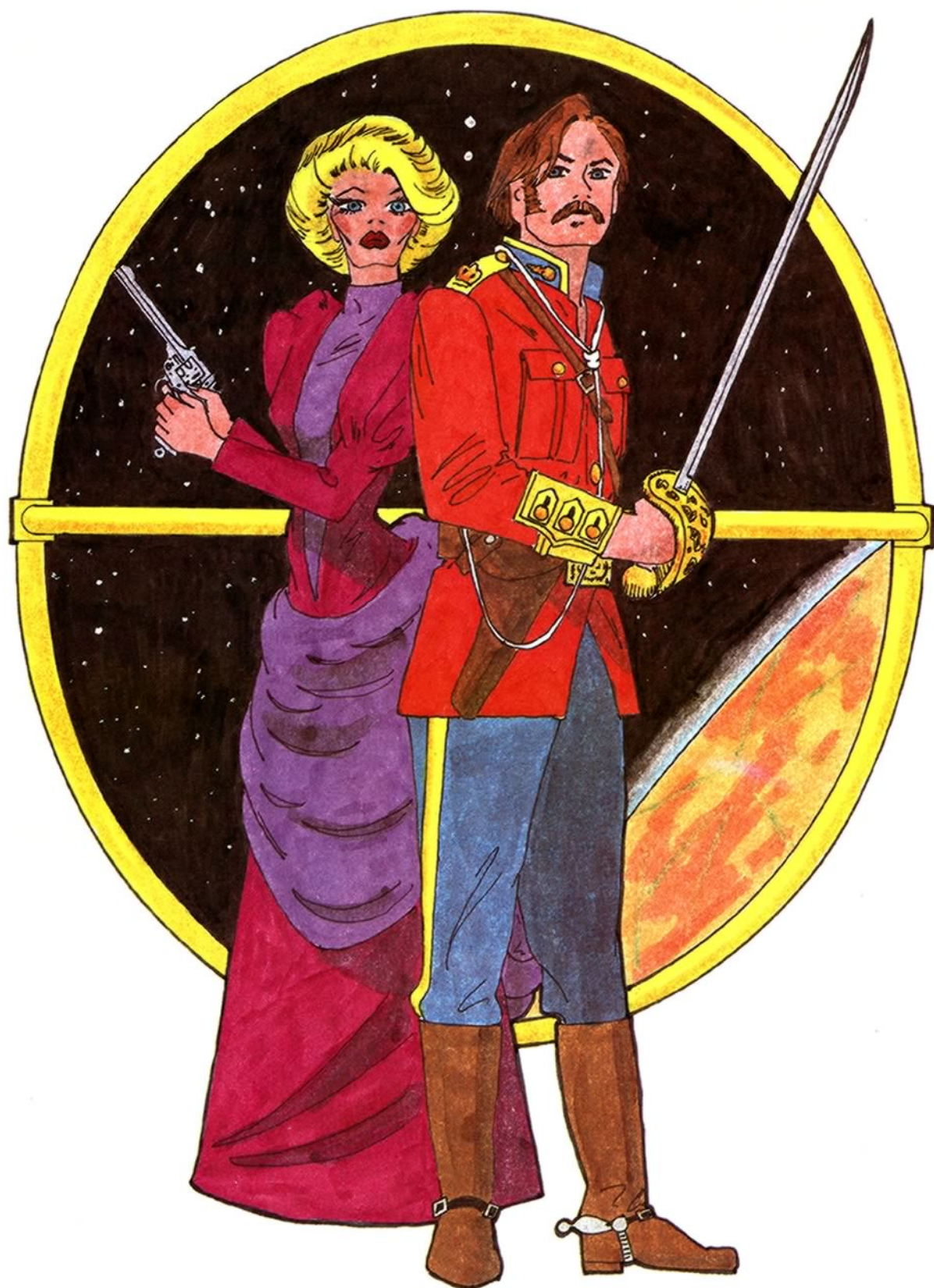
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INTRODUCTION

WELCOME TO the world of **Space: 1889**, a world filled with scientific wonders, strange civilizations, international intrigue, and, of course, adventure. **Space: 1889** is a science-fiction role-playing game, but one with a difference: It is set in the 19th century at the height of Victorian colonial expansion.

How is this possible?

The 19th century saw the birth of science fiction, and the works of the early masters of this genre, H. G. Wells, Jules Verne, and Arthur Conan Doyle, still have tremendous appeal. Their speculations about interplanetary travel and alien civilizations were based on sound principles of science as it was then understood. Since then we have discovered that principles like the "luminiferous ether," then widely accepted, have no real foundation in fact.

But what if they did? What if instead of quantum mechanics and relativity, there was only "the ether"? And what if the fertile, brilliant mind of a young inventor named Thomas Edison had turned its power to harnessing the ether for science?

The answer to that question is what **Space: 1889** is all about.

WHAT IS ROLE PLAYING?

SPACE: 1889 is a role-playing game, which means that the players

each take the role of a single character in an adventure. These characters will be quite detailed, and players will assume the roles of their characters in adventure after adventure, gradually accumulating more knowledge, greater skills, and more prestige. Each adventure is a story, and the player characters are its heroes, but with an important distinction: Their actions are not determined by an author, but rather by the players themselves.

One person does not control a character, but instead serves as the referee. The referee's responsibilities include resolving events and encounters, playing the parts of other characters in the world with which the players come in contact, and, most importantly, serving as the eyes and ears of the players. He describes the world to them as they would experience it, in all of its exotic, beautiful sights, its strange sounds, even its smells and the way it feels.

ORGANIZATION OF THE RULES

ALL THAT players really have to read in this book are the first three chapters: "Introduction," "Characters," and "The Victorian Age." This will tell them what sort of world they are adventuring in, show them how to generate a character, and explain how the proper Victorian adventurer behaves. Players may read the chapters on basic game mechanics as well, as it will help speed play if they know the basic steps of combat, travel, etc. They should read only those parts of the background sections that their referee tells them to.

Referees will need to read the entire book and become familiar with both the rules and the background.

The last 16 pages of the book are printed on heavy white paper and are perforated for easy removal from the book. These are reference charts designed to make the referee's life easier. If you do not want to tear pages out of your book, you have permission to photocopy as many copies of these pages as you need for your personal use with the game.

REQUIRED EQUIPMENT

THIS BOOK is almost all you'll need to play. You will also need several (six or more) six-sided dice as well as paper and pencils. Graph paper is also useful for drawing the interiors of buildings, caverns, etc.

Dice are used to resolve tasks, combat, and random events. As a general rule, if a number is listed to roll, the player must roll that number or less to achieve the indicated result.

GDW also produces an extensive line of supporting materials for **Space: 1889**, including novels, sourcebooks, adventures, and board games. Any or all of these can prove useful to the referee and players, but none are absolutely necessary. This book is a complete game by itself.

A NOTE ON GENDER

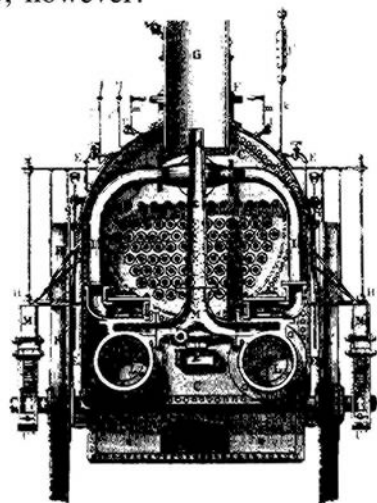
FOR EASE of expression, all references to characters and referees in this book use the masculine pronoun. This should in no way be interpreted as excluding either female players or characters. Although Victorian society did not encourage women to embark upon careers of danger and adventure, the large number of women who did so anyway is ample proof that it was possible. For more on this theme, see the section of "The Victorian Age" entitled "Victorian Women."

THE WORLD OF SPACE: 1889

THE PERIOD from 1870 to 1900 was historically one of tremendous political, social, and technological change. In **Space: 1889** this is even more the case, as space travel and flight have been added to all the other achievements of this era. This section of the book is designed to give players and referees an overview of this era so that they can understand its many opportunities and occasional limits.

Technology: Although electricity was known and utilized, widespread residential electrification was just being adopted. Many houses were lit by gaslights, and all “appliances” were hand-powered. Indoor plumbing, on the other hand, was widespread in the cities of the industrialized countries.

Industry was almost universally powered by coal-fired steam boilers. Oil-burning boilers were used where oil was plentiful; the gasoline engine had been developed by Herr Benz and Herr Daimler of Germany in the mid-1880s; and Otto von Diesel was tinkering with an oil-burning internal combustion engine of his own. None of these were in widespread use, however.



Transportation: Transportation in the 1880s was notable for its lack of single-person mechanical vehicles, such as the automobile. The closest to this was the urban cab, but the cab of the 1880s was horse-drawn. Trips outside of a city would usually be made by train, powered by a coal-fired steam locomotive. Horse-drawn coaches still serviced areas not linked by rail, and travel in primitive surroundings was by horse or even foot.

On the water, the sailing vessel still was used as a slower, but cheaper, means of transporting low-priority cargoes. The majority of cargoes and passengers were carried in steamships. Steam vessels were in the midst of a tremendous increase in power and efficiency due to adoption of more advanced engine technology and forced draught boilers. Mr. Parsons in the United Kingdom had produced his first working steam turbine in 1884, and this invention promised even more efficient steam transportation in the near future.

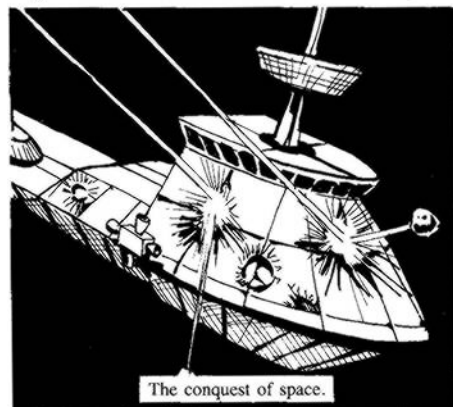
Flight: One of the great differences between the world of this game and the historical 1880s is the greater incidence of flight. Edison's discovery of liftwood on Mars in 1870 and its subsequent use in aerial steam vessels provided a tremendous spur to aeronautical research. Count von Zeppelin produced an efficient, hydrogen-lifted, rigid airship in 1874 powered by a lightweight steam engine and in the 1880s began producing airships using the more efficient internal combustion engines of Herr Daimler. These are now in widespread use.

Flying machines are built using liftwood whenever possible, however. Liftwood is the product of a

tree which grows in certain parts of the Martian highlands, and which synthesizes a complex organic compound with contragravitational effects. Attempts to artificially reproduce this compound in the laboratory have thus far failed, and the trees will not grow anywhere except in certain locations on Mars. Thus the supply of liftwood is severely limited and is the cause of many conflicts.

Space Travel: Interplanetary space travel was first demonstrated by Thomas Edison in 1870, and while it is hardly commonplace, it is an accepted part of life in 1889. It has made possible the establishment of extensive colonies on Mars and Venus, frequent visits to Mercury, and occasional visits to the Moon.

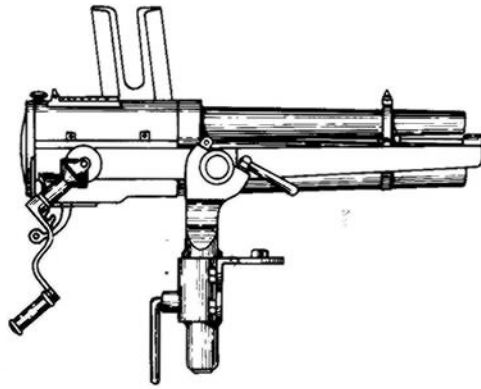
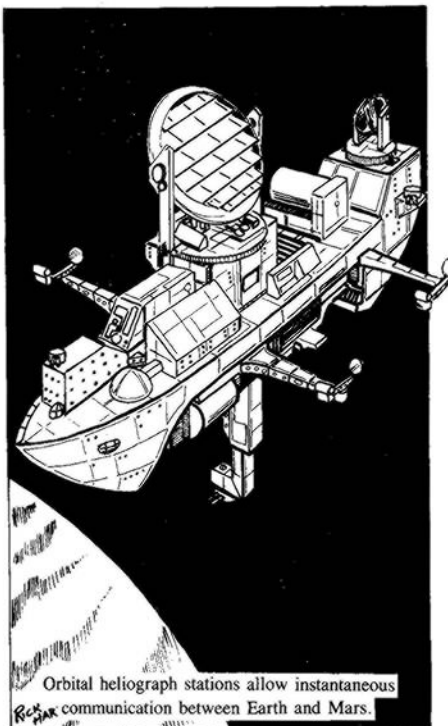
Space voyages are fairly long, typically taking a month or more between worlds. The voyages are made in interplanetary ether flyers powered by large solar boilers. A reflecting lens directs the Sun's rays onto the boiler's water tank to produce steam and power the ship without the need for combustion. (Ships do not carry enough oxygen to support continuous burning of coal for several weeks.) Because the Sun's rays are quite weak further out from the Sun, solar boiler-powered ships have so far been unable to explore beyond the asteroid belt.



The conquest of space.

Communication: Alexander Graham Bell invented the telephone in 1876, and already it is in limited use in major metropolitan areas. Most long-range communication on Earth, however, is by telegraph, and communication between the U.S. and Britain is via the Transatlantic Cable. Wireless telegraphy (radio) has not yet been invented, the closest approaches being the heliograph and the photophone.

The heliograph consists of mirrors which reflect the Sun's light toward the receiver, who sees a series of flashes. The timing of these flashes produces a readable code, just like the dots and dashes of Morse Code on the telegraph. Field heliographs, with a range of a dozen miles, are no more than a five-foot tripod and a lens. The largest heliographs are the two British orbital heliograph stations, above Earth and Mars, whose giant lenses are powerful enough to flash messages across the millions of miles separating the two worlds.



Weaponry: Military weapons are in a period of transition from breech-loaders to bolt-action magazine rifles; 1889 is the first year in which large numbers of British infantry turned in their Martini Henry breech-loaders for the new Lee Metford eight-shot bolt-action rifle. Artillery was largely converted to rifle breech-loaders, and for light close-range work relied on the ingenious and deadly Hotchkiss Revolving Cannon, a sort of large Gatling gun that fired exploding rounds. But the new technology of quick-firing guns, such as the British 4.7" naval gun, promised an even more dramatic increase in firepower.

Machineguns had been in service since 1861 when Mr. Gatling invented his famous weapon. Still in widespread service, it had been supplemented and to an extent supplanted by newer versions of man-powered machineguns, such as the Gardner, Nordenfelt, and Montigny Mitrailleuse. All of these weapons relied on a gunner turning a crank or operating a lever to continue firing. In 1889, however, the British began buying their first quantities of the Maxim gun, a self-loading gun that would continue firing under its own power so long as the gunner held down the trigger.

International Relations: Britain was, at this time, a constitutional monarchy, America was a stable republic, and France an unstable one; Germany and Russia were empires ruled by hereditary monarchs, and Japan was a society in transition, a curious mixture of the new and the old. All aspired to "great power" status, however, and in 1889 great power status required interplanetary colonies, trade, and liftwood.

The tiny state of Belgium did more to destabilize the international balance in the 1880s than any other state, with its aggressive imperialistic policies in the Congo and on Mars. The Belgians were driven by King Leopold's desire to secure a sovereign territory a safe distance from the armies of France and Germany so that the monarchy could be preserved in the event of a military defeat. They slashed and burned their way up two great basins: the Congo and the Coprates. Resentment on Mars created a ripe climate for plot and counterplot, and the decade from 1885 to 1895 was as rich with intrigue as any in human history.





CHARACTERS

SPACE: 1889 is a role-playing game, which means that you will play it by acting out the role of a character. This chapter tells you everything you need to know to generate a character. When you generate a character, you will first determine his physical and psychological attributes. Then you will select one or two prior careers that will give him additional skills and experience to help him on his path to adventure in **Space: 1889**.

The chapter following this one, entitled "The Victorian Era," tells you

a great deal more about the attitudes of the day. This was a civilized time, and your character will likely as not be a Victorian gentleman or lady, with a clear set of values to adhere to. While this chapter ("Characters") is about your own character's strengths and assets, the next chapter is about his personality, heart, and soul.

SKILLS AND ATTRIBUTES

A CHARACTER'S attributes define his physical and psychological composition, while skills define

those special abilities he has learned over the years. During the game a character's skill levels will increase, and a character will learn new skills due to his experiences, but the character's basic attributes will tend to remain constant.

Skills and attributes are defined by a number which ranges from 1 to 6. As the characters attempt various tasks, their players or the referee will roll dice to determine the characters' success or failure based, in part, on the characters' different skills and attributes.



CHARACTER ROBERT CARSTAIRS

Player BILL JONES

Ht. 5' 9"

Wt. 180

Income _____

Nationality ENGLISH

1st Career ARMY OFFICER

2nd Career SAME

ATTRIBUTES AND SKILLS

Strength 4

Fisticuffs 3

Throwing 2

Intellect 2

Observation 1

Engineering* _____

Science* _____

Close Combat* 2

SABER

Trimsman* _____

Gunnery* 1

MACHINE GUN

Agility _____

WOUNDS

Unconsciousness _____

Str + End/2 4

Potential Wounds _____

Str + End 7

Current Wounds _____



POSSESSIONS

ATTRIBUTES

CHARACTER ATTRIBUTES are divided into two main types: physical and psychological. Physical attributes are Strength (Str), Agility (Agl), and Endurance (End). Psychological attributes are Intellect (Int), Charisma (Chr), and Social Level (Soc). Each attribute is defined by a number from 1 to 6, with higher numbers being better. In the case of Social Level, the number defines a specific social class to which the character belongs, as shown below.

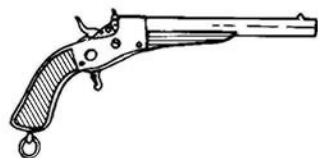
SOCIAL LEVEL

<i>Attribute</i>	<i>Social Class</i>
6	Aristocracy
5	Wealthy Gentry
4	Gentry
3	Middle Class
2	Tradesman
1	Working Class

For example, Fred Caruthers has the following attributes:

<i>Physical</i>	<i>Psychological</i>
Str: 6	Int: 2
Agl: 3	Chr: 4
End: 1	Soc: 5

Fred's Strength attribute of 6 makes him a remarkably strong man, perhaps the strongest in Europe, and his Agility is average, but his Endurance is very low. He has below-average Intellect but sufficient Charisma to make him a likable, agreeable fellow with a reputation as a wit. His Social Level of 5 indicates that he is from the wealthy gentry.



DETERMINING ATTRIBUTES

THERE ARE three acceptable means of generating attributes. You and the referee should agree beforehand as to which method will be used. The three methods are distribution, free purchase, and random generation.

If the distribution system is used, the character assigns a number from 1 to 6 to each attribute, but never uses the same number twice. Thus he will have one attribute rated as 1, one rated as 2, etc. The distribution system provides characters which have strong points and weak points that make for interesting role-playing possibilities and is strongly recommended for your first character.

In the free purchase system each character is allotted a total of 21 attribute points which may be assigned in any way the player wishes. The only restrictions are that each attribute must have a value of at least 1 and no more than 6. The free purchase system should only be used once players are familiar enough with the game to have a clear idea of exactly the sort of character they wish to role play.

In the random generation system the player rolls a die once for each attribute, with the die roll result being the attribute value. If the sum of all six attribute rolls is less than 18, the player may add points to the attribute or attributes of his choice to bring his total up to 18. This system gives the player no control over his attributes but does offer the possibility of a few lucky rolls giving him a superior character. Many experienced players prefer the challenge of role playing a randomly generated character.

SKILLS

THE GAME includes 24 principal skills, although referees may feel the need to make up additional skills. The basic 24 skills are divided into six groups of four each, and each group is associated with a particular attribute. These skills are listed below.

SKILLS

Strength	Intellect
Fisticuffs	Observation
Throwing	Engineering*
Close Combat*	Science*
Trimsman*	Gunnery*
Agility	Charisma
Stealth	Eloquence
Crime*	Theatrics
Marksmanship*	Bargaining
Mechanics*	Linguistics
Endurance	Social Level
Wilderness	Riding*
Travel*	Piloting*
Fieldcraft	Leadership
Tracking	Medicine
Swimming	

Skills marked with an asterisk (*) are cascade skills (listed at right). Cascade skills cover a variety of specific skills. The skill level covers the character's skill in one area of the skill's field. The character is then assumed to have a skill level equal to half that (round fractions down) in all other areas of the skill's field. For example, Marksmanship is a cascade skill covering pistols, rifles, and bows. Caruthers has a Marksmanship skill level of 2; his weapon of choice is the rifle. He has a Marksmanship skill of 2 firing a rifle and of 1 firing pistols and bows.

CASCADE SKILLS

<i>Trimsman</i>	<i>Crime</i>
Aerial Flyer	Lockpick
Cloudship	Pickpocket
<i>Marksmanship</i>	Forger
Pistol	<i>Engineering</i>
Rifle (includes carbines and shotguns)	Structural Engineering
Bow	Naval Architecture
<i>Mechanics</i>	Explosives
Steam	Earthworks
Electricity	<i>Science</i>
Machinist	Physics
<i>Wilderness Travel</i>	Chemistry
Mountaineering	Biology
Foraging	Geology
Mapping	Archaeology
<i>Close Combat</i>	<i>Gunnery</i>
Edged Weapon	Muzzle-Loading Cannon
Pole Arm	Breech-Loading Cannon
Bashing Weapon	Machinegun/Rotary Cannon
<i>Riding</i>	Exotic Weaponry
Horse	<i>Piloting</i>
Camel	Aerial Flyer
Elephant	Cloudship
Gashant	Zeppelin
Ruumet Breehr	Interplanetary Ether Flyer
Flying Skril	Sailing Vessel
Pacyosaurus	Steam Vessel
	Submarine

Linguistics constitutes a special type of cascade. All characters are assumed to be fluent in their native language. Each point taken in Linguistics allows the player to speak and understand one foreign language. The total Linguistics score is the player's fluency in one particular language, while his fluency in all of his other languages is half that of his primary chosen language (rounding fractions down). Thus a character with a Linguistics skill of 1 would have a limited knowledge of one language, while a character with a

skill of 4 would be quite fluent in one language (skill 4) and reasonably proficient in three others (skill 2).

WEIGHT

AT TIMES it will be important to know your character's weight. To determine a character's weight in pounds, multiply Strength by 20 and add 100. Fred Caruthers, for example, with a Strength of 6, weighs 220 pounds.

OBTAINING SKILLS

SKILLS ARE obtained in three ways: defaults, careers, and purchases.

Default skills are those in which a player has some ability by simple virtue of his attributes. The first skill listed in each attribute group is a default skill. In addition, Throwing is a second default skill in the Strength group. Each character starts with a skill level in each default skill equal to one less than his attribute value, except for Throwing. Each player starts with a Throwing skill equal to half his Strength attribute (rounding fractions down). Colonel Caruthers, for example, would have the following default skills due to his attributes:

Fisticuffs: 5 *Observation:* 2
Throwing: 3
Stealth: 1 *Eloquence:* 3
Wilderness Riding: 4
Travel: 0

Career skills are obtained as described in the section labeled "Careers," which begins on page 12.

Finally, all players may purchase additional skills for their characters. Each player receives either two or six general skill points (as described in the "Careers" section) with which to purchase more skills. Points may be used to raise default skills and subsidiary cascade skills as well. Caruthers, for example, might use one skill point to raise his overall Marksmanship level to 3 (which would make his skill with rifle a 3 but his skill with pistols and bows still 1) or could spend a point in raising his pistol skill level to 2.

CAREERS

EACH PLAYER may take one career and six general skill points, or two careers and two general skill points. If the player takes two careers, they are referred to as his first and second careers.

Career Selection: Each career lists a prerequisite for entry (or the notation "no prerequisite"). For example, the Merchant career listing reads "Soc 4-, Chr 3+". The prerequisite for being a merchant is that your Social Level be 4 or less and your Charisma be 3 or higher.

There are several limitations on career entry, which are explained below.

Male Only: These are government positions from which women are barred by policy. Female characters may attempt to enter such careers, but only by successfully impersonating a man, which was done in this period with surprising regularity (one woman in disguise actually rising to the position of a cabinet minister in Canada). To successfully impersonate a man, the player must roll one die and roll equal to or less than the character's Agility or Intellect, whichever is higher.



Female Only: The Adventuress career is open only to women.

Criminal Careers: The Master Criminal career may only be selected as a second career. Other Criminal careers may be selected as first careers, but, if so, then the only second careers possible are another Criminal career, the Army, Acting, or Adventuress.

Skills: A career provides a player with a number of skills. Usually the career provides seven skill levels divided between several different skills, although a few of the more difficult or selective careers provide more. The Merchant career skill listing is "Bargaining 3, Eloquence 1, Linguistics 1, Leadership 2." Those skill levels are received or added to skills already acquired.

Second Career: A second career may be a repeat of the first career, or it may be an entirely new career.



GENERAL SKILL POINTS

GENERAL SKILL POINTS are used to purchase additional skills. Each skill level purchased in an area with an associated attribute level of 5 or 6 costs 1/2 point. Each skill level purchased in an area with an associated attribute level of 3 or 4 costs 1 point. Each skill level purchased in an area with an associated attribute level of 1 or 2 costs 2 skill points.

No player may purchase a skill level greater than his associated attribute level (although career skills may cause the skill level to be higher than the associated attribute). No character may buy an increase in Close Combat skill greater than 1 above his career-generated level.

WEALTH

ALL CHARACTERS begin the game with a "fortune," or life's savings. This represents the money they have accumulated or inherited and which is available to bankroll any expedition they care to undertake. The aristocracy and wealthy gentry will have an annual income or allowance from their family or income-producing lands, and their initial fortune represents the first year's installment of this. Each year in the game they receive additional money.

The amount of the initial fortune is determined by rolling one or more dice and multiplying the result by a fixed number. The formula varies for each Social Level, as indicated below. In all cases the resulting amount of money is in pounds sterling (£). If either career of your character was Merchant, Adventuress, or Criminal, multiply your starting fortune by an additional 10. If your second career was Master Criminal, multiply your starting fortune by an additional 50.

Aristocracy: 3 dice $\times$ 100.

Wealthy Gentry: 2 dice $\times$ 100.

Gentry: 1 die $\times$ 50.

Middle Class: 2 dice $\times$ 50.

Tradesman: 2 dice $\times$ 10.

Working Class: 2 dice $\times$ 1.



ADDITIONAL CAREER BENEFITS

SEVERAL CAREERS have an additional benefit associated with them, which can be an associate, an income, or an invention.

Associates

CHARACTERS WITH certain social levels or in certain careers may have an associate. An associate is a non-player character who travels with the player's character and is, to a limited extent, controlled by the player. The actual actions of the associate are determined by the referee, as explained in the chapter "The Referee." However, the player will have considerable influence over his or her associate.



Characters with a Social Level of 6 have a servant who accompanies them on their travels, looks after them, and sometimes serves as a bodyguard for them. Male characters have a manservant. Female characters may have either a manservant or a maid. If the character is an army or navy officer, this servant is the character's "batman" and is a private soldier.



Adventuress characters have a "gentleman companion," a wealthy male usually of fairly high Social Level and fairly low Intellect, who serves as a convenient facade for the character's activities.



Personal Servant characters have a "master," who is again a wealthy upper-class man or woman with a fairly low Intellect and who is, presumably, easily influenced. Personal Servant characters need a fairly good Eloquence level, however, or an attempt to talk their masters into a liftwood-poaching expedition in the Astusapes Highlands might end up as an elephant-hunting safari in Africa.



Master Criminal characters have a henchman, a petty criminal who can be dispatched to do various dirty deeds.

Income

CHARACTERS WITH a Social Level of 5 or 6 receive an annual income equal to their initial fortune. This is paid in 12 equal monthly installments and represents the income from their estates.

Characters who are in government service receive a monthly salary. For characters in the military, this salary is entirely consumed by pay stoppages for lodging and equipment, mess bills, and so forth. For game purposes they have no income, but are supported by the service. Officials of the Foreign Office and the Colonial Office receive a salary of £40 per month.

Characters who are inventors receive royalties from their patented inventions. Roll 2 dice and multiply the result by 10 to determine the annual royalties received. These are received once per year as a lump sum payment. The dice are rolled each year for the royalty rate, and thus it will vary from year to year. If the player ever rolls two or more 1s for royalty amount, subtract one die from the number of dice rolled in future years. If the player ever rolls two or more 6s, add one die to the number of dice rolled in future years. For example, if a player rolled two 6s his first year for royalties, he would roll three dice for royalties in every subsequent year.



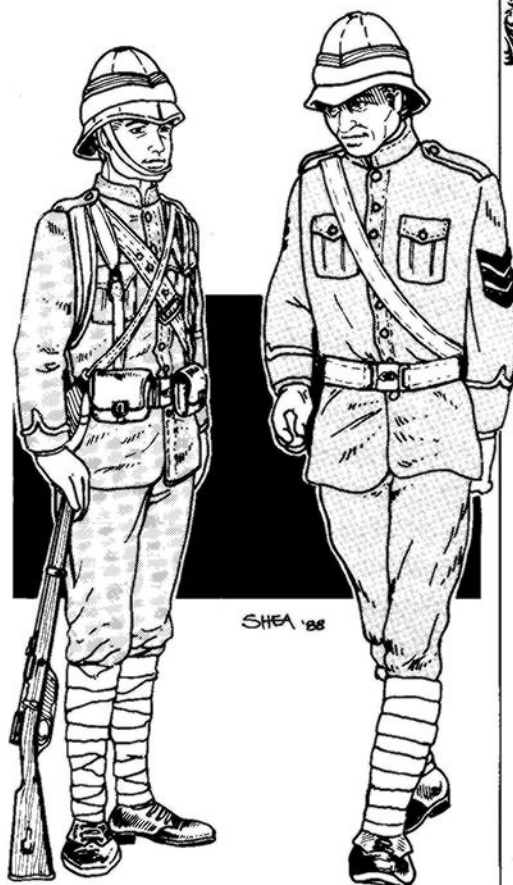
Inventions

INVENTOR CHARACTERS may have one or more inventions. The process is described in the chapter called "Science."

THE CAREER or careers chosen by a player determines the sorts of skills available to his character.

Part 1—Government Careers

Army: Male only. No prerequisite.



Soc 1: Private soldier, any branch—Close Combat 1, Wilderness Travel 1 (foraging), Marksmanship 1 (rifle), Bargaining 1.

● **Infantry:** Marksmanship 1 (rifle), Fieldcraft 2.

● **Cavalry:** Riding 2, Observation 1.

● **Artillery:** Gunnery 2 (BLC or machinegun), Mechanics 1 (machinist).

● **Sapper:** Marksmanship 1 (rifle), Engineering 2 (earthworks).

● **Medical Orderly:** Medicine 1, Science 1 (biology), Observation 1.

Soc 2: Noncommissioned officer—Close Combat 1, Wilderness Travel 1 (foraging), Marksmanship 1 (rifle), Leadership 1.

Branch skills same as for private soldiers.

REGIMENTS

AS A RULE the regiments of the British Army fell into two general categories. The expensive, “fashionable” units—the Guards, most of the cavalry, and a few select infantry regiments like the 60th Rifles and the Gordon Highlanders—were the preserve of the wealthy and well-born; they were often superb on parade but unready for the hard realities of active service. (The mess president of the Grenadier Guards once wrote to his counterpart in the unfashionable Warwickshires to ask about the availability of ice in the Sudan.) The less prestigious county regiments on foot, or the “technical services”—the artillery and engineers—were the place for a man who wanted to get practical experience on campaign. He might also avoid the crippling mess bills and cost of horses and tailoring that were expected in, for example, the 11th Hussars or the Coldstream Guards. For those inclined to the military but without private means, the best options were the Royal Marines—life afloat was cheap—or the Indian or Egyptian armies; besides, it was not lineage or influence that helped a man get ahead in the Afridi hills or the Nile frontier.

Soc 3: Officer, native regiment or technical branch—Leadership 2, Marksmanship 1, Close Combat 1.

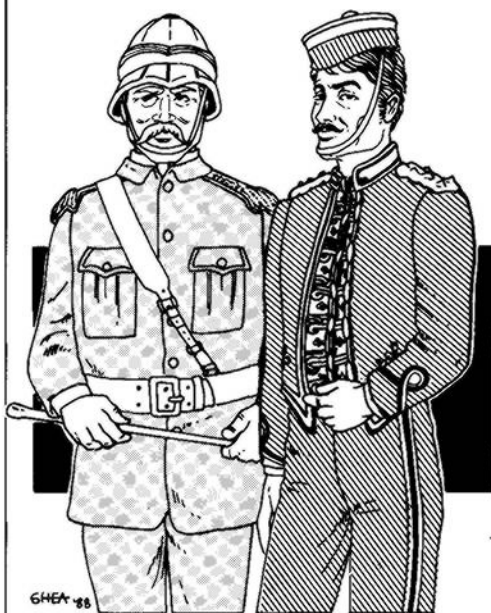
● **Infantry (Native Regiment):** Fieldcraft 1, Linguistics 1 (as troops commanded), Observation 1.

● **Cavalry (Native Regiment):** Riding 1, Linguistics 1 (as troops commanded), Observation 1.

● **Artillery:** Gunnery 2 (BLC or machinegun), Mechanics 1 (machinist).

● **Engineer:** Engineering 3 (earthworks).

● **Surgeon:** Medicine 2, Science 1 (biology).



Soc 4: Officer, common regiment or technical branch—Leadership 2, Marksmanship 1, Close Combat 1.

All branch skills are the same as for Social Level 3, except that Wilderness Travel 1 (mapping) is substituted for Linguistics skill in the infantry and cavalry.

Soc 5, 6: Officer, fashionable infantry or cavalry regiment (technical services not allowed)—Leadership 2, Marksmanship 1, Close Combat 1, Linguistics 1 (any European language), Riding 1, Eloquence 1.

Navy: Male only. No prerequisite.

Soc 1: Ordinary seaman—Swimming 1, Gunnery 1 (BLC or machinegun), Mechanics 1 (steam), plus any four of the following:

Linguistics 1, Observation 1, Close Combat 1, Marksmanship 1, Trimsman 1, Piloting 1, Medicine 1.

Soc 2: Petty officer—Swimming 1, Gunnery 1 (BLC or machinegun), Mechanics 1 (steam), Leadership 1, plus any three of the same group as for ordinary seamen.



Soc 3, 4: Engineering officer—Leadership 1, Mechanics 2 (steam), Science 1 (physics), plus any 3 of the same group as for ordinary seamen.



Soc 5, 6: Line officer—Leadership 2, Close Combat 1, Piloting 1, Observation 1, plus any one of the following:

Linguistics 2, Marksmanship 2, Gunnery 2.



Foreign Office—Agent: Int 4+.

Linguistics 2, Crime 2, Theatrics 2, Observation 1.



Foreign Office—Diplomat: Male only. Soc 3+, Int 4+.

Bargaining 2, Linguistics 3 (French), Eloquence 1, Observation 1.



Colonial Office: Male only. Soc 4+.

Bargaining 1, Linguistics 2, Eloquence 1, Observation 1, Theatrics 1, Marksmanship 1.

ADMINISTRATORS

THE MEN who ran the Empire “on the spot” were products of a narrow caste, and most spent their entire careers running Britain’s overseas possessions, working their way through postings in Sarawak or Swaziland in the hope of a plum job, a governorship in a pleasant land with a decent climate and properly organized sporting activities. Mostly young men of the upper middle class, educated at the public schools and older universities, they were generally Anglican in faith and Conservative in politics, and well imbued with the games-playing cult of “Muscular Christianity.” The Foreign Office selected candidates by examinations of notorious difficulty, to be followed by a year’s study in law and languages before being placed in postings abroad. The less prestigious and less pompous Colonial Office chose its men by personal recommendation and informal interview, on the grounds that, in the strange and backward territories that fell to its lot, “character” and robust good health were rather more necessary than brains or knowledge. Once posted in Upper Burma or deepest Gorovaan, the young District Commissioner (or whatever his local title) would function as judge, policeman, tax collector, census taker, architect, civil engineer and perform a hundred other duties. As far as possible he would try to follow local laws, omitting only those repugnant to Anglo-Saxon tastes, and invent legal theories and procedures as seemed appropriate to the moment. Some stations were more comfortable than others—Ceylon and Syrtis Major were renowned as “good billets”—while others offered only mud huts and mosquitoes, the closest European company being the French or German official in his own thatched hovel across the ill-defined border. Not surprisingly, some administrators grew slack, taking to imported gin and local mistresses—especially in tropical Africa, where the “Old Coasters” had an unenviable reputation—but most showed a dedication, energy and resourcefulness that far outweighed their lack of useful training or empathy with their often misunderstood charges.

Part 2—Exotic Careers



Big Game Hunter: Agl 4+, End 5+.

Wilderness Travel 1, Fieldcraft 1, Tracking 2, Marksmanship 2, Linguistics 1.



Explorer: End 5+, Str 2+.

Wilderness Travel 2, Fieldcraft 1, Marksmanship 1, Linguistics 2, Leadership 1, Swimming 1.



Dilettante Traveller: Soc 5+.

Linguistics 3, Pilot 1, Science 1, Wilderness Travel 1, Marksmanship 1, Swimming 1.



Adventuress: Female only. Int 4+, Chr 5+.

Close Combat 1, Marksmanship 1, Linguistics 2, Theatrics 2, Eloquence 1, Crime 1, Leadership 1.



Reporter: Int 4+, Chr 4+.

Observation 1, Theatrics 2, Eloquence 1, Linguistics 2, Wilderness Travel 1.

Part 3—Service Careers

Actor: Soc 4-, Chr 5+.

Theatrics 3, Eloquence 1, Linguistics 2, Leadership 1.

Personal Servant: Soc 3-, Chr 4+.

Close Combat 1, Linguistics 2, Bargaining 1, Medicine 1, Riding 1, Observation 1.

Tutor/Governess: Soc 2, 3 or 4, Int 5+.

Science 2, Linguistics 2, Eloquence 1, Theatrics 1, Leadership 1, Medicine 1.

Grounds Keeper: Soc 3-, End 4+.

Marksmanship 1, Wilderness Travel 1, Tracking 2, Fieldcraft 3.

THE PRESS

THE ADVANCE of literacy during the Victorian Era, particularly after the Education Act of 1870, fueled a growth in readership for cheap, popular literature of all kinds. The older, highly respectable press exemplified by *The Times* was joined by a vigorously Imperialist group of London dailies—*The Standard*, *The Morning Post*, and, especially, by “the embodiment and mouthpiece of the Imperial idea,” *The Daily Mail*. Weekly pictorial magazines—*The Illustrated London News*, *The Graphic*, *The Black and White Budget*—portrayed the growth of Empire as both a divinely inspired mission and a jolly lark in the (often rather distant) countryside. Journalists became celebrities, especially the intrepid war correspondents. Archibald Forbes rode through enemy territory alone to be first with the news of the defeat of the Zulus at Ulundi in 1879 and would alternately predict trouble in the Balkans or the Belgian Coprates, “in the spring, mark my words.” Bennet Burleigh rallied a broken square at Tamai in the Sudan; his “Desert Warfare,” “Conquest of the Red Planet,” and “Khartoum Campaign” were enormously successful. Melton Prior’s impression of the “Last Stand at the Shastapsh Residency” hung above the mantelpiece in many a suburban parlor. G. W. Stevens, “the High Priest of Imperialism,” never regained his health after a dose of Parhoon thorn fever and died of typhoid at Ladysmith in 1900. It was the work of these correspondents, whose purple prose made the myth of Empire so real for the man in the street, to create a popular enthusiasm for Imperial adventurism.

Part 4—Mercantile Careers



Inventor: Int 4+, Agl 3+.

Science 2 (physics), Engineering 2 (naval architecture), Mechanics 2 (choice).



Merchant: Soc 4-, Chr 4+.

Bargaining 3, Eloquence 1, Linguistics 1, Leadership 2.



Mechanic: Soc 3-, Agl 4+.

Mechanics 3, Engineering 1, Science 1, Observation 1, Bargaining 1.

Engineer: Soc 4-, Int 4+.

Engineering 2, Mechanics 2, Science 1 (physics), Observation 1.



Seaman: Soc 3-, Str 3+.

Fisticuffs 1, Throwing 1, Swimming 1, Linguistics 2, Piloting 1, Observation 1.

Part 5—Professional Careers



Detective: Soc 3+, Int 5+.

Close Combat 1, Science 2, Crime 2, Theatrics 1, Tracking 2, Medicine 1.



Doctor: Soc 3 or 4, Int 4+.

Science 2 (biology), Medicine 3, Observation 1, Linguistics 1.



Scientist: Soc 4+, Int 5+.

Science 3, Engineering 1, Observation 1, Linguistics 2 (German or French).

Part 6—Criminal Careers



Master Criminal: Second career only. Int 6.

Crime 2, Science 1, Close Combat 1, Marksmanship 1, Theatrics 1, Linguistics 1, Leadership 2, Medicine 1.

Poacher: Soc 3-, Agl 4+.

Marksmanship 1, Close Combat 1, Fieldcraft 2, Tracking 2, Crime 1.



Smuggler: End 4+, Agl 4+.

Close Combat 1, Piloting 1, Crime 2, Linguistics 1, Bargaining 1, Swimming 1.



Thief: Soc 3-, Agl 5+.

Close Combat 1, Stealth 1, Crime 2, Theatrics 2, Eloquence 1.



Anarchist: Soc 3-, Agl 5+.

Crime 2, Close Combat 1, Eloquence 1, Engineering 1 (explosives), Theatrics 1, Linguistics 1.

EXPLANATIONS OF SKILLS

THIS SECTION defines the various skills and the tasks they are used to perform.

Strength Skills: The following skills fall under the Strength attribute:

Fisticuffs: Fisticuffs skill is the ability to hit an opponent with fist or foot and cause pain or injury, and also the ability to hold and restrain an opponent or, conversely, to struggle free from an opponent's grasp. Fisticuffs skill would be used in any situation where a character attempts to subdue or silence an opponent with a blow, wrestle someone to the ground, fight off an attacker, or escape from the coils of a giant snake or octopus.

Throwing: Throwing is the ability to hurl objects accurately. As a weapons skill this is used as the equivalent of Marksmanship with any thrown weapon (spear, knife, hatchet, bolo, boomerang). It is also used to determine the success of throws of grappling hooks, heavy lines, rocks, grenades, etc.

Close Combat: This skill defines a character's ability to keep his head in situations of mortal danger and use a weapon effectively. While Marksmanship determines the ability of a character to hit a distant target, it has little or nothing to do with the likelihood that a character will be coolly able to drop a charging dervish or swooping High Martian at less than five paces. Close Combat is a cascade skill which must have a primary emphasis on bashing weapons, edged weapons, or pole arms. Whenever a character attempts to use any weapon in close combat, whether a firearm or melee weapon, the

Close Combat skill is used to determine success.

Trimsman: Trimsman skill is the ability to maintain a liftwood vessel in proper, level trim. Liftwood vessels are held up by many individual liftwood panels, arranged much like Venetian blinds, which provide varying amounts of lift depending on their angle toward the surface of the planet. Trim is maintained by almost constant adjustment of the individual panels and is an exacting task. As Martian and European trim controls differ considerably, this is a cascade skill which must have a primary emphasis on either cloudships or aerial flyers.

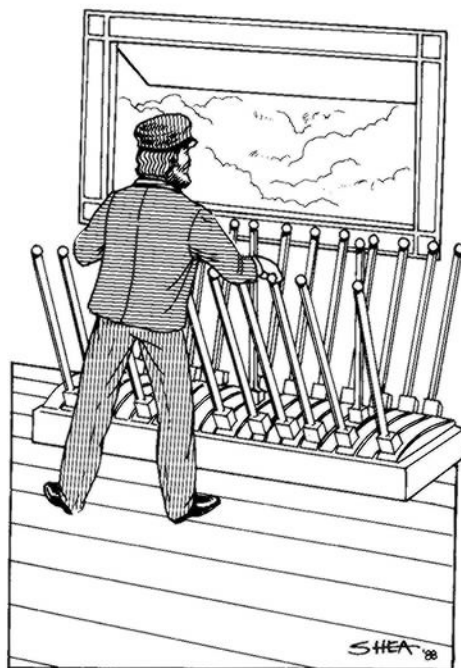
Agility Skills: The Agility attribute is closely tied to the following skills:

Stealth: Stealth is the ability to move silently and avoid detection. This skill is used to determine the ability of a character to sneak up on guards, creep past enemy outposts or sleeping animals, lurk in shadows and dark alleys, etc.

Marksmanship: The ability to hit a distant target with a firearm or bow is Marksmanship. This is a cascade skill which must have a primary emphasis on pistols, rifles (including carbines and shotguns), or bows.

Mechanics: The ability to construct, operate, and repair machines is Mechanics. This cascade skill must have a primary emphasis on steam engines, electrical devices, or skill with precision machinery (called machinist).

Crime: Crime skill covers a familiarity with one or more of a variety of illegal practices. This cascade skill must have a primary emphasis on forgery, lockpicking, or pickpocketing.



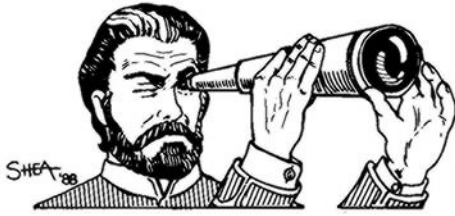
Endurance Skills: Endurance influences the following skills:

Wilderness Travel: Wilderness Travel is the ability to travel across uncharted and hostile country. This is an essential skill for explorers and adventurers. It is a cascade skill that must have a primary emphasis on mountaineering, foraging, or map making.

Fieldcraft: The ability to judge the lay of the ground and use its potential to the fullest is Fieldcraft. Fieldcraft skill determines the ability of a character to move silently through the woods, use the lay of the land to move under cover and unobserved, and take up covered positions with good fields of fire in combat.

Tracking: Tracking is the ability to detect and follow the trail of a man or an animal. This is particularly important for hunters, but is also useful if pursuing a fleeing enemy.

Swimming: The ability to avoid drowning without recourse to flotation devices is Swimming.



Intellect Skills: Intellect is the attribute of primary importance for:

Observation: Observation is the ability to notice things. This skill defines the ability of a detective to notice clues or items out of place, the ability of a soldier to notice an enemy ambush or signs of enemy movement, the ability of a scientist to notice an unusual rock formation or the skeleton of an extinct animal, etc.

Engineering: The ability to design and supervise the construction of structures is Engineering. This cascade skill must have a primary emphasis on structural engineering (bridges, roads, dams, and buildings), naval architecture (the design of nautical and aerial vessels), explosives (the use of dynamite and gunpowder to move earth and rock or destroy structures), or earthworks (the construction of military fortifications).

Science: The Science skill covers a familiarity with the basic laws of science and the body of scientific knowledge. This is a cascade skill which must have a primary emphasis on physics, chemistry, biology, geology, archaeology, or astronomy.

Gunnery: Gunnery is the ability to man and direct the fire of large weapons. This is a cascade skill which must have a primary emphasis on muzzle-loading cannons (such as the Martians use), breech-loading cannons (of the modern European type), machineguns (including rotating cannons of the Hotchkiss type), and exotic weapons such as the Smutts Discharger.

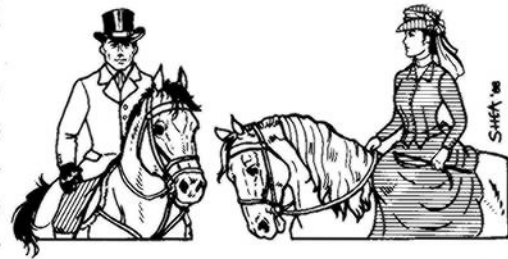
Charisma Skills: Charisma is very important to a good skill level in:

Eloquence: Eloquence is the ability to convince non-player characters to go along with your ideas. This is particularly important when trying to convince a university to fund an expedition, a senior officer to send a relief column, or a bureaucrat to issue a permit.

Theatrics: The ability to play a role convincingly is covered by Theatrics skill. This skill defines the ability of a character to fool non-player characters when impersonating someone else, or the ability to tell convincing lies. It also is used when preparing a successful disguise.

Bargaining: The ability to effectively negotiate is Bargaining. This determines the ability of a character to get the best possible price when buying or selling an item, the ability of diplomatic personnel to negotiate with foreign officials, etc.

Linguistics: Linguistics is the ability to learn and speak foreign languages.



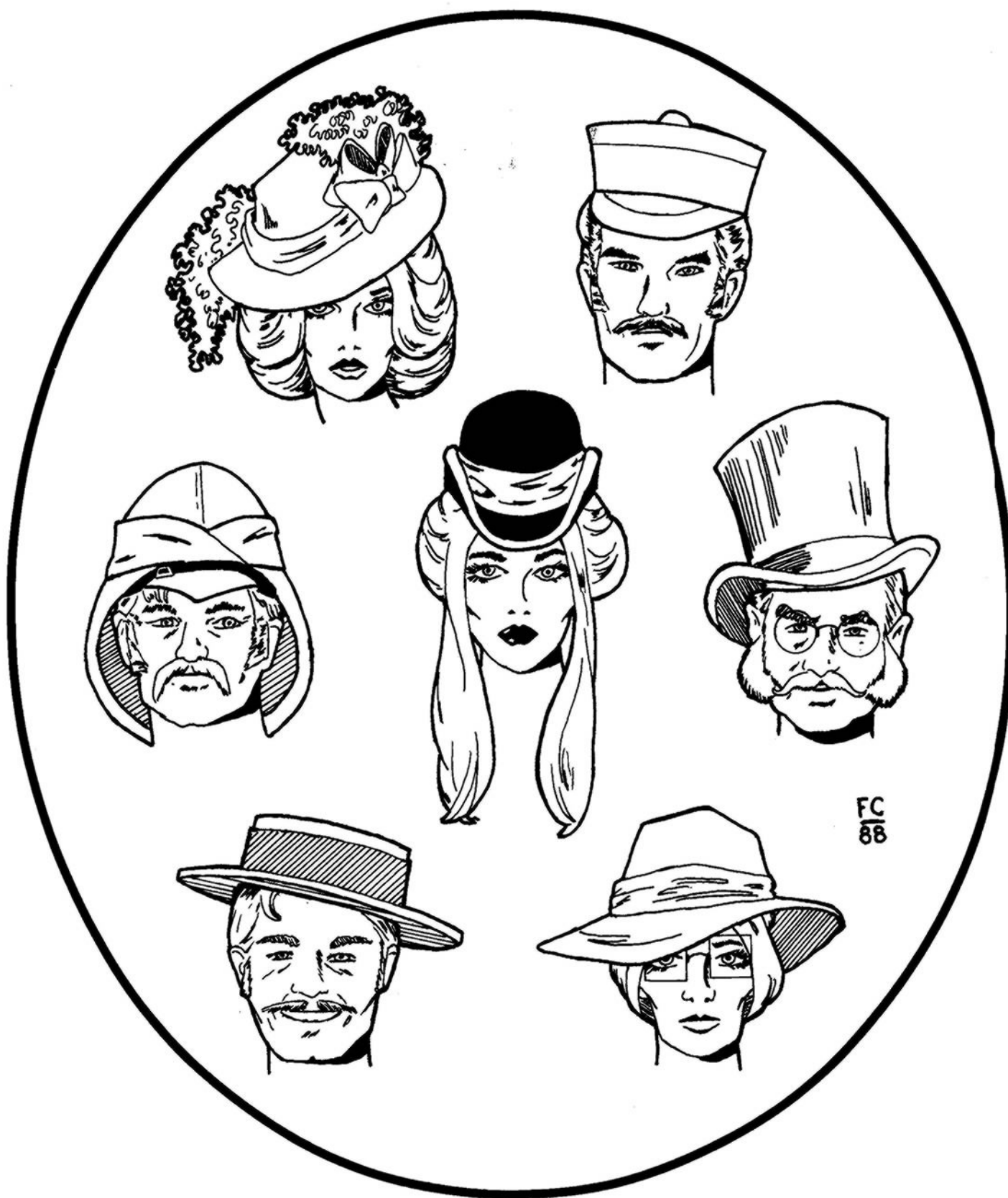
Social Level Skills: Social Level influences the following skills:

Riding: Riding skill is the ability to control animals while riding them. This cascade skill must have a primary emphasis on riding the terrestrial horse, camel, or elephant, the Martian gashant, ruumet breehr, or flying skroll, or the Venusian pacyosaurus.

Piloting: The ability to steer a vessel is Piloting. While any skill level of 1 or greater is sufficient to operate such a vessel, higher skill levels are useful in avoiding crashes in hazardous situations and are used to attempt difficult maneuvers. This cascade skill must have a primary emphasis on aerial flyers, Martian cloudships, Zeppelins, interplanetary ether flyers, nautical sailing vessels, nautical steam vessels, or submarines.

Leadership: Leadership is the ability to project a forceful, commanding presence. This skill is used to determine a player's success in rallying demoralized troops, recruiting followers from non-player characters, facing down brigands or thugs, and so forth.

Medicine: A knowledge of medicine and the ability to administer care to wounded and ill characters is covered by this skill. Medicine skill determines the chance of successful recovery by a patient and the length of time that a specific recovery will take.



THE VICTORIAN AGE

IN THE year 1889, Great Britain was approaching the height of her power, pride, and prestige. She was the mistress of an empire which covered a quarter of the Earth's dry surface and exerted a quiet, iron grip on the water. She controlled much of the world's commerce and led the globe in manufacturing production. She possessed a political stability unknown amongst the nations of Europe and had, two years before, celebrated the 50th anniversary of the coronation of her ruler, Queen-Empress Victoria. Confident, comfortable, vigorous, perhaps a little heavy around the jowls, the British Empire was growing. In 1889, British troops were fighting in Sikkim and Sierra Leone, Nyasaland in Africa, Lushai in Asia, and Syrtis Major on Mars. The crown had recently taken control in Burma and Bechuanaland; the columns would march into Mashonaland and Mala-

kand Pass within the next year. There seemed no limit to British energy, ambition, and resolution. The frontiers of the Empire were being pushed back farther every day; and, since Edison and Armstrong had plummeted into the atmosphere of Mars 19 years before, there were vast areas of two planets upon which the Sun, it was said, never set.

The United Kingdom is a combination brought about by England's domination of her three Celtic neighbors. In 1889, it consisted of two large and several smaller islands, something more than 100,000 square miles, floating off the northwestern coasts of Europe in the warm, wet path of the Gulf Stream. For most of its history this small nation had been of secondary significance, at best, in global affairs. Greek traders had visited; Roman conquerors had walled half of it inside their empire and stood sentry against the re-

mainder. Angles, Saxons and Jutes had seized the eastern lowlands from the Romanized Celts and pushed them westwards, then fallen prey themselves to Danes and Normans. The Britons of the Victorian Age, however, were likely to point to the reign of Elizabeth, another much-revered queen, as the time in which the first signs of a greatness, an Imperial destiny, could be seen. Colonies had grown up along the coasts of the Americas and the Indies. By 1763, two centuries of seagoing deriding-do and indomitable land-taking had given Britain possession of huge tracts of North America, key areas of India and the Caribbean, and footholds in Africa and the Antipodes. When the older colonies of the American seaboard fought for and won their independence, Britain's response to the loss of an empire was to go out and find another one. In 1889 it was busily doing so.

BRITAIN AND THE WORLD

TO SAY that Britain set out to conquer an empire is rather to simplify things. The British rarely wanted overseas holdings merely for the act of acquisition. Britain was a trading nation, and her colonies had to serve a commercial end. If they provided raw materials, or offered a market for British goods, or stood as strategic points for the Royal Navy which guarded British shipping, they were worthwhile; if not, London wanted to get rid of them, or at least avoid spending any money for their upkeep. In the middle of the 19th century, British governments were concerned not with expanding the empire but with making a profit from the useful bits and preventing hot-headed men on the spot from getting into expansionist adventures. When an army was sent to fight King Theodore of Ethiopia in 1867, it marched in, defeated him, released his British captives, and marched out; owning Ethiopia was not part of the Imperial plan. Likewise, the reaction of London to the outbreak of the Zulu War in 1879 was one of horror that local officials had begun a campaign without consultation and against government wishes. India, now "the Jewel in the Crown," the romantic heart of the Empire, had been conquered largely against instructions from home, as aggressive governor-generals gobbled up Sikh states and Hindu princedoms.

By the 1880s, however, a new spirit of populist expansionism had taken hold. The "New Imperialism," embodied by men like Chamberlain and Cecil Rhodes, was a creed of "the White Man's Burden," of divinely inspired missions, a right and duty to dominate foreign lands and peoples as a race of natural-born rulers. This was not the old style of mercantilist empire—though the profit motive loomed large in its manifestation and its rhetoric—but a new, proud, vulgar expression of British ambitions. Fueled by the so-called "Yellow Press," the exponents of "jingo" imperialism talked of Cape-to-Cairo railways crossing British territory all the way and of maps awash in British red. This was almost a religion; it was one thing to steal the lands and burn the villages of indigenous peoples for British gains, but quite another to claim it was for their own good.



Not surprisingly, Britain had few friends. The traditional isolationism of a seagoing power, the rapid growth of her overseas empire, and the ancient British disdain for those unlucky enough to have been born elsewhere—sometimes expressed as "Wogs begin at Calais"—meant that

she sought few alliances. Her European neighbors generally envied British wealth, disliked British boastfulness, and, if they laughed at the small size of her army, had a healthy respect for the might of the Royal Navy. Relations with the French were built upon an ancient rivalry, and threats of an invasion by Napoleon III in the '50s and '60s; the Fashoda Incident of 1898 almost brought the two to war. Relations were worse yet with the Russians, for the "Great Game" of intrigue and exploration over the northern gateways to India was in full swing. Germany was increasingly seen as an economic threat, as her industry grew in leaps and bounds, and the new Kaiser, Wilhelm II, was prone to making grandiose and excitable comments that worried his great-aunt Victoria and her government. Landlocked Austria-Hungary was of minor concern to British interests, while the minor nations—Italy, Spain, Portugal, Turkey—were treated with a cavalier mixture of patronizing goodwill and callous disregard. The only nation which seemed to be growing closer to Britain was the United States, where people spoke most of the same language and claimed an Anglo-Saxon heritage; American heiresses married British noblemen—like Lord Randolph Churchill's bride, Miss Jennie Jerome—and U.S. sailors had tacitly supported the British seizure of the Suez Canal in 1882. Whatever the actions and attitudes of foreign powers towards the British government, private travellers were usually more than welcome abroad, and wealthy Britons might spend much of their leisure time in fashionable continental spas and resorts.



VICTORIAN VALUES

VICTORIAN SOCIETY was characterized by strong adherence to a widely accepted set of values, and many of the actions of the British government and her citizens can be explained by that. Each value tended to produce both virtues and vices, sometimes paradoxically, at the same time and in the same person. All that was best and all that was worst about Victorian society lay in these virtues and vices.

Value	Virtue	Vice
Honesty	Personal integrity, fair dealing	Naivete and disdain for alien codes of behavior
Loyalty	Sense of duty	Failure to examine orders or actions of comrades
Resolution	Dynamism, strength of purpose	Inflexibility, intolerance
"Progress"	Concern for improvement	Disregard for foreign values, tendency to meddle
Enthusiasm	Good humor, vigor	Lack of foresight and planning, failure to learn from others
Sportsmanship	Fitness, team spirit	Obsession with games, anti-intellectualism
Bravery	Courage, leadership	Rashness, militancy
Detachment	Fair judgment, cool reasoning	Coldness, lack of sympathy
Pride of Race	High self-esteem	Racism, bigotry

At his best the Victorian Englishman combined a boyish zest for hard work and adventure with tremendous personal courage and integrity. At his worst he was smug, prudish, half-witted, hostile to everything alien to his race and class, and pointlessly obsessed with sporting activities. The difficulty for outsiders was that very often all these attributes, positive and negative, could be found in the same individual. Add to this mixture the frequent eccentricities cultivated by Victorians, and one might meet a particularly "rum character" or "queer fish," a fellow whose obvious virtues were somehow counterbalanced by strange or unattractive quirks of character.

Players should be aware that a general acceptance of and adherence to these basic values is essential to success in Victorian society at large. However, that does not mean that the characters they play in **Space: 1889** are obligated to rigidly play out each and every virtue and vice appearing on this chart.

Beneath the pomp and circumstance, the British Empire was an odd, ramshackle entity, working in spite of, rather than because of, its internal organization. Britain was an industrial power ruled by landed aristocrats. She was proud of her achievements in trade, manufacturing and practical engineering but had been in a state of economic decline vis-a-vis her German and American competitors since the '60s and had been in a commercial slump since 1875. London was the largest city in the world, teeming with four million people, yet the focus of British life remained essentially rural for many of her rulers. The Empire was a hodgepodge of systems. Canada, Australia and New Zealand had elected assemblies based on the model of Westminster, while India was ruled autocratically by the Viceroy appointed by London. Egypt continued in a pretense of independence, while British administrators quietly ran things. In west and central Africa, private trading companies such as the Royal Niger Company and African Lakes Company had writs to govern and produce dividends for investors without any real Crown supervision. In isolated areas, British officials left the old rulers in charge, a pragmatic decision later developed into the "theory" of Indirect Rule, while valuable regions were tightly controlled. Every rule seemed to have an exception, and all were enforced with scrupulous fairness. It was that sort of time and place.



GOVERNMENT AND POLITICS

GREAT BRITAIN was a constitutional monarchy—the first of its kind. Over the centuries, from the Magna Carta through the Glorious Revolution of 1688, to the period of major electoral reforms from 1832 onward, the power of the Crown had been stripped away; it was now a ceremonial, almost ritual symbol of British nationhood. The Queen, much beloved by her subjects, reigned but did not rule. Government was in the hands of Parliament, the two houses of Lords and Commons, and specifically the Prime Minister and his cabinet.

By 1886 there was universal male suffrage in Britain, but the extension of voting rights had as yet made little difference to the traditional pattern of government. A tight ruling clique of eminent, often aristocratic families who had controlled British politics for centuries remained in power; Lord Salisbury's cabinet was overwhelmingly patrician.



Parliament: the rule of law.

A two-party system was in force. The Whigs had become Liberals; their Tory opponents were now Conservatives. Both were dominated by established, landowning families, and both were feeling the push from below, from ambitious middle-class politicians and from working-class voters. The Liberals were more prone to "progressive" instincts—a tendency which, as we look at the world of 1889, had brought division and eclipse.

Two issues had brought this about. First, the age-old Irish question had split the party into "Home Rulers," who favored limited self-government for Ireland, and "Unionists," who did not. The "Grand Old Man" of the Liberals, William Ewart Gladstone, had worked to preserve unity, but the failure of his Home Rule Bill (1886) broke the party and swept Salisbury's Conservatives into power. The second issue was the New Imperialism, the aggressive expansion of British influence in Africa, in Asia and, most importantly, on Mars. Gladstone had railed against the expense, questioned the moral reasoning, and thundered against the motives. It did no good. The Liberal-Unionists, led by Joseph Chamberlain, trooped over to join the Tories in support of "Union, Empire and Mars" (as Chamberlain was to put it in his Selly Oak speech of 1890), and the rump of the Liberals fell into disorder as Gladstone finally retired, at the ripe age of 82, in 1891.

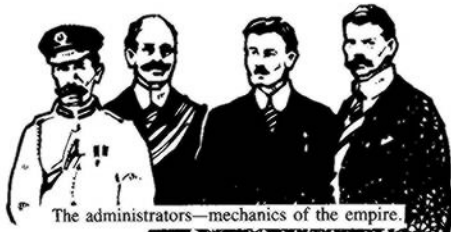
All of this rather put the ball in the Conservative court. The Tories had taken on the confident, assertive spirit of Imperialism under the far-sighted Disraeli (1804-81), finding in it a cause which brought the new

working-class vote together with the ancient landholding elite. Lord Randolph Churchill made Martian expansion a plank of his "Tory Democracy" platform, advocating investment and settlement in the mooted "White Man's Country" of the Meepsoor Highlands. More aggressive still was Chamberlain, who as early as 1882 had looked forward to standing in the Commons Lobby with the Honorable Member for Parhoon West.

All this came as something of a surprise to Salisbury, a traditional Tory who believed that Britain ought to be ruled by gentlemen bred for the purpose. A half-century in politics had shown Lord Salisbury the fleeting nature of Imperial glory, and he considered "this Martian Adventure" a red herring in Britain's efforts to preserve a waning global hegemony. He was by nature a power broker, a maker of deals, and is alleged to have mortified his cabinet, in 1888, by advocating that Britain barter Syrtis Lapis, Heligoland and Ceylon for the whole of the Kaiser's sphere of influence in Africa.

Outside these two parties, governing alternately, were others of a different stamp. The Irish Nationalists, led by Parnell, had seats in the Commons. George Bernard Shaw founded the Fabian Society, a group of Socialist moderates, while William Morris—the Renaissance Man of Victorian Britain—advocated a Utopian society. Karl Marx developed his theories in London and was buried in Highgate cemetery (1883), while the exiled Russian anarchist, Prince Kropotkin, advocated the politics of the bomb from his home in Hammersmith.

The statesmen might devise policy and issue orders, but administration—the act of *doing*—was in the hands of career civil servants. Bureaucracy had grown immensely during the Victorian Era, in response to the increasing sense that government could be a force for improvement. Among the civil servants, it was those with Imperial responsibilities—the men at the Foreign, Colonial and India Offices—who were most strongly smitten with a sense of dedicated destiny, that which Kipling would dub “the White Man’s Burden.” These administrators were idealistic and highly principled—usually far more scrupulous than the trader or settler on the Imperial Frontiers—generally the products of the public schools and universities,



The administrators—mechanics of the empire.

and selected by rigorous examination. There was fierce, if friendly, rivalry between the three departments for control of the most prestigious territories and the budgets that went with them. The Foreign Office was in charge of relations with sovereign powers, from France and Russia to the Martian treaty dependencies, whose independence was no more than nominal. This situation was to bring friction with the Colonial Office, who had taken control of Syrtis Major on the establishment of the Crown Colony in 1881. That the upstart Colonial Office, which Cecil Rhodes had denounced as being run “by missionaries, philanthropists and Jews,” should admin-

ister important new lands concerned not only the smart set at the Foreign Office, but also the powerful India Office. In 1878 the Viceroy of India, Lord Lytton, took time off from the business of invading Afghanistan to suggest that the vast experience, huge treasury, and powerful armed might of British India made her the obvious choice to govern the Martian Regency, as it had so many of the Princely States of the subconti-

ment. A series of biting editorials in *The Times*, and a famous *Punch* cartoon showing a winged elephant transporting the Viceroy from Calcutta to the red planet for the hot season, ended the idea, though Indian troops were to serve in the Goro-vaangian War as instructors to the Parhoon Rifles. The father of the famous Martian writer, Gurchan Xyypt Singh, was one of these Indian troops.

PROFILE: JOSEPH CHAMBERLAIN

JOSEPH CHAMBERLAIN (1836-1914) was perhaps the most significant politician of his age and certainly its most characteristic. The son of a shopkeeper, Chamberlain became a manufacturer of screws, retiring at 38 to become Lord Mayor of Birmingham. His success in slum clearance led to his election to Parliament (1876) and an increasing standing in Liberal circles. Still the radical, he saw himself as the successor to Gladstone, but the Grand Old Man showed no signs of stepping down. Chamberlain’s imagination was soon fired by the commercial possibilities opened up by the Martian possessions; he began to “think Imperially.” On his split with Gladstone in 1886, Chamberlain caused a sensation by accepting Salisbury’s offer of the Colonial Office while still a member of the Liberal party; his popularity in the Midlands ensured reelection, and in 1895 he formally “crossed the House” to the Tories. Unlike the cool aristocrats of the Salisbury cabinet, “Pushful Joe” was sharp, aggressive, and a player to public opinion. Faultlessly dressed, monocled, with a fresh orchid in his buttonhole, his smooth manners did not cover his ambitions, and his devious maneuvers as Colonial Secretary—the Avenel Incident (1887), the Jameson Raid (1896) and the events leading up to the second Boer War—caused disquiet in government circles. Chamberlain saw the new acquisitions in Africa and on Mars as a vast slum in need of “improvement,” and his love



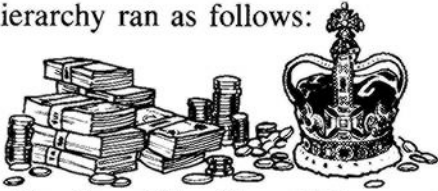
of orchids meant that his trips to Syrtis Major (1886, 1894) were as much in search of new species for his conservatory outside Birmingham as State Visits. He left the Colonial Office in 1903 and was struck down by paralysis—possibly caused by chemical secretions of the Oenotrian Black Palm in Earth’s atmosphere—three years later.

VICTORIAN SOCIETY

BRITISH SOCIETY in the 19th century was divided quite sharply into classes which determined the lives and expectations of its members. Movement between classes was not easy; it was difficult to gain acceptance when attempting to rise, and it was a shameful degradation to fall.

There was no real "system" at all in this class system; there were differences between the city people—who, in Victoria's reign, for the first time became the majority—and the country dwellers, and between the different regions. Wealth had little to do with class *per se*—certainly less than manners—but an improvement in personal fortune might well be the spur to acquire the behavior and attitudes of a higher status, an effort that might succeed or fail according to the whims of fate and the competence of one's teacher of etiquette.

In descending order, as a Victorian observer might see them, the class hierarchy ran as follows:



The Royal Family, which was at this period fairly large. Besides the queen herself, there were royal personages in key positions in society; the Prince of Wales was the leader of the London "fast set" of *bon viveurs*, while the Queen's cousin, the Duke of Cambridge, was commander-in-chief of the army from just after the Crimean War until 1896. Nevertheless, many of the older noble families of England preferred to regard the Royals as upstart Germans of questionable breeding and manners.



The Aristocracy was the elite of British society in terms of wealth, prestige and power. Political reform was beginning to undercut the traditional domination of government by the titled and privileged, while the decline in farm prices would slowly devalue the country estates upon which noble fortunes depended. If decline was in the wind, however, it was not obvious. The aristocrats were, in many ways, the least "Victorian" element of society. They came to enjoy the conveniences of the modern world, but their outlook remained Georgian, Rococo perhaps, in a time of grave and somber virtues. The nobles did not really care about "progress"; they were perfectly satisfied with the way things had always been. Hunting and balls and winters in France and afternoon drives and dinner at the Carlton or the Turf club; these were the pursuits of a leisured class, a class whose wealth, though based in rolling acres of prime farmland, allowed them to live wherever and however they chose. As rulers, they had little

regard for trade or industry; their education consisted largely of Greek and Latin, with an increasing emphasis on games as the century wore on, for a gentleman needed little knowledge of mathematics or science. In turn, there were few careers he could enter after his years at Eton, Harrow or Winchester, perhaps followed by a spell at Oxford or Cambridge. The eldest son would take over the family title and estate, the younger brothers would enter the more fashionable regiments of the army, or the Church, or enter politics. By the last quarter of the 19th century it might be possible to go into law, or the more prestigious parts of the civil service. The real aristocracy—as opposed to the county squires of Berkshire and Kent—consisted only of some 200 families, and those born to rule usually knew one another from childhood. A man was expected to be a leader, but could comfortably be a "cad"—one of Lord Salisbury's sons is alleged to have died a drunk in Australia. Women were luxuriously cloistered and bargained away in marriages every bit as arranged as those of India; their educations were limited to music, art, and the conduct befitting a lady. The nobility was not ready for the 20th century, which was to bring almost total eclipse; indeed, its only concessions to the 19th were a slight tightening of the lax morality and raucous good living it had enjoyed since 1066 or thereabouts. Nevertheless, although young Lord Algie might appear something of a fool in his monocle and paisley cravat, he was certainly a fine horseman, probably an excellent shot, and knew very well indeed that he had been born to run things.



The Gentry were the poor relations of the aristocracy. They were not dukes or earls, though some might carry minor peerages or baronetcies, often of very ancient lineage indeed. These people would seldom admit inferiority to anyone, least of all a Johnny-come-lately whose title was granted by Charles II or any of that *nouveau* kind. In education and attitudes they were much like the higher nobility, but with lesser expectations, assumptions, and, of course, bank accounts. These were people who went hunting and shooting in their own shires rather than in Argyllshire or Central India, and whose traditional offices of government were those ancient county appointments—magistrates and sheriffs rather than ambassadors and ministers. Likewise, their career paths were the same restricted avenues—estate management, the church, the armed and diplomatic services, and perhaps law; “trade” was, of course, almost taboo. In retrospect, the country gentry seem as anachronistic and pleasure-bent as their superiors, rather more stuffy and reactionary, yet more attractive; they had strong ties to the land, carried traditional responsibilities seriously, were stable and honest, and retained tremendous respect in their communities—far greater than any self-made man could ever expect. The country gentleman could be expected to be a model Englishman, courteous and dutiful, at home in the Manor or serving as a District Commissioner in Uganda or Avenel.

Below the “quality” of the shires was a group that has received little recognition as a class but which would contribute its sons to the service of the Empire in large numbers. These were the country doctors, parsons, lawyers, and the better-off type of landholding or tenant farmer. Their traditional role was as supporters of the gentry and the old, rural-based order. Many would gravitate to the Army and Navy, or the civil services of India or Syrtis Major, where they would enjoy a frugal prosperity and a sense of useful position.



The Urban Middle Classes were the Victorians par excellence. It was the values and virtues of the rising bourgeoisie—self-help, duty, competition, piety, thrift—that came to define the era. In their prosperous respectability the tradesmen, lawyers, manufacturers, parsons, and clerks came to dominate the tone, and many of the institutions, of British life. It was a middle-class empire, and Victoria, in her attitudes and pronouncements, was a middle-class queen. The rise of the Victorian middle class was a consequence of a burgeoning economy fueled by Britain’s industrial and commercial dominance in world affairs. The traditional elites might scorn “trade,” as “money-grubbing” business, but their social inferiors emphatically did not and rose dramatically in wealth, prestige and influence as a result. Austere and

prudish in their Methodist and Congregationalist forms of Christianity, judgmental and moralistic in their attitudes, dedicated to “progress,” to Free Trade, to “improvement,” the middle class dominated the town councils, the charities, and the Temperance Movement. The middle-class man tended to look down on the workers, so clearly morally inferior in their drunkenness, poverty, and savage amusements, and when he had contact with the poor, it was often with the plan of educating and improving them in his own likeness. The upper classes were another matter. The bourgeois world had scant regard for the idleness, frivolity, and scandalous morals of the nobility, but the urge for “gentility” was strong; if, as a Scots engineer or Lancashire mill owner, he was a little rough for “Society,” he would send his sons to the right schools to learn Latin and become a barrister or broker and would hope to marry his daughters to young aristocrats of ancient pedigree and empty pockets.

The middle class was not adventurous in spirit. Caution, planning, thrift, and profit were the watchwords. The daring frontiersman riding with the Rhodesia column or venturing into the Meroe Badlands was more likely to be an impoverished aristocrat or a grim-jawed millwright. The middle class provided the traders, the professional men, the engineers, and the senior clerks. These were respectable pioneers, concerned about steam turbines, lift-wood prices, the appalling moral turpitude of the Canal Martians, and the rarity of a decent cup of tea. With wives, housemaids, and rosy-cheeked children, they epitomized Victorian civilization on Mars.

The Working Classes of the cities fell into several categories, though this was only dimly understood by those better placed in society. At the top were the craftsmen, the "artisans," who with careful budgeting, good health, and 12-hour shifts could attain a modest prosperity and adopt some of the comforts and values of the middle class. Often deeply religious, committed to self-help less through the entrepreneurial spirit than through trade unions and co-operative enterprises, this group might oppose the bourgeoisie as workers against employers but shared with them a fear of the teem-

ing masses of the poor. Literacy was high amongst the artisans; they were believers in Empire, but also supported reform in the shape of a practical, populist socialism that was to grow into the Labour Party and the Liberal radicalism of David Lloyd George. These were not usually empire builders in the sense of administrators and soldiers. Their contribution would be later, as settlers, engine drivers, and skilled workmen hired to oversee the efforts of local laborers.

Below this comfortable working class came the poor. They made up the largest group of urban Britons,

yet they were unrecognized in any form other than a narrow and unfair stereotype. The myth saw the poor as immoral, drunken, and shiftless. In truth, since they were overcrowded in tiny, dark, cold rooms, and grossly underpaid for their labor, they had every reason to fit this image. If they were angry, prone to fight outside pubs and riot in Trafalgar Square, they had every right to be so—that was the opinion of reform-minded observers. The harsh life of bad food, "cruel habitations," work that was back-breaking in effort and seldom steady, meant that the city poor were stunted and malnourished; army statistics showed a serious decline in the size and health of recruits from 1800 to 1900, as the slums replaced the country villages as prime sources of young men. The London of Sherlock Holmes and Jack the Ripper—both at the height of their careers at this time—is one where images of the dim alleys of Whitechapel and the Dickensian workhouses and grim streets of "back to back" houses without water or drainage loom large. Yet amongst those who lived the life of the streets—the thieves and prostitutes who dominated the stereotype—were millions of honest working people deprived of the opportunity to change their situations, who would always be day-laborers and never skilled craftsmen. They did not need policemen to control them or charity workers to teach them thrift and temperance; they needed a decent place to live, a reasonable wage, and some chance for advancement. Many of them were to emigrate for that chance—to New Zealand, Canada, or, as politicians now suggested, the cool, dry uplands of the red planet.

THE SCOUNDRELS OF EMPIRE

THEY BRIBED, they lied, they swindled. They lived at the best hotels and drank champagne at eleven o'clock in the morning. When not involved in some sordid financial intrigue, they spent their time making open and indecent love to the maids behind the bars set up at almost every corner.

This description, by the jaundiced Mr. Vere Stent, is of the transient collection of British scavengers, shysters, and petty criminals who found their way to any part of the Empire or beyond where an easy-living might be made; here it was Johannesburg in the Transvaal gold belt, there it might be the rough ruby diggings of Moerus Lacus. To these adventurers Victoria's Empire meant only a chance to play by their own rules and flout the laws of others. Some were from the lowest classes—escaped convicts, children of transportees, thieves and tricksters from London, Glasgow and Dublin. Others were aristocrats, disappointments to their families, like Lord Avonmore, or "Have-one-more," whose well-appointed entourage conspicuously failed to reach the Yukon in time to make a fortune, or, indeed, at all. The low-born vagabond might be hustled out of Singapore or Syrtis Major, before he could bring down the tone of things; he might be hired as an estate manager, abusing the native peoples at will. The public school "bounder" might parlay his breeding and charm into position and property. The astonishingly lax morals and brutal conduct towards indigenous peoples was explained away as "Tropic Frenzy," a behavioral disorder brought on by strenuous living in a hot climate. In fact, it was more a matter of bad character, bad whiskey, and a belief that a fox, provided that he be a British fox of proper ancestry, could be trusted in charge of a henhouse.

The Rural Laborers were, perhaps, the poorest of all. The green fields might not run rife with pickpockets and beggars, but there was little hope for the comfortable life of an established town artisan; many countrymen made their way to the towns in the hope that, since employers liked the "thick-set, red-faced men of enormous strength" from the shires, they might find success. With a pig in the cottage yard and a vegetable garden, the laborer's family would not starve—though, as the tragic tale of the 1840s testified, the devastating poverty of Ireland could not guarantee any kind of support. At best, prospects were slender—domestic service for daughters, the fields for sons (and even when he had the chance of going to school, the country lad was likely to be pulled out for harvest time). Pay was bad, especially in the marginal areas—the heaths and moorlands of the north, the thin-soiled glens of the Scottish highlands, and especially in Ireland. The Irish tenant had fewer rights to his land than even the English cottager, and, despised for his Catholicism and "ignorance," was probably the poorest, most badly treated and angriest inhabitant of the "Scepter'd Isles" that comprised Victorian Britain.

The urge to escape rural poverty was strong, and country-born people could be found at the ends of the Earth and beyond—as soldiers and sailors, domestics, horse handlers, blacksmiths, and any position that honest labor and a strong back could take on. If he was unsophisticated, a "yokel," he was exactly the man an empire-building gentleman would want at his side, and at his back, during a difficult moment.

GOING NATIVE

GOING NATIVE was a phenomenon that the Victorian world regarded as eccentric, scandalous, and, worst of all, un-British. In the 18th century, Englishmen abroad had been expected to conform to local styles, and an officer or administrator would set up a home with Hindu wives, adopt Indian clothing, and embed himself in the native culture. This was no longer tolerable. An Englishman was expected to dress and conduct himself as an Englishman at all times—in Bangalore or Syrtis Major as much as in Kew Gardens. Yet there remained some individuals, relishing their independence and reveling in their flouting of convention, who "went native" with a vengeance.



Wilfred Scaven Blunt (1840-1922) served for eleven years in the diplomatic service, but left to marry the granddaughter of the poet Byron and travel with her through North Africa and the Middle East. Blunt was enraptured by the Arab world, founding a stud farm in Sussex with brood mares given to him by an Emir. He bought an estate, "Sheikh Obeid," which he referred to as "my house in the desert," although it was actually in the suburbs of Cairo. His studied adoption of Bedouin ways, vocal anti-Imperialist agitation, and bad poetry made him something of a celebrity in British-occupied Egypt; if he was a poseur and a madman, he was good company, and his attempts to provoke the Consul-General, Lord Cromer, were always interesting. Blunt's amorous career led to a separation from his wife; she remained at Sheikh Obeid while he retired to Sussex with a "niece."

Franklin Jeroboam Peel (1858-1965) was a research geologist in the service of the Royal Moerus Lacus company who took off into the wilderness of the Astusapes in 1884. The High Martians believed that Peel, with his pale complexion and unusual physique, was part Martian and welcomed him into their society. Peel adapted to the highland culture, transcribing their war chants for the Spanish guitar, drinking the potent Yfgraag liqueurs in legendary quantities, and occasionally coming down from his mountain to deliver the drafts of his influential treatises on the geomorphology of the Astusapian uplands (vol 1, 1893; vol 2, 1898) and his neglected "Offal Recipes of the Martian."

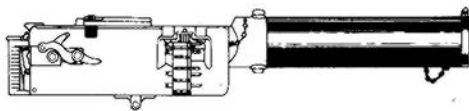
Few, however, went as far as **Charles de Russet**. The son of a British contractor resident in Simla, he gave up his faith and family to become a disciple of the Fakir of Jakko; silent, saffron-robed, draped in a leopard-skin headdress and surrounded by apes, De Russet spent two years alone at the Temple of Hanuman the Monkey God. As late as the 1920s, he was still living in the jungles below Simla, having forgotten most of his native language.

THE ARMY

BRITAIN DID NOT have much of an army by the standards of continental Europe. She had some 200,000 officers and men, all volunteers, spread from County Cork to Singapore, with a heavy concentration in India. In addition, Britain could call on assistance from the Indian Army, whose peacetime strength was less than 150,000, but whose reserves of manpower made those of the Czar seem paltry. Britain could also draw upon the eager volunteer forces of white colonists (New South Wales forces served in the Sudan in 1885) and the countless local corps, from the superb Hausas of the Gold Coast Constabulary to the terrified members of the Natal Native Contingent, who had run from the Zulus in 1879. In combination, as at Victoria's Diamond Jubilee in 1897, the armed might of the Pax Britannica was impressive, but, serving in penny-packets throughout the Empire, "Victorians' sons" could expect to find themselves outmanned in any outbreak of hostilities. It did not help that the British Army had no permanent tactical organization of brigades, divisions, and army corps; nor did it have a General Staff on the Prussian model. It was a very old-fashioned army; a German military attache reported, "It is excellent for fighting savages, just as ours is excellent for fighting the French." Indeed, the British Army was a superb instrument for small-scale operations against irregular opponents. Seasoned professional warriors, imbued with a rigid regimental discipline, would take on huge numbers of brave and skillful Afghans or "fuzzy-wuzzies" without fear or loss

of drilled order, and beat them unless something went dreadfully wrong. It was at this regimental level that the British Army was unequalled, which served rather to mask the manifest inadequacies of officer training, staff work, tactical theory and logistical support. As it was, the British Army of 1889 was entirely ready for the Crimean War of 1855.

There were, however, voices for reform. In 1871 the Purchase System, the appointment of officers by sale of commissions, had finally been abolished. In 1881 the old regimental numbers had been replaced by a system of pairing battalions by county, one serving overseas and the other at home on an alternating basis to avoid the ancient habit of leaving forgotten units in the colonies so long that they collectively died of fever or settled down with local wives and families. A staff college was set up at Camberley in Surrey; flogging disappeared as a punishment. Weaponry was up-to-date, and the British professional soldier could validly claim to show as much skill at arms as any foreign competitor.



The Maxim machinegun.

The leading exponent of reform was Britain's most successful general of the Victorian Era, Sir Garnet Wolseley. He was, in 1889, 56 years old and Adjutant General of the British Army. He was a member of the militant Anglo-Irish gentry, highly ambitious, vain, and none too tactful; he was also a brilliant organizer, a superb strategist and a man so

respected for his successes that the phrase "All Sir Garnet" was coined to indicate anything that worked perfectly. He had won campaigns in Canada (1870), Ashanti (1874) and Egypt (1882); he had been just too late to claim credit for the defeat of the Zulus, despite his efforts to reach the front before his predecessor had time to win a battle; he was the man who had taken the expedition to rescue General Gordon 1500 miles up the Nile. In 1889 his enemy was no longer a Red River Metis rebel or a wild Sudanese warrior but the Commander-in-Chief of the Army, the Duke of Cambridge. Ancient and reactionary, the Duke had been in his present job since 1856; his actual field experience was limited to an undistinguished period of service in the Crimea. He had fought all attempts at reform fiercely in the belief that the only time for change was when it could no longer be avoided. Wolseley's response to the archaic and amateurish attitudes of his superiors had been to create his own staff system, known as the "Ashanti Ring," from its origins as a group of officers who had impressed him in that campaign. Whenever Wolseley went to war, he would assemble his chosen band as key staff officers, and his patronage was often the key to rapid promotion; Sir Herbert Stewart was an unnoticed captain when he met Sir Garnet in 1879, but was a brigadier general when a derelict bullet got him six years later. Not surprisingly, the preferential treatment given to the Ring was resented by the rest of the officer corps, not just by the rigid, conservative element, but by the "Indians," the clique of soldiers led by Lord Roberts, Kipling's "Bobs."

Not surprisingly, the officers of this army varied from dedicated career men to inefficient, lazy—though always brave—sons of privilege waiting for the family title to drop into their laps; there were, of course, many officers who combined duty and an interest in their commands with a high-spirited love of sports and boyish jokes.



The "other ranks" of the Victorian army were recruited from Britain's poorest citizens, the slum-dwellers of the cities and the starving peasantry of the peat bogs; upwards of a third of the army was Irish, and the brogue was a familiar sound in English and Scottish regiments as well as those from the Emerald Isle. Conditions were improving for the soldier, with properly built barracks, army schools, and facilities for recreation that went beyond the traditional drinking and fighting. The young recruit now signed up for six years of active duty and six more with the reserves, rather than the 25 years of "life" enlistment in Wellington's day. Still, soldiers were continually feared and looked down upon by most British civilians, and military service was not a career a mother would likely want for her son.

The Combat Arms

British infantry battalions were comprised of eight companies of 60-120 men, armed with the Martini-Henry, a single-shot breech-loading rifle; in 1889 this was being replaced by the Lee-Metford 303 magazine rifle, a rapid-fire weapon using smokeless powder rather than the old black gunpowder which wreathed a battlefield in smoke. The Martini would remain in service in Indian and Egyptian hands until 1914. Both of these rifles had a range of 1500-2000 yards, but normal usage was to open fire with volleys at 600-800 yards; fire discipline was more important than rate of fire, for excited soldiers could waste ammunition at an astonishing rate. Kipling characterized the infantry battalion as "eight 'undred fighting Englishmen, the colonel and the band," and though its numbers might be as low as 350 men on campaign, it was the backbone of the army.

Cavalry was organized into troops of 40-50 men, two troops to a squadron, four squadrons to the regiment, which then totaled somewhere between 400 and 600 horses and men. Modern training emphasized dismounted action with carbines, mounted scouting, and pursuit of a beaten foe as the work of the cavalry, but natural conservatism, success against spear-armed opponents, and a belief in the virtues of the "arme blanche" meant that cavalrymen, even the highly experienced Indian regiments, still looked for a chance for the knee-to-knee charge with sword and lance.

Gunners and engineers were, as groups, the most modern and professional elements in the British Army.

With rifled guns, some muzzle-loading, others breech-loading, with balloon detachments, railway companies, telegraph crews, and steam traction engines, the technical services looked forward to the 20th century rather than backward to a glorious martial past.

NAVAL OFFICERS

THE MEN who commanded this navy were iron-willed and often eccentric. The ability to make one's subordinates quake in their seaboots was widely regarded as the key to success. Colorful characters abounded. One captain asked to be brought a bucket because the second-in-command made him sick! Captain Algernon Heneage insisted on calling all his chief engineers by the same name, dressed his hair with two eggs each morning, and always removed his coat before praying since it would be unthinkable for a British officer in uniform to sink to his knees. He lived to be 81, opposing the reforms of Admiral "Jacky" Fisher all the way. The commander of the Channel squadron, known as "Old 'Ard 'Art," recorded in his diary for June 6, 1884: "Docked ship. Received the V.C." Perhaps the best expression of the mind of a Royal Naval officer in the face of difficulties was the comment of William Packenham to his Turkish interpreter when surrounded by an angry mob of Asiatic brigands: "Tell these ugly bastards that I am not going to tolerate any more of their bestial habits."



REMARKABLE WOMEN

THE TRADITIONAL picture of Victorian womanhood presents us with an image of frailty and timidity—an oppressed group rigidly corseted into a sternly respectable second place to the male. There were, however, women unwilling to bow to convention, and many more whose outward genteel graces concealed a spirit of strength, vision, and adventure.

Beatrice Potter Webb (1858-1943) was born into a class that “habitually gave orders.” The daughter of a prosperous businessman, she was briefly courted by the rising politician Joseph Chamberlain. She was drawn towards radical social reform through association with the Trades Union and Cooperative movements. Miss Potter married the Fabian socialist Sidney Webb in 1892, spending their honeymoon tracing Union records in Glasgow; together they became influential proponents of reform, founding the London School of Economics and *The New Statesman* magazine. In a stream of books and articles, the Webbs laid out their plans for a better world, Beatrice often referring to Britain’s expansion into the Solar System as “humbug” and “sheer tommyrot designed to divert the interest of the proletariat from its legitimate concerns.”

Mary Kingsley (1862-1900) was a classic Victorian spinster who, at 30, went from caring for her elderly parents to paddling alone down the crocodile-infested rivers of West Africa. Two best-selling books showed her knowledge and authority, revealing a compassion and understanding for the African peoples, and opposing the extension of British crown rule. Miss Kingsley died of enteric fever in South Africa while tending Boer prisoners-of-war.

Ethel St. Clair Grimmond was the beautiful, young wife of the British political agent in Imphal, the capital of the remote protectorate of Manipur. In March of 1891, the leaders of a revolt seized the senior British political and military officials in Imphal, including Ethel’s husband Frank, and murdered them. The surviving junior British officers of the small garrison proved incapable of exercising decisive leadership and so Ethel, “dressed in a white silk blouse, black patent leather shoes, and a long, blue skirt,” led the small column of loyal native troops through the steaming jungles and on a 3000-foot climb up the mountains to safety. The officers with the column were later cashiered while Ethel, hailed by the *Illustrated London News* as “the heroine of Manipur,” was awarded the Order of the Royal Red Cross and granted a pension for life.



Lizzie Hessel (1870-1899) began, in 1896, a 4000-mile journey up the Amazon by steamer, canoe, and mule. Thirteen months later, after being stranded amongst primitive Amerindian tribes, she reached the rubber plantation managed by her brother. Her letters home reveal a fascinating mixture of Victorian gentility and indomitable adventure. Sadly, Lizzie Hessel died of fever in Bolivia, at age 29.



Frances “Fanny” Duberly (1830-1903) was the wife of a captain in the 8th Hussars. Vivacious and witty, she became the toast of the British Army in the Crimea; indeed, she was the only officer’s wife to stay there, riding Lord Cardigan’s horse and being present—as an observer—at the Charge of the Light Brigade. In 1857, Mrs. Duberly accompanied the regiment to India, and marched 1800 miles with the Rajputana column. She wrote to her sister: “There is plenty of fighting to be done, they say. I hear ladies are forbidden to go further than Deesa. In which case, I shall stain my face and hands and adopt the Hindu caftan and turban—I ain’t going to stay behind.” At Gwalior she rode with the Hussars in a charge against the mutineers. The remainder of her life was quiet; in 1896 she complained to a nephew, “I cannot stand dullness for long.”



Elizabeth "Nellie Bly" Cochrane

by the age of 22 was already an ace reporter for the *New York World* and had a reputation for courage and determination. She had written an expose of New York's Blackwell Island Insane Asylum by successfully pretending madness. In 1889, she set out to beat the fictional record set by Jules Verne's novel *Around the World in Eighty Days* and, without resort to liftwood flyers, completed the journey in 72 adventure-filled days.



Annie Besant (1847-1933) lived a most scandalous life, at least by the standards of her time. Raised in a devoutly Christian home, she married a clergyman at 17; at 23 she left him to become a militant Atheist, advocate of birth control, Fabian socialist and, in 1893, a convert to Madame Blavatsky's doctrine of "Theosophy," a mystical blend of Eastern religions. The mesmerizing and mysterious Madame Blavatsky passed over into the spirit world in 1895, entrusting her mission to Mrs. Besant, who immediately sailed for India and announced that she had, in a previous life, been a Brahmin. She founded the first college for Hindus (at Benares in 1898), split the Theosophic Society by proclaiming her adopted son the Messiah (which claim he later denied), and, in 1916, initiated the Home Rule for India League. Interned briefly, she lost the leadership of the Independence movement to Gandhi but continued to vocally decry British rule in India.

THE CHIVALRIC ORDERS

HEROISM OR outstanding service to the monarch was often rewarded with a knighthood. This award usually entailed membership in one of the chivalric orders. While these were technically all equivalent in honor, everyone knew different. The different orders, and their various ranks, are listed below in order of precedence; the Order of the Garter was the most prestigious of all. Those ranks noted with an asterisk (*) had fewer than 20 members, most of whom were members of the royal family; players should not expect to achieve these ranks in the normal course of things. Nothing, however, is impossible.

Members of chivalric orders were entitled to append the initials of that order after their name, these usually being given in order of precedence of the order. For example, Queen Victoria's son was officially Field Marshal His Royal Highness Albert Edward, The Prince of Wales, KG, KT, KP, GCB, GCSI, GCMG, GCIE.

Women were uncommon members of the chivalric orders but were not altogether absent from their rolls. Women members of the chivalric orders substitute the title "Dame" for Knight, and thus a Dame Commander of the Order of the Bath (of which there were several at this time) would append the initials DCB to her name instead of the initials KCB.

Order of the Garter

Knight (KG)*

Order of the Thistle

Knight (KT)*

Order of St. Patrick

Knight (KP)*

Order of the Bath

Knight, Grand Cross (GCB)

Knight Commander (KCB)

Companion (CB)

Order of the Star of India

Knight Grand Commander (GCSI)

Knight Commander (KCSI)

Companion (CSI)

Order of St. Michael and St. George

Knight, Grand Cross (GCMG)

Knight Commander (KCMG)

Companion (CMG)

Order of the Indian Empire

Knight, Grand Cross (GCIE)

Knight Commander (KCIE)

Companion (CIE)

THE REFEREE

WHAT IS the essential difference between a role-playing game (or RPG) and other games, such as board games? Some would say that board games are obviously different because they are played with playing pieces on a map or game board. However, many times in an RPG maps and playing pieces are extremely valuable. This book itself contains several maps, and the use of miniature figures to represent players and non-player characters can be very helpful. That can't be the difference, then.

Other people point out that in a role-playing game each player plays the role of a single character, usually quite different from himself, and measures his success in terms of achieving the goals that his character holds dearest, rather than his own. However, that's a pretty fair description of *Monopoly*, as well. In that game, each player assumes the role of a business tycoon and attempts to drive his competition into bankruptcy. Seldom are players of the game actual businessmen, and if they are they probably measure their own success somewhat differently than in the game. This is equally true for

Risk (world conqueror), *Milles Bornes* (European auto racer), and many other games. This, then, is also not what separates RPGs from other games.

The essential difference between an RPG and other games is the referee. In a board game, players interact with a world defined by the game rules. In an RPG they interact with a world defined by the referee, and the rules are merely present to help him in the task of definition. RPG rules are not meant to limit the referee, but rather to free him from having to decide how to resolve every routine event in the game. By freeing him from that task, the rules allow him to make his most important contribution to the game—his imagination.

It is the referee's imagination that turns the cold, printed words of the rules into a rich, vibrant world, full of colorful characters and thrilling adventure. To make this world come alive for your players, you will have to do four things. The referee must describe the world, play non-player characters, resolve critical events, and guarantee adventure. Let's examine these one at a time.

DESCRIBING THE WORLD

TAKE A MOMENT off from reading these rules and just think about what your senses tell you about your environment. Sight is the most obvious source of information available to you, but it is supplemented by sounds as well. What do you see around you? What do you hear? Do these two senses complement each other or give you contradictory messages? Perhaps you're in a quiet room which looks tranquil and orderly, but you can hear your brother and sister arguing in the next room—contradictory messages. What can you smell? Dinner cooking? Someone painting somewhere in the building? Garbage you've been meaning to take out getting a little rank? How about touch? You can feel this book in your hands and the chair you're sitting on, but what else? Is it a little warm, or is it maybe a little chilly? Is the humidity fairly high, or is it pretty dry right now? Are you outside? If so, you don't need a weatherman to know which way the wind blows.

All of these things let you know that you aren't just watching a TV program; you are alive in the world. For your players to enjoy the game fully, the world must seem real to them. That sense of reality must come from their senses. You are their senses. You are all of their senses, not just their sight and hearing. Your descriptions of the world don't have to be ageless prose, and they shouldn't be tediously detailed. They should include the most vivid impression the player receives from each of his senses. If the players want more detail, you can always provide it to them.

For example, a group of players makes a long trip from Earth to Venus and lands their interplanetary ether flyer in the lowlands. They tell the referee that they will open the hatch and climb down to the ground. The referee now takes over.

Referee: "You look out the hatch, and see swamp and jungle."

Right away the players can tell that Venus is going to be a real yawner. Try adding the other senses as well, and always begin your description with the sensory stimulus that will make the first and strongest impression on the players. On Venus that will probably be the heat.

Referee: "You open the hatch and you're hit by a wall of hot, damp air. You start sweating immediately, and you can feel your clothes sticking to your skin. You wipe the sweat out of your eyes and see mostly jungle and swamp. The sky is overcast, and you can't see for more than maybe half a mile because of the mist. The marsh smells like a combination of rotting vegetation and dead fish. There's kind of a sulfur smell, too, like you have near a volcano. You can hear lots of animal noises, the screech of small tree dwellers and the deep roars of the hunting meat eaters. You can also hear the distant crashing of trees and branches, the sounds a really big animal makes going through the bush."

Venus has just become real. It is exotic and interesting, with hints of danger to make it exciting. It's a place the players may be a little afraid of, but they probably feel a tingle of excitement, too, and they know that whatever happens, they probably won't be bored.

Here are some brief rules of thumb to remember when describing a scene

to your players.

- Never make it overdetailed. Stick to impressions, and let the players ask for details if they want them. Tell them the wall is covered with carvings; don't describe the carvings unless they ask.

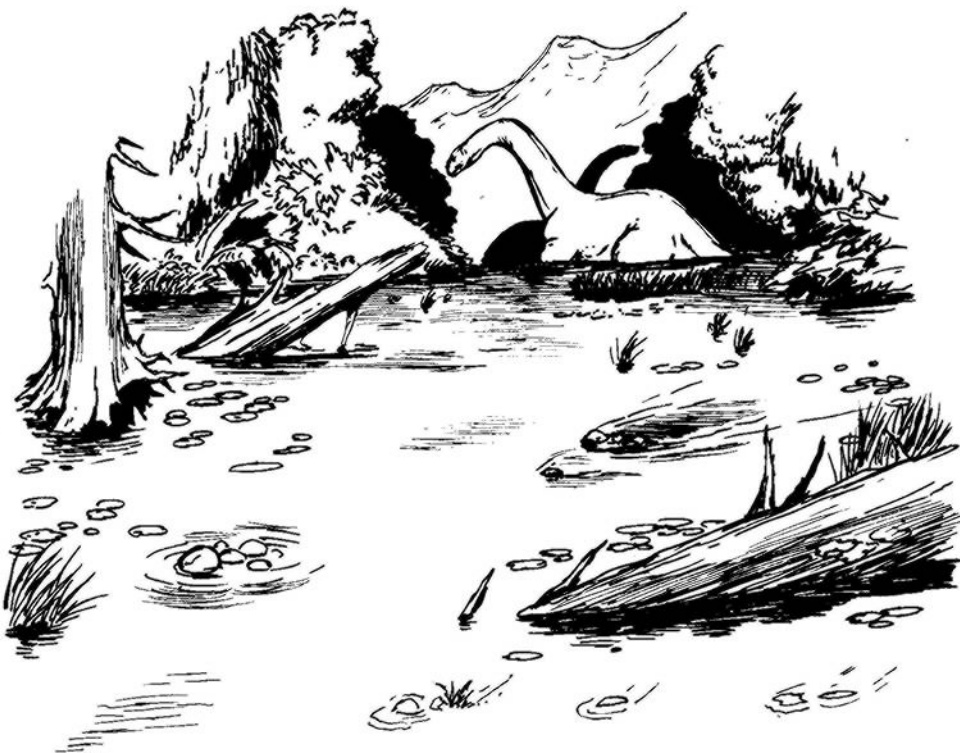
- Use all the senses. Movies and television have sight and sound. Reality has sight, sound, smell, taste, and touch. Don't just tell them they're tired; tell them what it feels like to be tired. Don't just tell them they fell in the bog; tell them what the bog tastes like when they swallow a mouthful of it.

- Start with the strongest sensory impression. The biggest change will be the first thing they notice, so start with that. That first sensory input (heat and humidity in the case of the Venus description above) sets the stage for all the others.

- Nothing gets players' interest like a hint of danger. In most cases there will be no immediate threat to

the players, but they will seldom be in a situation where there is absolutely no hint of danger. In the Venus description we have the roar of carnivores, the sounds of a giant animal, and the suggestion that there are volcanoes at least fairly close by. None of these pose any direct or immediate threat to the players, but each of them suggests lurking danger.

- Save the best (or worst) for last. In the Venus description, the single greatest possible threat to the players is the sound of the giant animal. Save that for last so that the other, more mundane impressions will not dilute its effect. When the players hear about the giant animal noises, their first reaction will probably be to ask, "Are the sounds coming closer or getting further away?" Now they don't have to wait through the other descriptions to ask. Also, saving the best for last will help keep the suspense level high during the adventure.



NON-PLAYER CHARACTERS (NPCs) are all the thinking beings that inhabit the universe with the exception of the players. They may be Martian pirates, Venusian Lizardmen, or German spies. They can be friendly, indifferent, or murderously hostile toward the players. The one thing that they all have in common is that the referee plays them when they come in contact with the players.

NPCs are extremely important in a game and can make the difference between a good, serviceable world and one that literally comes alive. In fact, in the best adventures the NPCs seem nearly as real as the player characters. For your NPCs to come alive in the minds of your players, you need to know three things: their abilities, their motives, and their appearance.

NPC ABILITIES

THE ABILITIES of an NPC are determined by his skills and attributes, just as with a player character. However, you can't afford to spend all the time of going through the character generation process just to come up with an NPC that the characters may ask one question of and then walk away from. Instead, a very simplified process is used.

NPC abilities are determined largely by the NPC's occupation. To begin with, occupation will almost always dictate Social Level. If the NPC is an ordinary seaman, he is almost certainly Social Level 1; if he's an admiral, he's probably Social Level 5 or 6.

Next, the occupation is liable to be either physically oriented or mentally oriented. The referee should make this decision, although usually it's

pretty clear. *A mentally oriented occupation has Intellect and Agility attributes of 4 with Strength and Endurance attributes of 2. Physically oriented occupations have these numbers reversed.*

Roll a die for his Charisma, or decide on it yourself. Is he charming and outgoing, or inarticulate and somehow irritating? This attribute is obviously not based on occupation, and you're as likely to find a charming rogue in an army barracks as on a country estate.

Skills are determined almost entirely by occupation. If the skill is needed for the character's job, give him a 2 or 3 in it. Exceptionally experienced NPCs might have a 4, while very young ones might have a 1. If it's the sort of skill the character might have picked up by chance, roll a die and subtract 2, 3, or 4 from the result. (The more experienced the character, or the more closely related the skill is to his occupation, the less you subtract.)

Close Combat skill and morale are determined by placing the character in one of five experience categories: Green, Trained, Experienced, Veteran, and Elite. Close Combat skills range from 1 to 5 and morale from 7 to 11 (respectively). This is repeated on the NPC Chart at the back of the book.

Finally, remember that none of the above is meant to limit your freedom of action. These are suggestions as to quick and easy ways of determining skills and attributes of NPCs. If your adventure plot calls for an accountant with a Strength of 6 and an Endurance of 5 whose hobby is the study of physics and the ancient stone carvings of the proto-Martians, well fine.

NPC MOTIVES

ANOTHER THING that can be of aid to a referee in playing the part of an NPC is a definition of that NPC's motives. In many cases the motives of NPCs are unimportant. For example, the third spear-carrier from the left in King Hattabranx's personal bodyguard may be seething with anger and humiliation over the fact that his fiancée has jilted him for a local merchant, but that fact is unlikely to affect your player characters. Motives become important, however, with influential or potentially influential characters.

To determine NPC motives, roll two dice, preferably of different colors. The result thrown on the first die (called the control die) determines the general category of NPC motive while the result of the second die rolled (the trait die) determines the specific motive or personality trait. The personality trait is described in the sidebar with a single word meant to sum up the trait, followed by a short explanation. Later in the rules and in adventures these motives will be listed only by the single identifying word. After a short while this one word should be sufficient, but an occasional rereading of these descriptions can be helpful.



NPC MOTIVATIONS

ROLL TWO differently colored dice; read results as two different numbers (do not total).

1: Danger

11: Coward. The NPC is a total coward and will run from danger at every opportunity.

12: Cautious. He is particularly mindful of the potential hazards of a venture and is often suspicious of potential tricks being played upon him or his group.

13: Steady. He is not frightened or intimidated by violence or threats of violence.

14: Aggressive. He is aggressive and accepts the necessity of violence as an occasional means of achieving solutions to problems.

15: Adventurous. He loves danger and adventure and will actively seek it out for the excitement and variety it brings.

16: Sadistic. He is a sadistic brute who enjoys inflicting pain on others.

2: Honor

21: Liar. The NPC is a liar, perhaps a thief, and probably a traitor. He is completely untrustworthy.

22: Disgraced. He has been disgraced, either by his own actions or by events beyond his control. This has left him a broken man with little hope or self-esteem.

23: Driven. He has been disgraced, as above, but he now bends all of his efforts toward redeeming himself and recovering his honor by means of a deed of great heroism or some exceptional service.

24: Proud. He is concerned with proving that he is honorable and is likely to take offense at any suggestion that he is not.

25: Honest. He is scrupulously honest and his word of honor is his absolute bond. He has contempt for liars and anyone who breaks his word.

26: Just. He sees justice as the greatest virtue and the only important consideration in deciding on a course of action. He hates cheaters, liars, and crooks, will always assist any attempt to right an injustice, and would sooner die than turn away from the obligations that his concept of honor imposes on him.

3: Wealth

31: Generous. The NPC is generous to a fault and gladly gives whatever he has to those in need.

32: Spendthrift. He is a reckless spendthrift or addicted to gambling. He is either squandering what money he has or already is heavily in debt.

33: Mercantile. Making money is always his first consideration, and he will always haggle over prices and wages.

34: Frugal. He is cost-conscious and interested in making money. He has a good eye for a bargain.

35: Greedy. His lust for money makes him easy to bribe, and he might even betray his friends if the price were right.

36: Miser. He is obsessed with money, believes that everything has a price, and will do literally anything if offered enough money.

4: Power

41: Boastful. He is a self-important braggart who wishes to impress everyone with his importance.

42: Responsible. His desire for a position of greater importance and social status makes him self-reliant and willing to accept responsibility. He has a healthy ambition that makes him a go-getter.

43: Ambitious. He is ambitious and has a tendency to manipulate those around him. He does so for what he believes to be the common good, however, not for personal gain.

44: Ruthless. He is ruthlessly ambitious and will let nothing stand between him and his goals. He can appear to be considerate, generous, loyal, or anything else which serves his purpose. But beneath this exterior he has no genuine concern for anyone else and will use anyone or anything to achieve his ends.

45: Arrogant. He is pompous and arrogant. He clearly believes himself superior to everyone around him and makes no secret of the fact.

46: Leader. He is a charismatic natural leader who draws others to him and inspires extreme loyalty.

5: The Mind

51: Eccentric. The NPC is an eccentric. He is actually harmless and may be quite entertaining but insists on engaging in bizarre behavior.

52: Knowledge. He is driven by an overpowering thirst for knowledge. This may be knowledge of a particular ancient race or civilization, knowledge in a particular field of science, etc.

53: Stubborn. He is stubborn and nearly impossible to persuade once he has made up his mind.

54: Wise. He is very wise, shows good judgement, and offers sound advice.

55: Rage. He is subject to sudden, violent, and uncontrollable rages.

56: Mad. He may appear to be a harmless eccentric or, perhaps, completely normal. However, he is genuinely and completely insane. This condition may render him helpless and bewildered or may turn him into a dangerous and cunning killer.

6: The Heart

61: Lust. The NPC is driven by lust for the opposite sex and a desire to control or dominate them. This desire can be directed either toward one particular person or just toward the opposite sex in general.

62: Hatred. He is consumed with hatred for a person or group, usually because of a real or imagined injury, and will direct much of his energy toward seeking revenge.

63: Friendly. He is amiable, friendly, and cooperative.

64: Fair. He has a strong commitment to fairness and reacts with anger to injustice and brutality.

65: Loyal. He feels a strong bond of loyalty to his group. This bond may be toward his band of fellow adventurers, his regiment (in the army), his country, his family, or any other suitable group.

66: Love. He loves a person (friend, spouse, parent, child, etc.) so completely that he would willingly sacrifice himself for that person.

NPC APPEARANCE

THE APPEARANCE of an NPC is the first thing a player notices but should be the last thing you decide about the NPC. The NPC's appearance will in many cases be a reflection of his abilities and motives. Likewise, appearances will shape the opinions of your player characters; often they will be all a player has to go on when making a decision. Appearance includes physical description and clothing, speech, posture, and so forth. As with a scenic description, emphasize the things that deviate from the norm and will catch the player's eye. Also, make an attempt to use colorful adjectives when describing NPCs. If you were a player, which of the following NPC descriptions would you prefer?

"As you ride down the road you see a farmer standing in his field."

"As you ride down the road, you come to a grizzled, old farmer in dusty work clothes leaning against the sagging rail fence that surrounds his field."

The second NPC description gives a much more vivid picture of the farmer. Now apply some of the other advice concerning scenic description. Provide other sensory information, throw in a hint of danger, and save the best for last. You may end up with a description like this:

"As you ride down the road, you come to a grizzled, old farmer in dusty work clothes leaning against the sagging rail fence that surrounds his field. He must be resting after hard work, because he gives off the strong smell of sweat. He shows no sign of interest or welcome as you approach. The left side of his face is puckered by a long, jagged scar."

Usually you will want to make up the appearance of NPCs yourself with some specific image or mood in mind. Also, the appearance of some NPCs will be dictated by their occupation. A member of the engine crew on a steamship will be covered with coal dust. A government clerk will be conservatively dressed and perhaps physically frail or small.

STOCK CHARACTERS

THERE ARE a number of instances where a stock character can come in very handy, usually when large numbers of them are encountered. The NPC Chart in the chart section of this book lists a variety of stock NPCs and their typical experience, attributes, and skills.

DETAILED NPCs

MOST NPCs are "spear-carriers." They hang around and provide local color as long as they are needed, and then they vanish forever. They are generally slow of wit, weak of limb, and quick to perish. Well, not everyone can be the hero of this story, and if the NPCs were as capable as your players, life would be much more difficult for them and, more importantly, impossible for you, the referee. Imagine every person your players run into with detailed skills and attributes, and three or four cunning plans up their sleeve. The paperwork alone would choke your game. So, for a variety of excellent reasons, most NPCs are just the bare bones of a character, a cardboard cutout to which you give the illusion of reality with elaborate descriptions and a couple of well-chosen motivations.

Most NPCs. But not all of them.

**"So, Baron von Gruber,
We Meet Again."**

SOME NPCs deserve more, and we call these *detailed NPCs*. These detailed NPCs are recurring characters. They include the NPC associates that the characters have acquired as a result of character generation as well as certain major characters that the players may run into from time to time. As there is only a limited number of these, you can lavish them with a little more attention. Most importantly, however, these NPCs are where the referee really gets to play the game, for in a sense these are his own characters. You can generate detailed NPCs yourself once you are familiar with the system, but we've included several of them here and on the following pages to get you rolling.

Gentleman Companion (Green NPC)

Att.	Skills
Str: 3	Fisticuffs 2, Throwing 1,
Agil: 5	Stealth 4, Marksmanship 2 (rifle),
End: 2	Wilderness Travel 2, Swimming 1,
Int: 1	Science 1 (astronomy),
Chr: 4	Eloquence 3, Linguistics 3 (French, German, Italian),
Soc: 6	Riding 5 (horse), Pilot 1

Motives: Friendly, Generous.

Appearance: A handsome, well-dressed man of average build with a faint scent of cologne about him. His speaking voice exhibits an upper-class accent and a trace of a lisp. His expression is almost invariably cheerful and friendly, if just a trifle blank.



Manservant (Experienced NPC)

Att. Skills

Str: 4 Fisticuffs 3, Throwing 2,
Agl: 3 Stealth 2, Marksmanship 2 (rifle),
End: 4 Wilderness Travel 3,
Int: 2 Observation 3,
Chr: 3 Eloquence 2, Linguistics 4 (French, German, Italian, Spanish), Bargaining 2,
Soc: 2 Riding 3 (horse), Medicine 2

Motives: Honest, Loyal, Steady.

Appearance: He is a large man, although in excellent condition. If encountered in civilized surroundings, his clothing (which is well made but not flashy in any way, as befits his station) will disguise his size and strength to some extent. He will seldom venture an opinion of his own and if asked about any subject outside of his immediate responsibility, he will claim ignorance and display a lack of interest. His entire attention seems to be focused on his master at all times.

Master (Experienced NPC)

Att. Skills

Str: 4 Fisticuffs 3, Throwing 2,
Agl: 4 Stealth 3, Marksmanship 3 (rifle),
End: 3 Wilderness Travel 3, Swimming 1,
Int: 2 Observation 1, Science 1 (chemistry),
Chr: 2 Eloquence 1, Linguistics 3 (French, German, Arabic),
Soc: 6 Riding 5 (horse)

Motives: Adventuresome, Arrogant (or Proud, if desired), Rage.

Appearance: Though large, his size does not impede his actions, and he deports himself in a manner befitting his class and athletic interests. His clothing is stylish and well tailored.

Maid (Trained NPC)

Att. Skills

Str: 2 Fisticuffs 1, Throwing 1,
Agl: 3 Stealth 2,
End: 3 Wilderness Travel 2,
Int: 4 Observation 5,
Chr: 4 Eloquence 3, Linguistics 4 (French, German, Italian, Spanish), Bargaining 2, Theatrics 2,
Soc: 2 Riding 3 (horse), Medicine 2

Motives: Honest, Loyal, Cautious.

Appearance: She is an attractive woman, but not exceptionally so, a fact emphasized by her very plain but proper clothing. She is well-spoken but does not venture to speak unless spoken to. Her face is an intelligent one, and she seems quite alert to her surroundings.



Henchman (Experienced NPC)

Att. Skills

Str: 4 Fisticuffs 3, Throwing 2,
Agl: 5 Stealth 5, Crime 2,
End: 3 Wilderness Travel 2,
Int: 3 Observation 2,
Chr: 2 Eloquence 2, Theatrics 2
Soc: 1

Motives: Loyal, Sadistic, Ambitious.

Appearance: He is a wiry man, of about average size, badly in need of a shave and haircut. If the wind is blowing toward you, you can tell that he could use a bath as well. He has cruel but penetrating eyes and his lip curls in a sneer as he sees you. His clothes are dirty and shapeless. His nose has been badly broken at some point in the past. An especially observant character may notice that his lean face and baggy clothes disguise the fact that he is actually extremely strong and carries himself with a natural grace reminiscent of a hunting cat. He is undoubtedly extremely agile.

Baron Hasso von Gruber (Experienced NPC)

THE BARON is the head of the German diplomatic mission to Mars in Western Dioscuria. He is in his mid-50s and served as a junior officer in the army when younger, seeing some action in the Franco-Prussian War (1870). He was wounded in action, as a result of which he has lost the use of his left arm. Despite this he has a warm regard for the French and respects and admires their culture greatly. He has little regard for the British, however, whom he sees as dull, meddlesome, middle-class merchants, with neither the martial discipline of the Germans nor the fiery dash of the French. He is frequently known to observe that, "It is one of nature's genuine paradoxes that the achievements of the British are so fascinating, while the British themselves are so mind-numbingly dull."

His mission on Mars is to increase German power and prestige and to obtain a secure access to liftwood for the Imperial German Navy's building plans. While able to purchase considerable supplies from various sources over the past three years, Gruber has so far been unable to gain a secure territorial enclave with permanent access to liftwood. To an extent this is due to the fact that he devotes considerable resources to undermining British rule in Syrtis Major as opposed to improving German influence in the northwest. As players uncover various plots and intrigues against Great Britain, Gruber's shadowy and sinister presence behind the scene will increasingly be felt.

Gruber is continually hatching

some new plot against the British, and if the players get in his way, he will attempt to deal with them efficiently and ruthlessly. If they escape after foiling his plans, however, he will seldom hold a grudge. Although he may some day be forced to liquidate the player characters, he has much more respect for a worthy adversary than for a weak ally.

Gruber's native language is German.

Att. Skills

Str: 4 Fisticuffs 3, Throwing 2,

Agl: 2 Stealth 1, Marksmanship 3 (pistol),

End: 1

Int: 5 Observation 5,

Chr: 3 Eloquence 4, Linguistics 3 (French, English, Dioscurian), Bargaining 1, Theatrics 1,

Soc: 6 Riding 6 (horse)

Motives: Ruthless, Aggressive, Hatred (the British).



Appearance: The baron is a stout, heavy man, with a large frame. He was obviously quite strong when young and probably is still very formidable. He wears his black hair, now graying in places, short, and he sports a small military mustache with the ends waxed and turned up. He has a surprisingly soft voice for a

man of his size, although it has a penetrating quality which seems to demand attention. Aside from state occasions when he will appear in uniform, Gruber prefers to dress casually in riding or hunting clothes. His left arm hangs limp at his side, and he always wears a black leather glove on his left hand. If players meet him in a social setting, they will notice an understated but very original wit. In other environments, however, Gruber will be (literally) deadly serious.

Ravachol the Anarchist (Experienced NPC)

"RAVACHOL" IS an alias. He was born Francois Königstein in St. Chamond, France in 1849 and from the age of eight had supported his family by various endeavors—some legal, some not. At 18 he abandoned religion for anarchism. He became an extremely dangerous criminal, "thief, counterfeiter, murderer," as he himself said, and a grave robber as well. Anarchism seemed to legitimize his crimes as blows against the class enemy, yet he displayed a streak of sincere conviction as well. After being arrested by the French authorities, he explained at his trial that "My object was to terrorize so as to force society to look attentively at those who suffer." One anarchist paper compared him to Jesus, while others questioned whether a man who bludgeoned old ladies could bring about a perfect society. His conviction and subsequent death sentence, however, made him a hero. The French coined the verb *ravacholiser*, meaning "to wipe out an enemy." He was clearly a threat to the republic. So, when he escaped inexplicably from his cell on July 7th,

it was a Most Serious Matter. The authorities believe they will hear again from Ravachol. On his cell wall he left a motto: "If you want to be happy, hang your masters and cut the priests to pieces."

Ravachol's native language is French.

<i>Att.</i>	<i>Skills</i>
Str: 2	Fisticuffs 1, Throwing 1,
Agl: 6	Stealth 5, Crime 4 (forger),
End: 4	Wilderness Travel 3,
Int: 5	Observation 4, Engineering 2 (explosives),
Chr: 3	Eloquence 4, Theatrics 2, Linguistics 2 (German, English)
Soc: 1	

Motives: Hatred (for authority, government, and the upper class), Cautious, Ruthless.



Appearance: Ravachol is a slight man, standing five feet, four inches, and of slender build. He is 40 years old when the players meet him, but his age is difficult to determine. He has brown hair untouched by gray which he wears long. He also sports a full beard. His face is sallow and thin and his eyes deep-set and steady. He will generally be dressed in a wrinkled, dark suit, although he seldom wears a collar or necktie. He has a round scar on his left hand between the thumb and index finger.

Major General Andre Foucard (Trained NPC)

GENERAL FOUCARD is the commander of the Belgian military forces in the Coprates and, as it is under martial law, the governor of the region as well. True to the wishes of his monarch, King Leopold of Belgium, he has vigorously pursued a military campaign for the past several years to pacify the inhabitants of the Coprates Rift Valley and turn the valley into a prosperous Belgian colony. Unmindful of the wishes of the native inhabitants, the Belgian Army has cut a swath of death and destruction through the valley and met any show of resistance with merciless cruelty. Despite this, the war is in danger of spilling out of the boundaries of the Coprates proper.

The reason for this is fairly simple: Foucard is a dull-witted, mediocre military commander with nothing to recommend him except a talent for cruelty and absolutely no conscience. His actions have been, and will continue to be, crude and heavy-handed. He is inclined to act first and worry about the consequences later (if at all). Eventually he will overstep his authority too much and will be disposed of, but he lacks the imagination to foresee this.

The real danger to the players, should they run afoul of Foucard, is this very lack of imagination. He is quite capable of taking violent action in a fit of rage or lust which no responsible official would dream of. The resulting diplomatic incident might or might not result in Foucard's removal, which may prove of some small comfort to the player character's next of kin.

Foucard's language is French.

<i>Att.</i>	<i>Skills</i>
Str: 4	Fisticuffs 3, Throwing 2,
Agl: 5	Stealth 4, Marksmanship 2 (pistol),
End: 6	Wilderness Travel 6, Fieldcraft 1,
Int: 2	Observation 2,
Chr: 1	Leadership 2,
Soc: 4	Riding 3 (horse)

Motives: Arrogant, Sadistic, Lustful.



Appearance: Foucard is short and ugly. He will probably be wearing his uniform, although in a slovenly manner, without a shirt and with the jacket completely unbuttoned to expose his hairy chest (which he imagines women find exciting). He is almost always dirty and oily looking and in need of a bath. He deliberately cultivates the look of a man who has just returned from the bush, although he actually seldom leaves his headquarters compound. His eyes are narrow and cruel, and his ferret-like face is usually covered with a thin, uneven stubble of beard.

Kaaraahn Kaashneek (Experienced NPC)

KAASHNEEK IS a Canal Martian from any city-state that is convenient for the referee. He is an orphan and grew up in the slums and criminal quarters, making his own way by petty theft and various cons. Now that he is older he has turned to the path of honesty, at least by his own rather lax standards. He will attach himself to the party of adventurers as a guide and interpreter and will not stop bothering them, in a very friendly and helpful way, until they take him on.

Kaashneek is a very useful NPC for the referee, for he is extremely streetwise and knows everything about local politics, crime, and law enforcement. He can contact the underground in almost any city and gain valuable information. He is, in short, a good way for the referee to fill the players in on important information without just reciting it to them.

Kaashneek's only drawback, from the players' point of view, is his propensity for wild schemes. He will repeatedly come up with plans for dangerous and improbable expeditions that promise great riches for the players, which he honestly believes will work. These plans should be very grandiose, involving such things as Kaashneek's having purchased a map to the lost treasure vault of Emperor Seldon. How true they are is up to the referee, but bear two things in mind. If they are what they purport to be, the players will soon become so rich they have no need to continue adventuring. On the other hand, if they have no reward at all the players eventually will stop pay-

ing attention to him altogether. You probably don't want that to happen as his schemes are excellent starting points for adventures of your own devising.

Kaashneek should be played as a real "character," a charming, likable rogue with a weakness for crazy get-rich-quick schemes.

Att. Skills

Str: 2 Fisticuffs 1, Throwing 1,

Agl: 5 Stealth 5, Crime 4 (pick-pocket),

End: 4 Wilderness Travel 3 (foraging), Swimming 1,

Int: 3 Observation 2,

Chr: 6 Eloquence 6, Linguistics 5 (English, any four Martian languages), Theatrics 2, Bargaining 1,

Soc: 1 Pilot 1 (boat)

Motives: Adventuresome, Friendly, Eccentric.



Appearance: Kaashneek is tall and slender, even by Martian standards, and when first met will be dressed in a wild conglomeration of ill-fitting, cast-off clothing, probably ragged and a little dingy. As his finances improve, his taste in clothing will not, and he will sport garish, ridiculous outfits. His features are broad and friendly, and his smile reveals several missing teeth (lost in alley fights). He will usually be smiling and cheerful.

King Hattabranx (Veteran NPC)

KNOWN TO the Oenotrians as the "Thug King" and known to most others by a variety of less polite names, Hattabranx is the High Martian king of the Baarovaangian Host. His stronghold, the sinister Kraag Barrovaar high in the Astusapes Mountains, is the most famous and formidable of the High Martian fortress-mountains. From his barbaric throne room, littered with the bones of former prisoners, he plots revenge against the Red Men from Earth for all the real and imagined humiliations he has suffered at their hands. Goaded on by the diabolical Worm Priests, his mad, twisted mind seethes with hatred and blood-lust.

Hattabranx is very bad news.

Att. Skills

Str: 1

Agl: 3 Stealth 3, Marksmanship 3 (bow),

End: 5 Wilderness Travel 4 (foraging),

Int: 2 Observation 1,

Chr: 4 Eloquence 4, Linguistics 3 (Syrtan, Umbran, English), Bargaining 4,

Soc: 6 Leadership 5, Pilot 4 (cloudship)

Motives: Hatred (of Earth humans), Sadistic, Mad.



Appearance: Hattabranx will almost always be encountered in his throne room, which is filthy and stinks of rotten meat and waste. He will be seated on or crouching in his throne, his heavy, twisted, gold King's Necklace (the High Martian equivalent of a crown) draped around his shoulders and the heavy, spiked, mace-like royal scepter at his side. His shaggy hair is matted, and much of his black hair has become a grizzled white and gray. His skin is dry and wrinkled, like leather. His eyes are deep-set and suspicious, and his attitude is decidedly unfriendly.

Frederick Gustavus Burnaby (Elite NPC)

BURNABY JOINED the British Army in 1858 at the age of 16 and resigned in 1885 to emigrate to

Mars. When he resigned, he was a colonel in the Horse Guards, one of the most fashionable regiments in the army, but had managed to see considerable action during his career. He has always been an aeronautics enthusiast as well, having made numerous balloon ascents and having built several aerial steam launches in the early 1880s. The high point of his career was his rescue of General Gordon from Khartoum by aerial flyer in '85. When the government decided later in the year to place all aerial vessels under the control of the navy, Burnaby resigned.

Burnaby was suffering from a heart ailment in any case, and he decided to emigrate to Mars where the slightly lower gravity might help his condition. Upon arriving, he built a powerful aerial steam vessel (the *Penelope*) and soon was active along with the other Red Captains as an explorer, privateer, and point man for British expansion on Mars. He is now the most famous and respected of the Red Captains and has tremendous influence with Her Majesty's government on Mars as well as many of the neutral Martian princes.

Att.	Skills
Str: 6	Fisticuffs 5, Throwing 3,
Agl: 2	Stealth 1, Marksmanship 2 (pistol),
End: 1	Wilderness Travel 1 (mapping), Swimming 1,
Int: 3	Observation 2, Science 1 (physics),
Chr: 4	Eloquence 4, Linguistics 6 (French, German, Spanish, Russian, Turkish, Arabian, Italian, High Syrtan, Low Syrtan, Umbran, Oenotrian),
Soc: 5	Riding 5 (horse), Leadership 2, Piloting 3 (flyer)

Motives: Adventuresome, Loyal, Steady.



Appearance: Burnaby is a remarkably big man, six feet, four inches tall with a 46-inch chest. (His height and massive chest contribute to his popularity with the Martians, who often make crude but good-natured jokes about the possibility of his having a Martian ancestor.) He is now 47 years old, and his dark brown hair is flecked with gray, but he is obviously still very strong. (He was widely believed to be the strongest man in Europe when he was younger, and he sometimes demonstrated his strength by carrying a pony under one arm.) He has deep-set eyes and a serious face. He generally wears an old, threadbare, black army patrol jacket and a sun helmet and carries a heavy, four-barrel pistol in a holster at his side. On his neck is a nasty, ragged scar, a souvenir of his fighting in the Sudan in 1885.

EVENT RESOLUTION

THE RULES for resolving events are presented to give you a fair and impartial means for determining the success or failure of a character's attempt at a task. However, the most important thing to remember is that you, as referee, actually decide how events are resolved. The event resolution systems shown below are meant to help you, not restrict you.

For example, a formal means is given to determine whether a character notices something out of the ordinary. However, if it is important to the adventure that a guard not notice the hiding player characters, it is perfectly all right to decide that they remain undetected. To maintain the suspense, however, you should roll one or more dice before announcing that the guard passes by unaware.

In fact, in general it is a good idea to conduct as many of the event resolution die rolls as possible yourself and then announce the results. This makes the game seem less mechanical to the players and enables you add a secret die roll modifier here or there to make things come out right without anyone being any the wiser.



A second important thing to remember is that this is a role-playing game, not a dice-rolling game. While many different die roll resolution methods are available to resolve events, they should never be considered a complete substitute for role playing.

For example, many characters have Bargaining skill. If desired, all Bargaining could be reduced to a single die roll, but that method is very dry and sterile, the exact opposite of what a role-playing adventure should be. Instead, the player character should actually bargain with the NPC (as played by the referee), and how well he does at role playing should be as important as his actual Bargaining skill. What the referee may choose to do is give players with higher Bargaining skill more information, such as: "He seems nervous, as if he's anxious to sell this statue quickly. Maybe something's wrong with it." Players with low Bargaining skill might be told an NPC seems unwilling to make any concessions, when in fact he is ready to give in. In both cases the skill level affects the ability of the player to bargain effectively, but the actual haggling is up to him.

Another example, and a very important and common one, is an attempt to persuade an NPC. The skill which influences this is Eloquence, and the attribute that will influence it is Charisma. The referee should choose one of these, whichever seems more appropriate to the situation, as the principal skill or attribute and use the other as a die roll modifier. However, the player should actually attempt to persuade the NPC (again played by the referee), and the quality of his argu-

ments should determine how easy or difficult the task of persuading the NPC is. In other words, his Eloquence and Charisma do not enable him to come up with good arguments, they merely help him phrase them in more pleasant and effective ways.

Finally, always remember that you can make something up. It is far more important that the events be resolved quickly and smoothly than that you follow each and every rule in this section. If you don't remember which skill is used for a specific task, use your own common sense. After all, that's how we came up with these rules in the first place.

EVENT RESOLUTION METHODS

THE TWO methods for resolving an event are the skill dice/attribute dice method and the quick roll method. The skill dice/attribute dice method has more scope for variation and fine-tuning, and should be used for most important tasks. The quick roll method is used for routine, less important tasks. The quick roll is good for resolving things that need to be done quickly to maintain the tempo of the game (especially in the case of combat, which should be fast and furious), and for those tasks which are too simple to need or benefit from the skill dice/attribute dice method.

Skill Dice/Attribute Dice

THIS METHOD has the player character (or the referee for NPCs) roll a number of dice equal to his skill level or attribute level, whichever is appropriate. The dice rolls are added together, and the total is compared to a fixed target level.

Normally the number of dice rolled is equal to the relevant skill level. If the specific task is covered by a listed skill, that skill is used. However, if there is no specific skill covering the task, the referee decides which of the six attributes best covers the task and uses its score as the number of dice rolled instead. If two different skills seem to cover the task equally well (or nearly so), use whichever is higher. If two different skills are both required to complete a task successfully, use whichever is lower. For example, figuring out how to operate a mad scientist's lightning cannon might be accomplished using knowledge of either Electricity or Gunnery. Use whichever is higher. But to impersonate a German officer requires both Theatrics skill *and* a knowledge of German, so use whichever skill level is lower.

In general, the target level of the dice roll is based on the difficulty of the task attempted. Difficulty goes up in increments of four from the easiest to the most difficult, as noted in the table below:

TASK

DIFFICULTY LEVELS

<i>Difficulty</i>	<i>Target Level</i>
Easy	Target 4
Moderate	Target 8
Difficult	Target 12
Formidable	Target 16
Impossible	Target 20

Several players may combine (add their skill or attribute rolls together) to perform certain tasks, such as lifting a heavy weight. The referee should limit the number of players who combine to attempt a task, how-

ever, if physical space is limited. Only one or two players at a time could attempt to force a door, for example.

The target levels of certain physical tasks are easier to define in concrete terms, and specific target levels are set for them. These physical tasks are:

Lift a Heavy Weight: Roll Strength dice. The target level is 1 per 10 pounds of weight. Lifting a 100-pound weight has a target level of 10, for example.

Leap a Distance: Roll Agility dice. Jumping a one-yard gap is Easy, a two-yard gap Moderate, a three-yard gap Difficult, etc. Reduce the difficulty by one level if the character takes a running start. Raise it by one level if carrying more than 20 percent of his own body weight, by two levels if carrying more than 40 percent, etc. A 150-pound character, for example, would increase the difficulty by one level if carrying over 30 pounds, by two levels if carrying over 60 pounds, by three if carrying over 90 pounds, and so forth.

Throw an Object For Distance: Roll Throwing or Strength dice (whichever is greater). The distance the object is thrown is four times the dice roll divided by the weight of the object in pounds. For example, a character with a Strength of 4 rolls a 15 on his Strength dice. This result would mean that he threw a one-pound object up to 60 yards, a two-pound object 30 yards, a 10-pound object six yards, and a 100-pound object onto his foot. The player does not have to throw the object the full distance rolled. He can state how far he wants to throw it, and it will go that distance (roughly), unless it falls short due to a poor die roll.

Quick Roll

THE QUICK ROLL system is done with one die; the referee instructs the player to "roll against" a skill or attribute. Alternatively, the referee may make the roll himself and ask the players for their appropriate skill or attribute numbers. The task is successful if the skill or attribute number or less is rolled.

This is a good way to resolve quick events that occur. Do the players notice that the carvings on the wall are the same as in the temple at Kraag Barrovaar? Roll against Observation. Do they notice the vaguely stilted accent of the French customs official? Roll against Linguistics (French). Do they notice, when seated at the large viewing window in Doctor Ladislav's ether flyer, that they are not heading toward Mars after all? Roll against Astronomy. Most NPC tasks should be resolved this way.

Die Roll Modifiers

SOME TASKS are performed using one skill or attribute but are modified by another. For example, some melee weapons have a required Strength level. If a player's Strength is below the required level, the deficit is a negative modifier on his chance of hitting. The referee has the player roll against his Close Combat skill to hit, but would subtract the deficit from the skill level.

This can be used to good effect when knowledge from several different fields will help complete a task. A player with a good knowledge in these fields would use his best skill, but would also receive a die roll modification (at the referee's discretion) to further help him in his attempt.

ADVENTURES

ANY ADVENTURE has three basic elements: the situation, the characters, and the plot. Each element helps contribute to the overall level of excitement and interest that makes the adventure memorable.

The Characters: The players will bring their own player characters into the adventure, and they will be the protagonists, the main characters around which the action revolves. Almost as important, however, are the non-player characters that you will make up for the adventure. Refereeing a role-playing adventure is very much like telling a story (with the big difference being that the players decide the actions of the main characters). What makes a story interesting is usually the interaction between characters in it. If your non-player characters are lifeless and uninteresting, the excitement level will suffer. So before running an adventure with your characters, take a few minutes and give some thought to the NPCs they will encounter, and to what you can do to make them more interesting.



The Situation: The referee determines the situation that the characters face. Someone has to establish the scene and the initial events that will plunge the group of characters deep into the adventure, and by default, the referee has this responsibility. This situation will give the characters an understanding of their location, resources, potential problems, and, most important of all, their goal.

There are five pure goals that can drive an adventure. These goals are the chase (and its opposite, the pursuit), the assault or rescue, the voyage of exploration or discovery, the search for enrichment, and the mystery. For an adventure to be successful, it has to have at least one of these goals present. Most good adventures will have the potential for more than one. In addition to providing a more complex plot, this also can lead to interesting conflict between the player characters if they have different opinions as to which goal is more important.

The initial situation can also be used to good effect to set the mood of the adventure. For example, suppose the players are asked to perform a mission for the British colonial government on Mars. The briefing can take place in the cool interior of an official's office. Imagine, however, that the briefing takes place at an outpost soon to be overrun by an advancing Oenotrian column. The compound is full of activity as soldiers rush to pack what gear they can, while clerks keep large bonfires fueled with government files. Dependents will move out as well, and there are wives, crying children, frightened servants, loudly protesting pack animals, and a general air of near-panic. The official who asks for help should be exhausted, harried and perhaps even slightly wounded. But in the midst of all this beehive like activity, he will take time to explain this mission and its importance. How much more of a sense of urgency will your players come away with in that situation?



The Plot: The plot is determined jointly by you and your players. Obviously you cannot completely control their actions (or you might as well have nothing but NPCs in your game!), nor can your players completely control their surroundings or the actions of the NPCs. Therefore, the actual course of the adventure, its plot, is determined jointly as events unfold. The referee, however, bears the major responsibility for the plot since he determines which events and encounters happen when. It is up to him to keep the players on track and moving toward a logical conclusion to the adventure and to keep the adventure from dragging.



An adventure drags when players lapse into inactivity. This may happen on a long caravan trip, a sea voyage, or when engaging in any repetitive activity such as exploring, travelling, etc. The referee should liven these times up with a catalyst to force action. Typical catalysts include:



Danger: to force action through a threat of harm or disaster.

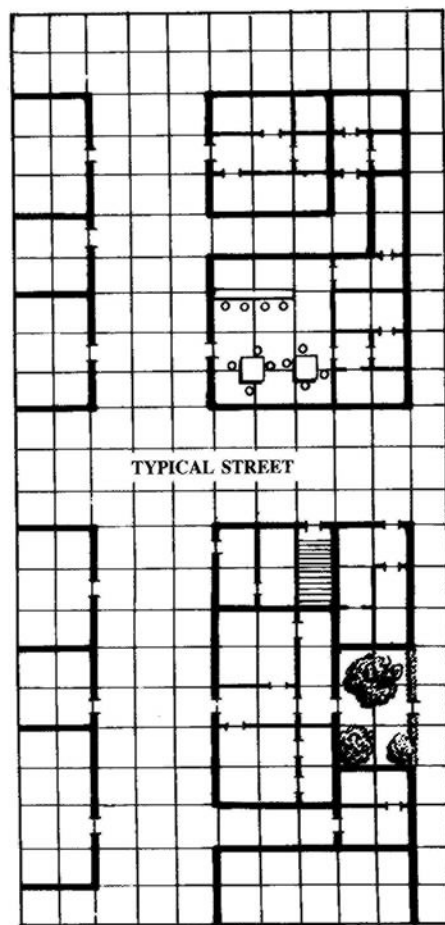


Opportunity: to force action through promise of a reward.



Puzzles: to force action through curiosity.

Although some discretion should be used when dealing with extra wrinkles thrown in like this, it is much harder to overdo the action than to underdo it. These players of yours are, after all, adventurers. They are in the situation they are in because they are looking for adventure. While recklessness is not recommended as the best means of ensuring survival, excessive timidity or caution should be discouraged.



Alternatively, situations which cause an adventure to drag can be summarized, and the scene of the plot can be moved directly to the locale of the next adventurous activity. If you don't want to put in an extra wrinkle because it would cause too great a set of complications, summarize useful information gained and cut to the excitement.

REWARDS

THE SUCCESSFUL completion of an adventure by your players should be accompanied by suitable rewards. Five types of rewards may be acquired as a result of an adventure: money, awards and renown, experience, knowledge, and souvenirs.

Money: The easiest form of monetary reward to acquire is that found during the adventure. This often takes the form of loot which can be brought back and divided up immediately or auctioned off and the money divided into whatever shares are agreed upon. The prices in the equipment section help in determining what the players receive at auction. The prices, however, are for new merchandise, and that which the players bring back will probably not be new. After deducting an auctioneer's expenses and commission, the players will be lucky to clear half the item's original purchase price.



A second type of money reward is, literally, a cash reward. This reward may have been agreed upon before as a fee for completion of some specific job, or it may come as a surprise. It was not unheard of for charitable or patriotic societies or the government itself to provide a cash reward for a service well rendered, and it was certainly not considered ungentlemanly to accept. (It was considered tacky to complain about the smallness of the reward, but that did not prevent even prominent figures from doing so on occasion.)

Awards and Renown: Players start out with no fame, but will gradually accumulate it as the game goes on. At the end of each adventure in which the referee judges that a character's actions would have gained him some fame, the referee should give him one renown point. This will be based partly on the performance of the character, partly on the importance of the mission or expedition, and partly on how likely the action is to gain public recognition.

Renown points are given separately in each of the following fields: Heroic Acts, Scientific Achievement, Exploratory Discoveries, Military Prowess, and Service to the Crown. Heroic Acts are fairly obvious, and require the player character to do something very brave (or stupid), get away with it, and have a fair number of people notice. Scientific Achievement consists of perfecting experimental devices that have a background knowledge requirement greater than 15. Exploratory Discoveries include new species of animals (the bigger the better—who cares about a new species of rat?), new archaeological ruins, undiscovered tribes, etc. Military Prowess consists of leading or playing a prominent role with a body of men victorious in battle. Fighting nomads and bandits hardly counts, unless you were formally dispatched to do so. In most cases renown should be gained by fighting regular troops or naval vessels, preferably of a colonial power. Service to the Crown covers a host of possible achievements, mostly of a diplomatic nature; securing the signature of a native prince on an important treaty, for example, or uncovering and foiling a German plot.

As to the likelihood of gaining recognition, the simple truth is that someone with a Social Level of 6 is more likely to be recognized than is someone with a Social Level of 1, but this should be played down a bit in the game. Social Level should be an advantage in garnering fame, but not an overwhelming one. Another consideration is prior career. A military man is much more likely to gain renown for a military achievement than is a civilian, and less likely to gain renown for an exploratory discovery. Thus it is possible for three characters to participate on a mission and all divide the responsibilities equally, but have two of them receive renown points in different fields and the third not receive a point at all.

Medals and awards were quite common during the Victorian era, particularly for service of a military nature, and it would be the rare soldier who did not earn at least a campaign or battle medal during his career. Every major campaign would usually have a medal struck for it and awarded to the participants. If there were one or more important battles, each might have its own clasp that participants would wear attached to their campaign medal.

Heroism in the face of the enemy was rewarded most often with a "mention in dispatches," an honor which could be given to both officers and other ranks. Although no specific award accompanies a mention in dispatches, the names of such individuals are printed in the *London Gazette*, for which the character receives a renown point. Greater deeds of courage might be rewarded with a medal, the Distinguished Service Order for officers or the

Distinguished Conduct Medal for other ranks (two renown points). Finally, the highest award for gallantry was the coveted Victoria Cross (four renown points), available to both officers and other ranks, and awarded only for outstanding heroism in the face of the enemy. Recipients of the Distinguished Service Order and the Victoria Cross were entitled to include the initials D.S.O. or V.C. (respectively) after their name.



In addition to medals, officers were often rewarded for bravery under fire, particularly valuable service, or an outstandingly successful campaign with membership in one of the chivalric orders. Usually, early awards would be the lowest rank in one of the lower orders, and subsequent awards would be for a higher rank in that order (thus replacing the lower rank, not adding to it). Once a higher rank in an order had been gained, the next award might be the bottom rank in a higher order, and so forth. Each such award is accompanied by an additional renown point. Officially, there was no difference in rank between the different orders, but everyone knew otherwise. (The orders are listed in the "Victorian Era" chapter, in the sidebar of page 33.)

Experience: For each major event or episode, award one experience point. Players may accumulate experience points or spend them at once. Experience points are used to increase a skill level. To increase a skill level by one, experience points must be spent equal to the desired skill level. If that increase would raise the skill above its associated attribute level, then a die roll must be made to confirm the skill promotion. *The skill promotion is confirmed if the die roll is equal to or greater than the current skill level (not the sought-after level). Seven is the highest skill level possible.*

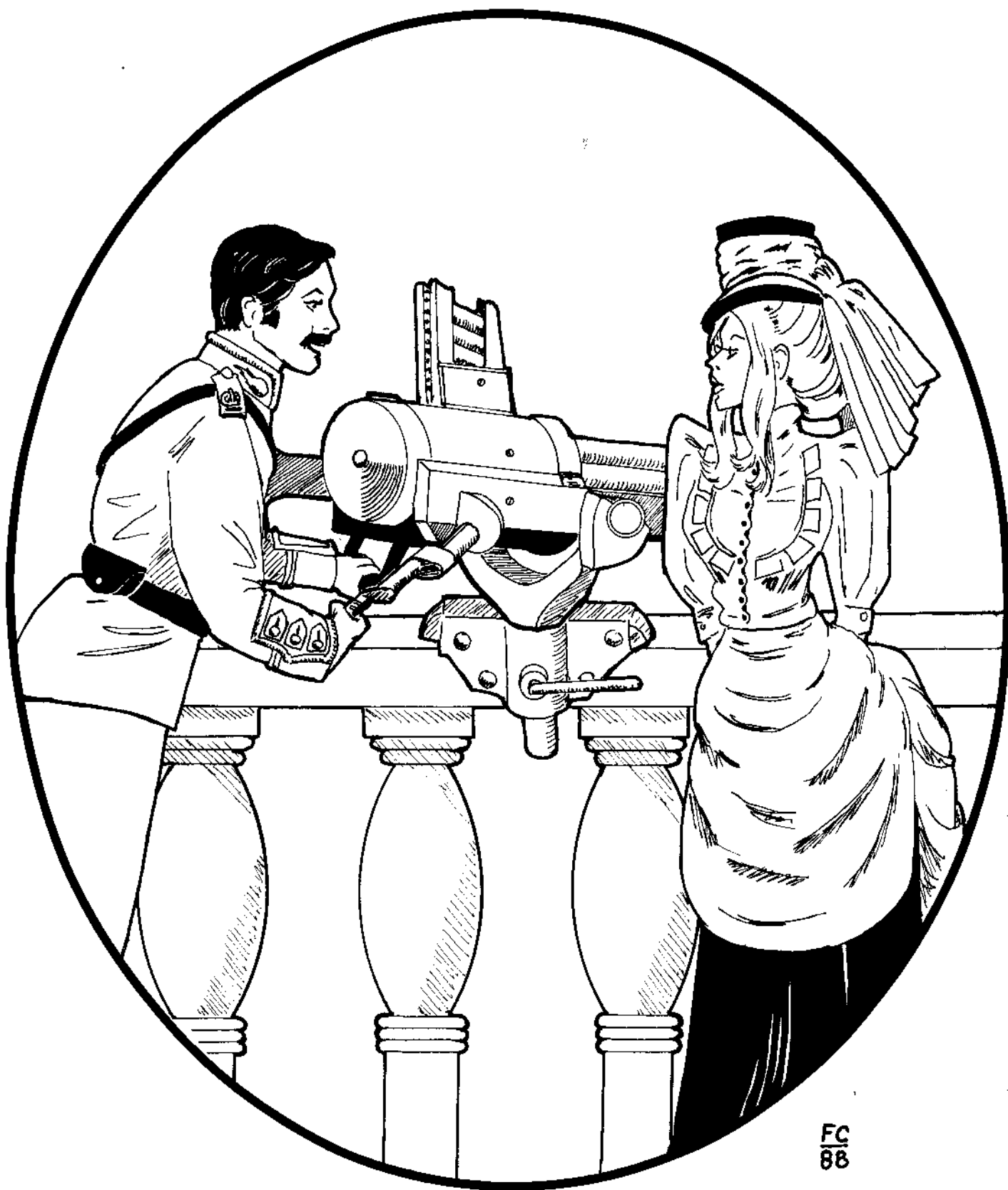
Close Combat Points: If the player took part in any close combat, he receives a Close Combat experience point. These points are awarded separately from general skill points and can only be used to buy Close Combat skill. General experience points may not be used for Close Combat skill.



Knowledge: During the course of the game, the referee should award additional research dice to inventors as a result of their experiences. The referee may award these as skill-based dice (such as Physics or Machinist), or may make them specific to a certain research area (such as the ether), or may award them without restriction (the same as Intellect dice). Generally, he will award skill-based dice if a player has used that particular skill extensively. Area dice may result from learning some interesting new fact about the phenomenon covered by that research area. Unrestricted dice might be awarded if the player was able to spend a great deal of time in a laboratory, such as during a long space voyage.

A referee should seldom award more than one research die at the end of an adventure and may consider several alternatives instead. If a player has been able to extensively examine or use an experimental device, the referee can give him a die roll modifier on any experimental attempt to perfect it. Alternatively, the referee can award a general increase in the inventor's knowledge of a specific research area. The invention system is sufficiently flexible that the referee has many different ways that he can allow the characters to gradually increase their knowledge of the universe.

Souvenirs: These are various weapons, devices, artifacts, and so forth acquired during the adventure which the characters do not wish to sell. Often these can be very useful later, especially in the case of one-of-a-kind items.

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EQUIPMENT

MOST ADVENTURES will require some sort of equipment for their successful completion. This chapter provides an extensive listing of various items of equipment the characters may want to acquire, ranging from simple knives to large aerial flyers. Each item includes a brief description of the item, its weight, and the typical purchase price. Purchase price is based on its market price at its point of manufacture or most likely sale point. A revolver, for example, costs the indicated amount on Earth, or in an established human enclave. Revolvers are not generally for sale in remote nomadic villages, and if they would have one, the price might be considerably higher.

In many cases equipment will be obtained by barter rather than purchase, and in this case the prices should guide the referee in determining relative equivalent values.

A Note on British Money: For

those unfamiliar with the British system of currency in use in 1889, here is a short discussion.

The basic units are the pound, the shilling, and the penny. Twelve pennies make a shilling, 20 shillings (or 240 pennies) make a pound. Pennies are sometimes divided into ha'pennies (half-pennies) and farthings (quarter-pennies). Prices are written as "pounds shillings/pennies." For example, three pounds, two shillings and six pennies would be written as £3 2/6, read as "three pounds, two-and-six." Shillings alone are written without the £ sign; for example, three shillings is written 3/—. Pennies alone are identified by the abbreviation "d" following the number; for example, sixpence would be written as 6d.

Currency Conversions: In 1889, a pound sterling was worth \$5 in American currency. A shilling was worth \$.25 and a penny, just over \$.02.



SCIENTIFIC EQUIPMENT AND REFERENCE MATERIALS

ASSORTED PIECES of scientific equipment and reference materials available include:



Binoculars (Field Glasses): A device which makes distant objects appear closer, using two pairs of lenses to retain stereoscopic vision. *Wt: 2 lbs Price: £4.*

Conklin's Atlas of the Worlds and Handy Manual of Useful Information: A gazetteer and atlas of Earth, Mars, Venus, and other worlds in the Solar System, with vital statistics and other information, all in a single handy reference book. *Wt: .5 lb Price: 1/—.*



Dissecting Kit: A small box containing forceps, a scalpel, and various probes and other tools for the dissection and study of zoological and botanical specimens. Jars for preservation of samples are not included. *Wt: 1 lb Price: 8/—.*

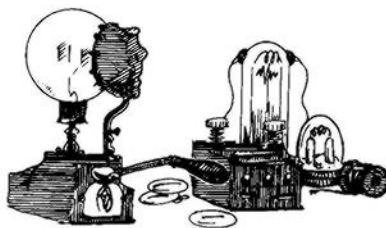


Doctor's Bag and Supplies: A leather bag containing surgical instruments and supplies, and also a supply of medicines and other materials for the treatment of wounds and sickness. *Wt: 10 lbs Price: £3.*

Edison's Encyclopedia of General Information: A font of useful information about the universe, written by the inventor of the ether flyer. No inventor or scientist can be without this compact volume. *Wt: 1 lb Price: 1/—.*



Laboratory Apparatus, Chemical: This kit contains flasks, test tubes and other assorted glassware, a portable alcohol burner, thermometers, and sundry other items and supplies to allow the owner to perform chemical experiments in the field. *Wt: 15 lbs Price: £5.*



Laboratory Apparatus, Electrical: Various electrical tools, meters, coils, and other apparatus for electrical experimentation. *Wt: 8 lbs Price: £6.*

Magnifying Glass: A glass which makes small things appear larger. No consulting detective can be without one. *Wt: Negligible Price: 12/—.*



Microscope: An instrument used in the study of bacteria and other extremely small things. *Wt: 3 lbs Price: £5.*

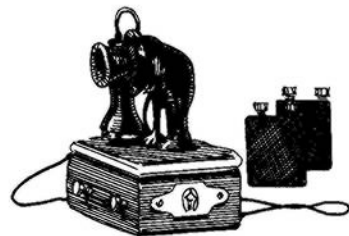


Navigation Instruments: A sextant, chronometer, compass, and other instruments used in celestial navigation. *Wt: 8 lbs Price: £12.*

Robb's Medical Companion and Household Physician: A compact source of medical information for use by those not trained as physicians. *Wt: 1 lb Price: 2/—.*



Telegraphic Instruments: This kit contains a sending key and receiver, plus the batteries required to operate a single station of a telegraphic system. *Wt: 1 lb Price: £1*

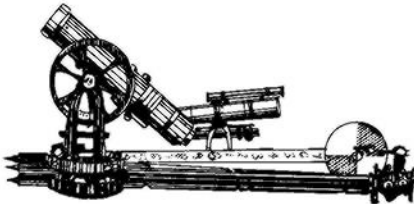


Telephonic Instrument: A single telephone and the batteries for its operation. A minimum of two are required for communication. *Wt: 3 lbs Price: £2*

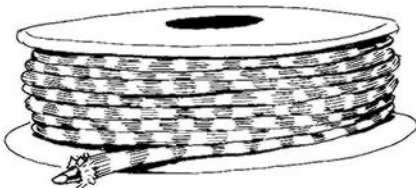


Telescope (Spyglass): An instrument used to magnify distant objects, thereby making them appear closer. *Wt: 1 lb Price: £2.*

The Millwright's Companion and Handy-Book: The tinkerer's bible, a book of plans and directions for the fabrication of hundreds of useful items of equipment. No inventor can afford to be without this useful volume. *Wt:* 1 lb **Price:** 8/—.



Surveying Instruments: A set of instruments (compass, tripod, transit, clinometer, and so on) for mapping and measuring landforms. *Wt:* 1 lb **Price:** £12.



Wire, Insulated: Used in connecting telegraphic or telephonic systems. *Wt:* 100 lbs per mile **Price:** £1 per mile.

TOOLS

EVERY INTREPID explorer will need tools.



Axe: A wood-cutting tool, usable as a weapon. *Wt:* 3 lbs **Price:** 2/—.



Forge, Portable: Tools for heating and forging metal (bellows, firebox, anvil and so on). *Wt:* 500 lbs **Price:** £6.



Hatchet: A small hand axe. *Wt:* 1 lb **Price:** 6d.



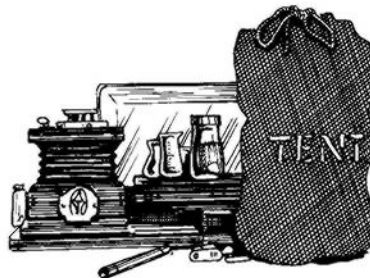
Machete: A long-bladed cutting tool, usable as a melee weapon. *Wt:* 2 lbs **Price:** 8d.



Knife, Two-bladed Jack-: A small folding knife, not intended for fighting. *Wt:* Negligible **Price:** 1/—.



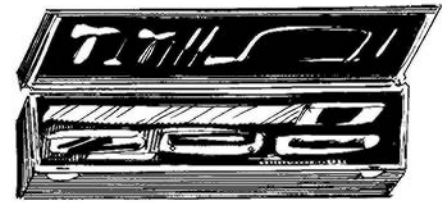
Lockpicks, Set: Tools for opening locks without the proper key, including several picks, skeleton keys, and so on. *Wt:* Negligible **Price:** 18/



Photographic Lab, Portable: This setup contains everything needed to develop photographs in the field, including the chemicals, apparatus, and a special lightproof tent. *Wt:* 30 lbs **Price:** £7.



Pick, Mattock, Shovel, etc.: Tools used in excavating. *Wt:* 5 lbs **Price:** 2/—.



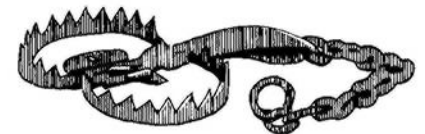
Tools, Carpenter: Saws, chisels, planes, and other woodworking tools, contained in a wooden chest for storage. *Wt:* 30 lbs **Price:** £4.



Tools, Instrument-maker: This is a set of Swiss files, rifflers, gravers, drills, and other tools used in making clocks, watches, scientific instruments such as barometers and sextants, and for repair and manufacture of the metal parts of firearms and other delicate machinery. *Wt:* 10 lbs **Price:** £7.



Tools, Metalworker: This setup contains hammers, rivets, files, and everything else needed to shape metal except an anvil and forge, which are needed for the shaping of larger items. *Wt:* 60 lbs **Price:** £6.



Trap, Bear: A heavy-duty trap used to capture large, dangerous animals. *Wt:* 3 lbs **Price:** 1/—.



Trap, Small Animal: A smaller trap used to capture animals for food or fur. *Wt:* 1 lb **Price:** 6d.

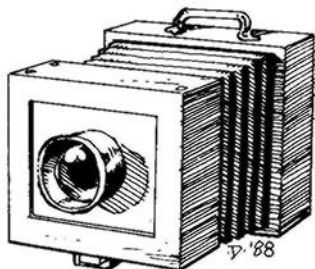
TRAVELLING GEAR

ITEMS USEFUL to the traveller and explorer include:



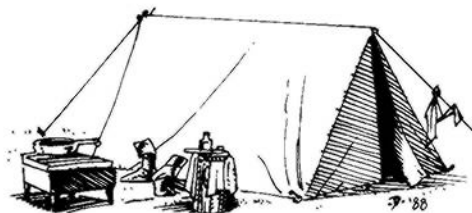
Bag, Carpet: A carrier for other items, maximum capacity 50 lbs. *Wt:* 3 lbs (empty) **Price:** 2/—.

Blanket: A heavy woolen blanket used for protection from the elements. *Wt:* 1 lb **Price:** 8d.



Camera, Portable: Scientists and explorers find the camera especially valuable for speedily recording scenes for later examination at leisure. *Wt:* 1 lb **Price:** £4.

Camp Stove, Portable, Coal Oil: Used for cooking and to provide warmth in the wilderness. *Wt:* 2 lbs **Price:** 10/—.



Camping Outfit: A gentleman needs certain essentials for life, even in the wilderness, and this kit provides them all in a convenient carrying case. It includes a stove, tent, cot, folding stool, cooking pots, dining utensils, toilet requisites, and many other items. *Wt:* 80 lbs **Price:** £2.

Food, Canned, One Day: Preserved food in tinned cans capable of keeping reasonably fresh for several years. *Wt:* 4 lbs **Price:** 8d.

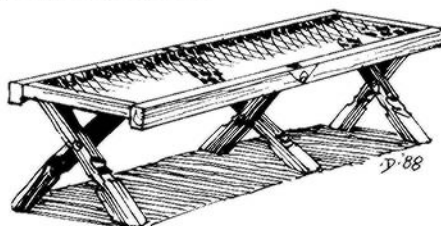
Food, One Day: This is a meal in a restaurant or boarding house. *Wt:* 3 lbs **Price:** 6d to £1.



Clothing, Foul Weather: A rubberized hat, overcoat and boots to protect the wearer from wind and rain. *Wt:* 3 lbs **Price:** 8/— to 12/—.

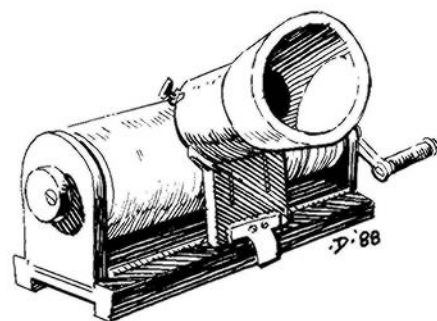


Clothing, Rough-Living: A suit of heavy-duty clothing, including pants, shirt, jacket, boots, hat, and so on, for use by explorers and those who expect to be "roughing it." *Wt:* 3 lbs **Price:** £1.



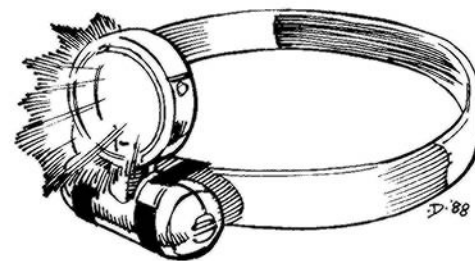
Cot, Folding: *Wt:* 15 lbs **Price:** 15/—.

Fishing Tackle: *Wt:* 1 lb **Price:** 12/—.



Gramophone or Similar Talking Machine: The latest invention of Thomas Edison, a machine that can preserve any sound and reproduce it at any time. The tinkerer's delight. *Wt:* 3 lbs **Price:** £1.

Hammock: A portable bed designed to be slung between two supports. *Wt:* 1 lb **Price:** 4/—.



Lamp, Miner's Safety: A small lamp designed to be worn on the head, usually fueled by carbide and water. A pound of carbide will provide 16 charges, each charge will last two hours. *Wt:* .3 lbs **Price:** 8d

Lantern, Carbide: A larger version of the miner's safety lamp. A pound of carbide will provide eight charges, and each charge will provide light for four hours. If spilled, the carbide will not burn, unlike liquid fuels. *Wt:* 1 lb **Price:** 1/—.



Lantern, Kerosene or Gasoline: A pint of liquid fuel provides light for up to 12 hours. *Wt:* 1 lb **Price:** 5/—.

Rope, 100 ft: This has a tensile strength of 300 pounds. *Wt:* 5 lbs *Price:* 2/—.

Tarp: A 10'×10' square of rubberized or oiled canvas used to cover other items and protect them from the elements. *Wt:* 2 lbs *Price:* 10d.



Tent, 10-man: Protection from the elements for up to 10 people. *Wt:* 35 lbs *Price:* £6.



Tent, Two-man: Protection for two people. *Wt:* 12 lbs *Price:* £3.

Trunk, Steamer: A container for other objects, maximum capacity 140 lbs. *Wt:* 6 lbs (empty) *Price:* 8/—.

Watch: Pocket watches vary in quality from the gold-filled basic pocket timepiece to highly engraved, solid gold works of art, and their prices reflect the variety. More expensive versions often have second hands. *Wt:* Negligible *Price:* From 5/— to £2+.

Watch, Stop-: High-quality chronographs are used by certain scientists and inventors in pursuit of their experiments, and by sporting enthusiasts to time various sporting events. *Wt:* Negligible *Price:* £3

FUEL

POWER PLANTS and smaller engines may run off of one of a variety of fuels.

Coal: The most common solid fuel. *Price:* £1 per ton.

Petroleum: Used to fuel some boilers near oil fields. *Price:* £3 per ton.

Liquid Fuels: These include kerosene, coal oil, petroleum waste, and other flammable liquids. The flammable cleaning fluid called gasoline has recently been used as a fuel in an internal combustion engine by a German named Daimler. *Price:* £6 per ton in bulk, or 1d per pint.

Wood, Peat: More primitive solid fuels, but often easier to come by in primitive areas. *Price:* Usually free.

Carbide: Carbide is a powder which reacts with water to produce flammable acetylene gas. It is used in certain lamps and lanterns, particularly miners' headlamps. Carbide is nonflammable by itself, which makes it safer if the lamp is dropped or damaged. It comes in sealed tins. *Wt:* 1 lb/tin *Price:* 5d.

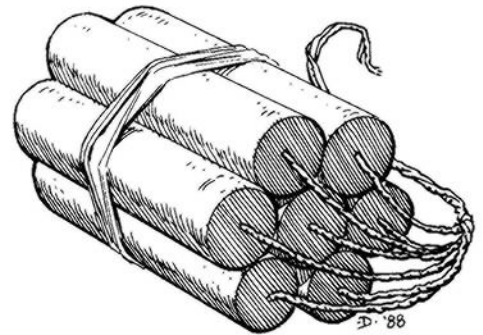
EXPLOSIVES

THE FOLLOWING are essential for heavy construction or major demolition work.

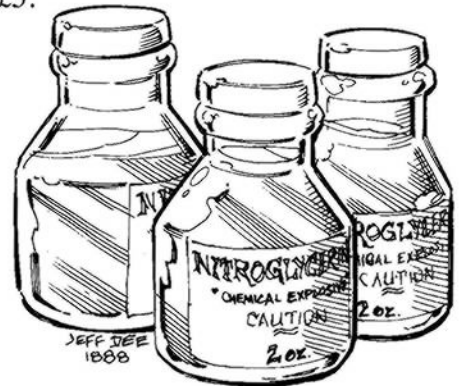


Gunpowder: Although outdated by human standards as an explosive,

it is still widely used as an ammunition propellant. Gunpowder comes in six-pound kegs, but may be divided into smaller one-pound charges with the use of cloth bags or small tins. Gunpowder has an explosive power of 1 per pound. *Wt:* 6-lb/keg *Price:* 10/—.



Dynamite: Invented in 1866 by Nobel, dynamite has largely replaced gunpowder as a common explosive. Dynamite comes in cases, each with 100 half-pound sticks. Dynamite has an explosive power of 4 per pound (2 per stick). *Wt:* 50 lbs/case *Price:* £5.



Nitroglycerin: Nitroglycerin ("nitro" for short) is powerful but dangerously unstable. It comes in two-ounce bottles, with 20 bottles to a case. The case is internally divided with a separate compartment for each bottle and usually also has a compartment for ice as well. (The ice helps keep the nitro stable.) Nitro has an explosive power of 8 per pound (1 per two-ounce bottle). *Wt:* 5 lbs/case *Price:* £1.

FIREARMS

THE FOLLOWING firearms are representative of those available in 1889.

Pistols

PISTOL USE is determined by the Pistol cascade of the Marksmanship skill.

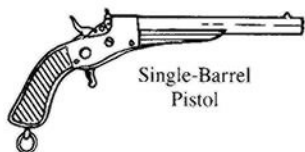
Single-Barrel Pistol: This is a one-barreled breech-loading cartridge pistol, of which the Remington Rolling Block Pistol is typical. *Wt:* 1 lb **Price:** 8/—.

Light Revolver: This is a small-caliber pistol with a single barrel and a multiple-shot rotating cylinder, of which the Hopkins and Allen .32-caliber revolver is typical. *Wt:* 1.5 lbs **Price:** 10/—.

Heavy Revolver: This is a large-caliber pistol typified by the Colt Single Action Army revolver. *Wt:* 2 lbs **Price:** £2.

Light Multibarrel Pistol: A small pistol with two (rarely more) barrels, sometimes called a derringer, typified by the Remington .41-caliber Double derringer. *Wt:* .7 lb **Price:** £1.

Heavy Multibarrel Pistol: A four-barreled pistol, typified by the British Lancaster pistol. *Wt:* 2 lbs **Price:** £1.



Single-Barrel Pistol



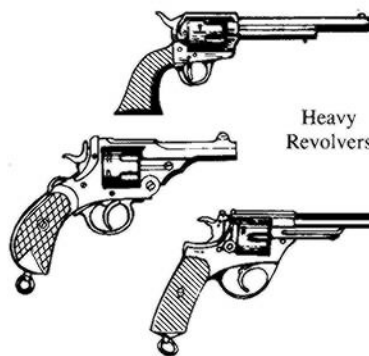
Light Revolver



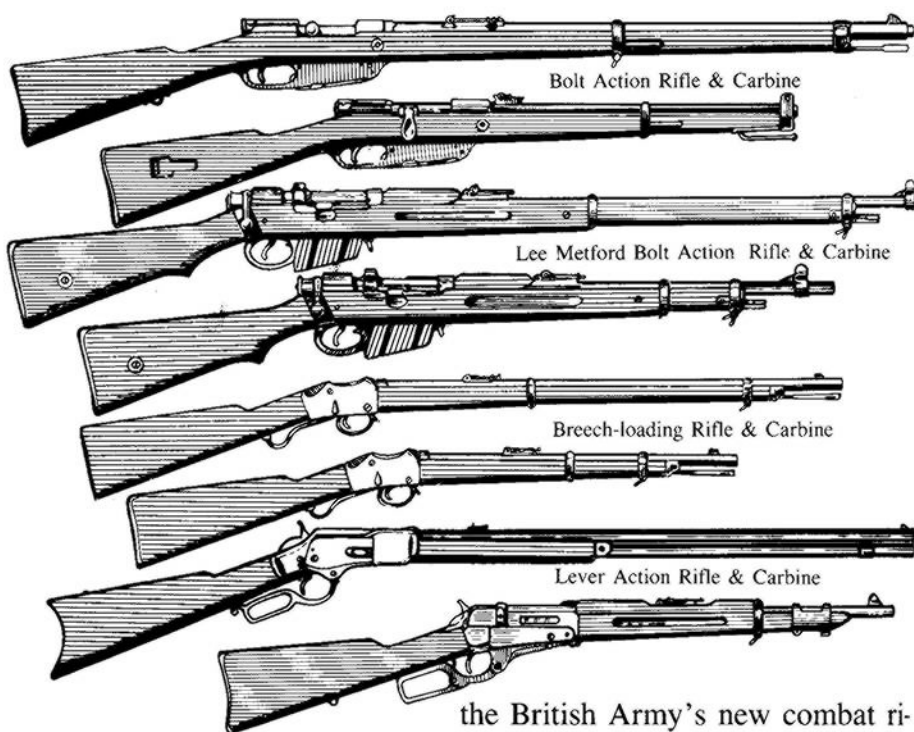
Heavy Multibarrel Pistol



Light Multibarrel Pistol



Heavy Revolvers



Bolt Action Rifle & Carbine

Lee Metford Bolt Action Rifle & Carbine

Breech-loading Rifle & Carbine

Lever Action Rifle & Carbine

Rifles

RIFLE USE comes under the Rifle cascade of the Marksmanship skill.

Bolt Action Rifle: A modern rifle with a five-round magazine, such as the French Lebel, the Austrian Mannlicher, or the German Mauser rifles. Such weapons have a manually worked bolt which loads and ejects each round. *Wt:* 9 lbs **Price:** £2.

Bolt Action Carbine: Similar to the Bolt Action Rifle, but with a slightly shorter barrel. *Wt:* 8 lbs **Price:** £1 6/—.

Lee Metford Bolt Action Rifle: Recently adopted on a trial basis as

the British Army's new combat rifle, the Lee Metford is similar to other bolt action rifles with the exception that it has a larger, eight-round magazine. *Wt:* 9 lbs **Price:** £2.

Bolt Action Carbine (LM): Similar to the Lee Metford rifle but with a shortened barrel. *Wt:* 8 lbs **Price:** £2 6/—.

Breech-loading Rifle: A single-shot cartridge weapon, typified by the Remington Rolling Block Rifle, or the British Martini-Henry. *Wt:* 8 lbs **Price:** £2.

Breech-loading Carbine: A shorter-barreled version of the breech-loading rifle. *Wt:* 7.5 lbs **Price:** £1 18/—.

Lever Action Rifle: A modern rifle with a multiple-round magazine, with a manually operated lever which ejects a spent round, cocks the weapon, and loads another round. The most famous example is manufactured by the American arms firm of Winchester. *Wt:* 9 lbs **Price:** £2 2/6

Lever Action Carbine: A weapon similar to the lever action rifle, but with a shorter barrel (and often in a smaller caliber). *Wt:* 8 lbs **Price:** £2.

Muzzle-loading Rifle: A single-shot weapon in which the ammunition is loaded into the muzzle or front of the rifle instead of through a closable breech. The British Enfield and American Springfield Rifle-Musket are typical examples. *Wt:* 7 lbs **Price:** 8/— to 10/—.

Muzzle-loading Carbine: Similar to the muzzle-loading rifle, but with a shorter barrel. *Wt:* 6 lbs **Price:** 6/— to 8/—.

Smoothbore Musket: A primitive muzzle-loader, lacking the grooves in the barrel (rifling) which give a rifle bullet stability during its flight. Consequently, the smoothbore musket has a shorter range and is less accurate than rifled weapons. *Wt:* 8 lbs **Price:** 8/—.

Smoothbore Carbine: Similar to the smoothbore musket, but with a considerably shorter barrel. *Wt:* 7 lbs **Price:** 6/—.

Long Hunting Rifle: A large-bore breech-loading rifle, usually with a longer barrel (and more accurate), of which the Sharps .50 caliber Long Range Express "Big Fifty" is typical. Such weapons are often called "Buffalo Rifles" because of their use by American hunters. *Wt:* 10 lbs **Price:** £6.

Heavy Double Rifle: A very large-bore, breech-loading rifle (between .50- and .60-caliber, often using the new nitrocellulose gunpowders), built with two barrels, also commonly called an "elephant gun." Such weapons are usually custom built to suit an individual customer and are thus quite expensive. The firm of Holland and Holland, in London, is the most famous maker. The Holland and Holland .600 Nitro Express is the finest example available. *Wt:* 10.5 lbs **Price:** £10.

Nordenfelt Light Machinegun: A weapon with a single Nordenfelt action, capable of very rapid fire. *Wt:* 15 lbs **Price:** £20.

Shotguns

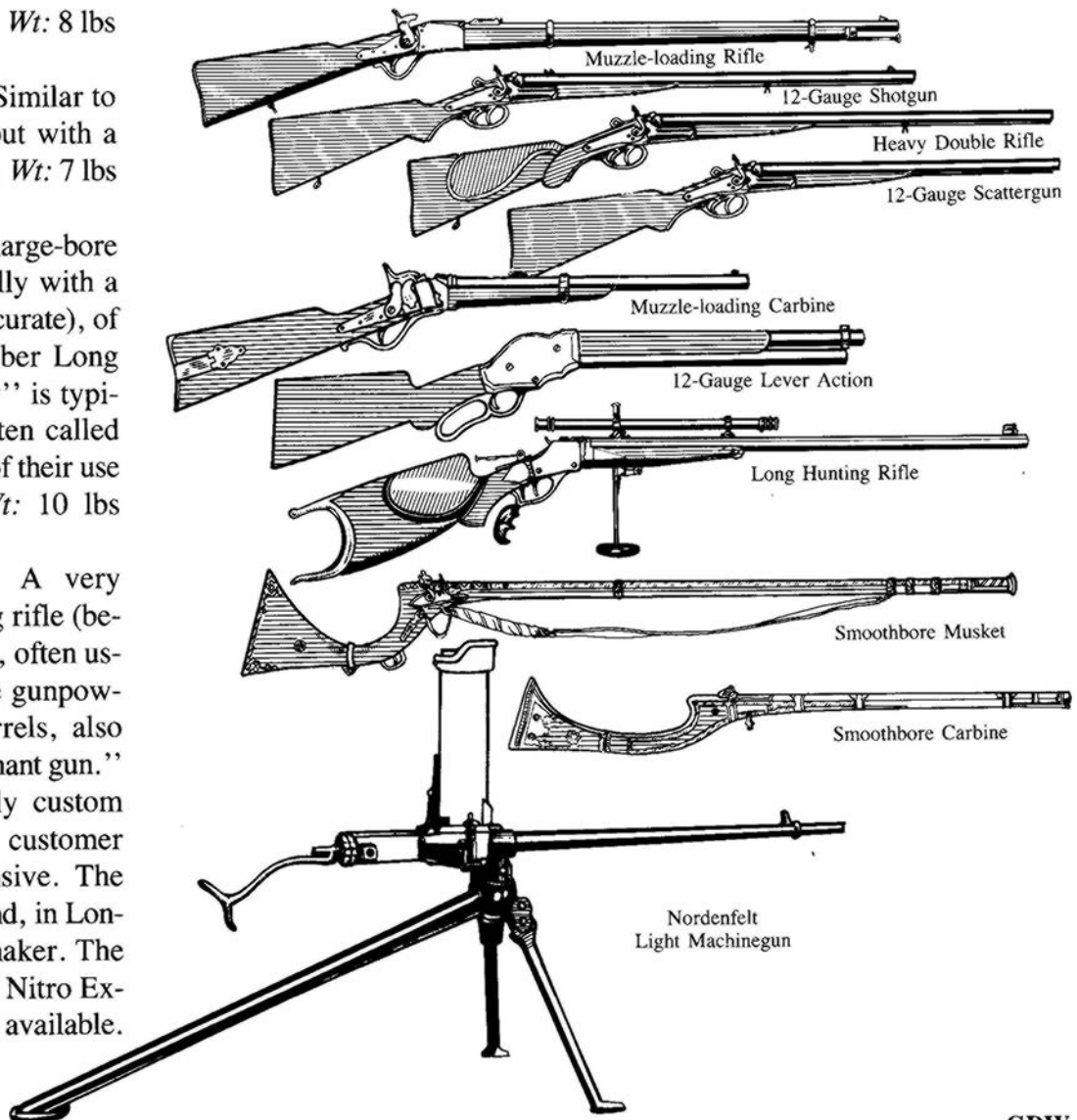
SHOTGUN USE is also covered under the Rifle cascade of the Marksmanship skill.

12-Gauge Double: In shotguns, gauge is a measure of bore diameter, expressed in the number of lead balls of that barrel diameter which make a pound. Double means the weapon has two barrels. By 1889 most shotguns used modern-type cartridges rather than loose powder and shot. *Wt:* 9 lbs **Price:** £3 to £5.

12-Gauge Lever Action: A shotgun with a tubular magazine capable of holding five cartridges. The weapon is cocked and cartridges loaded and ejected by means of a manually operated lever. The Winchester Repeating Shotgun is a typical example of a lever action shotgun. *Wt:* 9 lbs **Price:** £5.

20-Gauge Double: A smaller type of shotgun with two barrels. *Wt:* 7 lbs **Price:** £2.

12-Gauge Scattergun: A standard 12-gauge double-barrel shotgun with the barrels sawed off to give greater effectiveness at close range. Favored by American desperadoes. *Wt:* 6 lbs **Price:** £5



MELEE WEAPONS

THESE WEAPONS are used in armed melee attacks.

Pike: A primitive pole arm, designed for thrusting. It is between 12 and 18 feet in length. *Wt:* 6 lbs **Price:** 2/—.

Boarding Pike/Spear: A pole arm designed for thrusting or throwing. It is between four and seven feet in length. The smaller versions can be thrown as well. *Wt:* 2-5 lbs **Price:** 1/—.

Rifle/Bayonet: A knife attached to the end of a rifle to make it usable as a pole arm in a melee. The rifle itself can be used as a club, with or without the bayonet. *Wt:* 1 lb plus weight of rifle **Price:** 8d, plus cost of rifle.

Sword/Saber: An edged weapon designed for cutting or thrusting. *Wt:* 2 lbs **Price:** £2.

Knife: A short, edged weapon designed for combat, used mainly for thrusting at close quarters. A typical example is the American Bowie knife. *Wt:* 1 **Price:** 1/—.

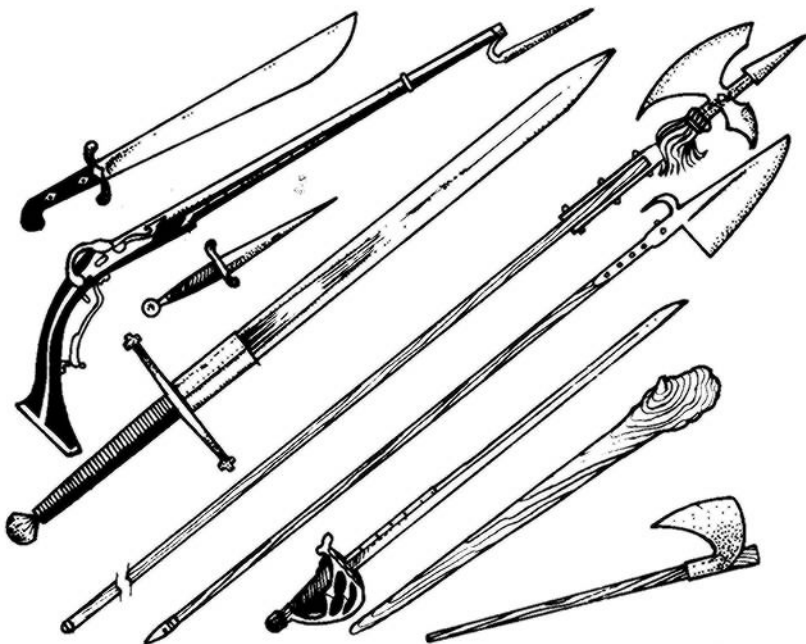
Club: A bashing weapon, usually improvised from local materials, such as a table leg or tree branch. *Wt:* 3-4 lbs **Price:** Free.

Axe: A bashing weapon, also usable as a wood-cutting tool. *Wt:* 3 lbs **Price:** 2/—.

Hatchet: A small hand axe, also usable in cutting wood. *Wt:* 1 lb **Price:** 6d.

Machete: A long-bladed cutting tool, usable as an edged weapon. *Wt:* 2 **Price:** 8d.

Great Sword: A large, edged weapon designed for use with two hands, such as the Scottish Claymore or the Martian Coddling-Chopper. *Wt:* 6 lbs **Price:** £10.



ARMOR

ARMOR PROTECTS the wearer from melee weapons and is widely used by primitive armies.

Doublet: Stiffened leather protection for the chest and abdomen. *Wt:* 2 lbs **Price:** 1/—.

Shoulder Scales: Metal epaulets designed to protect the shoulders and neck from downward chopping blows. *Wt:* 2 lbs **Price:** 2/6.

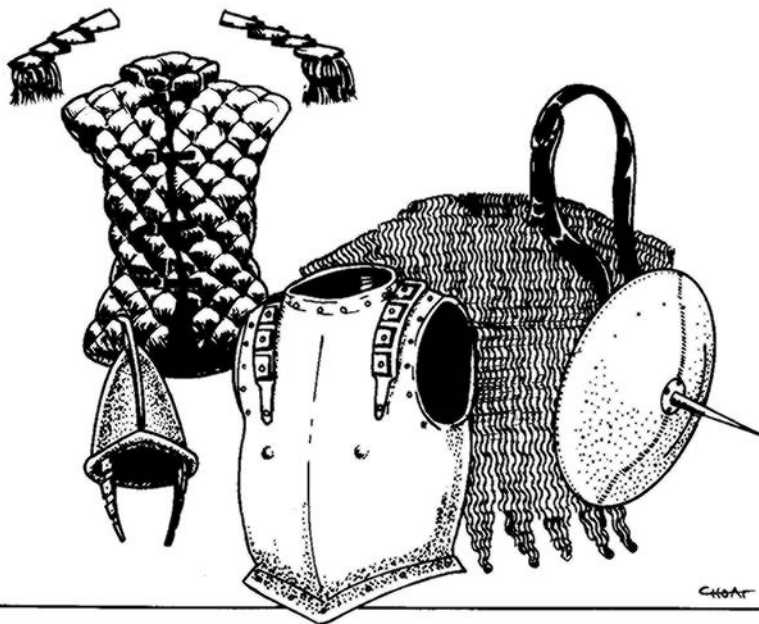
Mail: Protection for the chest,

arms, and upper thighs, made of interlocked metal rings. *Wt:* 4 lbs **Price:** 18/—.

Breast Plate: Solid plate metal protection for the chest and abdomen. *Wt:* 6 pounds **Price:** £1.

Helmet: Protection for the head, usually of metal. *Wt:* 2 lbs **Price:** £1 2/—.

Shield: A blocking device, usually made of wood, and occasionally covered in leather or metal. *Wt:* 4 lbs **Price:** 12/—.



PRIMITIVE MISSILE WEAPONS

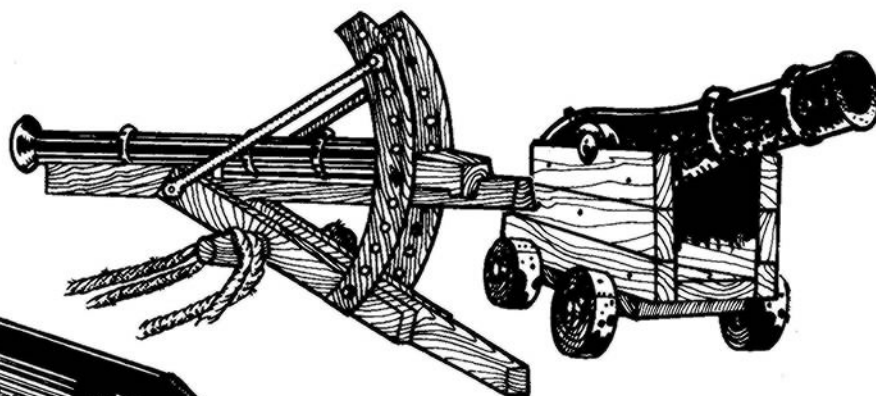
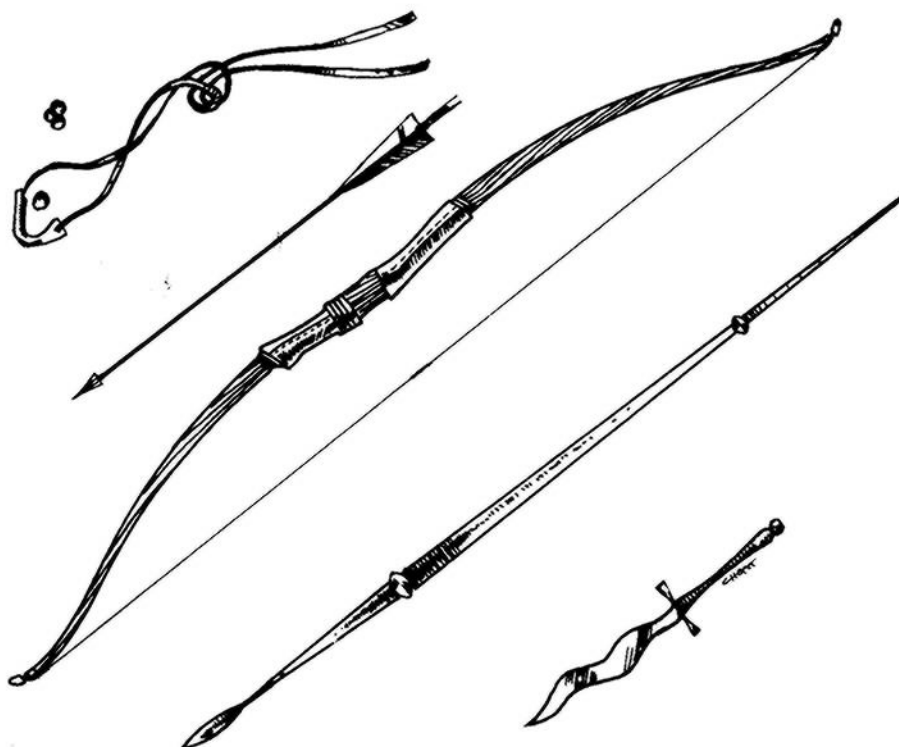
SOCIETIES WHICH do not have access to firearms use these weapons instead.

Bow and Arrow: A simple missile weapon which holds a sentimental attachment for many Englishmen. *Wt:* 2 lbs *Price:* £1.

Thrown Spear/Javelin: A simple missile weapon. *Wt:* 2 lbs *Price:* 10d.

Throwing Knife: Most knives can also be used as missile weapons. *Wt:* .5 lb *Price:* 1/—.

Stone: Perhaps the simplest of missile weapons, gathered from the ground. When thrown using a sling, the range is tripled. *Wt:* .1 lb *Price:* Free.



MARTIAN ARTILLERY

MARTIAN ARTILLERY pieces are muzzle-loading guns mounted on wooden carriages. They fire round shot or grapeshot.

Sweeper: *Wt:* 1 ton *Price:* £200.

Light Gun: *Wt:* 2 tons *Price:* £400.

Heavy Gun: *Wt:* 4 tons *Price:* £1000.

Rod Gun: *Wt:* 3 tons *Price:* £800.

Rogue: *Wt:* 6 tons *Price:* £2000.

Lob Gun: *Wt:* 20 tons *Price:* £2000.



EUROPEAN ARTILLERY

EUROPEAN ARTILLERY consists of modern rifled breech-loading pieces which fire shell and shrapnel.

1-pounder Hotchkiss Rotating Cannon: The Hotchkiss rotating cannon is a rapid-fire weapon similar in overall principle to the Gatling gun but of an improved and more rugged design. *Wt:* 300 lbs **Price:** £160.

3-pounder Hotchkiss Rotating Cannon: *Wt:* 400 lbs **Price:** £180.

6-pounder Hotchkiss Rotating Cannon: *Wt:* 800 lbs **Price:** £220.

6-pounder Rifled Breech-loader: *Wt:* 600 lbs **Price:** £200.

9-pounder Rifled Breech-loader: *Wt:* 800 lbs **Price:** £250.

12-pounder Rifled Breech-loader: *Wt:* 1000 lbs **Price:** £300.

15-pounder Rifled Breech-loader: *Wt:* 1200 lbs **Price:** £400.

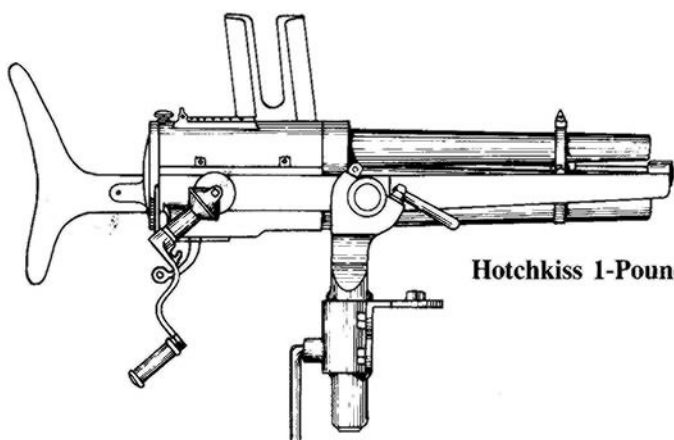
20-pounder Rifled Breech-loader: *Wt:* 1600 lbs **Price:** £500.

40-pounder Rifled Breech-loader: *Wt:* 3500 lbs **Price:** £1000.

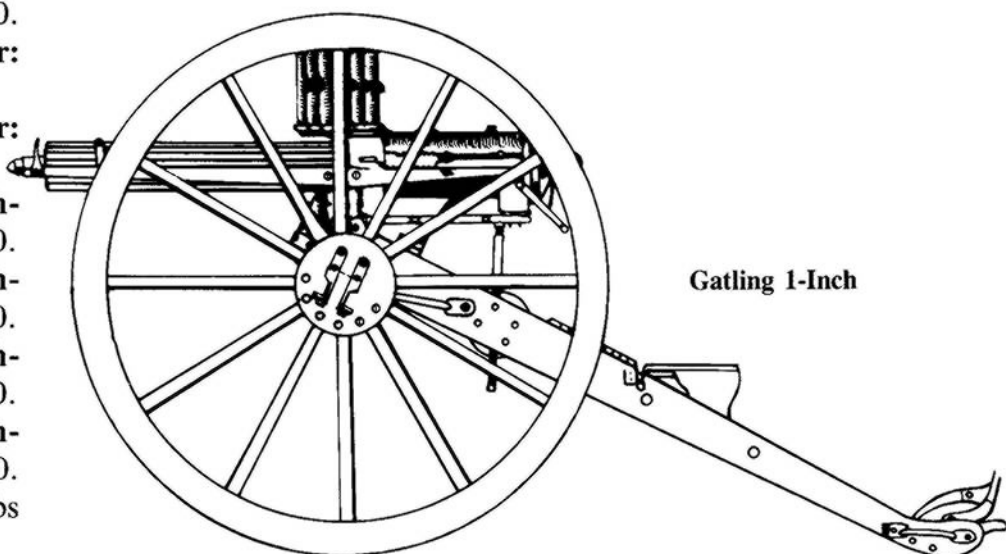
5-inch Howitzer: *Wt:* 3000 lbs **Price:** £1000.

7-pounder Mountain Howitzer: A weapon designed to be readily broken down into several easily carried loads for transport through mountainous areas. *Wt:* 400 lbs **Price:** £200.

Hale Rocket: An improvement over the old Congreve rocket, with much better accuracy and higher reliability. *Wt:* 20 lbs **Price:** £5.

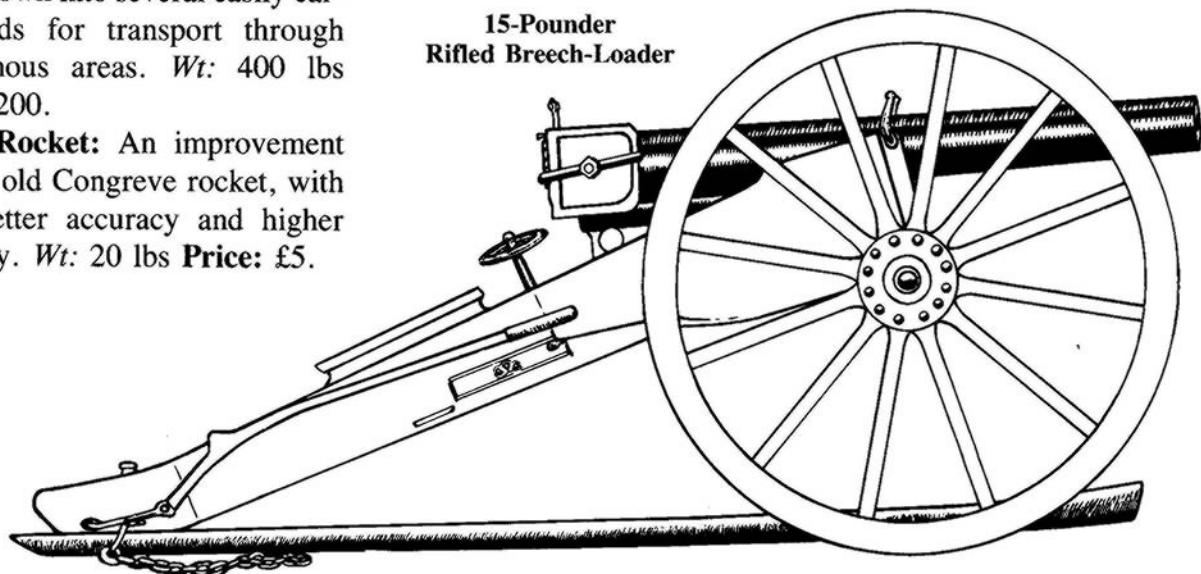


Hotchkiss 1-Pounder



Gatling 1-Inch

15-Pounder
Rifled Breech-Loader



MACHINEGUNS

A MACHINEGUN'S rate of fire makes it a deadly weapon to use against closely grouped opponents.

Gatling .50: A hand-cranked machinegun with six to 10 rifled barrels grouped to rotate around a central shaft. As the crank is turned, the barrels revolve, each barrel in turn receiving a cartridge, firing it, and moving out of the way for another. Gatling guns have a very high rate of fire, but tend to jam because of their complexity. *Wt:* 200 lbs **Price:** £40.

Gatling 1-inch: A larger version of the .50-caliber Gatling gun. *Wt:* 250 lbs **Price:** £70.

Mitrailleuse: A hand-cranked machinegun with 25 stationary barrels and a detachable breechblock containing the cartridges for each. The gunner places the block in position and turns the crank, camming the hammer to each barrel and fir-

ing them in sequence. *Wt:* 300 lbs **Price:** £60.

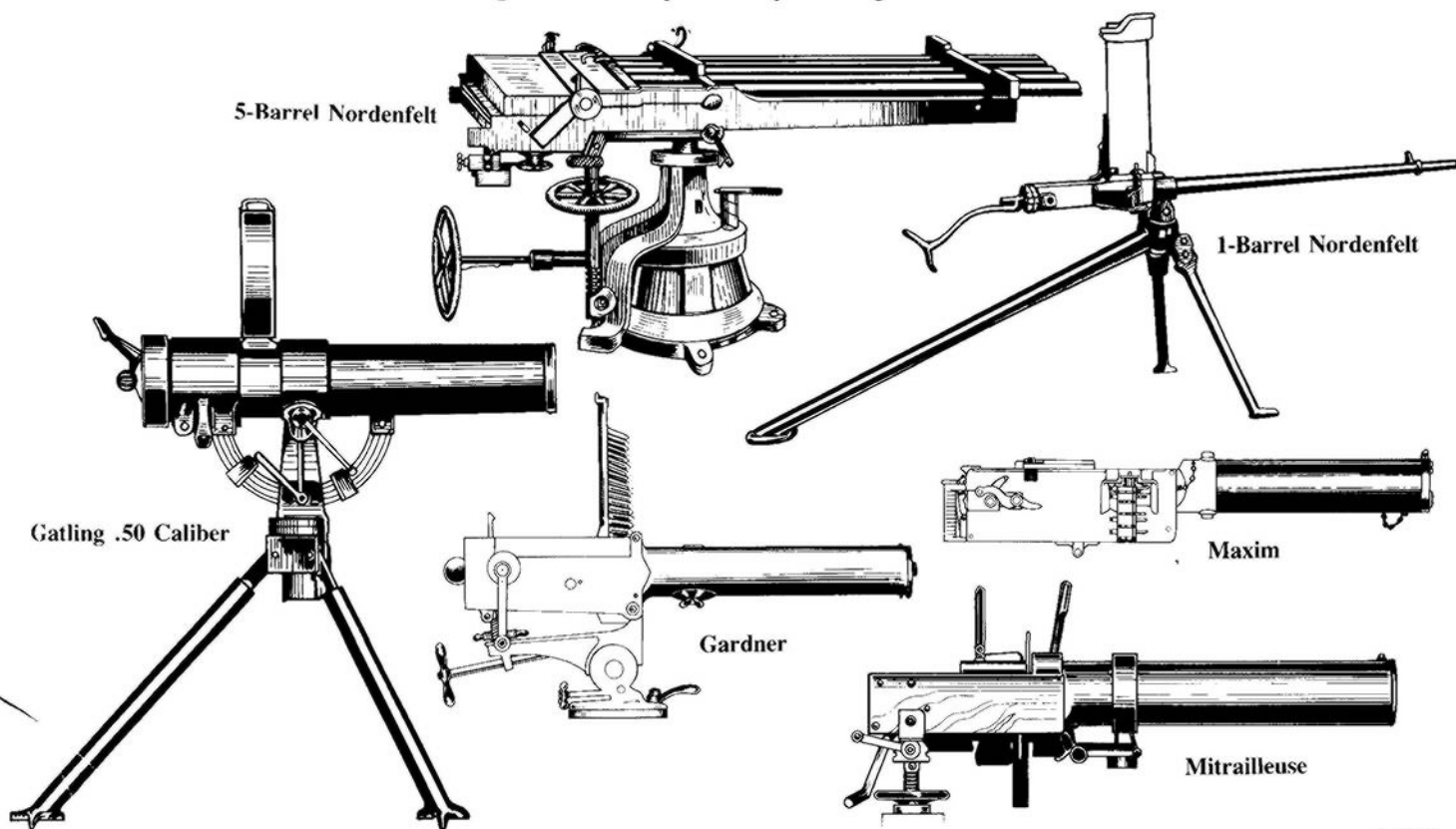
Gardner: A hand-cranked, two-barreled machinegun. The operation of the crank loads, fires, and ejects a cartridge from each barrel alternately. Gardner guns have a slower rate of fire than Gatlings, but the water-cooled breech of each barrel allows the fire to be kept up longer. The simpler mechanism of the Gardner gun is less prone to jamming than that of the Gatling gun. *Wt:* 40 lbs **Price:** £50.

Nordenfelt: A machinegun with one, three, or five barrels, each with a separate ammunition feed system. Unlike other machineguns, the Nordenfelt uses a side-acting lever instead of a crank. The gunner draws back the lever, which ejects the spent round and cocks the hammer for each barrel, and then releases it, which loads a fresh cartridge and releases the hammer to fire it. Nordenfelt guns are less prone to jamming, and

the action of working the lever automatically clears the jam in the normal course of firing the weapon (and except in the single-barrel version, the other barrels still fire, so a jam is not as critical as on other weapons). The barrels can be adjusted to be parallel or angled for a fan-shaped spread of fire.

Nordenfelt 1-Barrel *Wt:* 15 lbs **Price:** £20; **Nordenfelt 3-Barrel** *Wt:* 200 lbs **Price:** £60; **Nordenfelt 5-Barrel** *Wt:* 450 lbs **Price:** £100.

Maxim: The Maxim gun is a single-barrel, water-cooled machinegun which uses the force of one cartridge's recoil to eject the spent round, load a fresh one, and fire it. This sequence continues until the gunner removes pressure from the trigger or the ammunition is exhausted. Maxim guns are just entering experimental service with the British Army (although the gun has been on the market since 1883). *Wt:* 40 lbs **Price:** £150.



INVENTED DEVICES

THE FOLLOWING devices may be invented by players. They are grouped by research area for ease in locating the desired device. All devices have prices and weights, and many have power requirements. The price is the cost of parts necessary to fabricate the device. Parentheses around the price indicate that the initial prototype is free but all subsequent devices cost the indicated amount. The power requirement number is the power plant level required to operate the invention. Most devices also have a special feature or rule governing their use which will be noted in the descriptive text.

THE ETHER

THE ETHER is a topic of great scientific speculation and progress, especially in its practical applications.

Ether Propeller: An electric device for propelling vessels through space. Ether propellers are defined by their power level and efficiency. There are three patents on ether propellers: Edison's, Armstrong's, and Zeppelin's. The accompanying chart lists the maximum power value, efficiency, and price per power level of these.

A propeller invented by a player is free, has a maximum power of the device reliability, and has an effi-

ciency of 20 plus three times the device reliability. All ether propellers weigh 1 ton per power value.

Ether Sail: An alternative device for travelling between worlds, the ether sail relies on the currents of the ether to propel it. Only available to inventors, the ether sail is treated like an ether propeller except that it may only be installed at a power level equal to one tenth of the ship's tonnage (round fractions up) and has an efficiency of 30. *Wt:* 1 ton per power level **Price:** (£100 per power level) **Power:** Ship tonnage/10.

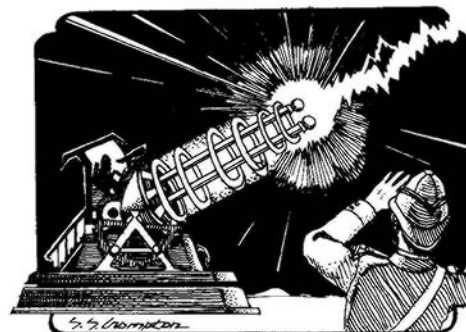
Etherometer: A device for measuring the density of the ether in deep space, the etherometer is useful for avoiding ether turbulence. Available only if invented, it is free and takes up no significant space or weight in the control room of an ether flyer. When encountering ether turbulence, the reliability of the etherometer is added to the pilot's skill in avoiding damage. *Wt:* 20 lbs **Price:** (£20) **Power:** Nil.

Hertzian Wave Communicator: Also known as a radio or wireless telegraph, the Hertzian wave communicator transmits electric signals through the ether without recourse to a wire. These communicators may only be invented. The device reliability determines both the maximum range of the device and its required power level. Range is illustrated on the accompanying chart. *Wt:* 10 lbs

per energy level **Price:** £10 per energy level **Power:** Equals reliability.

HERTZIAN COMMUNICATORS

Reliability	Range (Miles)
1	10
2	100
3	1000
4	100,000
5	1,000,000
6	10,000,000



Lightning Cannon: Projects a bolt of lightning toward a target and may only be fired at large targets, such as ships or dinosaurs. It has an effective range of 200 yards per reliability number and both a penetration and damage value equal to its reliability. *Wt:* 10 tons **Price:** £500 **Power:** 1.

Freeze Ray: Projects a heat-dampening ray which freezes targets in its path. It has an effective range of 10 yards per reliability number and a save number of 1. Characters hit by the ray, and who fail their saving roll, are frozen solid. They will thaw out (with no ill effects) one hour later. Each turn roll against the device reliability to prevent overheating. If the device overheats it will not fire that turn. In one turn it will cool enough to resume firing. *Wt:* 1 ton **Price:** £200 **Power:** 1.

ETHER PROPELLERS

Type	Maximum Power	Efficiency	Price per Power Level
Edison	Unlimited	25	£1000
Armstrong	Unlimited	20	£500
Zeppelin	4	15	£100

Weather Control Ray: A ray projector which causes weather changes in the atmosphere, bringing on storms or dispersing them. The device may make one weather control attempt per week, which is resolved by rolling against the device's reliability. *Wt:* 20 tons **Price:** £1000 **Power:** =Reliability.

Mind Control Ray: A device used to hypnotize characters. If a character is exposed to the ray, roll against its reliability to successfully hypnotize him. If successful, the character will become docile, will answer any question asked, and will perform any commands given, although in a zombie-like state of trance. The effects last from several days to several weeks. Range of the device in yards is four times its reliability rating. *Wt:* 1 ton **Price:** (£100) **Power:** Nil.

Gravity Focus Ray: A device used to intensify the gravity of a world. It has an effective range of 200 yards times its reliability versus vessels and 10 yards times its reliability versus characters. Any aerial vessel which is hit by it will plummet one altitude level, just as if it had suffered a loss of trim. Any nautical vessel hit by the ray will sink. Any character hit by the ray will collapse from the additional weight and be immobilized for as long as the ray remains focused on him. *Wt:* 10 tons **Price:** £1000 **Power:** =Reliability.

Gravity Control: A device which can offset gravity, working on the same principle as liftwood, with the device reliability determining the maximum altitude of the vessel, as shown on the chart to the right. *Wt:* Nil **Price:** £100 per power level **Power:** Vessel weight/100 (round fractions up).

GEOLOGY AND METALLURGY

GEOLOGICAL AND metallurgical inventions can be both useful to one's ether flyer and literally Earth-shattering to one's opponents.

Superhard Steel: A very hard steel alloy, specially forged for greater hardness. Any ether flyer built by the inventor has an armor value of 1 if fired on, and all damage from ether turbulence and meteor showers is reduced one level. (Major becomes minor, minor has no effect). Armor plate may be manufactured as well, and armored vessels rebuilt with superhard steel have their armor values multiplied by 1.5, rounding fractions down. **Price:** £50 per ton.

Rustless Iron: A rust- and corrosion-proof version of iron. Rustless iron is extremely useful on Venus, where Venusians will trade rare plants worth £10 for each one-pound rustless iron utensil. *Wt:* 1 lb per utensil **Price:** 1/—.

Woven Steel: This is a procedure for making flexible, fabric-like material from steel, from which effective body armor can be constructed. A woven steel vest will reduce the wound value of any weapon that hits it by 2. If this reduces it to zero, the weapon has no effect. However, the

vest does not protect the entire body. Roll a die, and on a roll of 1 or 2, the attack hits a part of the body not protected and does normal damage. *Wt:* 5 lbs **Price:** (£10).



Mineral Detector: This device allows detection of rare minerals, such as gold and silver. The referee rolls against the device reliability to see if it actually detects the presence of a mineral deposit. *Wt:* 100 lbs **Price:** (£1000).

Cast Stone Chemical: This corrosive chemical will temporarily soften rock and allow it to be reshaped into any form desired. Each pound of the compound will soften one ton of rock times the device reliability rating. *Wt:* 1 lb **Price:** £20.

Transparent Aluminum: The manufacture of transparent aluminum allows creation of large, secure armored view ports in flyers and armored warships. The main effects depend on the uses the players put it to. **Price:** £500 per ton.

Volcanic Control Device: This device can cause eruptions in dormant volcanoes. It is a ground-vibrating machine with directional capability and can affect volcanoes within 200 miles of the device. The referee rolls against the device reliability to determine the success of the attempt. One attempt may be made per month. *Wt:* 50 tons **Price:** £25,000 **Power:** 20.

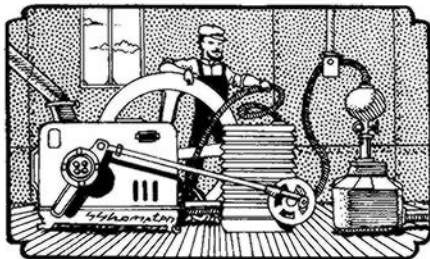
Earthquake Control Device: This device is similar in concept and function to the volcanic control device except that it triggers earthquakes. *Wt:* 100 tons **Price:** £30,000 **Power:** 30.

GRAVITY CONTROL

<i>Reliability</i>	<i>Altitude</i>
1	Very Low
2	Low
3	Medium
4	High
5	Very High
6	Orbit

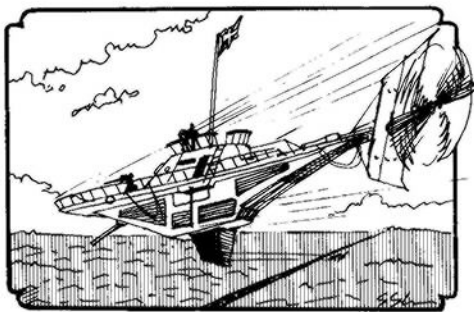
COMBUSTION

NEW INVENTIONS in the field of combustion have wide applications.



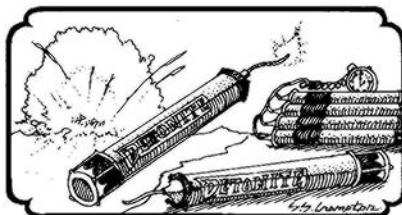
Fuel Refiner: This device allows you to refine gasoline from petroleum in your vessel. For every five tons of oil processed, you receive one ton of gasoline and four tons of usable oil. Conversion of five tons of oil takes eight hours. *Wt:* 1 ton (plus 5 tons of oil) **Price:** (£150) *Power:* 1.

Smokeless Powder: With smokeless powder it is extremely difficult to spot snipers, and massed troops can deliver more accurate fire as no smoke obscures their vision. To spot a sniper, roll Observation skill dice for an Easy task at close range, and increase the difficulty by one for each additional range band. Massed troops firing smokeless powder add 1 to their Marksmanship skill. **Price:** £10 per ton.

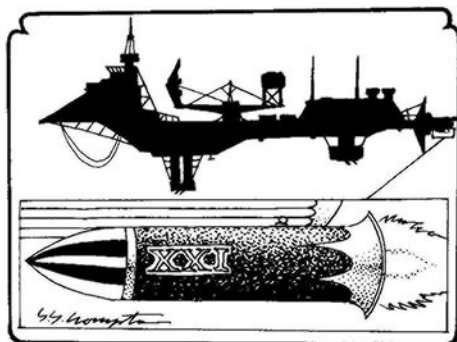


Liquid Fire: A compound which burns fiercely when exposed to oxygen. Water will not extinguish it but dry sand will. *Wt:* 8 lbs/gallon **Price:** £1 per gallon.

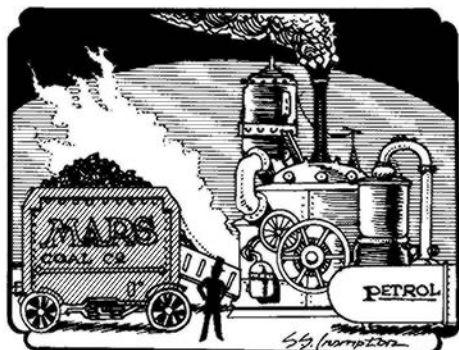
Welding: Welding enables steel parts to be fastened together without the use of rivets, which makes for a stronger structure, but the only means of accomplishing it requires a forge and heavy tools. If a player invents a system of portable welding (either a torch or an arc welding system), then any metal structure built thereafter by him or with his assistance may be welded. Any armored vessel multiplies its armor value by 1.5 (rounding fractions up). Any major damage to a welded ether flyer due to turbulence or meteors becomes minor damage and any minor damage becomes no damage. *Wt:* 5 lbs **Price:** £8.



Detonite: A more powerful version of dynamite. Detonite comes in half-pound sticks just like dynamite, but each stick has an explosive power equal to the reliability of the detonite. *Wt:* 1/2 pound/stick **Price:** 4/—.

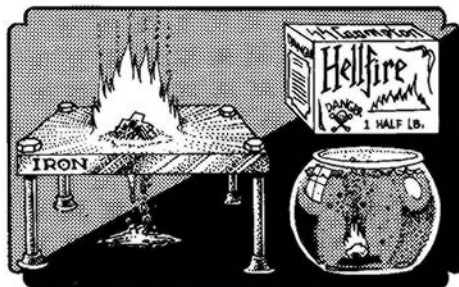


Rocket Engine: A rocket engine allows an ether flyer to maneuver safely in a vacuum, thus making landings on Luna and on asteroids hazard-free. *Wt:* 5 percent of the mass of the ether flyer **Price:** £10 per ton.



Coal Gasifier: This device allows conversion of coal to gasoline. For every five tons of coal processed, the user receives one ton of gasoline. Conversion of five tons of coal takes eight hours. *Wt:* 1 ton (plus 5 tons of coal) **Price:** (£200) *Power:* 1.

Noiseless Powder: Noiseless powder allows creation of truly silent guns. To spot a sniper firing noiseless powder, roll Observation skill dice for a Moderate task and increase the difficulty by one level for each additional range band beyond Close. **Price:** £20 per ton.



Hellfire: This is a chemical which burns with intense heat, sufficient to melt through steel in seconds. It cannot be extinguished as it contains its own oxidizer and will burn both in vacuum and underwater. It is used as a breaching charge and will melt through eight inches of barrier per minute. This amount is modified by the toughness of the barrier. Each half-pound block of hellfire will burn for a number of minutes equal to its reliability. *Wt:* 1/2 pound **Price:** £10/—.

ELECTRICITY

ELECTRICAL INVENTIONS range from batteries to lightning guns.

Hand Lamp: This lamp is attached by a cord to a small battery and a handcranked generator attached to the belt. It allows visibility of two yards in the dark per reliability number. *Wt:* 1 **Price:** £2.

Batteries: Batteries are defined by their power level (which is used the same way as the power level of a boiler) and their endurance, which is the number of days that the batteries will function at full power. Batteries may not be purchased at power levels greater than 4. Batteries may be purchased at any endurance desired. The weight of batteries in tons is equal to their power value times their endurance in days. Purchased Batteries: *Wt:* Power $\times$ endurance (in days) tons **Price:** £10 $\times$ power $\times$ endurance *Power:* Max. of 4.

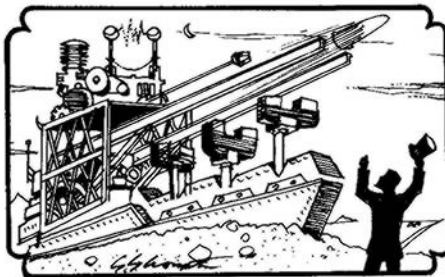
If the player has invented batteries of his own, their maximum power value is the device reliability number, and their weight in tons is their power value times their endurance divided by the device reliability. For example, if a player has invented batteries with a reliability number of 5, he could install batteries with a power level of 5 and any endurance desired. Their weight would be five times their endurance divided by 5. Invented Batteries: *Wt:* Power $\times$ endurance (in days) $\div$ reliability **Price:** £1 $\times$ power $\times$ endurance *Power:* Maximum equals reliability.

The price in pounds of batteries which are purchased is equal to 10 times their endurance times their power value. For example, batteries with a power value of 4 and an en-

durance of 8 days would cost ($4 \times 10 \times 8 =$) £320. Batteries invented by the players cost one-tenth of this amount.

Electric Engine: This engine allows the use of batteries to power a propeller for maneuvering in an atmosphere. The maximum power level is the device reliability. *Wt:* 1 ton per power level **Price:** (£200 per power level).

Long Wire Power: This allows transfer of electricity by wire over long distances without significant loss of power. The device reliability times 10 is the number of miles the electricity can be transferred before it loses half of its power to resistance in the wire. It will lose half its remaining power each additional increment of distance it is transferred. *Wt:* 5 tons per mile of cable **Price:** £20 per mile of cable.



Electric Rail Gun: This gun uses electromagnets to accelerate steel shells down its barrel. For game purposes it is equivalent to a 12-inch naval gun. *Wt:* 100 tons **Price:** £10,000 *Power:* 3.

Energy Cells: A means of converting sunlight directly to electrical energy. Subtract 2 from its output if used in an atmosphere; subtract 2 for every orbit further out than Earth (counting the Asteroid Belt as an orbit); and add 1 for every orbit further in than Earth. Energy cells may not be used on Venus. *Wt:* 1 ton **Price:** £1000.

Lightning Cannon: Projects a bolt of lightning toward a target and may only be fired at large targets, such as ships or dinosaurs. It has an effective range of 200 yards per reliability number and both a penetration and damage value equal to its reliability. *Wt:* 10 tons **Price:** £500 *Power:* 1.

Superconductors: Much of the power of an electric device is lost through resistance in its internal wiring. If a character develops superconductors, he may rebuild any electrical device to work at twice its normal efficiency. This means that its power requirement is halved. Rebuilding the device doubles its cost.

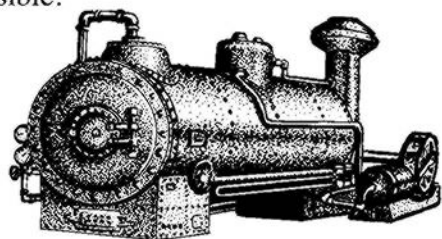
Wireless Power Transmission: This allows power to be beamed or broadcast through the ether. The maximum power level that may be beamed is the device reliability. Range of the device is 100 miles times reliability. There must be a transmitter to beam the power and a receiver to receive it. *Wt:* Transmitter, 10 tons per power level. Receiver, 1 ton per power level. **Price:** Transmitter £10,000, Receiver £2000 *Power:* 2 per power level.



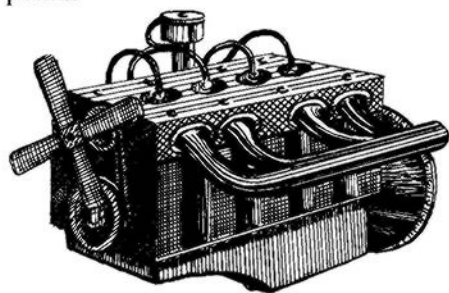
Electric Rifle: This rifle is noiseless and smokeless, has the same effective range as a bolt action rifle, and has a rate of fire of 4. It can fire 40 shots before its internal batteries run down. Recharging takes 1 hour on any power plant. *Wt:* 15 **Price:** (£200).

POWER PRODUCTION

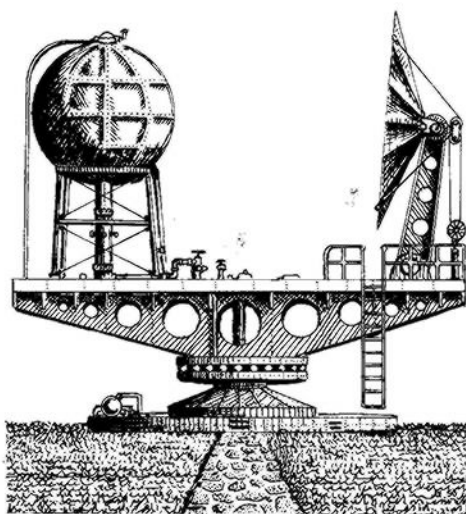
IMPROVEMENTS IN methods of power production are often needed to make other scientific advances feasible.



Forced Draught Boiler: An improved version of a conventional steam boiler, using a fan or blower to improve the combustion of the fuel and extract more energy. *Wt:* 3 tons/power point **Price:** £600/power point.



Internal Combustion Engine: An engine which burns the fuel inside the cylinder instead of outside (hence the name). These make use of liquid fuels such as kerosene, petroleum waste, or gasoline. *Wt:* 1 ton per power point **Price:** £600 per power point.



Solar Boiler: A device to harness the power of the Sun, by means of one or more focusing mirrors. The weight of the solar boiler in tons is twice its power value. If a player has invented a solar boiler of his own, he may build one for free. The power value is equal to the reliability value of the device. If a boiler is purchased instead, it costs £500 times the power value. *Wt:* Power $\times$ 2 tons **Price:** (£500 $\times$ power) *Power:* Maximum is reliability (if invented). No maximum if purchased.

Petrol Boiler: A steam boiler constructed to make use of liquid fuels (usually petroleum, petroleum waste, kerosene, or gasoline). Weight, price, and power are as for a conventional boiler; only the fuel changes. Weight of fuel is halved.

Steam Turbine: The device converts steam power into mechanical power by using high-pressure steam to turn rotary vanes (something like a windmill). It enables a steam engine to produce the same power for the same cost at less weight. *Wt:* 1 ton/power point **Price:** £800/power point.

Gas Turbine: A turbine that uses the hot, expanding gases from combustion instead of steam. *Wt:* .5 tons/power point **Price:** £1000/power point.

Energy Cells: A means of converting sunlight directly to electrical energy. Each energy cell has an output equal to its reliability rating at the orbit of Earth. Subtract 2 from its output if used in an atmosphere; subtract 2 for every orbit further out than Earth (counting the Asteroid Belt as an orbit); and add one for every orbit further in than Earth. *Wt:* 1 ton **Price:** £1000.

Heat Ray: This device focuses the rays of the Sun through several large lenses and produces a powerful beam of light that melts objects in its path. It has an effective range against vessels in the atmosphere of 1000 yards times its device reliability, and of 1000 miles times the device reliability outside the atmosphere. It has a rate of fire of 1 and a damage value of 10, although this is reduced by 2 in an atmosphere, plus it is reduced by 1 for every orbit out from the Sun past Mercury (-1 at Venus, -2 at Earth, -3 at Mars). *Wt:* 1 ton **Price:** £10,000 *Power:* 6.

The Atom: A power plant which harnesses the power of the atom. This power plant, once it is constructed, never again needs fuel. *Wt:* 10 tons **Price:** £2000 *Power:* 10 $\times$ reliability.

POWER PLANTS

Type	Weight	Cost	Fuel	Consumption
Conventional Boiler	6	300	Coal	1
Forced Draught Boiler	3	600	Coal	1
Petrol Boiler	6	300	Oil	1/2
Internal Combustion	2	600	Oil	1/2
Steam Turbine	1	800	Oil	1/2
Gas Turbine	1/2	1000	Gas	1/4

BIOCHEMISTRY

INVENTIONS IN the field of biochemistry can go very far to help or harm humanity.

Preserved Food: A means of storing food that retains the taste, nutrition, and palatability of food for longer periods than conventional methods such as canning or drying. *Wt:* 3 lbs per meal **Price:** 20/— per meal if purchased, otherwise regular, noncanned food price.

Aspirin: An analgesic medicine derived from salicylic acid, useful in relieving pain and the symptoms of fever. *Wt:* 100 doses per ounce **Price:** 10d per dose.

Sleep Gas: An extremely volatile liquid which induces unconsciousness when breathed in gaseous form. Within a few seconds of inhalation, the victim rapidly loses consciousness and will fall into a light sleep which will last one hour after the gas has dissipated. The victim will then awaken without ill effects. This gas can also be used as an improved anesthetic during surgical operations. One ounce of the liquid will vaporize in 10 minutes (or instantly, if sprayed) and fill an area 10 feet square to an effective density. *Wt:* 1 ounce **Price:** £1 per ounce.

Antibiotic: A substance with bactericidal properties that can be ingested by mouth, applied topically, or injected into the body using a hypodermic syringe. Severe infections and fevers can be cured within days using this compound. *Wt:* 10 doses per ounce **Price:** £3 per dose.

Strength Elixir: A liquid which temporarily boosts Strength 2 points higher. This effect lasts for a number of hours equal to the device reliability; then the user must rest for eight

hours. *Wt:* 1 dose per ounce **Price:** £2 per dose.

Mind Control Drug: A hypnotic drug which destroys the victim's will and makes him susceptible to commands and suggestions. The drug can be ingested by mouth or injected by means of a hypodermic syringe. Its effects last for a number of hours equal to the device reliability. *Wt:* 10 doses per ounce **Price:** £5.

Water-Breather: A small device which permits the wearer to extract dissolved oxygen from water in a manner similar to a fish's gills. It is a masklike contraption which covers the mouth and nose, and enables normal underwater breathing for an indefinite period. The functional portion of the device is differentially permeable and constructed of an artificial cellulose-like material. *Wt:* 1 lb **Price:** £12.

Tangle Cord: A liquid which solidifies upon exposure to air and forms a very sticky substance. When forced through a number of fine holes under high pressure, the liquid forms a web very much like a spider's. To escape, a character rolls Strength attribute dice for a Difficult task. The substance will last for a number of hours equal to the device reliability, after which time it will dry and crumble to dust. *Wt:* 4 ounces per web **Price:** £4 per web.

Food Pill: The essential nutrients and minerals of food, condensed into an easily portable tablet form. One ounce of tablets, taken with a pint of water, provides the equivalent of a full meal. *Wt:* 1 ounce **Price:** £1 10/— per ounce.

Synthetic Nutrient: An artificial food which induces rapidly accelerated growth when ingested. Adult creatures are not affected, only

juveniles. When fed this food instead of its normal fare, the animal will increase in weight by 10 percent per week. The animal will refuse all other food after tasting this substance. A failed experimental die roll should cause uncontrolled growth and/or dangerous behavioral changes in experimental animals and perhaps local plant life. *Wt:* 1 lb **Price:** £2 per pound.

Infrared Sight Liquid: A liquid which acts chemically upon the photoreceptors in the eyes to enable the user to see by means of the electromagnetic radiation in the otherwise invisible infrared spectrum, yet retain vision in normal light. The effect wears off in a number of hours equal to the device reliability. *Wt:* 1 ounce per dose **Price:** £5 per dose.

Prolonged Hibernation Device: An electronic device that permits humans to enter a state of suspended animation, requiring less than 1/1000th the usual amount of air and no food or water for a period of up to a year. It possesses a timer which can be preset to awaken the sleeper or can be activated from the outside at any time. *Wt:* 30 lbs **Price:** £600.

Synthetic Life: The generation of animal life from synthetic chemicals in vats. This animal life can take a variety of useful forms for agriculture or even simple labor. A failed experimental die roll should instead produce a bizarre, grotesque, and probably dangerous animal. **Price:** £5000 per experiment.

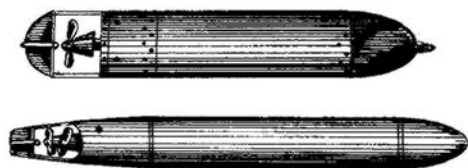
Synthetic Liftwood: A means of recreating the power of liftwood in the laboratory, manufacturing it at will. **Price:** £150 per ton of lifted mass. (£7500 per hull size if using the ship-building rules from *Sky Galleons of Mars*).

PRECISION MACHINERY

INVENTORS WORKING on pieces of precision machinery may choose to invent:

Photophone: This is a telephone which relies on light waves, instead of electricity through a wire. As it can be focused with fair precision, it allows secure voice communication between two vessels in space. It is not effective in an atmosphere, and there is too much sunlight interference for it to work inside the orbit of Mercury. Its range in miles is the device reliability times one million. *Wt:* 500 lbs **Price:** (£1000) *Power:* 1.

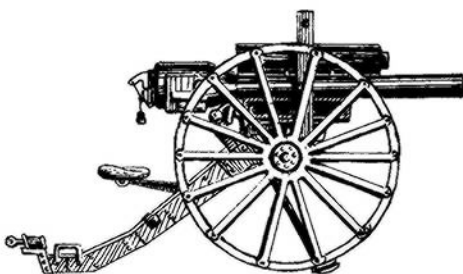
Torpedo: A torpedo may be fired from either a submarine or a surface vessel. The required hit number of the torpedo is twice its reliability number, but subtract one from the hit number for every 200 yards of range. A hit by a torpedo will sink all but the largest of warships. *Wt:* 500 lbs **Price:** (£50).



Improved Torpedo: This torpedo is identical in function to the above torpedo except that its hit number is reduced by 1 for every 400 yards of range instead of every 200 yards. *Wt:* 500 lbs **Price:** (£200).

Orrery: A mechanical model of the Solar System with gears that move all of the planets in their orbits and show the relative positions of all of them at any specified time. The orrery is a valuable navigational tool, and its uses are covered in the "Space Travel" chapter. *Wt:* 5 lbs **Price:** (£20).

Quick-Firing Gun: A field or naval gun mounted in a recoiling carriage which allows the gun to be operated at a higher rate of fire than normal guns. Any field or naval gun can be so modified. The modified gun's rate of fire increases by 1, and its cost increases by 50 percent.

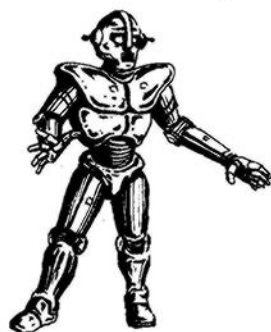


Gyroscope: Although small gyroscopes have been available as curios and toys for some time, this invention represents a large, useful gyroscope. Installation of a gyroscope in any flyer gives it a favorable die roll modifier equal to half the gyroscope's reliability rating (with fractions rounded down) in maintaining or recovering trim, whether due to storms or battle damage. *Wt:* 1 ton **Price:** (£200).

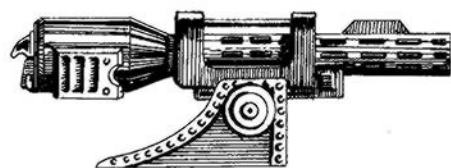
Analytical Engine: A mechanical computing and calculating machine with punchcard memory and programming, this device is a useful navigational tool. *Wt:* 1 ton **Price:** (£1000).

Inertial Compass: As conventional compasses do not work on Venus, an inertial compass significantly reduces the dangers of becoming lost. An inertial compass also is useful in navigating under the planet's surface in a mole drill. *Wt:* 50 lbs **Price:** (£100).

Mechanical Man: This is a complex, clockwork machine which resembles a human being. It can be programmed to carry out a number of simple commands, and its telephonic speaker and "ears" allow it to respond to a limited number of voice commands and answer simple questions. It is particularly useful for conducting operations too hazardous for humans. It is too slow to be much of a threat in melee, although it has tremendous strength, and if it should seize a character, it will prove nearly impossible to break free. It walks only four yards per action and always receives four actions per turn. Its device reliability is the number of hours it will function before it has to be rewound. It is also susceptible to rust and must be lubricated frequently. *Wt:* 1000 lbs **Price:** (£2000).



Underwater Gun: A specially vented breech-loading gun which fires a streamlined, underwater projectile. The gun has the same effect as the 4-inch short breech-loading gun, but can be fired from a submerged submarine at either surface vessels or other submarines. *Wt:* Replaces two torpedoes in the submarine **Price:** (£200).



TRANSPORTATION

INVENTIONS IN the field of transportation may include:

Space Suit: Allows free movement in a vacuum. The reliability of the device is the number of hours the suit will function without recharging its oxygen system. *Wt:* 20 lbs **Price:** £20.

Diving Suit: This allows a diver to swim independently, free of an air hose to the surface. The device reliability times 10 is the number of minutes the diver may remain submerged. *Wt:* 5 lbs **Price:** £20.

Hydrofoil: A very fast boat that rides up out of the water on its hydrofoils. Its reliability rating times 10 is its speed in knots. It has a crew of three and a machinegun. It may replace the machinegun with room for two passengers. *Wt:* 5 tons **Price:** £1000 **Power:** 1 ton of coal per day.

Submarine: A submersible vessel powered by electric batteries while submerged and a conventional boiler when on the surface. It has a speed of five knots. If invented by the player, the reliability number is the number of hours it may stay submerged before having to surface and recharge its batteries. The submarine carries a total of six crew and four passengers, but may carry up to two torpedoes by dispensing with the passengers. *Wt:* 20 tons **Price:** £5000 **Power:** 1 ton of coal per day.

Deep-Diving Submarine: Most submarines can go only a few yards under the surface. A deep-diving submarine has a strengthened hull that enables it to dive much deeper. The reliability number is the number of depth levels it can dive, with each depth level being 100 fathoms (200 yards). The reliability number times

10 is the number of hours the vessel may remain submerged. It has a speed of five knots, a crew of eight, and provision for up to eight passengers or four torpedoes. *Wt:* 70 tons **Price:** £20,000 **Power:** 2 tons of coal per day.

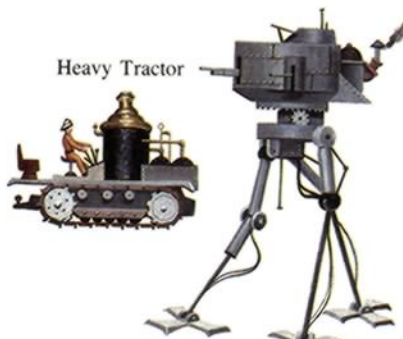


Diving Suit



Space Suit

Heavy Tractor: This tractor is a steam-powered land vehicle which moves on endless steel treads and is capable of crossing most terrain types. It has a land speed in miles-per-hour equal to its reliability number. *Wt:* 5 tons **Price:** £500 **Power:** 1/2 ton of coal every eight hours.



Heavy Tractor

Land Juggernaut

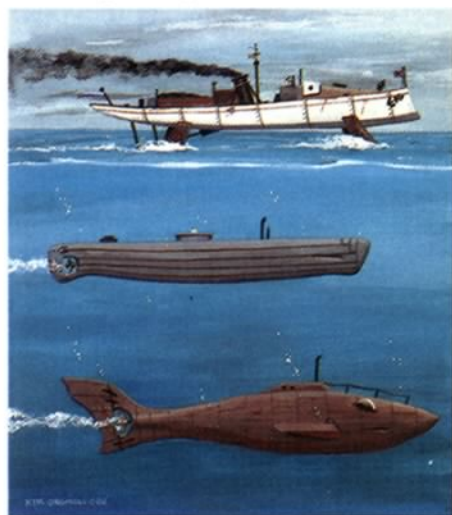


Mole Drill

Walking Tripod: This is a tall land vehicle which walks on three articulated legs. It is capable of crossing most terrain types and can wade in up to 20 feet of water. Its speed in miles-per-hour is its reliability number times 2. It is armor-plated and has an armor value of 1. It may be equipped with a machinegun or field gun. *Wt:* 2 tons **Price:** £1000 **Power:** 1/2 ton of coal every eight hours.

Land Juggernaut: A very large, armed, and armored version of the heavy tractor. Its reliability rating is its speed in miles-per-hour. It has a crew of eight (commander, driver, two engineers, and four gunners), has an armor value of 3, and is armed with two machineguns and a 12-pounder field gun. *Wt:* 30 tons **Price:** £15,000 **Power:** 3 tons of coal every eight hours.

Mole Drill: An enclosed drilling vehicle designed to bore deep into the crust of a planet and explore subterranean caverns. Its reliability times 10 is the number of miles per day it can drill. It has provisions for a crew of four and four passengers. It carries a total of 20 tons of coal. *Wt:* 30 tons **Price:** £20,000 **Power:** 1/2 ton of coal per day.



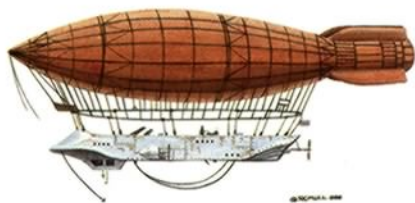
Hydrofoil, Submarine, Deep-Diving Submarine

FLIGHT

INVENTORS HAVE the chance to revolutionize flight almost as much as liftwood did by inventing one of the following devices:

Hydrogen Lift: A means of using hydrogen gas to lift an ether flyer or other device into the air. Hydrogen lift is free for a vessel up to 20 tons of lifted mass, then costs £50 per ton for lifted masses above that. Hydrogen is not practical for vessels of greater than 200 tons of lifted mass, given construction techniques available at this time. **Price:** £50/ton capacity.

Monohydrogen: Monoparticle hydrogen, which provides half again the lift for the same quantity of gas, allowing construction of 300-ton vessels. **Price:** £70/ton capacity.



Glider: A device making use of Bernoulli's Law to provide limited lift by the interaction of specially shaped wings and the atmosphere (the means terrestrial birds use for flight), thus independent of liftwood. The device has room only for the pilot and has a speed of 60 miles per hour. Constant forward motion is required; the device cannot hover. **Wt:** 400 lbs per ton capacity **Price:** £30 per ton capacity **Power:** 0.



Parachute: A large cloth canopy (usually of silk for lightness and strength) which slows a falling person's descent through the air by increasing air resistance. It is used as a means of emergency evacuation from damaged flyers and permits a person to drop from great heights without injury. **Wt:** 20 lbs **Price:** £3.



Improved Liftwood: A chemical means of enhancing the lifting power of liftwood, doubling its effectiveness. This compound has no effect upon liftwood decay. One gallon will treat the liftwood normally used to lift 50 tons of mass to orbit (or 1 hull size in *Sky Galleons of Mars*). **Wt:** 8 lbs/gal. **Price:** £36.

Autogyro: A flying machine which depends upon unpowered rotating lifting vanes instead of liftwood. It still requires power for forward motion. **Wt:** 440 lbs per ton capacity **Price:** £34 per ton capacity **Power:** 50 lbs of gasoline per hour.



Personal Conveyor: A small, one- or two-passenger flying machine, using liftwood for flight, and propellers, vanes, or flaps for propulsion and steering. It will lift 240 pounds. **Wt:** 26 lbs **Price:** £50.



Helicopter: A powered version of the autogyro (using an internal combustion engine) which is capable of hovering like a liftwood flyer. **Wt:** 600 lbs per ton capacity **Price:** £45 per ton capacity **Power:** 100 lbs of gasoline per hour.



OPTICS

THE FIELD of optics lies wide open for new inventions.

Telescope: This device is a large telescope useful for astronavigation, as opposed to the simple spyglass. *Wt:* 400 lbs *Price:* £200



Range Finder: This stereoscopic optic device allows precise calculation of range to a target and increases the gunner's effective skill by 1 at targets beyond close range. *Wt:* 10 lbs *Price:* £20.



Armor Glass: This substance is extremely hard glass which allows fabrication of secure vision blocks on vehicles and flyers. Its effects are similar to those of transparent aluminum. *Price:* £500 per ton.



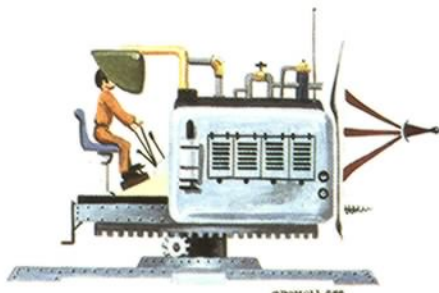
Infrared Telescope: This device allows players to see through fog, mists, and darkness. It is useful in spotting the enemy in limited visibility. Its two most common uses would be in night navigation and on Venus. *Wt:* 100 lbs *Price:* £150.



Heat Ray: This device focuses the rays of the Sun through several large lenses and produces a powerful beam of light that melts objects in its path. It has an effective range against vessels in the atmosphere of 1000 yards times its device reliability, and of 1000 miles times the device reliability outside the atmosphere. It has a rate of fire of 1 and a damage value of 10, although this is reduced by 2 in an atmosphere, plus it is reduced by 1 for every orbit out from the Sun past Mercury (-1 at Venus, -2 at Earth, -3 at Mars). *Wt:* 1 ton *Price:* £10,000 *Power:* 6.



Transvisor: This device allows a character to see through solid objects. The device must be adjusted to see through specific types of material, and then it will not register those materials at all, which limits the utility of the device to a certain extent. For example, a transvisor can see an iron bar on the far side of a stone wall, but it could not see it on the far side of an iron plate. *Wt:* 2 tons *Price:* £20,000 *Power:* 8.



Invisibility Device: This invention is a light-refracting device which bends light rays around its field and lets them continue on their way without absorbing or reflecting them, thus rendering the objects inside the field theoretically invisible. Actually there is a good deal of visual distortion, and the area of the field looks very much like heat waves. The device encloses an area in diameter in yards equal to four times the device's reliability rating. *Wt:* 500 lbs *Price:* £10,000 *Power:* 1.

COMBINATION DEVICES

THE PRICE and weight of a combination device is the total of its two components plus 10 percent. To invent a combination device the inventor must have invented both devices.

Ballistic Computer: A device to calculate ranges and the firing angle for a weapon to hit the target. A ballistic computer functions in place of a range finder increasing the effective skill of the gunner by 2. A gunner must have a Gunnery skill of at least 2 to use the computer, however.

Astrogration Computer: An automatic device for astronavigation, automatically adjusting the controls of an ether flyer when set for a given destination and calculating the most economical course.

Aeroplane: A powered, heavier-than-air machine for flight. The speed of the aeroplane in miles-per-hour is 60 plus 10 times the device reliability. It will carry a pilot and either one passenger, one machine-gun, or 100 pounds of bombs.

Improved Telescope: An astronavigational device which can be precisely adjusted and remain focused on one location.

TRANSPORTATION, LAND

LAND TRANSPORTATION will be heavily relied upon by adventurers.

Two-Passenger Chaise: A two-wheeled, one-horse cart, designed for two passengers and 100 pounds of assorted baggage belonging to them. *Wt:* 600 lbs **Price:** £8.

Four-Passenger Carriage: A four-wheeled, two-horse cart, designed for four passengers and 200 pounds of baggage. *Wt:* 900 lbs **Price:** £12.

Wagon: A four-wheeled, two-horse cargo carrier, designed for two people and up to 3 tons of cargo. *Wt:* 1000 lbs **Price:** £25.

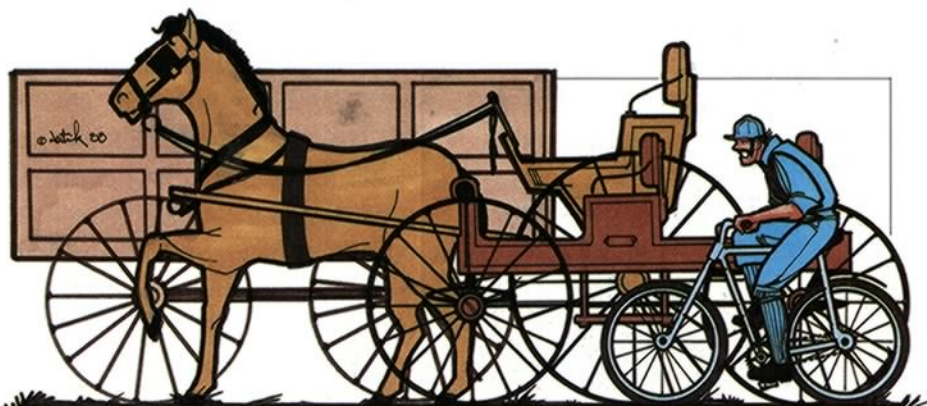
Mule: A mule can carry up to 160 pounds, including a saddle of the same dimensions as that used for a horse. Mules can be worked for 12 hours without exhausting them. **Price:** £8 (including saddle).

Bullock: A bullock is a neutered bovine used as a pack animal in some regions of the world. It can carry 150 pounds (not counting the pack saddle) and can be worked for six hours before exhaustion. **Price:** £6 (including saddle).

Elephant: An elephant used as a beast of burden can carry up to 1300 pounds (not counting the howdah) and can be worked for six hours before exhaustion. **Price:** £40 (not counting howdah).

Howdah: A bowl-like structure carried on the back of an elephant or ruumet breehr in which passengers or cargo are carried. *Wt:* 250 lbs **Price:** £5 to £20.

Camel: Camels can carry up to 400 pounds for six hours before being exhausted. **Price:** £12 (including saddle).

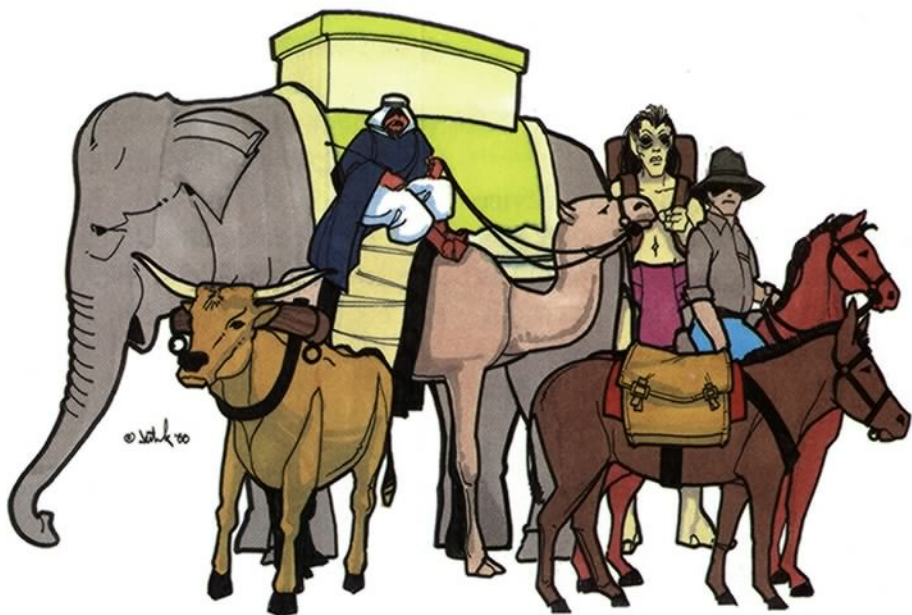


Human Porter: A human laborer can carry 45 pounds, and can be worked for 10 hours before exhaustion sets in. They need no saddles, but the object(s) to be carried must be of such a nature as to be easily grasped and handled. **Wages:** 5d per hour.

Bicycle: A modern safety bicycle, not the older penny-farthing, designed to carry one person and up to 50 pounds of baggage. *Wt:* 26 lbs **Price:** £5.

Horse: A horse can carry up to 240 pounds, including the saddle. Horses used as pack animals require a pack saddle and bridle, which cost the same as the horse tack mentioned below, but only weigh 10 pounds. Horses can be worked about eight hours without exhausting them. **Price:** £10.

Horse Tack: Saddle, bridle, blanket and other gear for riding a horse. Similar equipment is available on other worlds for other riding animals. *Wt:* 26 lbs **Price:** £1 to £5.





Pacyosaurus: A pacyosaurus can carry up to 400 pounds. They are normally ridden bareback with several riders. They can be worked about eight hours without exhausting them. **Price:** £10.



Martian Ruumet Breehr: The Martian ruumet breehr can carry a load of up to 3200 pounds (not including howdah) for six hours before exhaustion sets in. **Price:** £20 (not counting howdah).

Gashant: A gashant can carry up to 300 pounds, including the saddle. Gashants used as pack animals require a pack saddle and bridle which cost the same as the horse tack mentioned above, but only weigh 10 pounds. Gashants can be worked about eight hours without exhausting them. **Price:** £5.

TRANSPORTATION, WATER

THESE ITEMS move adventurers over the water.

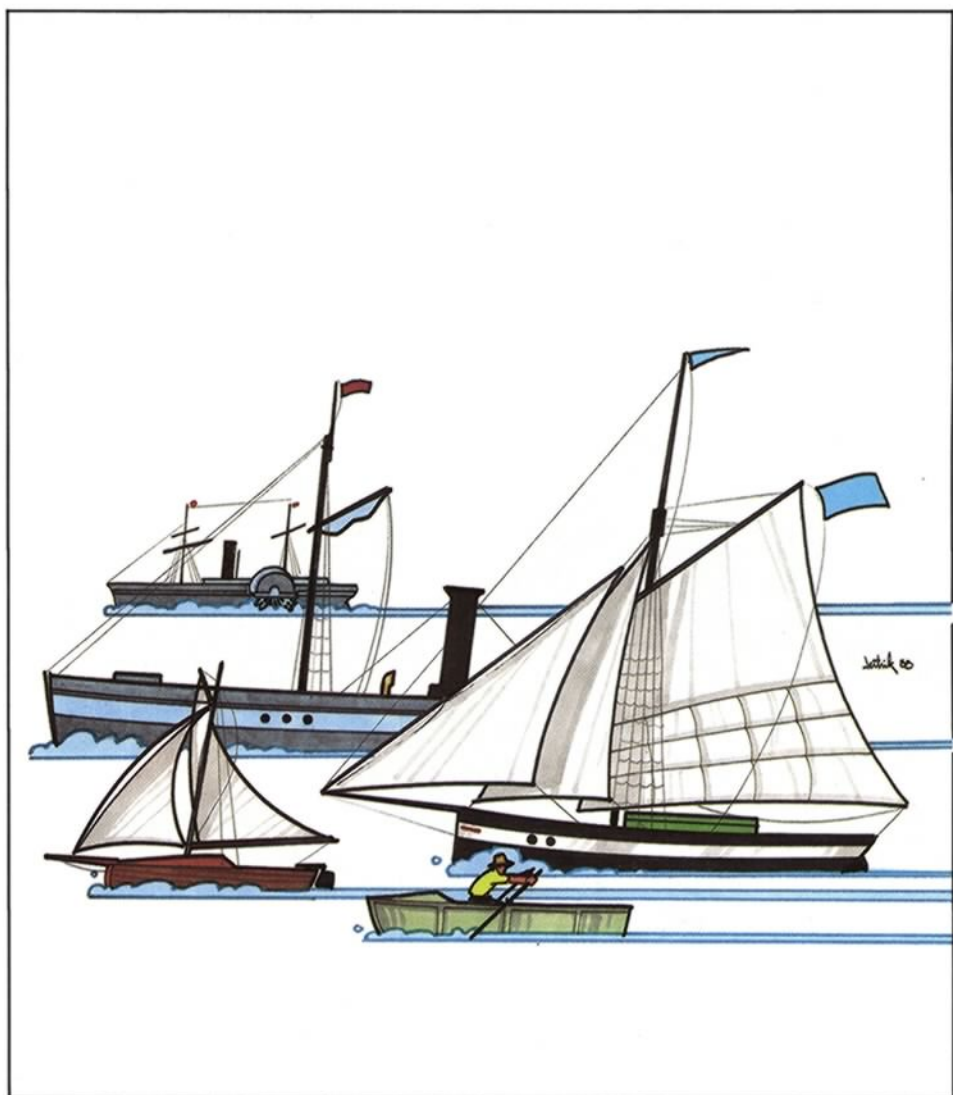
Boat, Folding Canvas: A small, readily portable craft capable of carrying up to 600 pounds of passengers and cargo. **Wt:** 35 lbs **Price:** £5.

Large Boat: There is a bewildering plethora of nautical terms for various sizes and types of small watercraft (launch, gig, cutter, pin-nace, whaleboat, etc.). We have chosen to divide these craft into large and small boats. Large boats have a cargo capacity of 3-5 tons **Price:** £8.

Small Boat: Small boats have a cargo capacity of 1.5 to 3 tons. **Price:** £5.

Steam Launch: A large boat powered by a small steam engine. **Price:** £10.

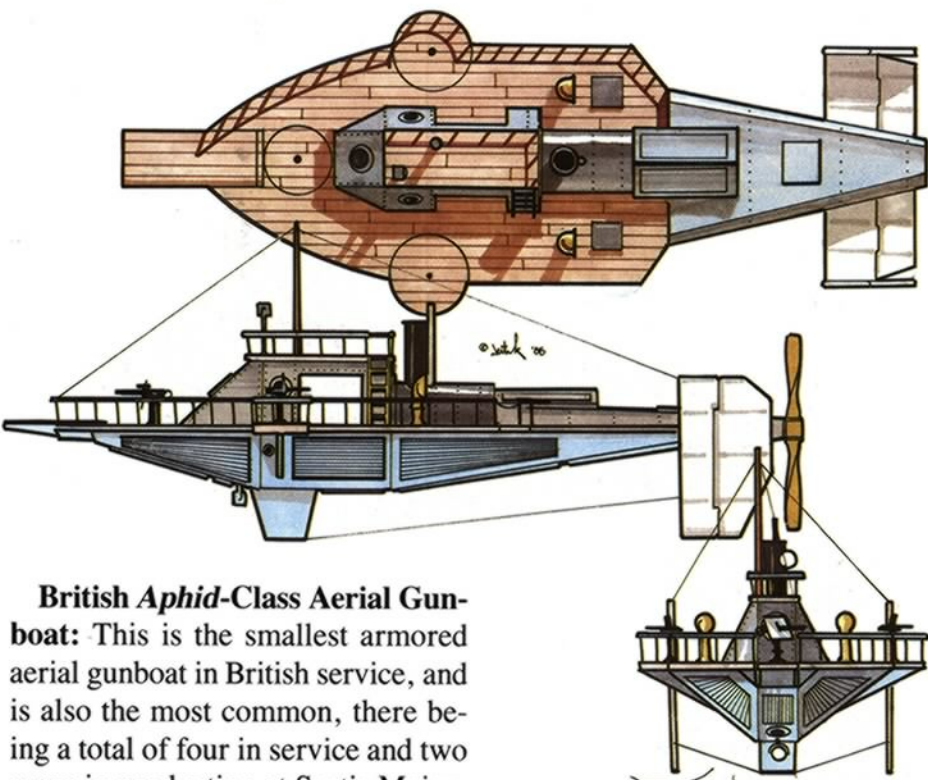
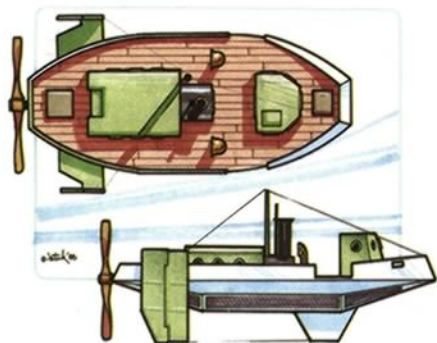
River Steamer: The more modern versions of these boats have propellers, but the older models still in service often use paddle wheels (side or stern mounted). The engines burn coal or wood, and cargo capacity varies from 50 to 200 tons. **Price:** £100.



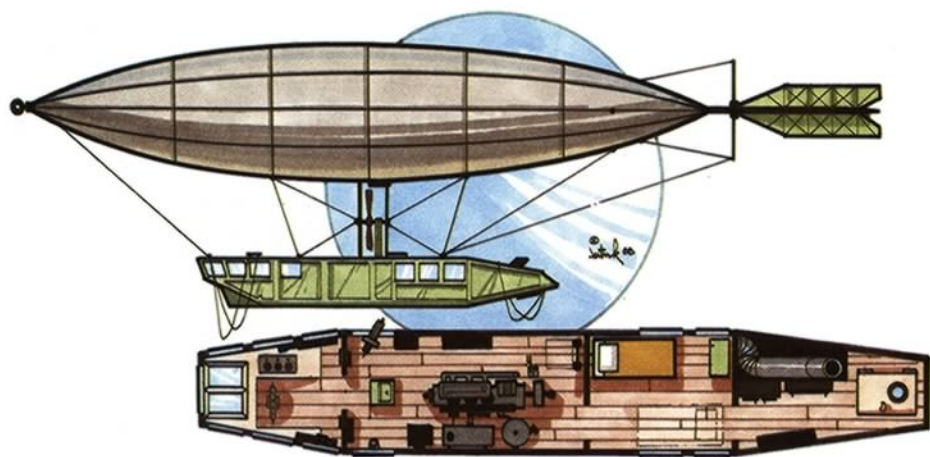
AERIAL VESSELS

VESSELS WHICH can carry adventurers through the air of the differing worlds include:

British Steam Launch: This is a small craft popular with exploratory missions. It has accommodations for eight (helmsman, trimman, engineer, gunner, and four passengers), and space for 5 tons of cargo and 20 tons of coal (40 days endurance at cruising speed). Its armament consists of a single five-barrel Nordenfelt machinegun in the bow. *Wt:* 50 tons **Price:** £4840.



British Aphid-Class Aerial Gunboat: This is the smallest armored aerial gunboat in British service, and is also the most common, there being a total of four in service and two more in production at Syrtis Major. Each of these vessels carries a crew of 15 and has an endurance of 20 days steaming. It is armed with a 4-inch gun, two Hotchkiss 1-pounder rotating cannons, and two five-barrel Nordenfelts. *Wt:* 160 tons **Price:** None are for sale, but their original cost to the Royal Navy was £23,220.



Zeppelin: Developed by the Germans but widely sold to powers which do not have reliable access to a supply of liftwood, the Zeppelin is a rigid airship held aloft by hydrogen. It obeys all rules of aerial combat with two exceptions. First, all hull hits cause only one hull hit, regardless of the damage value of the shot. (Exploding shells simply punch a hole through the gas bag and do not encounter sufficient resistance to detonate.) Second, any fire or fire/boiler critical hit result sets the hydrogen gas on fire and the Zeppelin crashes in flames. Characters on board will each suffer two dice of wounds from burns and concussion.

The Zeppelin has 20 days of endurance but burns only gasoline in its engines, and thus it can only refuel at German airship bases. *Wt:* 200 tons **Price:** £20,000.

Martian Small Screw Galley:

Various small dispatch vessels and gunboats are used by Martian principalities; the *Small Bird* class is typical. It has a crew of less than 20 but carries substantial armament for its size. Unarmed small screw galleys are generally faster than the *Small Bird*. **Wt:** 200 tons **Price:** Vessels of this type are valued by the British government at between £10,000 and £15,000.

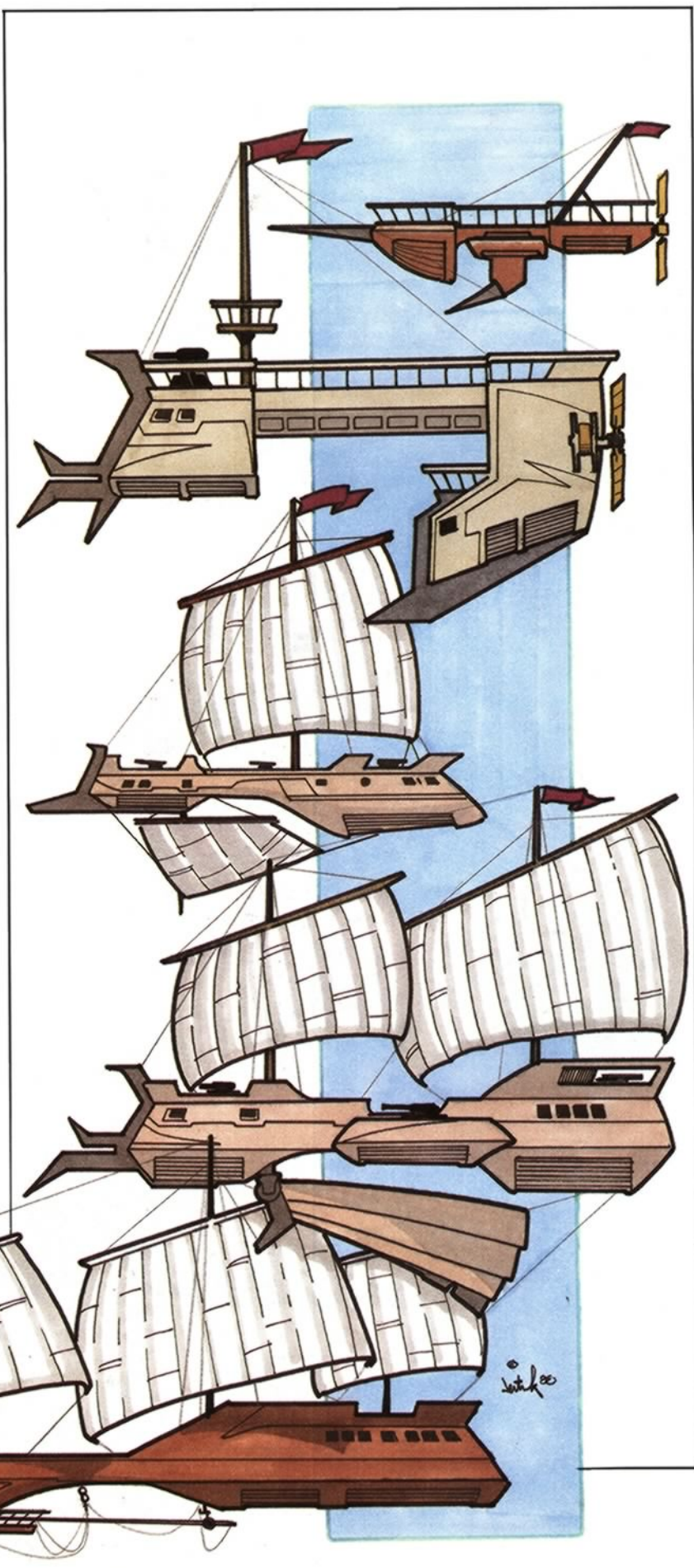
Martian Large Screw Galley:

Imperial Oenotrian *Hullcutter*-class screw galleys are typical of this size and type of vessel. They have a crew of 60 and are equipped with a ram bow and heavy ordnance. **Wt:** 700 tons **Price:** Valued by the British government at over £50,000.

Martian Small War Kite: These small aerial sailing vessels carry a crew of 10. **Wt:** 100 tons **Price:** £8000.

Martian Large War Kite: These powerful sailing vessels weigh up to 700 tons and have a crew of 40. They are equipped with a ram and heavy ordnance. **Wt:** 700 tons **Price:** About £60,000.

Martian Merchant Kite: Merchant kites are quite large, usually upwards of 2000 tons. They require a crew of about 50 to operate the complicated rigging, and carry 1000 to 2000 tons of cargo. **Wt:** 2000 tons+ **Price:** Valued at over £100,000 by the British government.





SCIENCE

THE VICTORIAN WORLD regarded science with a mixture of excitement and apprehension. On one hand, the obvious delights of modern medicine and engineering were making life more comfortable and prosperous for the respectable citizen; he was a strong believer in "progress" and could see the advantages of modern science all around him, not only in steamships and telegraphs, but in the more domestic amenities of the new electric lights and reliable indoor plumbing.

On the other hand, developments in scientific theory threatened much

that the Victorians held sacred. Darwin's *Origin of Species* (1859) had thrown into sharp relief the conflict between traditional Christian beliefs and the implications of modern discoveries. The turmoil this project of Darwin caused rebounded throughout the literature of the period. Many Victorian literary figures underwent a crisis of faith, symbolized as the receding "sea of faith" in Matthew Arnold's famous poem, "Dover Beach." The biologist T. H. Huxley (1825-95), crusading for science in a series of debates with Bishop Wilberforce, argued that science had effectively made religion obsolete—a frightening thought for good Anglicans and Methodists who had no wish to set aside either their beliefs or the benefits of technology. A secondary threat to established society concerned the future direction of education, a struggle termed "Art versus Utility." Huxley argued against Matthew Arnold in a series of essays that poetry, the humanities, the whole classical regimen of Greek verbs and Latin verse that comprised education among the landed aristocracy, would be swept aside. This revolution would be accomplished by (in the aristocracy's opinion) that most dangerous weapon of the ignoble engineers and manufacturers—modern technology. Science was to society a two-edged sword, a boon and a peril.

The result was a typically Victorian compromise. Science became accepted as a field for the "gifted amateur," the gentleman who would tinker with inventions or theorize on safe subjects, all the time guarding society from subversive discoveries or heresies that might undermine the status quo. Lord Salisbury was an enthusiast of this type. His experiments in hydroelectric power, which lit Hatsfield House and scared visitors, scarcely impinged on the pre-steam set of his mind. Player characters may prove more broad-minded in their inquiries and the uses to which they put their discoveries.



Electric light—the blessing of science.



Science gone wild.

RESEARCH AND INVENTIONS

THE OBVIOUS AIM of an inventor is to invent things. Characters who are inventors (had Inventor as at least one prior career) may have invented one or more devices prior to the start of play, and as the game progresses will probably continue their research and strive to invent new devices while perfecting those that they already have. Invention is a result of two processes: general research and specific experiments. The player carries out both these tasks by rolling research dice.

Research Dice: A player has initial research dice available equal to his skill level in the various scientific, mechanical, and engineering skill areas, plus dice equal to his Intellect attribute. These research dice may be allocated among different research areas. All research areas list which skills are appropriate to that area. Only dice from those skills may be used to research or experiment in that area. Intellect dice may be used in any area.

For example, Caruthers, whose science-related statistics are shown below, has been an inventor for both of his previous careers in hopes of making some truly impressive breakthroughs. He has an Intellect of 5 and skill levels in other areas as shown below. He has the same number of research dice in each area as his skill level, plus five research dice for his Intellect.

Science

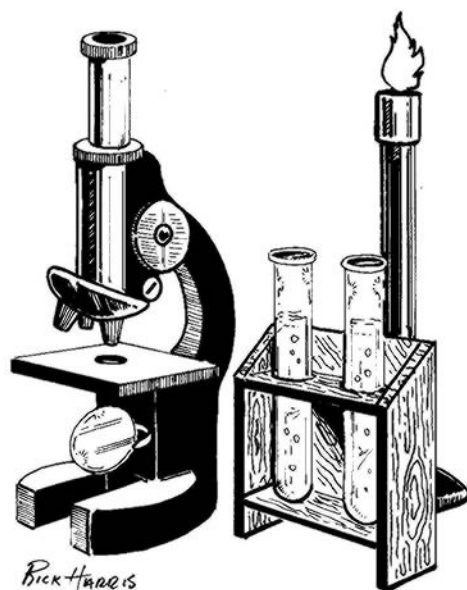
- Physics 4
- Chemistry 2
- Biology 2
- Geology 2
- Archaeology 2

Engineering

- Naval Architecture 4
- Structural Engineering 2
- Earthworks 2
- Explosives 2

Mechanics

- Electricity 4
- Steam 2
- Machinist 2



General Research: General research builds up the character's knowledge in a field. A player rolls one or more dice for general research and adds the results together. The result is his knowledge level in the area. A player may roll his dice one at a time if desired and stop rolling additional dice once he has gotten to a desired level.

For example, Caruthers wants to research the ether. He notes that the applicable skills are Physics and Electricity. He has a skill level of 4 in Physics and 4 in Electricity, and thus could roll up to eight dice for research and experiments. He could also add in his five Intellect dice, for a total of 13. However, he could not then later roll those dice to research another area. Caruthers decides to roll two Physics and two Electricity dice for basic research. He rolls a 2, 3, 5, and 6 for a total of 16. He wishes a level slightly higher than this, and so he rolls one additional Physics die, obtaining a 3. His knowledge of the ether is now 19. He still has 1 Physics die, 2 Electricity dice, and up to five Intellect dice available for experiments in the ether or research in other fields.

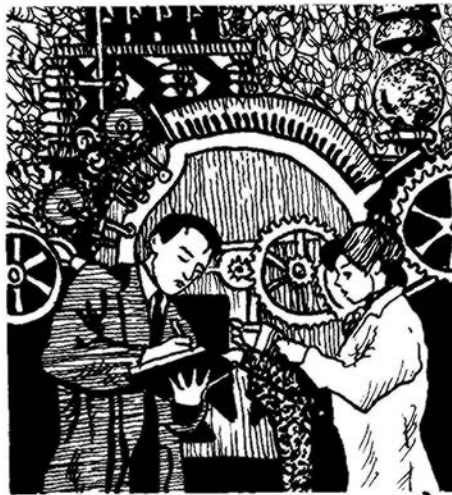


Experimental Devices: Each research area has a number of experimental devices listed with it. Each device has a minimum research level and an experimental success number. Once a player has a knowledge level equal to or greater than the minimum level, he may attempt to invent the device listed by conducting an experiment.

Caruthers, for example, has a level-19 understanding of the ether. By consulting the list of experimental devices, we see that he can attempt to invent an ether propeller (5), ether sail (7), etherometer (10), or Herzian wave communicator (14). He does not yet have sufficient knowledge of the ether to attempt a lightning cannon (25), freeze ray (31), weather control ray (33), gravity focus ray (38), mind control ray (35), or a gravity control device (42).

An experiment is conducted by rolling one research die. The die rolled is subtracted from the inventor's remaining pool of research dice. For the experiment to be successful, the die roll must be greater than the listed experimental success number. The amount by which the experimental die roll exceeds the experimental success number is the reliability value of the device.

By way of example, Caruthers wishes to invent an ether propeller and an etherometer. He decides to allocate one die to each and uses his remaining one Physics and one Electricity skill dice to do so. He rolls a 3 for the ether propeller and notes that its experimental number is -1. Since 3 is greater than -1, he succeeds in his attempt, and since his roll exceeds the number by 4, his ether propeller has a reliability of 4. He rolls a 2, which is four higher than the etherometer's experimental number of -2, giving Caruthers a working etherometer with a reliability of 4.

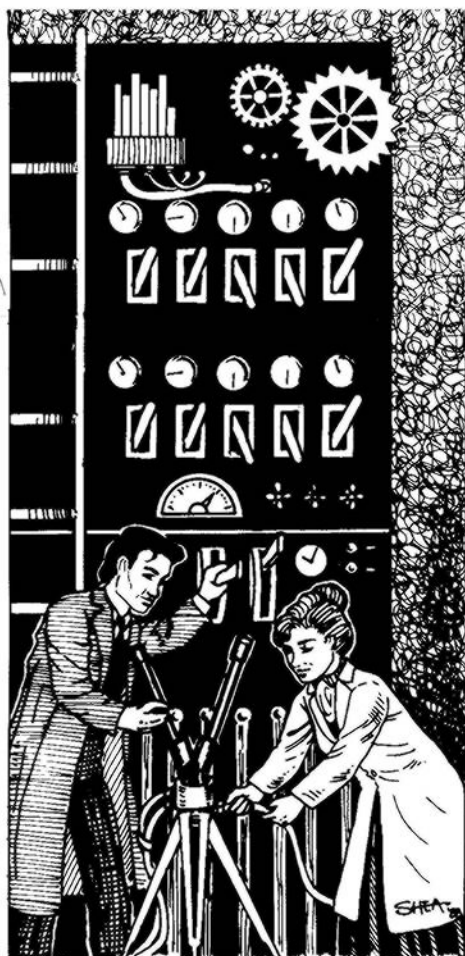


The reliability of a device is the chance that it will work as intended. This reliability may be increased by subsequent experiments. If an inventor is unhappy with the reliability level of his device, he may roll one research die to perfect it. If the die roll is higher than the current reliability number of the device, that becomes the new reliability number; otherwise the reliability number remains unchanged. An inventor may try as often as he wishes to increase the reliability of his inventions, provided he has sufficient research dice to do so.

Caruthers, for example, is unhappy with the reliability of his etherometer and conducts additional experiments to perfect it. He has used all of his experimental dice for Physics and Electricity, but still has his five Intellect dice. He rolls one die and rolls a 1. As this is not an improvement over the device's current reliability of 4, it remains unchanged. He decides to try one more time and rolls a 5. This now becomes the new reliability level of his invention, and he still has three Intellect dice to use on other inventions in this field or research in other fields.

Once a device has been invented, the inventor still has to actually build it. The individual devices are described in the "Equipment" chapter of this book. Each separate description indicates how the device is used, what effects it has, the requirements and costs for its construction, and any special rules applying to it.





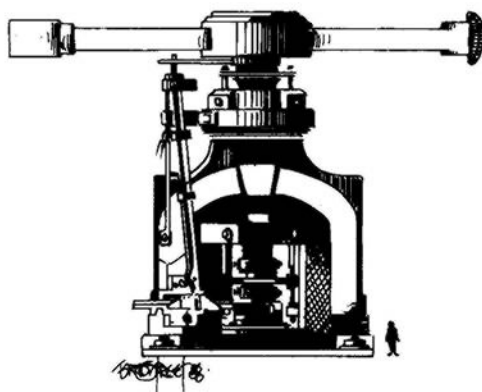
Combination Devices: Some experimental devices are combination devices. No specific knowledge level is required, but the player must have already invented both basic devices listed to invent the combination device. If he has done so, he may attempt to invent the combination device by rolling an experimental research die normally. Only Intellect dice may be used to invent combination devices. Note that combination devices have only one number in parentheses, their experimental number.

For example, Caruthers has, in the course of his various researches, invented both an analytical engine and a range finder. He decides to combine these two separate devices into a ballistic computer. He still has

several Intellect dice left and allocates one to this experiment. He rolls a 6, which is four higher than the ballistic computer's experimental number of 2. He has thus invented a ballistic computer with a reliability of 4.

Continuing Research: During the course of the game, the referee should award additional research dice to inventors as a result of their experiences. The referee may award these as skill-based dice (such as Physics or Machinist), or may make them specific to a certain research area (such as the ether), or award them without restriction (the same as Intellect dice and usable in the same manner for the purposes of inventing combination devices). Generally he will award skill-based dice if a player has used a particular skill extensively. Area dice may result from learning some interesting new fact about the phenomenon covered by that research area. Unrestricted dice might be awarded if the player was able to spend a great deal of time in a laboratory, such as during a long space voyage.

A referee should seldom award more than one research die at the end of an adventure and may consider several alternatives instead. If a player has been able to extensively examine or extensively and practically use an experimental device, the referee can give the player a die roll modifier on any experimental attempt to perfect it. Alternatively, the referee can award a general increase in the inventor's knowledge of a specific research area. The invention system is flexible enough to allow the referee many different ways to gradually increase the characters' knowledge of the universe.



Other Inventions: Referees are free to make up their own inventions, using those listed here as a guide. However, it is critical that the referee always strive to maintain the balance of the game. **Space: 1889** is a 19th-century role-playing game, and while the science-fiction aspects of it allow for colorful and interesting devices such as these, permitting the world to become overrun with them will soon change the nature of the game dramatically. To avoid this, always remember that superscientific devices should have some limitations. Most of the powerful weapons listed on this table are very bulky, expensive, require considerable energy, and always stop short of assured destruction. No hip-pocket ray guns or disintegrators exist, for example.

Finally, remember that this list of inventions and those generated by the referee provide a good shopping list for outfitting mad scientists and evil inventors. Most of these inventions, particularly the high-level ones, are unlikely to be perfected by players, but can be easily introduced into the game through non-player character villains. In most cases, however, the villain's masterworks are likely to perish with him by the end of the adventure.

RESEARCH AREAS

The research areas include:

Transportation (Naval Architecture, Structural Engineering)

Space suit (4, -3)
Submarine (10, 3)
Heavy tractor (14, 2)
Diving suit (16, 2)
Deep-diving submarine (22, 4)
Walking tripod (24, 3)
Hydrofoil (26, 2)
Land juggernaut (28, 4)
Mole drill (35, 4)

Electricity (Physics, Electricity)

Hand lamp (3, -3)
Batteries (5, -3)
Electric engine (10, -1)
Long wire power (15, 2)
Electric rail gun (22, 2)
Energy cells (25, 5)
Lightning cannon (28, 4)
Superconductors (35, 5)
Wireless power transmission (35, 5)
Electric rifle (40, 3)

Biochemistry (Chemistry, Biology)

Preserved food (4, -2)
Aspirin (12, -1)
Sleep gas (16, 1)
Antibiotic (22, 2)
Strength elixir (24, 4)
Mind control drug (26, 5)
Water-breather (28, 4)
Tangle cord (31, 4)
Food pill (32, 1)
Synthetic nutrient (33, 5)
Infrared sight liquid (34, 3)
Prolonged hibernation device (35, 3)
Synthetic life (38, 5)
Synthetic liftwood (42, 5)

The Ether (Physics, Electricity)

Ether propeller (5, -1)
Ether sail (7, 1)
Etherometer (10, -3)
Hertzian wave communicator (15, 2)
Lightning cannon (25, 4)
Freeze ray (31, 5)
Weather control ray (33, 5)
Mind control ray (35, 5)
Gravity focus ray (38, 5)
Gravity control (42, 5)

Optics (Physics, Machinist)

Telescope (5, -3)
Range finder (+1 Gunnery at long range) (15, 1)
Armor glass (22, 4)
Infrared telescope (28, 2)
Heat ray (33, 4)
Transvisor (38, 3)
Invisibility device (42, 5)

Geology and Metallurgy (Geology, Chemistry)

Superhard steel (15, -1)
Rustless iron (22, -3)
Woven steel (26, 1)
Mineral detector (32, -1)
Cast stone chemical (34, -2)
Transparent aluminum (36, 2)
Volcanic control device (38, 4)
Earthquake control device (40, 5)

Flight (Physics, Naval Architecture)

Hydrogen lift (5, -1)
Personal conveyor (8, 1)
Glider (15, 5)
Parachute (15, 3)
Improved liftwood (23, -2)
Autogyro (26, 3)
Helicopter (29, 4)
Monohydrogen (33, 2)

Precision Machinery (Structural Engineer, Machinist)

Photophone (3, 1)
Torpedo (5, 3)
Orrery (7, 1)
Quick-firing gun (9, 3)
Gyroscope (15, 2)
Improved torpedo (22, 3)
Analytical engine (26, 3)
Inertial compass (28, 4)
Mechanical man (35, 5)
Underwater gun (38, 4)

Power Production (Steam, Physics)

Forced draught boiler (4, -2)
Petrol boiler (6, -1)
Solar boiler (8, 1)
Internal combustion engine (10, 2)
Steam turbine (15, 3)
Gas turbine (25, 4)
Energy cells (34, 5)
Heat ray (32, 5)
The atom (40, 5)

Combustion (Explosives, Chemistry)

Fuel refiner (5, -4)
Smokeless powder (7, -2)
Liquid fire (15, -4)
Welding (12, -2)
Detonite (20, 4)
Rocket engine (25, 3)
Coal gasificator (25, -3)
Noiseless powder (33, 1)
Hellfire (38, 4)

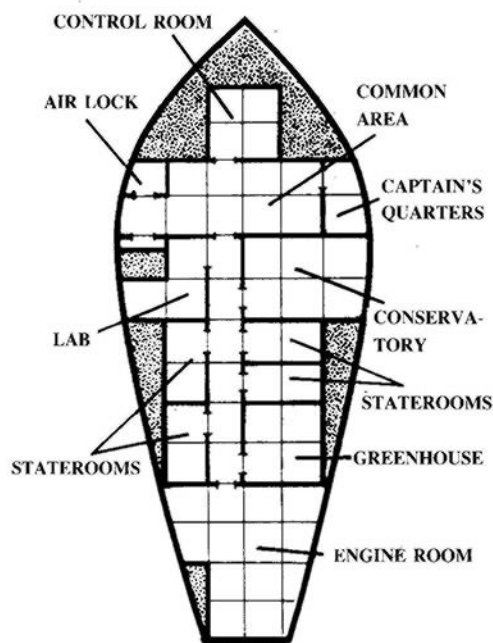
Combination Devices

Ballistic computer (range finder + analytical machine, 2)
Astrogation computer (orrery + analytical engine, 1)
Aeroplane (glider + engine, 4)
Improved telescope (telescope + gyroscope, 1)

DESIGNING ETHER FLYERS

IN ADDITION to the inventions covered in the research process described previously, an inventor may design and build a small interplanetary ether flyer in his workshop. The expense of this will be minimal, as it is assumed to be built mostly with scrounged parts and discarded electrical components. However, players with considerable financial resources at their disposal (Social Level 5 or 6) may purchase sufficient components to build a very large vessel.

Ether flyer design consists of two general procedures: basic design and ship rating. The basic design is a simple, six-step procedure that provides all the raw information about your ship. Ship rating enables you to determine the performance of the ship in game terms.



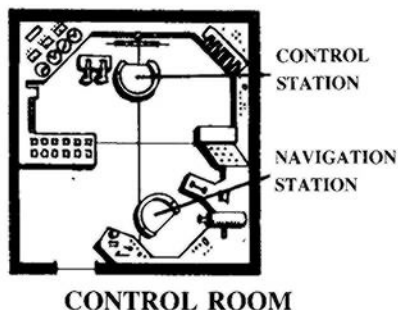
Part I: Basic Design

THE SIX STEPS of the ship's basic design determine its characteristics and performance. In each step there are small components which may be installed for free and then a cost listing for larger components which may be purchased to enlarge the ship.

1. Lift

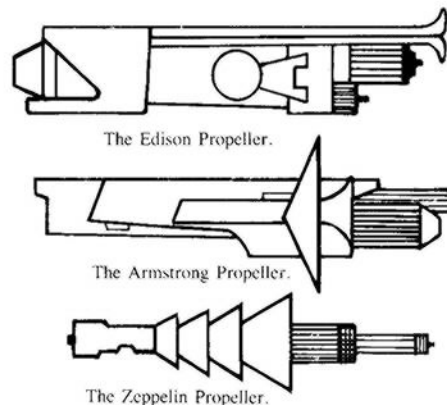
FOR THE ether propeller to work, the entire craft must be lifted to an altitude of 24,000 feet. Thus, the first thing you will decide is what form of lift it will use. The lift value of your craft will limit the final weight and thus influence all other design decisions made later.

Select a total ship weight in tons, and then decide whether you will use hydrogen or liftwood as a lifting agent. Hydrogen lift is free for a vessel up to 20 tons of lifted mass, and then costs £50 per ton for lifted masses above that. Hydrogen is not practical for vessels of greater than 200 tons of lifted mass, given construction techniques available at this time. Liftwood costs £200 per ton of lifted mass.



2. Controls

THE SHIP'S CONTROLS are located in a control room, generally placed toward the front of the cabin. The control room weighs one ton and costs nothing.



3. Ether Propeller

THERE ARE four options available for an ether propeller: the Edison Patent, the Armstrong Patent, the Zeppelin Patent, or one of the player's own invention. Each propeller is defined by its power value (the amount of energy needed to make it work) and its efficiency. Power values are expressed as whole numbers—1, 5, etc.

Edison propellers may be purchased at any power value and cost £1000 per power value. They have an efficiency of 25.

Armstrong propellers may be purchased at any power value and cost £500 per power value. They have an efficiency of 20.

Zeppelin propellers may be purchased at power values up to and including 4 and cost £100 per power value. They have an efficiency of 15.

All ether propellers weigh 1 ton per power value.

If a player has invented an ether propeller, he may build one at no cost. The maximum power value of the propeller is the propeller's reliability. The propeller's efficiency is $20 + (3 \times \text{the reliability number})$. For example, a player has invented a propeller with a reliability of 3. The largest power value he can construct is 3, and any propeller he builds has an efficiency of 29.

4. Power Plant

ONLY LIMITED amounts of oxygen can be carried in the craft, and these supplies need to be supplemented with large numbers of green plants just to meet the needs of the passengers and crew. Any sort of power plant which requires combustion (which includes coal-fired and oil-burning steam engines as well as internal combustion engines) is out of the question. As electric batteries cannot store enough energy to power a long interplanetary flight, a solar boiler is the only practical source of power.

The boiler's power value must be the same as or greater than the ether propeller's power value. A boiler with the same value as the propeller will power the ether propeller as well as provide heat to the cabins and power a small dynamo to supply electricity for lights and various instruments. A boiler value one greater is required if the ship has a laboratory which will be used while in flight.

The weight of the solar boiler in tons is twice its power value. If a player has invented a solar boiler of his own, he may build one for free. The power value is equal to the reliability value of the device. If a boiler is purchased instead, it costs £500 × the power value.

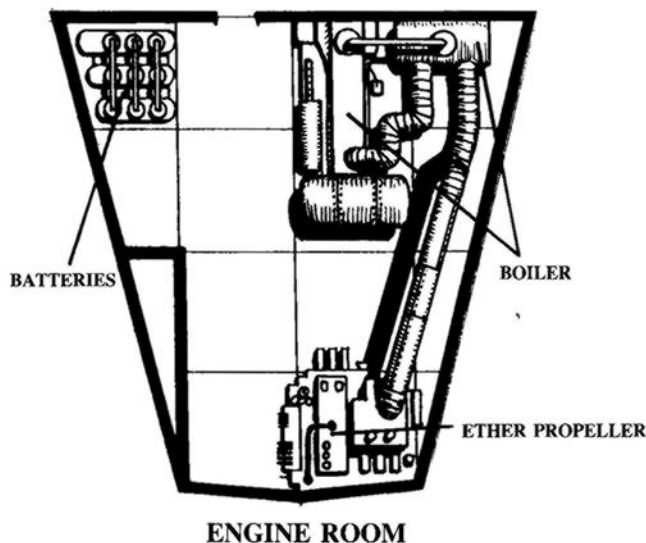
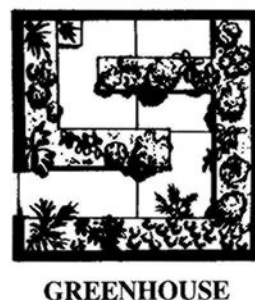
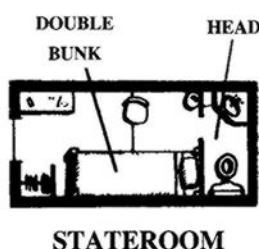
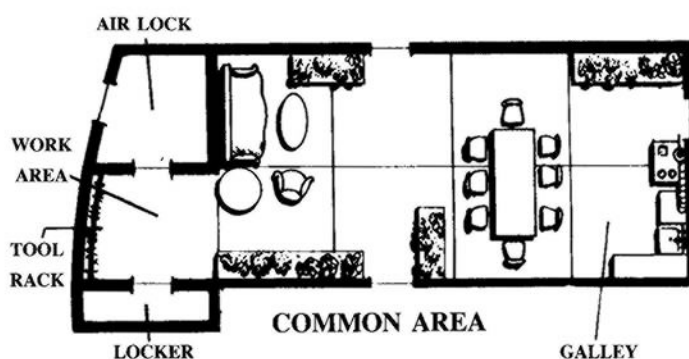
5. Crew

AN ETHER FLYER requires a pilot to fly it. If it is a liftwood vessel, it also requires a trimman when in atmospheric flight, although on craft of less than 40 tons of mass the pilot can perform this function as well. The craft must have one engineer for every two power levels of its largest

power plant, rounding fractions down. (Thus ships with a power value of 1 do not need an engineer.) If the flyer has a coal-burning auxiliary power plant, it must have one engineer per power level, provided that number of engineers is greater than the number normally required to man the main power plant. Finally, the flyer must have the required number of gunners to man its gun (if any).

6. Quarters

ONE TON of mass is required for each crewmember and passenger the craft will carry. This covers sleeping areas, a proportional share of the common areas, and green plants for rejuvenation of the air. Accommodations for up to 10 passengers and crew may be built for free. Accommodations for each additional passenger or crewmember cost £30.



7. Optional Features

OPTIONAL FEATURES include:

Emergency Power: Emergency power batteries can be installed to provide power in the event of a boiler malfunction. Batteries are defined by their power level (which is used the same way as the power level of a solar boiler) and their endurance, which is the number of days that the batteries will function at full power. Batteries may not be purchased at power levels greater than 4. Batteries may be purchased at any endurance desired. The weight of batteries in tons = their power value $\times$ their endurance (in days).

If the player has invented batteries of his own, their maximum power value is the device reliability number, and their weight in tons is their power value $\times$ their endurance $\div$ the device reliability. For example, if a player has invented batteries with a reliability number of 5, he could install batteries with a power level of 5 and any endurance desired. Their weight would be five $\times$ their endurance $\div$ 5.

The price, in £, of batteries which are purchased is equal to $10 \times$ their endurance $\times$ their power value. For

example, batteries with a power value of 4 and an endurance of 8 days would cost ($4 \times 10 \times 8 =$) £320. Batteries invented by the players cost one-tenth this amount.

Atmospheric Propulsion: An ether propeller will not function in an atmosphere at air densities greater than that found at 24,000 feet above sea level on Earth. If your ether flyer is intended to maneuver in the atmosphere and land, it is a good idea to mount an air screw (propeller) and motor. A screw-and-motor combination weighs $2 \times$ its power value and costs £400 per power value. However, players may construct a screw-and-motor combination of power value 1 at no cost.

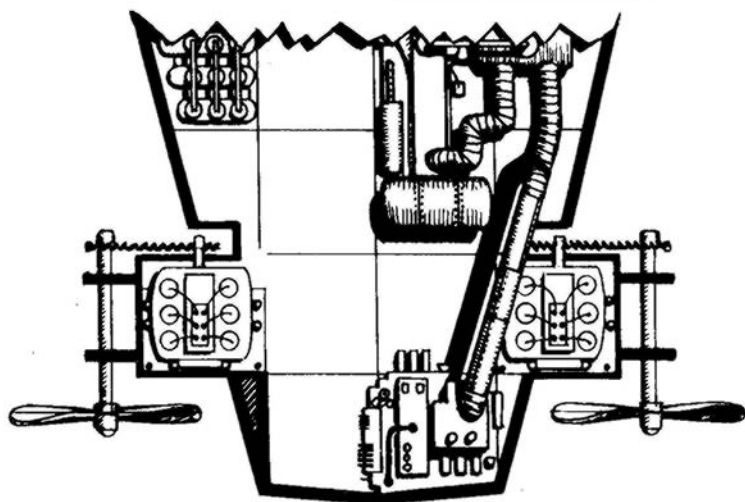
The screw and motor require raw power to function, however, and solar boilers will not function deep in the atmosphere. A power plant

must be available at least equal to the power value of the screw and motor. If the vessel has batteries of sufficient power, these may be used; otherwise a separate power plant must be installed. Since it will only be used in atmospheres, it may be a combustion power plant, such as a coal-fired boiler, and may be a standard power plant or an advanced model invented by the player. All of these power plants use fuel, either coal, oil, or refined gas. (Fuel can be carried in the cargo hold of the vessel. Special fuel tanks or coal bunkers are not required.)

The table below shows the types of conventional power plants, their weights (in tons per power value), costs (in £ per power value), types of fuel used, and fuel consumption rates (in tons of fuel burned per day per power value).

POWER PLANTS

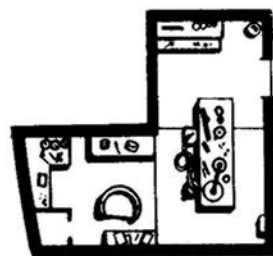
Type	Weight	Cost	Fuel	Consumption
Conventional Boiler	6	300	Coal	1
Forced Draught Boiler	3	600	Coal	1
Petrol Boiler	6	300	Oil	1/2
Internal Combustion*	2	600	Oil	1/2
Steam Turbine*	1	800	Oil	1/2
Gas Turbine*	1/2	1000	Gas	1/4



Of the power plants listed in the table above, only the first three are available for purchase; the last three (*) must be invented. Costs in all cases are costs to build versions of the power plant once it has been invented by the player. Standard versions of the first three power plants may be purchased at any power value on the open market for twice the price listed in the table.

In the case of a power plant invented by the player, the act of in-

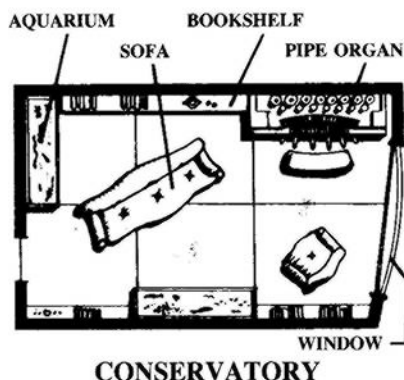
venting it produces a working prototype at no cost which may be used in an ether flyer if desired. The prototype always has a power value of 1, however. Later versions of the power plant may be built, at the costs listed above, at any power value up to the device reliability number.



LABORATORY

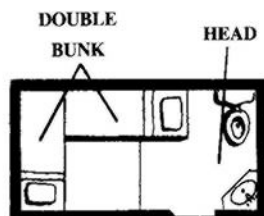
Laboratory: While not essential to the design of the vessel, a properly equipped laboratory is essential if an inventor is to continue his research while on long voyages between the planets. For every ton of lab equipment installed, the laboratory may be used to research two of the 10 research areas. These areas must be specified at the time the laboratory is built. A lab equipped with five tons of equipment can be used to research any or all of the 10 research areas. The first ton of laboratory equipment is free (taken from the inventor's own lab), but every ton after that costs £1000.

Armament: It is nearly impossible for an inventor to obtain or mount a wide variety of naval ordnance in sophisticated turret mounts and the like. However, each ether flyer may mount a single, fixed, forward-firing gun which can be used either in an atmosphere or in space (if the gun is of any value in space). Price and weight are as listed in the "Equipment" chapter.



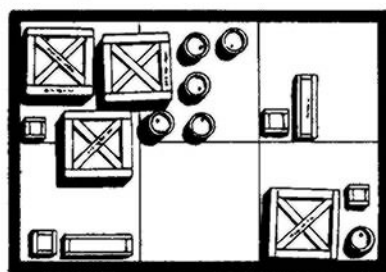
CONSERVATORY

Conservatory: If a conservatory is built into the ether flyer, it weighs two tons and costs £200.



BRIG

Brig: A brig (ship's prison) may be installed for the secure restraint of prisoners. Often prisoners can be locked in the cargo hold, but sometimes that is not convenient. A brig weighs 1 ton and costs £20.



CARGO HOLD

Cargo: All unused lifted mass in the craft is available for cargo. Cargo includes ammunition for the gun, fuel for the auxiliary power plant, and food for the crew, to name the most important items. Other items may be carried as desired.

Part II: Rating

RATING INCLUDES evaluating several factors:

1. Speed

TO DETERMINE interplanetary speed, multiply propeller power value (PPV) by the propeller efficiency (PE) and divide the result by the lifted mass (LM) ($S = PPV \times PE / LM$). Round all fractions to the nearest tenth. The result is the flyer's interplanetary speed value. For example, a 14-ton vessel with a propeller with a power value of 2 and an efficiency of 20 has an interplanetary speed of 2.857, which rounds to 2.9.

To determine atmospheric speeds multiply the screw-and-motor combination's power value by 600 and divide by the lifted mass, rounding all fractions down. If the result is greater than six, reduce the amount over six by half (rounding fractions down). Thus a speed of 7 would reduce to 6, a speed of 8 or 9 would reduce to 7.

2. Hull Hits

DIVIDE THE lifted mass by 100, rounding fractions down, to determine the number of hull hits of the craft in combat.

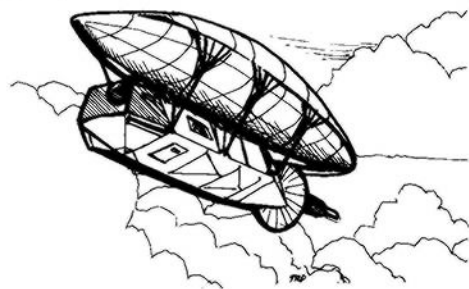
3. Background Data

THIS DATA is not necessary for the game but is sometimes handy to know. To determine the interplanetary speed of the vessel in millions of miles travelled per day, multiply the speed value by one million. To determine the airspeed of the vessel in knots, multiply its speed number by 5. To determine the horsepower of the vessel's power plants, multiply their power value by 125.

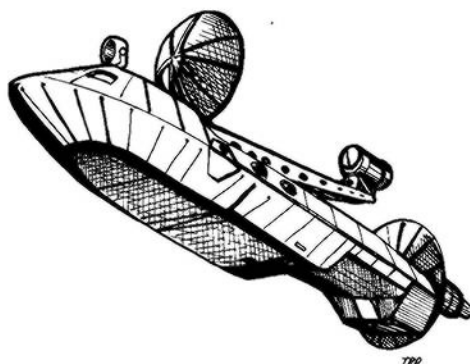
Part III:

Your Ether Flyer Described

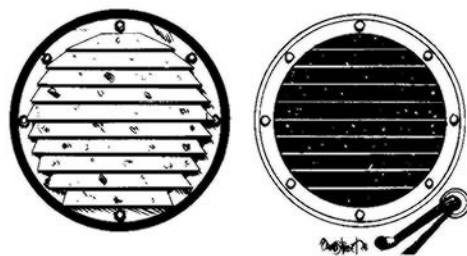
THE BASIC SHAPE of your ether flyer will be strongly influenced by whether it uses hydrogen or liftwood as a lifting agent. If hydrogen is used, the flyer will be dominated by the large gas chamber which will be cylindrical in shape. Some flyers use a separate gas chamber and suspend the cabin below it, while others combine the two and build the gas chamber around the outside of the cabin itself. The volume of this chamber can be calculated precisely: It contains 10,000 cubic feet of gas per ton of lifted mass. If monohydrogen is used, it contains 5000 cubic feet of gas per ton of lifted mass.



If liftwood is used, the vessel will look somewhat more boat-like in shape and, in particular, will tend to be fairly broad of beam for improved stability. The bottom of the flyer will be covered by the hundreds of thin liftwood slats or foil rollers which provide lift and trim.

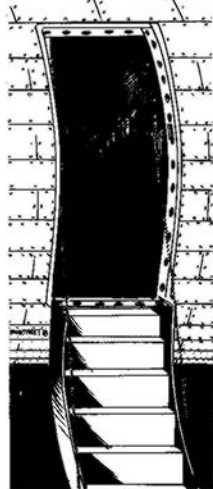


The other dominant feature of the exterior of the ship is its solar boiler mechanism. This consists of a water-filled boiler and a large, reflecting dish mirror mounted at opposite ends of a long girder. The girder is attached to the hull at its midpoint by a mechanical pivot. Thus the entire boiler assembly can be turned while in space to point the mirror's face toward the Sun. The mirror reflects and concentrates the Sun's rays on the boiler and brings the boiler's water to a boil.



The cabin itself will have a number of small portholes to let in light and provide a view for the passengers. These portholes will be small and round, and fitted with steel shutters closed by handcranks for protection against meteors.

Access to the cabin is gained by means of a large door hinged on the bottom which becomes a short stairway when it is folded out and down. This door leads into an air lock, which is one tactical grid square in size (two yards by two yards in area). Both the inner and outer doors have small, round windows, deeply recessed, with very thick glass, making meteor damage virtually impossible. The airlock will provide access to the work space adjacent to the con-



trol room, and on all but the largest flyers this space will be part of the control room itself.

The control room is located at the front of the cabin and has a large glass vision port to enable the pilot to steer the craft during atmospheric flight. Handcrank-operated metal shutters close over the port to protect it from meteors. All of the controls that operate the craft's power plant, ether propeller, and other machinery are located near and around the vision port, with the ship's wheel located in the center. If the craft is capable of atmospheric flight, there will be two wheels—one connected to the atmospheric rudder and one which alters the flux orientation of the ether propeller. The atmospheric wheel is the more impressive of the two, as it is reasonably large. The ether wheel is a small steel wheel with a ratchet arrangement for setting precise courses.

The control room averages about four tactical grid squares (four yards by four yards) although it may be one or two grid squares larger or smaller, depending on the whim of the builder. One grid square is given over to a work space adjacent to the airlock. There is a locker there which holds the craft's space suits, and the work area is kept clear to allow the crew room to put their suits on and take them off.

If a gun is mounted, it is manned from a small compartment directly under the bridge, and there will be a floor hatch to allow access to this space. This compartment is a full six feet deep directly in the middle where the gun crew mans the gun, but is shallower to the sides, where the ammunition (if any is required) is stored.

The area immediately behind the control room is the crew common area, given over to meals and recreation. The common area has one tactical two-yard grid square (four square yards of floor space) per passenger and crewman. On small ships this is usually not partitioned off from the control room. On larger vessels it is. If the vessel is made to accommodate many passengers, this area will be divided into a crew common area and a passengers' lounge.

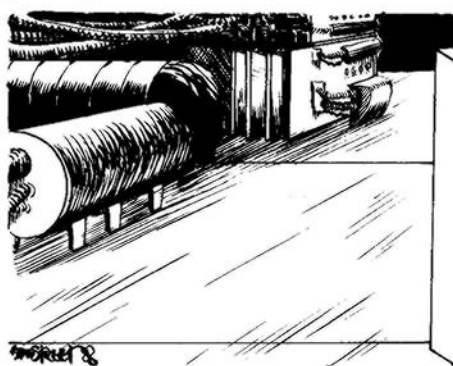
There will be several smaller astrogration domes set on various parts of the cabin to allow the pilot to take sightings on the stars and planets for navigational purposes.

Large parts of the crew common area are taken up with large planters filled with green plants, and the climbing vines and leafy shoots tend to grow up the walls of the cabin and wind around pipes. In addition, there will be a large greenhouse room with one grid square of planters for every two passengers and crew. The roof overhead in the greenhouse is divided into many pie-shaped window sections, each with its own steel shutter. The space underneath the greenhouse planters is taken up with part of the water purification system, which recycles moisture on the ship.

Quarters consist of one grid square per passenger or crewman. This allocation is usually broken up into two-person staterooms of two grid squares each. Much of this space is taken up with a double bunk, closet, writing desk and chair. On larger vessels (of more than 100 tons mass) there is sufficient extra space to give the captain his own two-square or three-square stateroom, and about one-quarter of the crew can occupy two-square private staterooms.



The conservatory, if installed, has a large, glass viewport, comfortable, stuffed chairs, shelves of books, and perhaps the inventor's favorite instrument. (Pipe organs are quite popular.) It consists of six or eight grid squares.



The engine room is always located at the stern of the ship. It contains the internal electrical controls for the ether propeller that allow the players to adjust or repair parts of the apparatus without leaving the ship. It also contains the valves and pipes regulating the flow of water and steam to and from the solar boiler. If there are emergency batteries or auxiliary power plants, they are located here as well. The engine room has one grid square of floor space occupied per ton of boilers, ether propellers, batteries, etc. Each device has its own block of contiguous floor space devoted to it. Between them are corridors one tactical grid square wide to allow maintenance and control access.

Due to the need to conserve both oxygen and moisture, the safety valve on the solar boiler vents into the engine room, and so the room is almost always hot and steamy, and all surfaces are wet with condensation as well as covered with a thin layer of grease, oil, and grime.



The laboratory is filled with lab benches covered with racks of beakers and test tubes, smelting furnaces, centrifuges, and obscure electrical devices. It takes up three grid squares per ton of lab equipment.



The cargo hold is usually located in a subdeck below the living quarters, although it may be located on the main deck instead. It takes up one grid square per ton if located in a subdeck (which is only three to four feet deep) or one grid square per two tons if located on the main deck. If on the subdeck, there will invariably be considerable moisture accumulation in it due to the inefficiency of the water recycling system. Given that the system is not absolutely efficient, most builders opt for too much moisture in the system rather than not enough. By the end of a long trip, however, the "bilges" of the craft will accumulate several inches of filthy, stinking, unrecyclable waste water.



COMBAT

COMBAT

THE BRITISH EMPIRE was not won, and is not maintained, by polite words alone, and genuine adventure is not found in the drawing room of a comfortable London club. In pursuit of fame and fortune, players will sometimes find themselves in dangerous situations which can only be resolved by resort to violence.



PERSONAL COMBAT OVERVIEW

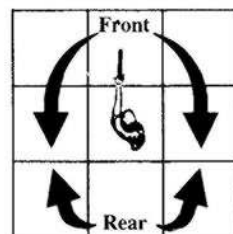
PERSONAL COMBAT includes attacks against people and animals using weapons such as guns, knives, bare fists, explosives, even rocks. But regardless of the type of weapon or target, the results always boil down to whether or not you hit the target and, if so, what sort of damage you did to it.

To resolve a combat attack, players and the referee roll dice to determine the answer to these two questions. While the specific rules may vary, and there are some special rules to handle unusual circumstances and weapons, the resolution of these two main questions always forms the basis of any attack.

All distances in these rules are given in yards, as are all movement allowances. Many combats can be resolved without reference to detailed maps by simply keeping rough track of distances in your head. Since people seldom stop to measure distance with a tape measure anyway, rough approximations of distance are all that are actually necessary. So the referee may say to you, "You see someone lurking in the alley about 20 yards away."

Sometimes it is convenient to map out the area in which the battle is fought, particularly if it is fought indoors, where narrow corridors and winding passageways restrict movement and fields of fire. Some maps such as this are provided in this book. Whenever mapping an area, use graph paper and make each square of the paper represent two yards. When moving or tracing range on the map, each square counts as two yards if moved through (or if range is traced through) horizontally or vertically. If it is moved through or traced through diagonally, it counts as three yards.

All characters must face in one direction at a time. The square they are facing and the two squares to each side of them are their "front squares" while the remaining three adjacent squares are their "rear squares." Players may only attack to their front, and may only attempt to block or dodge attacks delivered from their front.



TURN SEQUENCE

COMBAT IS fought in turns which represent 30 seconds of real time. In each turn a character may perform one or more of the following actions:

Remain stationary
Move
Charge
Attack
Prepare a weapon
Reload a weapon
Change weapons
Dodge
Block
Special action

Number of Allowed Actions: All characters (player characters and NPCs) may perform four actions per turn unless they are involved in close combat. If involved in close combat, player characters may perform a number of actions equal to either their Close Combat skill or their Agility attribute, whichever is greater. A character is involved in close combat if he is within 10 yards of a hostile character (or animal) at any time during the turn. All NPCs in close combat may perform actions equal to their Close Combat skill, which is determined by their experience level. NPCs are rated, for combat purposes, as shown on the accompanying table.

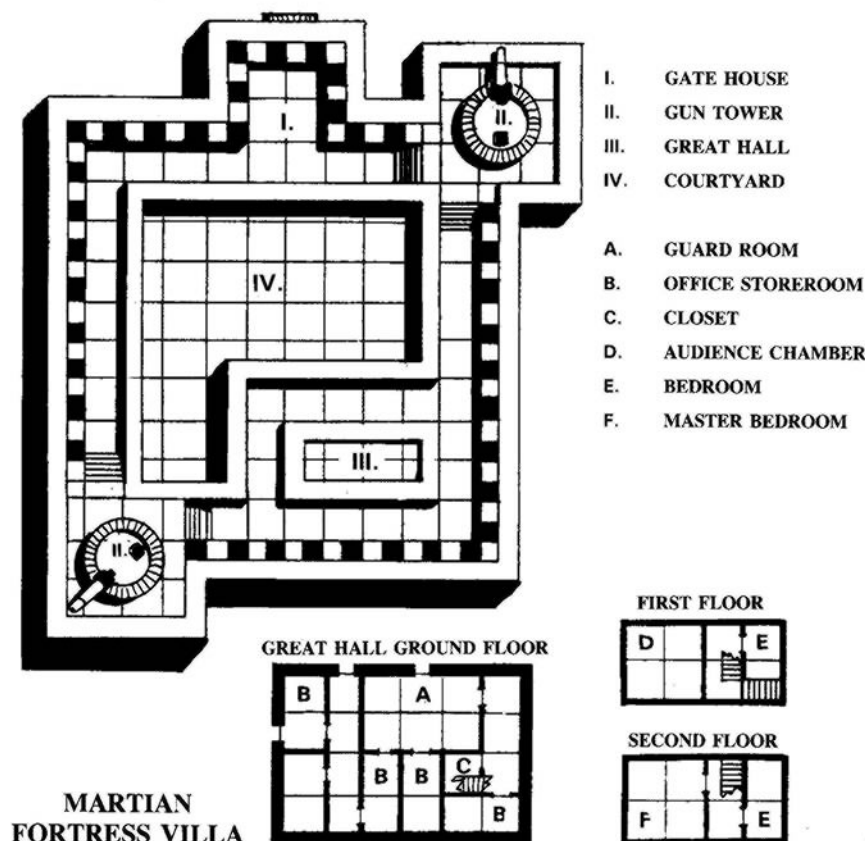
NPC COMBAT
EXPERIENCE TABLE

Experience	Close Combat Skill
Green	1
Trained	2
Experienced	3
Veteran	4
Elite	5

If a character has either a Close Combat skill or an Agility attribute greater than 4, then he will receive more actions in close combat than in other circumstances. If such a character starts the turn further than 10 yards from a hostile character (and thus has four actions for the turn) but uses his fourth action to move within 10 yards, he would then be able to conduct the additional actions (in excess of four) allowed under close combat. By the same token, if a character has a Close Combat skill of more than four but uses his fourth action to move out of close combat range, he reverts to four actions, and thus his turn is finished.

Dodges: A dodge is a special action which may be combined with any other action. If combined with an attack and if the dodge is successful, it has no adverse effect on the dodging player's attack. If it is unsuccessful, the character may not attack that action. If combined with an action other than an attack, a failed dodge has no adverse effect on the action.

If a character conducts a dodge, he must roll against his Agility to determine if the dodge was successful. If so, the required hit numbers of all attacks against him that action are reduced by one. If the dodge is unsuccessful, it has no effect.



Order of Actions: Actions are resolved one at a time. All characters involved in combat decide on and resolve their first action, and all results are implemented as if the actions were conducted simultaneously. Then all characters decide on and resolve their second action, then their third, and so on. In general, the referee will announce what actions the non-player characters (NPCs) are taking, and then players will decide what to do in response.



For example, Jamison is walking down a tunnel and, rounding a corner, stumbles into a party of three Venusian grave robbers. They are immediately in close combat range. Jamison has an Agility of 3 and a Close Combat skill of 4, which allows him four actions per turn. The Venusian grave robbers are Experienced NPCs, which gives them three actions per turn in close combat.

Referee: "The grave robbers have their knives out and are slashing at you with them. What are you doing?" (First action, attack.)

Jamison: "I'm dodging the knives and drawing my revolver." (First action, combination dodge and prepare a weapon.)

Referee: (Rolls several dice) "Your dodge was successful, and they miss you, but they're trying again." (Second action, attack.)

Jamison: "I'm dodging the knives and firing three shots from my revolver, one at each of them." (Second action, combination dodge and attack.)

Referee: (Rolls the dice several times.) "They miss you again. You hit one of them, and he drops wounded. The other two are still attacking with their knives." (Third action, attack.)

Jamison: "I'm still dodging, and I'll fire two more rounds from the revolver." (Third action, combination dodge and fire.)

Referee: (Rolls the dice again.) "You hit one of them, and he drops. The other one slashes you with his knife, and you take a wound, but you're still on your feet. They've finished their attacks for the moment, and your wound makes you hesitate as well."

Although Jamison has one action left, he cannot use it because of his wound. As the second turn starts, one of the Venusians is still on his feet and able to attack. Jamison is wounded and able to attack also, but has only one round left in his revolver.

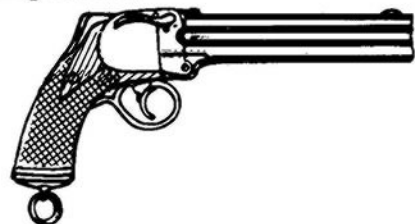
Player Characters Versus Player Characters: There are only a very few cases in which a player character will fight another player character. In these cases, the player with the fewest number of allowed actions declares each action first, and the other player then declares his.

ATTACKS

THERE ARE two general types of attacks: missile attacks and melee attacks. Missile attacks are conducted with weapons that throw a projectile of some type. Attacks with pistols, rifles, bows, and thrown rocks, for example, are missile attacks. Melee attacks are attempts to physically strike your opponent, either with your fist or feet (unarmed attacks) or with some melee weapon, such as a knife or club (armed attacks). Each attack is directed against a single enemy character.

In all types of attacks, one or more dice will be rolled to determine whether a hit was scored. This roll is called the hit roll. A hit will result if one or more of the dice rolls are equal to or less than a target number, which may be modified up or down by various circumstances. *Regardless of the modifications made, however, be sure to remember that a roll of 1 always hits, and a roll of 6 always misses.*

If a hit is scored, the target of the attack will roll a die to see if serious injury is avoided, either by armored protection, cover, or just chance. This roll is called a saving roll. This roll "saves" the target from injury if it is equal to or less than a target number, which may be modified up or down by circumstances. As with the hit roll, the saving roll's target number may not be modified to the point that a save is either assured or impossible.



MELEE ATTACKS

MELEE ATTACKS have several components, including hit dice, hit number, blocking, and saving roll, among others. The Melee Weapons Table is found on page 206.

Hit Dice

ALL MELEE weapons have an associated number of hit dice. This is the number of dice rolled to score a hit each time that an attack action is made with the weapon. Hit dice are a measure of how handy the weapon is, and a weapon usually has more hit dice the lighter it is. For example, a crude club has only two hit dice, while the finely balanced saber has five.

All unarmed melee attacks roll hit dice equal to the Agility of the attacker.

The number of hit dice rolled may be reduced due to the Strength of the attacker. Each weapon has a required Strength level. If the attacker's Strength is less than the required Strength of the weapon, reduce the number of hit dice by the difference.

For example, an axe has 2 hit dice and a required Strength of 4. Characters with a Strength of 4 or greater attack with 2 hit dice, characters with a Strength of 3 attack with 1 hit die, and characters with a Strength of 2 or 1 may not attack at all with an axe.

If any one of the hit dice rolled is equal to or less than the hit number, a hit is scored. Only one hit is scored regardless of how many dice are equal to or less than the hit number.

Cumulative Modifiers: All modifiers to the chances to hit are cumulative. However, a 6 always misses and a 1 always hits, regardless of the modifiers in effect.

Hit Number

TO DETERMINE whether an attack hits its intended target, roll the weapon's hit dice and compare them to the required hit number. If any of the die rolls are equal to or less than the required hit number, the attack hits; otherwise it misses.

All unarmed melee attacks use the attacker's Fisticuffs skill as the required hit number. All armed melee attacks use the attacker's skill with the weapon as the required hit number. The required hit number may be modified by reach or Strength.



Reach: All melee weapons have a listed reach of 1, 2, or 3. All unarmed melee attacks are assumed to have a reach of 0. Melee reach indicates the length of the weapon and is only important if a weapon is used against another weapon with a longer melee reach. If so, subtract the difference in reach from the chance of hitting with the shorter weapon.

For example, a knife has a melee reach of 1 while a pike has a reach of 3. A character with a knife attacking an enemy with a pike would suffer a -2 penalty from his hit number.



Strength: Weak characters often have difficulty using heavier weapons. Every weapon has a required Strength number. Any character with a Strength lower than that number suffers a negative modifier to hit equal to the difference.

For example, a great sword has a required Strength of 3. A character with an Edged Weapon skill of 4 would normally roll for 4s when attacking with a great sword. However, if his Strength were only 2 (one less than the weapon's required Strength), the hit number would be reduced to 3.



Blocking

IF A CHARACTER is blocking a melee attack, he rolls the weapon's hit dice for the normal required hit number. The hit number, however, is modified by the weapon's blocking modifier, if any. An axe, for example, has a blocking modifier of -2, and so a character with a Bashing Weapon skill of 4 would have a required hit number of 2 when blocking.

Each successful blocking die cancels one successful hit die. If the blocking player cancels all successful hit dice, then the attack does not hit. If he cancels more hit dice than actually hit him, he may roll the extra dice as a "riposte" (counterattack) with his normal hit number used for success.

Example: Gaaraan, armed with a pike, is attacking Bledsoe, armed with a machete. Gaaraan has a Pole Arm skill of 3 while Bledsoe has an Edged Weapon skill of 4. Both characters have sufficient Strength to use their weapons to full effect.

Gaaraan attacks with the pike, and Bledsoe attempts to block the attack. Gaaraan rolls two hit dice (normal for a pike) with a required hit number of 3 (his skill level). He rolls a 2 and a 5 for one successful hit die.

Bledsoe's blocking attempt, rolled at the same time for simplicity, consists of three hit dice (for the machete) with a required hit number of 2 (his skill of 4 minus 1 for the difference in reach, and minus 1 for the weapon's blocking modifier). He rolls 1, 2, and 2, for three successes.

Since Bledsoe has three successful blocking dice to Gaaraan's one successful hit die, Bledsoe can riposte (counterattack) with two hit dice (the

excess). He rolls the two hit dice for a required hit number of 3 (his skill of 4 minus 1 for the difference in reach). He rolls a 1 and a 3, for two successes. Gaaraan receives one hit, since each attack can cause only one hit, regardless of how many hit dice are successful.

Saving Roll

IF AN ATTACK hits, the target of the attack makes a saving roll. If the roll is equal to or less than the save number, the target suffers no wounds; if it is greater than the save number, the target suffers the number of wounds indicated by the wound value of the weapon. The save number can differ, depending on the type of attack, and is modified by a number of additional factors. *The save number for a player character may never be less than 1, however.* (That is, a player always saves by rolling a 1.)

Unarmed Melee Attack: The save number is the sum of the Strength and Endurance of the defending character minus the Strength of the attacking character. If a character is mounted, add 1 to his save number.

For example, a character with a Strength of 3 and an Endurance of 3 is hit by a character with a Strength of 4. The defending character has a save number of $(3 + 3 - 4 =) 2$. If he rolls a 1 or 2, the hit has no effect. If he is mounted, the hit has no effect on a roll of 1, 2, or 3.

Shields: A shield allows a player to block with two dice in addition to the blocking dice of any weapon used, or six dice if used by itself. If used by itself, the character uses his primary combat skill as a block number but may not riposte with any extra successful blocking dice.

Armed Melee Attack: The target's save number is 1 plus his armor value (if any). All mounted characters add one to their save number. Only one type of torso protection (doublet, shoulder scales, mail, or breastplate) may be used. All other armor effects are cumulative. The Armor Values Table is found on page 206 in the chart section.

For example, a defending character is wearing chain mail. His save number is 2, so he avoids injury from the attack if he rolls a 1 or 2. If mounted, he would avoid injury on a roll of 1, 2, or 3.



Oenotrian Imperial Marine.

MISSILE ATTACKS

MISSILE ATTACKS are easier to resolve than melee attacks, since each shot has only one hit die, and blocking actions have no effect. The Small Arms Firing Table and Small Arms Saving Throw Modifier Table are found on page 205.

Allowed Number of Shots

THE COLUMN on the weapons chart labeled "shots" lists the number of shots allowed per attack action. In most cases this is one, but some missile weapons may fire more than once per attack action. For example, a revolver can take three shots per attack action. Each one of these shots may be aimed at a different target, or all may be aimed at the same one.

Weapons capable of multiple shots may not fire more shots than remain in their magazine. A revolver, for example, has a magazine capacity of six shots. A player could fire three shots his first action and three his second, but could not then fire in his third action as the revolver would be empty.

By way of illustration, Jamison is confronted by three Venusian grave robbers. Jamison already has his revolver drawn, and all six shots are still in it. He decides to conduct two attack actions. He declares that he will fire one shot at each of the three grave robbers in the first attack. After the three shots are resolved (as explained below), there are still two grave robbers standing. Jamison fires one shot at each in the second attack action. He could have fired a total of three shots in the second action, but keeps one bullet in his revolver in case he misses one of his targets.

A character who takes more than one shot in an action suffers an accuracy penalty of -1 to his hit number, regardless of the number of shots taken.

Hit Number

ALL MISSILE ATTACKS conducted at a range of 10 yards or less use the attacker's Close Combat skill as the required hit number. All other missile attacks use the attacker's Marksmanship skill. This number can be modified by Strength or range.

Required Strength: All missile weapons have a required Strength, which affects accuracy in the same way as for melee weapons. For example, a lever action rifle has a required Strength number of 2. A character with a Strength of 1 firing a lever action rifle would subtract 1 from his required hit number. A character with a Strength of 2 or more would not have any modifiers.

Range: All missile weapons have an effective range, listed in yards. A character's Marksmanship rating is used when firing at a target within effective range. His Marksmanship is reduced by 1 when firing at targets which are up to twice effective range, reduced by 2 at up to three times effective range, and so on.

For example, a character has a Marksmanship skill of 4 and is firing a bolt action rifle with an effective range of 120 yards. His required hit number is 4 at any range up to 120 yards, 3 up to 240 yards, 2 up to 360 yards, and 1 up to 480 yards. He may not fire at a target further away than 480 yards.



Save Number

EACH MISSILE WEAPON has its own save number which is shown on the firing chart. The nature or activity of the target affects the save number as shown on the accompanying table.

MISSILE SAVING THROW TABLE

Target	Modifier
Mass Formation:	-1
Close Range:	-1
Charging:	-1
Airborne:	+1
Mounted:	+1
Light Cover:	+1
Medium Cover:	+2
Hard Cover:	+3
Concealed:	+Fieldcraft/2 (round up)

Mass formation means that the target character or characters are part of a large group in close proximity. *Close range* means that the target is within close combat range (10 yards). *Charging* applies only if the target is charging the firing character. *Airborne* applies to any flying target, whether a flying animal, its rider, or a crewman on a flying machine. *Mounted* applies to any character mounted on an animal. (A character mounted on a flying animal receives only one or the other of these two modifiers, however.)

Cover refers to some sort of blocking object capable of stopping or deflecting a shot. *Light cover* consists of partial concealment behind a fairly flimsy barrier. A character kneeling behind a rail fence, for example, or the heavy railing of a balcony, would be under light cover. *Medium cover*

consists of more complete concealment behind a light barrier or partial concealment behind a more substantial one. A character firing from the window of a wooden building or from behind a substantial breastwork would be under medium cover. *Hard cover* consists of near-complete concealment behind a substantial barrier, as, for example, a soldier firing from a prepared firing position in a fortress. In all cases the referee's decision is final.

Concealment refers to a barrier which obscures sight of the target but is not a significant barrier to the missile. Concealment is most commonly produced by bushes or other foliage. A *concealed* character adds half his Fieldcraft skill to the save number (rounding fractions up).

For example, a character is firing a bolt action rifle at an enemy character in bushes (concealed). The save number for a bolt action rifle is 1. The defending character has a Fieldcraft skill of 3, however, enabling him to make fairly good use of the cover of the bushes (+2). The final saving roll number is 3.

All modifications to the save number are cumulative. The save number may never be increased to 6, however. A roll of 6 always means the shot hit and caused full damage.

Firing While In Melee

ANY CHARACTER who conducts a melee attack may also fire a loaded weapon at the same time. This type of attack is limited to rifles, muskets, shotguns, and pistols. Only one shot may be fired, regardless of the normal number of allowed shots per attack action. If a weapon is fired in addition to a melee attack, the player's required hit number for all attacks is reduced by 1 for that action.

For example, Caruthers and Carstairs have been attacked by a large group of Martian brigands. Caruthers has a saber in one hand and a light revolver in the other while Carstairs has a breech-loading rifle with a bayonet mounted. Both have a Close Combat skill of 4. (Caruthers specializes in edged weapons, Carstairs in pole arms.) Both decide to make attack actions. Caruthers' attack action consists of a melee attack with his sword and a missile attack from his pistol. The saber attack is conducted using his Edged Weapon skill while the pistol shot is conducted using his Close Combat skill (since the enemy is within close combat range). But both required hit numbers are reduced to 3 because of the combination of firing and melee attack in one action. Carstairs also conducts two attacks in his one attack action, lunging with the bayonet (melee) and firing a round from the rifle (missile). Again, both would be resolved with a required hit number of 3. In the next turn Carstairs could only conduct one attack per action since his rifle is now empty. Caruthers still has five shots in his revolver, however, and can continue to fire single shots while slashing with his saber.

Reloading

MOST MISSILE WEAPONS hold only one projectile, and once they are fired, they must be reloaded before they can fire again. Some weapons, however, have magazines. The Small Arms Firing Table lists the number of shots in each weapon's magazine. A heavy revolver, for example, has six shots in its magazine. A weapon with a magazine may continue to fire until it has exhausted the shots in its magazine. It must then be reloaded.

For example, the British bolt action rifle has an eight-shot magazine and can fire once each attack action. A character armed with this rifle and with a full magazine could conduct four attack actions a turn for two turns, firing one shot each action (four shots per turn, or a total of eight shots in two turns), before having to use an action to reload. He reloads in two actions, loading four shots per action.

Most weapons take one action to reload. Some weapons have a parenthetical number listed under reloading. This is the number of shots that can be reloaded per reload action. A light revolver, for example, has a reload number of (3), meaning three shots can be reloaded each reload action. To completely reload a revolver a character would have to spend two actions doing so.

Some weapons have a dash instead of a number in the reload column. These weapons are thrown weapons (spears, knives, rocks) and cannot be reloaded as such. If another such weapon is available, however, the attacking player may pick it up or ready it by taking a prepare-a-weapon action.



MOVEMENT

ALL MOVEMENT is expressed in yards. Each movement action may be taken as a crawl, walk, or run. Characters crawl two yards or walk eight yards each movement action. Running characters move 20 yards plus their Agility attribute dice each movement action.

For example, Carstairs has an Agility of 4 and is running away from a large, ill-tempered carnivore. He rolls four dice (because of his Agility of 4) and obtains a total score of 17. Adding this to 20, the referee sees that Carstairs has run 37 yards that action. As he is spending four actions running, Carstairs rolls a second time, and this time rolls a 12, which means he has run a further 32 yards. His third roll nets him another 35 yards, and his fourth, 41 yards. He has run 145 yards that turn.

Movement is slowed in water. In shallow water (ankle- to knee-deep), walking and running are done at half of normal speed. Crawling is unaffected. In deep wading water (waist- to chin-deep) characters may only walk, and they do so at half of normal speed. In deep water (over head-deep), characters may only swim.

Swimming characters roll their Swimming skill dice to determine how many yards they move in an action. Subtract 1 from the Swimming skill for every 10 pounds of weight carried. Subtract 1 from the Swimming skill for choppy waters, extreme cold, or any other adverse condition.

Movement and Other Actions

CHARACTERS MAY combine a movement action, other than crawling, with any other action. Char-

acters who do so at a walk move only four yards instead of eight. Characters who do so while running move only 10 yards plus their Agility attribute dice instead of 20 yards plus Agility dice. Characters may not combine crawling with other actions.

Characters who combine a movement action with an attack do so at reduced effectiveness. Characters who walk and attack reduce their required hit number by 1. Characters who run and attack reduce their required hit number by 2.

Charging

IF A CHARACTER is not involved in close combat (is not within 10 yards of any enemy character), he may only move into close combat by means of a charge. Charging counts as a running action, regardless of the number of yards actually moved (but it does not allow characters to move further than their normal running speed would allow). Charging affects morale and the character's saving roll versus missile fire. It may be combined with a melee attack (with the required hit number reduced by 2), but not with a missile attack.

Blocking Passage

A CHARACTER, by his physical presence, blocks passage through a two-yard-wide path (one tactical grid square). If he is armed with a melee weapon, he blocks squares equal to the melee reach of the weapon. That is, a player with a pike blocks three squares. The blocked squares always include the square occupied by the player and one or both of the squares to either side. No enemy character may move through a blocked square or pass from a blocked square to a square in the character's rear.

Mounted Combat

MOUNTED CHARACTERS may attack normally. However, a character's Riding skill for the mount he is on serves as a limit on all other skills or attributes used in combat. That is, a mounted character with a Close Combat skill of 6, an Agility of 6, and a Marksmanship skill of 6, but a Riding skill of 1 could take only one action per turn in close combat and would have a required hit number of 1, at best. All mounted characters add 1 to their save numbers.

WOUNDS

ANY CHARACTER who suffers a wound during a turn may not conduct any actions for the remainder of the turn except for dodges and blocks (no ripostes are allowed either). A wounded character's allowed number of actions in a turn is reduced by the number of wounds he has suffered, but it is never reduced to zero so long as he remains conscious.

Each player character can remain conscious until he takes wounds equal to the average of his Strength and Endurance (rounding fractions up). For example, a player with a Strength of 2 and an Endurance of 5 remains conscious until he has taken a total of four wounds.

Most non-player characters lose consciousness after only two wounds. Some special characters may take more wounds than this, and large animals often can take a great many wounds before collapsing.

Player characters die if they take wounds greater than the sum of their Strength and Endurance. NPCs die if they take more than two wounds. Animals die if they take sufficient wounds to lose consciousness.

Weapon Wound Value: A weapon's wound value is the number of wounds the weapon causes. Some weapons have a wound value of "1+S." This value means that the number of wounds the weapon inflicts is 1 plus the amount the character's Strength exceeds the weapon's required Strength number. For example, an axe has a required Strength of 3 and a wound value of 1+S. A character with a Strength of 2 would subtract 1 from his hit number with the axe and would inflict one wound if he hit. A character with a Strength of 6 would roll normally to hit and inflict four wounds if successful. Successful unarmed combat attacks inflict one wound.

Some missile weapons have a wound value listing of "1-2." These weapons always inflict one wound except when firing at a range of 10 yards or less (close combat range), when they inflict two wounds instead.

Healing Wounds: Wounds will heal normally at the rate of one wound healed every two days spent resting and under medical care. If travelling or suffering from fever, wounds heal at the rate of one per week.

GRAPPLING

IF A CHARACTER has at least one hand free, he may attempt to grapple an enemy character. Grappling counts as an unarmed melee attack, and consists of grabbing the enemy character and trying to restrain him. Hit rolls and save rolls are made as for an unarmed melee attack. If successful, the attacker can grab either one of his opponent's wrists, his torso, or his throat. If the attacker has two hands free, he can grab two wrists, a wrist and the

throat, a wrist and the torso, or the throat and the torso, or may grab the throat, torso, or any one wrist in both hands.

Disarming: If a character has hold of an opponent's wrist at the start of an attack action, the opponent may not attack with any weapon held in that hand. The character may also attempt to disarm his opponent each time that he (the grappling character) conducts a melee attack. To attempt to disarm, both characters roll Strength dice. If the attacker is using both hands, he rolls additional dice equal to half his Strength, rounded up. If the attacker's roll is twice that of the defender's, the defender drops his weapon. If the defender's roll is twice that of the attacker's, the defender breaks free and may attack with the weapon held in his hand.

Throws: If a character has hold of an opponent's torso at the start of an attack action, he may attempt to throw the opponent down or against a wall. To do so he rolls Strength dice against the weight number of the opponent. The average weight number of a human opponent is 14. If only one hand is being used, roll half his Strength dice, rounding fractions up. If the opponent is thrown, the opponent must roll against his Endurance to avoid being stunned. If he avoids being stunned, he must use his next action to regain his balance and can then function normally. If he is stunned, he rolls two dice, the result being the number of turns spent stunned. A character is helpless and may not take any actions while stunned.

Chokes: If a character has hold of an opponent's throat at the start of an attack action, he may choke him.

In each action spent choking his opponent, one die is rolled for each character. The attacker adds his Strength attribute to the roll, and the defender adds his Endurance attribute. If the attacker is using both hands, add one and a half times his Strength attribute (rounding fractions up) to the die. If the defender's modified roll is higher than the attacker's modified roll, there is no effect. If the attacker's modified roll is higher than the defender's, the defender's Endurance is reduced by the difference. This reduction in Endurance remains in effect for as long as the defender is being choked. When the defender's Endurance is reduced to 0 or less, he loses consciousness. When his Endurance is reduced to -6 or less, he dies.

If a character is using a choking weapon, two dice are rolled for the attacker (plus Strength) to oppose the defender's one die (plus Endurance). A choking weapon is a knotted rope, a garrote, or any similar thing.

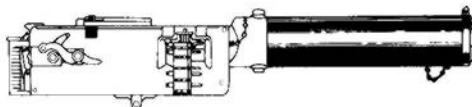
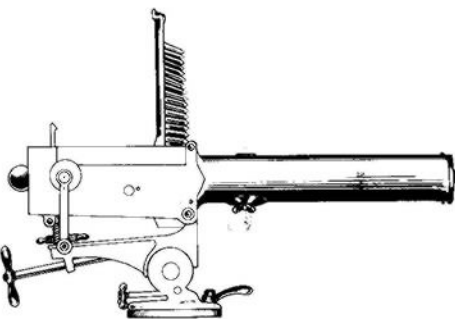
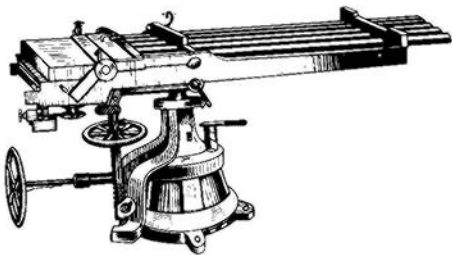
Escaping a Grapple: Each action during which a character is being held, he may attempt to escape. He does this instead of a melee attack. If a character escapes during an action (his escape attempt is assumed to happen before the attacker attempts to throw, choke, etc.), he takes no damage from an opponent's grappling attacks upon him during that action. To attempt to escape, the character rolls Strength dice and the opponent rolls Strength dice. If the opponent is using only one hand, the opponent rolls half Strength dice rounded up. If the escaping character's roll is twice that of the opponent holding him, the character breaks free. All of his opponent's holds are broken.

HEAVY WEAPONS

HEAVY WEAPONS are those too heavy for an individual to carry which are instead usually mounted on a field carriage, tripod, or on a vessel of some sort. There are two main types of heavy weapons: machineguns and heavy ordnance.

Machineguns

MACHINEGUNS AT this time were fairly large and bulky, and some of the older versions were prone to jamming. Despite this, they were murderously effective. Machineguns are fired following the same procedure as other missile weapons with the exceptions noted below. The Machinegun Firing Table is found on page 205.



Allowed Number of Shots:

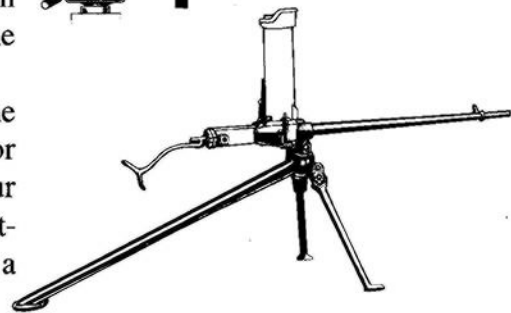
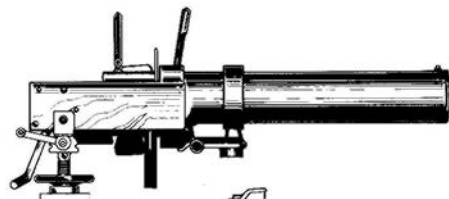
Several machineguns have two numbers in the shots column. The first of these is the number of rounds which may be fired per action with no danger of jamming. The second number is the maximum number of shots which may be fired. For each extra shot fired roll one die. If any of the die roll results are a 6, the gun jams and may not fire again until the jam has been cleared.

Clearing a jam takes the same amount of time as the reload time for the weapon. Thus, it would take four actions to clear a jammed 1-inch Gatling, but only two actions to clear a jammed Gardner.

Most missile weapons receive one shot for each bullet fired. Machineguns, however, receive one shot for each 10 bullets fired. This higher volume of fire enables them to engage targets accurately at long range (by "walking" the fire in on the target) and also accounts for their low saving roll numbers and high wound numbers (since individuals tend to be hit by multiple bullets if they are hit at all.) However, machineguns also enjoy an advantage if firing at densely packed targets.

Multiple Targets: Machineguns almost always are fired at multiple targets. Each shot that scores a hit is considered to be a hit on a separate target. If more hits are scored than there are targets, the excess hits are ignored. If desired, the gunner may concentrate all of his fire on a single target, in which case all hits rolled result in separate hits on the target.

If firing at massed targets, roll two dice for every shot fired from a machinegun. A massed target is one which has a density greater than one man per yard of frontage. On a tactical grid this means that a massed formation would have to be two or more ranks deep to qualify (since each square is two yards wide).



Required Hit Number: The required hit number for machinegun attacks is the gunner's Machinegun skill unless the range is 10 yards or less, in which case the required hit number is the gunner's Close Combat skill. Machineguns do not suffer a penalty for engaging multiple targets.

Reloading: The normal crew of a machinegun is two men: a gunner and a loader. If the loader is not present, it takes twice as long as noted to reload the gun.

Artillery

ARTILLERY CONSISTS mostly of big field guns, such as European breech-loading rifled cannon and Martian black powder muzzle-loaders. Modern European guns fire shrapnel and shell, while Martian guns fire solid shot and grapeshot. The British Field Gun Firing Table and the Martian Cannon Firing Table are found on page 205.

Types of Ammunition: *Shrapnel* is an artillery projectile filled with steel balls and a bursting charge. It is set to explode at a certain distance from the gun and is very effective against troops in the open. It has much less effect on troops under cover, however, and no effect on fortifications or ships.

Shell is an artillery projectile containing an explosive charge and set to explode either after a set delay, on impact, or shortly after impact (to penetrate armor). It is less effective against troops in the open, but is very useful against buildings, fortifications, and ships.

Solid shot is a stone or metal cannonball thrown from a gun at a target which does damage by impact. It has limited effect against troops in the open, but is useful against buildings, fortifications, and ships. It can also produce troop casualties in these types of targets as its impact against the structure usually produces stone, wood, or metallic fragments.

Grapeshot consists of large numbers of musket balls loaded into and fired from a cannon. It is very effective against troops in the open at short ranges but has no effect on harder targets.

Hit Rolls: Each time that a gun fires, the gunner rolls his Gunnery

skill dice to determine whether the shot hit its intended target. The difficulty of the shot is determined by its range. Shots at close range are Easy, at medium range are Moderate, at long range are Difficult, at very long range Formidable, and at extreme range Impossible.

The ranges listed on the Field Gun Firing Table are the weapon's close range. Medium range is twice this distance, long range is three times this distance, very long range is four times this distance, and extreme range is five times this distance.

No die roll to hit is ever made for guns when they fire grapeshot, as it always covers a set cone of ground directly in front of the gun. This cone is described to the right under "Burst Area."

Deviation: If a shot misses its intended target, it will either fall long or fall short. Roll a die: If the roll is 1-3, it falls short; 4-6, it falls long. Next roll dice to determine how long or short it falls. Roll one die if the intended target was at close range, 2D if at medium range, 3D if at long range, 4D if at very long range, and 5D if at extreme range. Double the die roll; the result is the number of yards the shot falls long or short. (The die roll itself is the number of two-yard grid squares that it falls long or short.)

Burst Area: Whenever a shot

lands, it has a burst area centered on its impact point. All characters within that burst area are attacked by the shot.

Shells have a burst area with a width and depth in yards as listed on the chart. Halve this to find the width and depth of the burst in two-yard grid squares.

Shrapnel burst areas are the same width as listed but twice as deep.

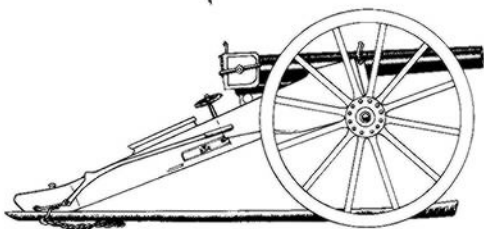
Grapeshot sweeps a triangular area which extends to a distance from the gun equal to twice the burst width, and with a width at its base equal to the burst area. It has no effect beyond this range.

Solid shot's burst area (actually the lethal area through which the shot passes) is always two yards (one grid square) wide and twice the gun's burst width long.

Roll one hit die for each character in burst area. The number of hits scored is the number of casualties. Each casualty from shells and solid shot suffers one die roll of wounds. Each casualty from other types of rounds suffers two die rolls of wounds. The required hit number depends on the type of ammunition fired.

Saving Throws: Each character hit by artillery fire makes a saving throw to avoid serious injury. The save number depends on the type of ammunition fired. The die roll is modified by the same modifiers as for small arms fire (see the Small Arms Saving Throw Modifiers Table on page 205).

ARTILLERY AMMUNITION EFFECTIVENESS		
Ammunition	Hit	Save
Shot	3	0
Shell	2	1
Grapeshot	3	2
Shrapnel	4	2



MORALE

PLAYER CHARACTERS will decide for themselves whether to run or fight. Non-player characters (NPCs) will have that decision made for them based on their morale.

Morale Level: All groups of NPCs have a morale level based on their experience. The more experienced a group, the higher their morale. The referee may decide to vary this based on the situation or the particular group of NPCs encountered. People will fight harder to defend their homes, for example, than to protect the reputation of a distant monarch, particularly a despotic or unpopular one. The base NPC morale levels are shown in the accompanying chart.

NPC MORALE

Experience	Morale Level
Green	8
Trained	9
Experienced	10
Veteran	11
Elite	12

When To Check Morale: NPCs check morale at the *end* of any turn in which they were attacked (which includes being fired at from any range) or in which a friendly group in their field of vision failed a morale check. NPC groups also must check morale in any action in which they charge or are charged.

How To Check Morale: The referee checks morale by rolling two dice against the morale level of the group. The morale level is modified by the presence of leaders, casualties, and other conditions noted below. NPCs check morale as a group, not individually. Thus, a band of 20 warriors would all check by making a single morale roll. Sometimes, at the referee's discretion, the enemy will consist of two or more groups, each operating independently. In this case each group checks separately.

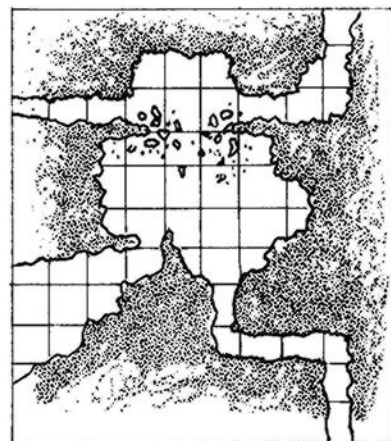


An officer bravely rallies his men.

Morale Level Modifiers: A group's morale level is reduced by the number of characters in the unit who have suffered wounds in the current turn. If, for example, three members of a group were wounded in a turn, the group's morale level would be reduced by three for the duration of the combat. If charging or charged by a group with superior morale, the group's morale level is reduced by the difference. If outnumbered by 2 to 1 or more, or badly outclassed in terms of weaponry (in the referee's judgment), the morale level is reduced by 2. A group's morale is increased by the leadership skill level of its leader.

EXPLOSIVES

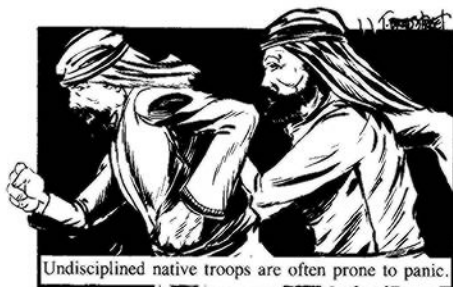
EXPLOSIVES ARE used to blast holes in things, usually walls or other barriers. They can also be used to attack other characters or animals. All explosives are defined in terms of their explosive value and their safety.



Breaching Barriers: Breaching a barrier is another term for blowing a hole through it. Whether or not you succeed in breaching the barrier depends on three things: how thick the barrier is, how tough the barrier's material is, and how much explosive you're using.

The power of the explosive used is determined by multiplying its weight in pounds by its explosive power. Gunpowder has an explosive power of 1, dynamite 4, and nitroglycerin 8.

The toughness of a barrier affects the ability of the explosive charge to breach it. Multiply the power of the explosive charge by the toughness of the material to determine the breaching value of the explosive. The breaching value of a charge is the number of inches of a barrier it will blow through. To determine the size across of the hole blown in a barrier, in inches, subtract the barrier's thickness from the breaching value of the charge.



BARRIER TOUGHNESS

<i>Material</i>	<i>Multiplier</i>
Wood	×5
Dirt	×3
Earthworks	×2
Brick, Stone	×1
Iron	×1/3
Steel	×1/4
Superhard Steel	×1/8

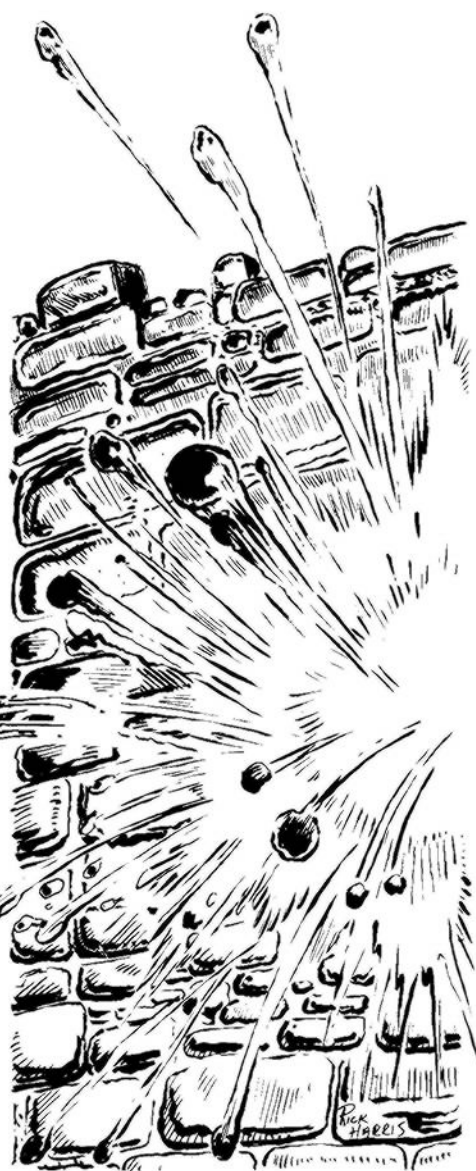
For example, Redvers wants to blow a hole through the wall of a cavern but doesn't know how thick the wall is. The referee decides that it is 18 inches thick, but does not tell Redvers that, as he has no way of knowing. Redvers decides to place six pounds of dynamite on the wall, take cover, and set it off. As dynamite has a power of 4 per pound, this is a total power of 24. Since stone has a toughness multiplier of ×1, 24 is also the charge's breaching value. It will blow through the cavern wall and open a 6-inch hole on the far end (24-18=6). Note that if the wall had been made of wood, Redvers' charge would have had a breaching value of 120 and would have blown a hole over eight feet wide (102 inches).

Attacks on Characters: Any character or animal in direct contact with an explosion will, in all likelihood, perish. The character or animal will, at the very least, be knocked over and lose consciousness, and will suffer wounds equal to one die roll for each level of power of the explosion.

Explosions also produce fragments which will attack characters in the immediate area just as if the fragments were an exploding shell from a gun. The same hit number and save number as for a shell is used, but the burst size is determined by the power of the charge. The width and length of the burst area, in yards, is shown on the Explosive Burst Size Table below.

EXPLOSIVE BURST SIZE

<i>Power</i>	<i>Burst</i>
1	2
2	4
3- 4	6
5- 8	8
9-12	10
13-18	12
19-24	14
25-32	16
33-40	18
41-50	20



Hazards: Dynamite and gunpowder are fairly stable and can be used fairly easily, while exercising reasonable caution. Nitroglycerin, however, is extremely unstable and very dangerous to transport. It becomes particularly volatile in heat and is never used on Venus for that reason. It is safer on Mars, but must be transported with care and in specially designed crates that effectively double its weight. Even in its crates it must be handled gingerly, as sudden shocks (like dropping it) will almost certainly set it off.

SHIP-TO-SHIP COMBAT

THE STRENGTH OF a Martian potentate is measured by the number of sky galleons in his fleet, and combat between aerial vessels is fairly common. (A detailed system for ship-to-ship combat is provided in the board game *Sky Galleons of Mars*. The following system is for players who do not own that game.) When resolving aerial combat, a hexagonal grid is used for positioning the ships, with each hex equal to 200 yards. The ships will move on the map, with the players determining the movement of their own ship and the referee controlling that of the enemy.

SHIPS

SEVERAL AERIAL vessels, both human and Martian, are listed in the equipment section of the book. Each of these vessels has a ship data form included in the chart section. This data form contains all of the information needed for aerial combat and should be photocopied. Its format is explained in the rules below.



The 4" gun mount of an *Aphid*-class gunboat brings an *Oenotrian Hullcutter*-class screw galley under fire.

TURNS

EACH TURN represents 30 seconds, as with normal combat, but the actions in the turn are streamlined. Players will not worry about individual actions unless and until there is a boarding action. In each turn the referee will decide what the enemy is doing, the players will move their own ship, the referee will move the enemy ship or ships, and then all ships will fire. All movement and fire is considered to take place at the same time.

MOVEMENT

4 EACH SHIP has a speed which is the number of hexes it may move per turn. Each ship record form lists the speed in a circle to the right of the ship's deck plan. Each ship is always oriented in such a manner that its bow is facing one of the six hexsides in its hex. Whenever a ship moves, its first hex entered must be the one directly in front of it.

A ship may change its facing by one hexside each time it enters a hex. At the cost of one hex of movement, steam vessels may change their facing in a hex without moving. This maneuver is called a power turn.

Whenever two ships enter the same hex there is a chance of a collision. Roll a die; there is a collision on a roll of 1 or 2. Add 1 to the die roll if the ships are end-on (bow-to-bow or bow-to-stern). Subtract 2 from the die roll if either of the ships attempts to turn while in the same hex as the other. If there is a collision, both ships immediately stop moving.

8 Each ship's hull size is shown in a box to the right of the deck plan on the ship record form. Each ship involved in a collision rolls a die and suffers a hull hit if the result is equal to or less than the hull size of the other ship. If the other ship has a hull size greater than 6, then one hit is automatically taken, and a second is suffered if the die roll is less than or equal to the amount by which the hull size exceeds six. In other words, the bigger the ship you collide with, the more likely your own ship is to take damage.

Finally, the smaller ship in the collision has a chance of suffering a loss of trim. Roll a die. If the die roll is less than or equal to half of the difference in hull size (round fractions down), the smaller ship suffers a loss of trim. (See the section on ship damage for a description of the effects of loss of trim.)



ALTITUDE

THERE ARE SIX altitudes in the game: Very High (VH), High (H), Medium (M), Low (L), Very Low (VL), and Ground (G). In general, the surface of the planet is at ground level, but some mountains rise to higher altitudes. The maximum altitude of a vessel is noted on its ship status sheet. There is a block of boxes labeled "Hull Hits" which is divided into several rows of boxes. The boxes to the left of the rows include abbreviations for the various altitude levels. The highest level shown is the maximum altitude of the ship.



All ships may go down one altitude level per turn at no cost. Each altitude the ship goes up costs

two hexes of movement. Each level the ship goes down after the first one costs one hex of movement. Thus a ship with a speed of 5 could move five hexes or move three hexes and climb one level, or move one hex and climb two levels. A vessel whose speed is reduced to 1 hex may still climb one level instead of moving. Each level of altitude change allows a one-hexside change in facing. This does not apply to the one free altitude drop per turn.

If a vessel is in the same hex as another vessel but is at a different altitude, there is no possibility of a collision. If the vessel changes altitude and thus both ships are at the same altitude, there is the normal chance of a collision.

If a vessel involuntarily drops to the same altitude as the surface of the planet, it crashes and is destroyed. If it voluntarily drops to the surface,

it has landed. However, a vessel may only drop one altitude level and may only move one hex the turn it lands. If it moves more than one hex or drops more than one level, it crash-lands. The crew is safe, but the vessel is crippled and is removed from play. If a vessel enters a hex which contains land at an equal or higher altitude than the vessel (such as a mountaintop or cliff wall), and the vessel is moving at a speed of 1, the vessel lands. If the vessel is moving faster than 1, it crashes.

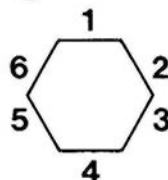


KITES

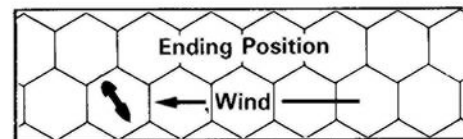
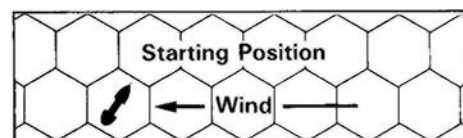
KITES (wind-powered vessels) do not have a fixed movement allowance and follow special movement rules. Kites may either move downwind ("run") or upwind ("beat").

If facing toward one of the three downwind hexsides, the movement allowance of the kite is 1 plus a die roll. The die roll is made at the start of its movement phase. If a 4 were rolled, for example, the kite would have a movement allowance of 5 for that movement phase. If facing toward one of the two upwind hexsides adjacent to the exact direction of the wind, the kite has a movement allowance of one die roll halved, rounding fractions up. Kites may never move directly into the wind.

At the start of each encounter, determine the direction of the wind. Roll the die and consult the following wind diagram.



As with other ships, kites may change their facing by one hexside each hex they move. Kites also have the ability to execute a tack, which consists of changing the ship facing by two hexsides to avoid heading directly into the wind. There is no speed cost to tack, but a kite may not make any other turns the movement phase it does so.



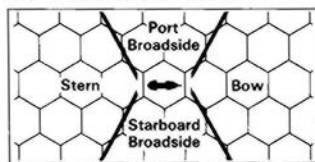
Kites may change altitude by one level per turn at no movement-point cost, but may never voluntarily change altitude by more than one level.

COMBAT

FIRING TAKES place at the end of each turn.

Each weapon has a limited arc of fire, as shown on the ship's deck plan. Each gun mount is indicated by a box on the deck plan. The type of gun is noted in the box, and its allowed field of fire is shown by the lines coming out of the box. A gun with lines that point to the bow, stern, and side, for example, can fire into the bow, stern and broadside (on that side of the ship) firing aspects. The small circles next to the gun box represent the gun crew.

There are four firing aspects of a ship, as illustrated below.



Separate firing tables are presented for shipboard ordnance which list its rate of fire in terms of shots per turn (the Martian Cannon and Royal Navy Guns Weapon Characteristics Charts, which are found on page 201), but because of the difficulty associated with hitting and damaging a large vessel, these usually represent more than just one round per shot. Weapons with a rate of fire greater than 1 may take more than one shot in a turn, but all must be directed at a single enemy vessel. Weapons with a rate of fire expressed as a parenthetical number take that many turns between shots to reload. Thus a gun with a rate of fire of (2) could fire on the first turn of a battle and then could not fire again until turn 4, having spent turns 2 and 3 reloading.

The chance of a shot hitting is determined by the range at which the gun is fired. The weapons charts list the close range and long range of a gun in hexes. The first (smaller) number listed under range for the gun is its close range. Weapons with a close range of 0 conduct close-range fire only when firing at targets in the same hex. Each shot from a gun hits on a roll of 3 through 6 at close range and on a roll of 5 or 6 at long range.

Altitude differences also affect the chance of hitting the target. No ship may fire at an enemy ship if the difference in altitude (in levels) is greater than the range (in hexes). For example, a ship cannot fire at an enemy ship two hexes away but three levels below.

If fire at a higher target is possible, add 1 to the range for every level higher the target is compared to the firing vessel. Thus, a target two hexes away and two levels higher would be fired at as if it were at a range of 4. Firing at targets at lower elevations does not add to the range.

Finally, all fire at targets of different altitudes is conducted with a die roll modification of -1 on the hit die roll. Thus, at close range shots would only hit on rolls of 4 through 6, and at long range they would hit only on rolls of 5.

DAMAGE

WHEN A GUNSHOT hits an enemy vessel, roll a die and consult the Hit Location Table (page 201) to determine what type of damage has been inflicted. Each gun has a damage value, which is the amount of damage it causes when it strikes an enemy vessel. The damage value of the round is the the number of hits

inflicted in that location. For example, if a gun with a damage value of 3 rolled a hull hit location, 3 hull hits would be recorded.

If firing at a vessel at a higher altitude, all crew hits become hull hits instead.

The following types of damage are possible:

Gun: A gun hit destroys one gun. If the firing gun has a damage value greater than 1, all additional hits are crew hits, with the crew of the destroyed gun suffering casualties first. The destroyed gun must be mounted in such a way that it faces the firing aspect from which it received the fire. If several such guns are present, roll a die to randomly determine which is hit. If no guns are present in that firing aspect, reroll the hit location and continue to reroll until a nongun hit is achieved.

Hull: A hull hit causes hits to the hull boxes equal to the damage value of the gun. Each ship has a series of hull boxes arranged in rows. Each row has hull boxes equal to the ship's hull size and each row corresponds to one of the altitudes the ship can fly at. For example, a ship with a hull size of 3 and a maximum altitude of High would have four rows of boxes (one each for Very Low, Low, Medium, and High altitude), each row with three boxes. Always check hull hits off from the row of the highest remaining altitude. When that row of boxes is filled in, the ship's maximum altitude is reduced to the next lowest level. If the ship is at its maximum altitude when this happens, it automatically drops one altitude in its next movement phase. This drop in altitude does not cost movement points. When all of the hull boxes are checked off, the ship crashes.

Crew: Each crew hit causes crew casualties equal to half of the damage value of the firing gun, rounding all fractions up. Losses are selected by the player who suffered the casualties and may be from any part or parts of the ship desired. However, the firing player also rolls an additional die, and if the result is a 6, then one of the casualties must be an officer or petty officer (owning player's choice). This die roll is made only once in the phase when the ship suffers one or more crew casualties; it is not made separately for each casualty.

Gun crews are shown on the ship status sheet as small circles next to their gun. All other crew are shown below the deck diagram as boxes in one of four categories: Bridge, Deck, Maneuver, and Marines.

Critical: If a critical hit is rolled, roll two dice and consult the Critical Hit Table (page 201) to determine the results. Critical hits are explained on the Critical Hits Chart (page 202).

ARMOR AND PENETRATION

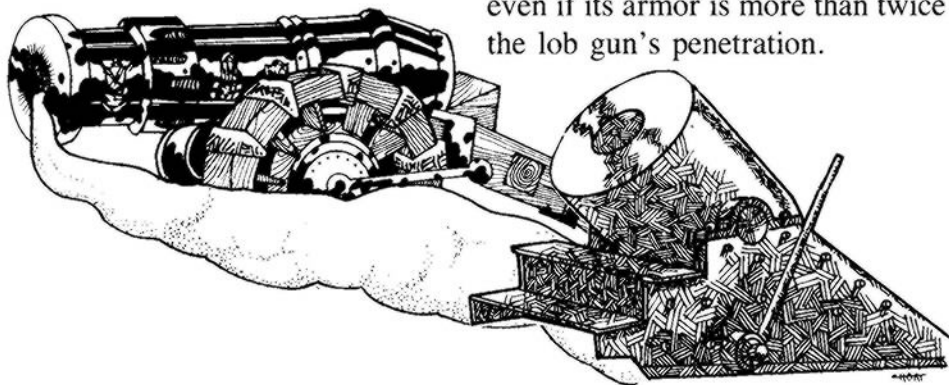
2 EACH GUN also has a penetration value, which is important only against heavily protected targets, such as armored gunboats and stone fortresses. The listed value is the gun's penetration.

Each ship status form lists the armor value of the ship in a hexagon to the left of the deck plan. If the armor value of a target exceeds the penetration of the gun, halve the gun's damage value. If this results in fractional hits, roll a die to determine if the hit takes effect, with a roll of 1-3 having no effect and a roll of 4-6 causing a hit. For example, a gun with a normal damage value of 3, but

which hit armor thicker than its penetration, would have a damage value of 1 1/2. If it caused a damage result that called for one hit per damage value, it would cause one hit automatically and a second hit on a roll of 4-6.

If the armor value of a target is more than twice the penetration of the firing gun, the gun has no effect. For example, a gun with a damage value of 3 would have a damage value of 1 1/2 against armor of 6, but would have no effect against armor of 7. Guns with a penetration of 0 do full damage against unprotected targets, half damage against targets with an armor value of 1, and have no effect on targets with an armor value of 2 or more.

Not all parts of a ship are protected by armor. Armor protects the hull, magazines, bridge, trim controls, and boiler. In addition, some ships have some or all of their guns mounted under armor. These armored guns are noted on the ship status sheet by a large box drawn around the smaller gun box and the circles of the gun crew. Guns under armor receive the benefit of the armor. If there is a hexagon connected to the gun mount, the number in the hexagon is the armor value of the mount. Otherwise the gun mount has the same armor value as the rest of the ship.



SMALL ARMS FIRE

SINCE SHIPS are not continuously in range and players will have to move about on the deck to get a good shot, characters may conduct only one attack action per turn when firing from ship to ship. This rule is only in effect for independently moving ships; once two ships are grappled, the normal combat rules apply.

MARTIAN LOB GUNS

MOST LARGER Martian ships have lob guns. A lob gun is a high-trajectory, large-bore weapon, similar to bombards of the Middle Ages. The lob gun is mounted on a turntable in the center of balance of a ship. (Due to its considerable downward recoil it would destabilize the ship if mounted anywhere else. This is also the reason each ship has only one.) The turntable allows all-around fire. The lob gun fires very large, heavy boulders, usually banded with iron. Two exceptions to the normal rules cover these unique weapons. First, lob guns hit only on a die roll of 6 at all ranges. Second, any hit from a lob gun causes an automatic loss-of-trim critical hit in addition to any other damage it does. Note that this loss of trim is due to the impact of the shot, not to damaging of the trim controls. As a result, the target ship suffers the loss of trim even if its armor is more than twice the lob gun's penetration.

RAMMING

SHIPS MAY deliberately attempt to ram enemy ships. If so, they are moved directly toward the enemy vessel and into (or through) the hex it occupies. The target may attempt to avoid the ram by expending half of its speed (round fractions up). The ship making the attempt then rolls a die. On a roll of 4 or less the ram is successful. If the enemy vessel was avoiding the attempt, subtract the speed spent avoiding the attempt from the number needed to ram. If the target of the ramming attempt is immobilized due to battle damage, the ramming attempt is automatically successful.

For example, a ship moves into a hex containing an enemy vessel. The enemy vessel has a speed of 5 and maneuvers to avoid the ramming attempt. Avoiding the attempt uses half of the vessel's movement allowance rounded up, or 3 movement points. Normally the ramming vessel would need to roll a 4 to ram, but this number is reduced to a 1 because of the target's avoidance maneuver.

If a ram is successful and the ramming ship was equipped with a ram, the effects are as follows: First, the rammed ship immediately suffers hull damage equal to half the hull size of the ramming ship (roll for fractional hits, with a 1-3 having no effect and 4-6 causing a hit). The ramming ship suffers no damage itself. Second, there is a chance that the rammed ship will suffer a loss of trim. Roll the die. If the result is less than the number of hull damage points sustained, the rammed ship suffers a loss of trim. (See the Critical Hits Chart on page 202 for a description of the effects of loss of

trim.) If the rammed ship does not suffer a loss of trim, then the two ships are grappled (see below), and the rammer may send a boarding party across.

If the ram was successful but the ramming vessel was not equipped with a ram, the ram is resolved in the same way as a collision, with two exceptions. First, if the ramming ship is smaller than the rammed ship, there is no chance of the rammed ship losing trim. Second, if the rammed ship does not suffer a loss of trim, then the two ships are grappled (see below), and the rammer may send a boarding party across.

GRAPPLING

TO ATTEMPT to grapple an enemy vessel, a ship must move into or through the same hex as an enemy vessel and be at the same altitude. Half the deckhands (round fractions up) may make grappling attempts. Roll a die for each attempt; it succeeds on a roll of 5 or 6. If grappled, a ship may be boarded immediately. The number of successful attempts is the number of grappling hooks in place. The referee should note which squares of the enemy ship have a grappling hook in place.

The ships remain grappled so long as the hooks remain in place. The original grappler may cut the hooks loose at any time; the grappled ship may do so only if someone is in the square with the hook and spends two full actions doing nothing but freeing the hook.

No vessel may move or change altitude while grappled to another. Grappled ships ignore any loss-of-trim critical hits, and if they take battle damage which would normally

force them to drop a level, they instead stay at the same height. They will drop an altitude level if the enemy ship also suffers damage requiring it to drop an altitude level or at such time as the grapple is cut. If a grappled ship suffers damage that would reduce its maximum altitude to two less than its current altitude, the grapple breaks, the vessel drops two levels, and it suffers a loss-of-trim critical hit.

Boarding actions are conducted on the ship deck plans using the normal combat rules.

TOWING

PLAYERS MAY want to tow captured enemy vessels or friendly vessels which have been immobilized by battle damage. To do so, the two vessels must be grappled. A captured vessel will probably already be grappled. However, if a friendly vessel wishes to grapple another friendly vessel, it does so automatically by ending its movement in the same hex. (There is the normal risk of a collision.) Once two vessels are grappled, it takes one complete turn for the crews to rig a tow cable. In the next turn, the nondisabled ship may begin towing.

Divide the towed vessel's hull size by the hull size of the towing vessel, round all fractions down, and subtract the result from the towing vessel's speed. For example, a towing vessel with a size 2 hull towing a ship with a size 5 hull would have its movement factor reduced by 2 ($5/2=2.5$, rounded down to 2).

A vessel being towed must have its trim station manned by an officer or petty officer while being towed. Martians can man the trim of a captured British vessel, and vice versa.

SHIP'S CREW

THE SHIP IS manned by officers, petty officers, and ratings (enlisted men), who carry out many functions.

A. Officers

EACH SHIP has a limited number of senior officers who perform key leadership functions. If all officers on a vessel are killed, it will attempt to withdraw from the battle and escape. If it is immobilized or boarded, it will surrender. Officers may take the place of a key petty officer (helmsman or master trimman) if no key petty officers remain alive to do so. An officer functioning as a helmsman or master trimman still counts as an officer on board.

The captain of the ship is represented by the box labeled "C" in the bridge section. Any additional officers are labeled "O" in the bridge crew.

B. Petty Officers

EACH VESSEL will normally have at least two petty officers: the helmsman and the trimman. (In British service the helmsman is referred to as the quartermaster and the trimman is referred to as the bo'sun.) In addition, on British ships there may be several extra petty officers among the deckhands. Casualties among key personnel (as a result of a bridge hit, for example) may only be replaced by extra petty officers or by the ship's officers.

The helmsman is represented by the box labeled "H" in the bridge crew. The trimman is represented by the box labeled "T" in the bridge crew. All extra petty officers are represented by the boxes labeled "P" in the deck crew.

If, for any reason, there is no one at the helm of a vessel, it may not change course or speed (except as a result of additional combat damage or a collision). If for any reason there is no one at the trim station of a vessel, it may not voluntarily change altitude. In addition, roll a die at the end of each turn. On a roll of 6 the vessel takes a loss-of-trim critical hit result (and probably crashes). On any other result it remains in trim.

C. Gunners

EACH GUN MOUNT has an assigned gun crew. The ship status sheet has one or more crew circles by each gun mount. As gun crew are killed, mark off crew boxes. Each casualty on a gun crew reduces its rate of fire by 1. For weapons with a rate of fire of 1 or less, each crew casualty adds one turn to the time required to load the gun.

D. Maneuvering Crew

THE MANEUVERING crew are those men assigned to man the boilers, masts, or crankshaft of a vessel. On a steam vessel these engineers are referred to as the "black gang," so called because they are usually covered with coal dust from stoking the boilers. On a kite these are "topmen" who control the ship's rigging, masts and sails. On a screw galley these are called turncranks. Each ship status sheet has a set of boxes representing the maneuvering crew of the ship. As crew casualties are taken, boxes are marked off. When a row of boxes is completely marked off the speed of the ship is reduced by 1. When the entire maneuvering crew is eliminated the vessel's speed is reduced to 0.

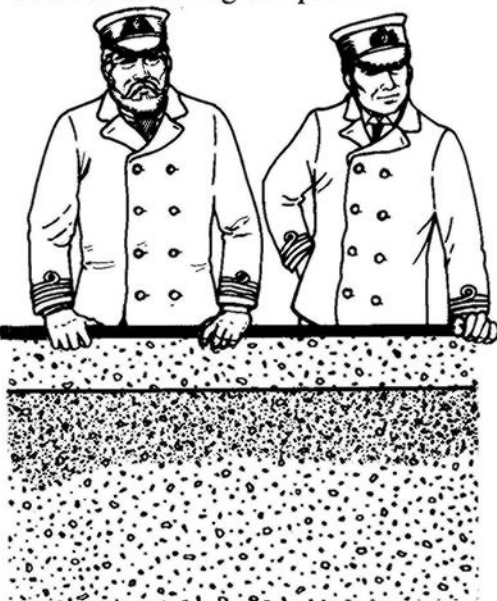
E. Signalman

EACH SHIP has one signalman, represented by the box labeled "S" in the bridge section. He has no effect except to give the ship one extra crewman to use as the player wishes.

Optional Rule: The signalman's actual function is to transmit messages from ship to ship so that vessels on the same side can coordinate efforts. Therefore, optionally, if he is removed as a casualty, such cooperation is not possible.

F. Deckhands

DECKHANDS ARE all crewmen other than those noted above. In combat the deckhands are responsible for damage control, are usually drawn on to form boarding parties, and replace losses among crewmen in other positions. Since most crew casualties can be taken against any crewman desired, the owning player will usually want to mark off a deckhand. This may represent a crewman in some other part of the ship being killed and one of the deckhands taking his place.



ANIMALS

ANIMALS ARE encountered often in the wilderness, and they are usually dangerous. While some animals will leave a party alone unless they or their young are threatened, others will attack with or without provocation, either for food or in defense of their territory. When this happens, the characters will have to fight for survival.

Encountering Animals

THE ENCOUNTER TABLE for a specific terrain type on a planet will often indicate an animal encounter and will also specify the type of animal encountered. In most cases the animal will attack the party. If the animal is a plant eater, however, a chance exists (1-3 on a die) that the animal will either ignore the characters (unless attacked), wander off, or flee. Small plant eaters (less than a ton in weight) will always flee unless cornered.

If the animal attacks, the Animal Chart then provides all information necessary to conduct the subsequent combat with the animal.

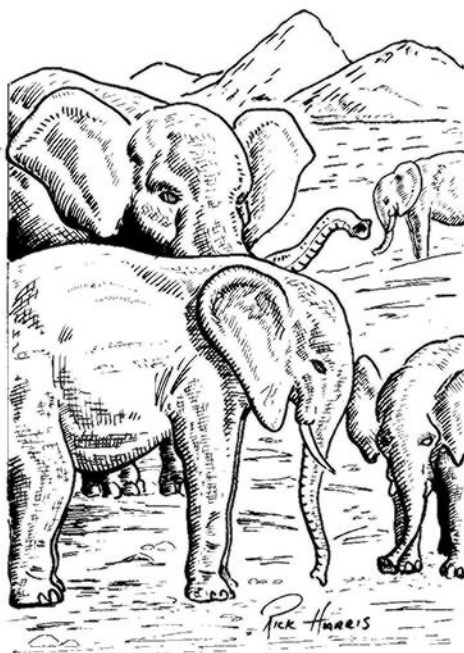
VENUSIAN WILDERNESS ENCOUNTERS

Terrain	Bog
Encounter #	3
Die Roll	Encounter Type
1	(Roll 2D.)
2	Giant Carnivorous Plant
3	Brontosaurus
4	Carnosaurus
5	Stegosaurus
6	Ceratopsian
7	Hadrosaurus
8	Pterodactyl
9	Native Hunting Party
10	Native Trading Party
11	Native Raiding Party
12	Tyrannosaurus

The Animal Chart

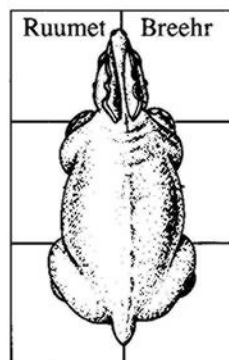
A SEPARATE Animal Chart is provided for each world. (The Animal Charts are found on pages 210-212.) The animals on it are grouped into predators, scavengers, and plant eaters, which are general categories that indicate the probable danger presented by the animal. Predators are usually the most dangerous while plant eaters are the least dangerous. In many cases, though, characters will not know what type of animal they are facing.

The Animal Chart lists the following information about the animal encountered:



Number Appearing: This may consist of a fixed number or a multiple of a die roll (expressed, for example, as $1D \times 10$). Both fixed numbers and die roll multiples are meant to be general suggestions, not hard and fast rules. The steppe tiger, for instance, usually is a solitary hunter, but the referee could have a pair or more hunting together if he desires.

Size: This is the number of two-yard grid squares the animal occupies in combat. The animal seldom completely fills these, but this is the area that is effectively blocked by its presence. It also provides the referee and players with a good general guide to the real size of the animal.



Move: The number of yards the animal moves in one action at top speed. Unless fleeing or charging, the animal will usually move half this speed or less. The number of yards is preceded by a letter which indicates the type of movement the animal practices: land (L), water (W), or flight (F).

Wounds: This is the number of wounds it takes to kill the animal.

Save: This is the animal's save number against melee attacks, and it is added to (or subtracted from) the save number of any missile weapon which hits it.

Weight: The weight of an average full-grown example of the animal. It is expressed in pounds unless otherwise noted. About 10 percent of this is edible meat if the animal is killed for food.

Weapons: This lists each of the weapons with which the animal may attack and gives their combat values in parentheses. These combat values are, in order: number of hit dice rolled, required hit number, reach, and wound value of the weapon.



Attacked by Roogies.

Attacks Against Animals

ATTACKS AGAINST animals are conducted in the same manner as those against humans, except:

First, animals have their own saving roll modifiers, as explained in the section on the Animal Charts on page 108.

Second, animals will not stop attacking in a turn in which they are wounded unless they have taken a total of half or more of their allowed wounds. In that case they will stop until the next turn begins.

Third, animals with horns may block attacks in the same manner as a person who is armed with a melee weapon. The referee rolls the animal's hit dice, with hits read as blocked hits from the characters. If more blocks are successful than hits by the characters, the animal may strike back (riposte) with its horns.

Finally, whenever a character wounds an animal, there is a chance that the shot will instantly kill it, regardless of the number of wounds that it normally takes to drop the beast. This type of kill can occur only if the animal does not make its saving roll. If it does not, the character who hit the animal rolls one die against the wound value of the weapon used minus one. A weapon with a wound value of 2, for example, drops an animal if a 1 is rolled, while a weapon with a wound value of 4 drops an animal if a 1 through 3 is rolled. Note that weapons with a wound value of 1 may not cause instant kill wounds. Weapons which cause 2 wounds only at close-combat range (certain pistols and lever-action rifles and carbines) have a chance of causing an instant kill only at that range.

Animal Morale

WHENEVER HALF or more of an attacking group of animals have been killed, they will break off the attack and flee. Whenever a solitary animal has suffered half its total allowed number of wounds, there is a chance it will break off its attack and flee. Roll the die once in each subsequent action in which the animal is wounded; if the die roll is equal to or less than the number of wounds inflicted on the animal that action, it breaks off the attack and flees. Otherwise it will continue the attack.

Whenever characters are attacked by a swarm of animals, roll the die once at the start of each action; on a roll of 1 the swarm breaks off the attack and flees. Otherwise it continues the attack. Characters may also defeat swarm attacks by such expedients as diving under water (if an aerial swarm), getting out of the water (if an aquatic swarm), or some other clever ruse.

Attacks By Animals

ANIMALS HAVE one or more natural weapons with which they may attack. An animal may attack with all of its weapons each action, but each character may only be attacked by one weapon. If an animal attacks with two or more weapons, its required hit numbers on all attacks are reduced by one. Animals always receive four actions per combat turn.

For example, a Martian steppe tiger has both claws and teeth. If facing one adversary, the tiger would attack with either its claws or its teeth, at the referee's discretion. If the tiger were adjacent to two characters, however, it could attack one with its claws and one with its teeth.

The one exception to the one-weapon-per-target rule is that an animal can attack a character with one weapon while holding the character with another. (Fangs, talons, coils, and tentacles are capable of holding a character, allowing another weapon to attack.)

If the referee has to choose which of an animal's weapons it will attack with, a good rule of thumb is that if the animal is aggressively attacking the character, it will use its most powerful weapon, while if it is attempting to defend itself, it will use the weapon with the greatest reach.



Animal Weapons

THERE ARE 12 different types of natural weapons used by animals. Many animals have more than one of these and may attack with one or several, depending on the situation. Most animal weapons attack as an armed melee attack action, rolling a set number of hit dice for a set required hit number. Many of these weapons have a unique characteristic as listed below.



Teeth: An animal's teeth do damage either by crushing a limb (if the animal is very large or strong) or by tearing. Typically, teeth have a range of 0.

Fangs: A few reptile-like animals have long, sharp fangs, which are used to pierce and hold an antagonist. Once an animal has struck a character with its fangs, it will not let go until it is killed. The character is locked in melee with the animal, but it will not attack again with its fangs. If, at the referee's discretion, the fangs fasten on a character's arm, that arm is pinned in place and may not be used until the animal has been killed.



Swarm: This is not a weapon *per se* but the manner in which certain animals attack. Individually these animals are incapable of causing serious injury, but a large swarm can be quite dangerous. Some animals who use swarm attacks are army ants, bees, bats, and piranha.



Coils: An animal which attacks by constriction does so by coiling its slender but muscular body around its prey and squeezing. If an animal with coils succeeds in an attack, it indicates that the coils are in place around the character, not that the character is wounded. Each attack action conducted by the animal after that is resolved by rolling dice equal to the wound value of the coils. The enwrapped character rolls his own Strength attribute dice. If the animal's total exceeds the character's total, the character suffers one wound. If the character's total is twice that of the animal, the character breaks free. All other results have no effect.

Other characters may assist the enwrapped character by pulling on the coils. This counts as an attack action. Each character pulling on the coils adds half his Strength attribute dice (round fractions up) to the enwrapped character's dice.



Horns: Horns are effective defensive weapons due to their reach but are not very effective when an animal is chasing prey. They are mostly found on plant eaters. Animals with horns may block melee attacks in the same manner as with melee weapons, by rolling hit dice to block hits. If extra hits are blocked, the animal can strike back (riposte) with its horns.



Tentacles: Tentacles work in much the same way as coils, with the exception that most animals that have them have multiple tentacles. The number of tentacle hit dice which the animal has is actually the number of tentacles it has. Each tentacle attacks separately with one hit die, and each successful attack enwraps the prey with one more tentacle. The tentacle wound value is actually the number of dice rolled per tentacle which enwraps a character.

For example, a creature has four tentacles and a wound value of 2. In the first attack action it rolls four hit dice. Suppose that two hits are achieved. In the next attack action it will roll four dice (two per tentacle) and compare the total to the Strength attribute dice of the enwrapped character, and it will also conduct an attack with the remaining two tentacles by rolling two hit dice.



Tail: Animals with heavy, muscular tails can use them as bashing weapons against their enemies. A tail can only be used to attack an enemy to the rear or side of an animal, not to the front.



Talons: Talons tend to be long and sharp and are used to rip at and grasp an enemy. Once an animal has wounded a character with its talons, it will continue to hold on until it is wounded. As soon as it is wounded, it will let go. So long as the animal holds onto its victim, the effects are the same as for fangs, with one exception. Animals with talons will hold onto a character with only one set of talons and will continue to attack with the other. Only half the animal's talon hit dice are rolled when it attacks with one set of talons. If the second set wounds a character, the animal will not grasp that character, but will keep one set of talons free to attack.

Crush: Very large animals attack by attempting to crush their enemies, either by butting them or stepping on them. This attack form is used mainly as a defensive measure, as most prey can escape from a large animal attempting to step on it. It is generally used only against characters and animals that are attempting to attack and which do not flee.



Claws: An animal with powerful limbs often has claws, which are used to rake an enemy. Claws typically do less damage than teeth, but have a longer reach.

Stinger: Animals with stingers inject poison which will incapacitate their prey. No animal on any planet other than Earth produces poison deadly to Earth humans, so a successful attack by a stinger will only render a human character unconscious. The animal will no longer attack that character but may drag him off to its lair.



Drop: This is a special sort of attack conducted by some flying animals. Flying animals will attempt to lift their enemies into the air and drop them. Flying animals on Mars can lift half their weight into the air for short distances. Once a successful attack is made, the animal climbs for 1 die roll of turns before dropping the character. The number of turns the animal climbs is the number of wounds the character suffers upon hitting the ground.

Once airborne, characters can attempt to hold on to the animal and attack it. If the animal is wounded, it will land and release the character; if it is killed, it will fall. The animal will, at the same time, attempt to attack the character if it has any weapons other than drop. If it wounds the character, the character will lose his grip and fall.

The Martian great kommotas has a special variant of the drop attack; it drops rocks on characters, especially if they are themselves flying. The rocks cause wounds equal to the roll of one die. If an aerial vessel is hit, it causes a loss-of-trim critical hit.



TRAVEL AND EXPLORATION

TRAVEL AND EXPLORATION

PLAYER CHARACTERS in **Space: 1889** will travel the road to adventure, literally as well as figuratively. Many of the encounters and adventures in the game occur as a result of travel, and so the rules covering it are fairly detailed.

While combat is fought in 30-second turns, travel takes place over hours, days, even weeks. Combat movement is measured in yards, while travel movement is measured in miles, at the very least, and more commonly in tens of miles or hundreds of miles. (Travel between the planets, of course, covers millions of miles, but is covered in a separate chapter.)

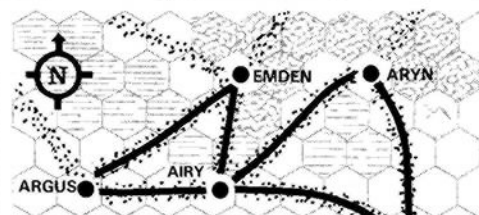
There are several different general categories of travel (land, water, and air); each of them has a wide variety of means, and travel in each medium is treated differently in settled regions than in wilderness regions. All travel considerations pertinent to this game, however, can be defined by considering four questions: What is the means of travel? How long will the journey take? What will the journey cost? What are the hazards of the journey? These are the questions addressed by this chapter.

MAPS

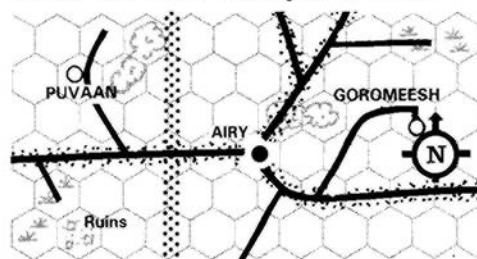
IN ORDER to regulate travel, you will need a map. In adjudicating travel, you will use three different scales of maps: large-scale maps, mid-scale maps, and small-scale maps.



Large-scale maps do not have a hexagonal grid. They are just maps of a planet, a hemisphere, a continent, or a region. Strategic maps of Mars, and Venus are included in this book. A scale is included with the map so that you can measure distances. Large-scale maps can be used to quickly determine the time necessary for a safe voyage (i.e., one through settled territory by ordinary transportation means) from one point to another. They are also used to help you create mid-scale and small-scale maps of different regions on the planets.



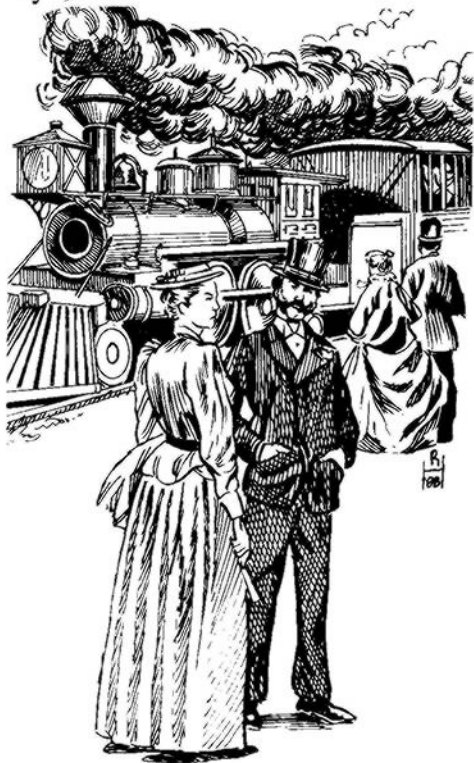
Mid-scale maps have a hexagonal grid superimposed on them with a scale of 100 miles per hex. This is a convenient scale for travel by "speedy" transportation, particularly aerial vessels. Mid-scale maps can also be used to chart the progress of any large military campaigns going on. Mid-scale maps lack fine detail, however. Everything looks pretty much the same from the air, and until you actually get down on the ground and walk around, you never know for sure what you'll find.



Small-scale maps are for walking around. They are used for land travel and may be used for some water travel as well, notably travel by river or canal in unexplored territory. They also have a hex grid, and their scale is 10 miles per hex. There is a blank small-scale map provided in the chart section, and you should (and have permission to) photocopy this for your use. Notice that there are larger hexes overprinted on the sheet, each of which is 10 smaller hexes across. Each one of these larger hexes corresponds to a hex on the mid-scale map of the region.

LAND TRAVEL

UNLESS PLAYERS are fortunate enough to have their own aerial flyer, they will do most of their travelling on land. In fact, it is a good idea to encourage land travel anyway, as this is really the only way to get a good feel for a planet and its many eccentricities. There are three means of land travel: by train, by animal, and by foot.



Trains: Train travel is only available on Earth, and then mostly in Europe and North America. Train travel is safe, fast, and comfortable. A traveller can travel up to several hundred miles in a single day, assuming there are connecting lines. The greatest delay encountered when travelling by rail at this time was the frequent number of transfers that had to be made, although this was a small difficulty when travelling from one major city to another in the same country. Train fare is 10s per 100 miles travelled.

Animals: Animal travel includes both riding a beast of burden and riding in a wagon or coach drawn by animals. The following table lists the travel distances per day for each of the forms of animal transportation.

ANIMAL TRANSPORTATION		
Type	Miles/ Day	Price/ Day
Riding Animal	20	3s
Howdah	10	2s
Wagon	10	2s
Coach	30	3s

The price shown for the riding animal is an approximate daily rental fee, although prices vary considerably. The prices for the others indicate the price for passage by coach or in a caravan. The caravan will be made up of drawn wagons or howdahs carried on the backs of large animals (such as elephants, gashants, or pacyosaurs).

Animals are somewhat limited in the sorts of terrain they can traverse. Coaches may only travel by road. Wagons and howdahs can travel by road or in deserts, hills, and prairies (steppe or grassland). Riding animals can travel in any terrain except mountains, but in any terrain other than deserts, hills and prairies they are reduced to 10 miles per day. All animals add 10 miles per day to their speed if travelling on a road. (This does not apply to coaches, which can only travel on roads.)



Foot: Most exploration will be done by foot, as an expedition on foot can go many places that animals cannot.

Characters may walk either 10 or 20 miles per day, at their option. (Players may not march 20 miles through mountain or swamp.)

At the end of each day's march each character rolls Endurance attribute dice for an Easy task to avoid fatigue. The difficulty of the task goes up one or more level(s) (cumulative) for each of the following:

Marched additional 10 miles: +1 level

Encumbered: +1 level for every 20 percent of body weight carried

Human on Mars: +1 level

Human on Venus: +2 levels

Mountains: +1 level



If characters fail the fatigue roll they have one level of fatigue. Later fatigue results are added to the total. Each level of fatigue reduces the character's Strength, Agility, and Endurance by 1. If any of these attributes are reduced to 0, the character collapses and cannot go on until he has rested for at least a day. All characters recover one fatigue level for every day spent resting.

Hazards: Most significant hazards encountered while travelling on land come under the heading of encounters and are covered there. The main differences are whether the party is travelling in settled countryside or unexplored territory. In settled areas the hazards tend to be things like enemy soldiers and brigands, while in the wilderness they tend toward ferocious animals and undiscovered native tribes.



Fever: One exception to this is fever. Once per week in the bush each character should roll to avoid fever. Roll Endurance attribute dice for an Easy task. However, the dice rolled are determined by the lowest level of a character's Endurance during the week (but the character is always allowed to roll one die).

A character with fever rolls against his Endurance each day to avoid fatigue. Rest does not allow recovery of fever-induced fatigue, however. Instead, the character must fight the infection himself. Each day after the fever is contracted, roll two dice and subtract 2. If the result is equal to or less than the character's original Endurance, the fever breaks and the character begins to recover. From then on each day of rest lowers the player's fatigue level by one.

Note that it is possible for a player's Strength, Agility, and Endurance attributes to all be reduced to negative numbers due to the fever. This has no permanent effect on the character, but it does temporarily render him delirious and incapable of action. (Many explorers died from fever; player characters in this game do not.)

Mountains: You do not march through mountains; you climb and march over them. Each mountain hex has a number of rock faces that must be climbed. The referee determines this by rolling the die, the result being the number of rock faces in a hex. If players wish, they can spend an additional day scouting the mountain for an easier way up. If they do so, the referee will roll again, and if a lower number is rolled the players can use that path instead. Players can scout a hex for as long

as they like, with the referee rerolling each day. If the referee wishes to make a mountain or mountain range particularly large, roll two or even three dice for number of faces in the hex.

One day's climb is measured in how many rock faces can be scaled. A party can scale rock faces equal to the highest Mountaineering skill in the party. If no one has Mountaineering skill the party can scale only one face per day.

Each day there is a chance of a climbing accident. Each player rolls Agility attribute dice or Mountaineering skill dice, whichever is greater, for a Moderate task to avoid an accident. An accident indicates a potentially injuring fall. The severity of the fall is left to the referee, or the following table can be used.



CLIMBING ACCIDENT

Roll	Result
1	Climb delayed. Subtract 1 from faces climbed in day.
2	Climb delayed. Subtract 2 from faces climbed in day.
3	Climb delayed. Subtract 3 from faces climbed in day.
4	Climb delayed. No faces climbed in day.
5	Injury. Treat as level 1 fatigue. Lasts for one week. No rock faces climbed in day.
6	Injury. Broken leg. Climber cannot walk or climb and must be carried up mountain. Cut number of faces per day in half (round fractions up) and add one to difficulty to avoid accident. Leg mends in one month.

WATER TRAVEL

WATER TRAVEL includes travel on the open seas as well as on rivers and canals and in swamps. The one thing that all of these have in common is, of course, that they require a boat.



Types of Vessels: There are two general types of vessels, inland and seagoing. Inland vessels are generally confined to rivers and canals. They tend to be shallow draft with low freeboards, which makes them very hazardous to take into the open sea, where a good wave or two might sink them. Also, they are not usually as fast as seagoing ships. Speed is not at as much of a premium on the inland waterways, as the more frequent navigational hazards impose a certain caution at all times.

Within these two general categories there are three specific types of ships, divided on the basis of their means of propulsion: mechanically-powered, wind-powered, and man-powered ships. Mechanically-powered ships are usually steamships, and for simplicity will be called that for the rest of this rule. However, they may include vessels with more exotic propulsion systems such as electric engines. Wind-powered vessels are sailing ships. Man-powered vessels are all those propelled by paddle or oar, from a canoe to a large galley. There are no oceangoing man-powered ships at this time.

The table below gives the distance travelled per day and the price per day for passage. In the case of ocean voyages, the prices are useful only for Earth, as Mars has no oceans and Venus, while it does possess an ocean, has no shipping for hire. The travel times are universally useful, however.

For long voyages, the characters will have to have proper quarters, especially if they have considerable amounts of luggage along. The prices listed are for "steerage" tickets. In steerage, the passengers are crowded together in large rooms and are allowed only limited baggage. The food is terrible and sanitary arrangements quite unsatisfactory. Certainly no gentleman would travel steerage unless in desperate straits. First-class accommodations cost five times the listed price. Remember, however, that for short voyages of a day or so there is usually only the one fare option.

WATER TRANSPORTATION TABLE		
Inland Waterway		
<i>Vessel</i>	<i>Miles/</i> <i>Day</i>	<i>Price/</i> <i>Day</i>
Man-Powered	20-30	2d
Wind-Powered	1D × 10	3d
Steamer	50	5d
Open Sea		
<i>Vessel</i>	<i>Miles/</i> <i>Day</i>	<i>Price/</i> <i>Day</i>
Wind-Powered	100	3s
Steamship	200	5s

Additional Rules on Travel Time: Man-powered vessels are listed as capable of travelling 20-30 miles per day. They may be paddled at a rate of 20 miles per day indefinitely. The

crew may exert itself particularly hard and manage 30 miles in a day, but its members must then roll for fatigue. On a roll of 1 or 2, the crew is fatigued and may only travel 10 miles per day until one full day is spent resting. Although there are no man-powered oceangoing vessels, oared craft may be taken out into coastal waters and the shallow seas of Venus. There is some peril involved in doing so, however, as explained in the "Hazards" section to the right.

Wind-powered river vessels have a speed listing of "1D × 10" meaning that each day a die is rolled and the result multiplied by 10. The result is the number of miles moved. (Alternatively, the die roll itself is the number of small-scale hexes moved.)

River steamboats have a listed speed of 50 miles per day, which is their normal speed assuming they steam during the daylight and tie up at night. If a group is in a particular hurry, they can get better speed than this by cruising at a higher speed and for longer hours. This increases the chance of a mishap, however. (See "Hazards" at right.)

Wind-powered ocean vessels have a nominal speed of 100 miles (one mid-scale map hex) per day, but each day roll a die to see if they manage an extra hex. They do so on a roll of 1 or 2. Fast ships should be given a favorable modification of 1 while slow ships should be given an unfavorable modification of 1. If a player character is captaining the vessel, roll against his Sailing Vessel Piloting skill for an extra hex, but keep the speed modifiers for the ship in effect. Regardless of the captain's skill, the ship never gets an extra hex if a 6 is rolled.

Hazards: Many hazards plague water travel.



Storms at Sea: On Earth there is a one-in-six chance of there being a storm or squall at sea on any given day. On Venus storms are almost continuous, while on Mars they are nearly nonexistent. Weather changes on Venus and Mars are treated in the "Encounters" section of this chapter. Storms are an inconvenience for oceangoing ships, but can be disastrous for man-powered ships. If there is a storm on Earth, roll again to determine its severity. On a 1-4, it is a mild storm; on a 5-6, it is a severe storm. On Venus all torrential rain counts as a severe storm, while all rain and drizzle count as a mild storm.

Oceangoing ships are unaffected by mild storms. Ocean-going steamships have their speed reduced by 100 miles per day in a severe storm. Sailing ships are blown one hex in a random direction (roll a die) by a severe storm. If this places them in a land hex, the captain rolls his Sailing Vessel Piloting skill dice for a Difficult task to avoid grounding. If the ship grounds in a severe storm, it is sunk, and the passengers and crew are shipwrecked.

Man-powered vessels may be sunk by a storm. Roll the captain's Sailing Vessel Piloting skill dice for a Moderate task to avoid sinking in a mild storm and for a Formidable task to avoid sinking in a severe storm.

If the ship the players are on sinks, they will more than likely lose all of their belongings that were onboard, but will cling to wreckage and avoid drowning. They will be washed ashore somewhere at the referee's discretion and then will probably be in considerable difficulty.



Navigational Hazards: Every vessel on an inland waterway must roll to avoid a navigational hazard once per day. This is an Easy task and is rolled for using the captain's Steam Vessel or Sailing Vessel Piloting skill dice. If the vessel is a steamboat attempting to make better time, the difficulty goes up by one level for each hex (10 miles) added to the speed.

If the ship suffers a navigational hazard, it has run aground or had its hull, screws, or rudder damaged by an underwater obstacle. The referee can make up an appropriate result for the area the characters are in or use the following table:

NAVIGATION HAZARDS	
Roll	Result
1	Boat aground. 10 miles travel lost pulling it off.
2	Boat aground. One full day lost pulling it off.
3	Screw or rudder damaged. Speed halved until boat reaches port.
4	Hull damaged. Two full days lost making repairs.
5	Hull damaged. One die roll of days lost making repairs.
6	Hull crushed. Vessel is grounded to avoid sinking. Cannot be refloated unless a large work crew and a large vessel are brought to the site.



Hostile Encounters: Pirates, hostile navies, and large hungry animals are all possible hostile encounters on the water. These are covered in the "Encounters" section of this chapter.

AERIAL TRAVEL

THE MOST visible difference between the universe of **Space: 1889** and the historical Victorian Era is the widespread use of flight, and aerial travel is an important part of this adventurous world.

Types of Craft: Aerial craft are held aloft by one of three possible means: liftwood, lifting gas, or dynamic lift. Liftwood is the wood from a tree that grows in certain of the Martian highlands and which has remarkable antigravity properties (reducing the weight of a vessel to less than that of air and thus allowing it to float). Craft constructed with liftwood are often called flyers. Lifting gas consists of either hot air or some gas lighter than oxygen, such as helium or hydrogen. Most balloons are merely novelties and not serious means of transportation. The Germans, however, have built numbers of rigid hydrogen airships powered by efficient, but expensive, engines. These are universally called Zeppelins, after their inventor Count Zeppelin. Dynamic lift is generated by an airfoil (the wing of a glider or aeroplane) moving rapidly through the air. There are no known dynamic lift vessels in existence in 1889, but the player characters or some NPC scientist may invent them during the course of the game.

In addition to their means of lift, craft are differentiated by their means of propulsion, types of which include mechanically-powered, wind-powered, and man-powered propulsion. Mechanically-powered craft are usually steam flyers, and for simplicity will be called that for the rest of this section. However, they may include craft with more exotic propulsion

systems, such as electric engines. Wind-powered craft generally use sails. The only examples of these in existence are the stately Martian "kites." Man-powered craft are driven by a large air screw (propeller) turned by manual labor. The most common versions of man-powered aerial craft are the Martian screw galleys, although small lever-and-ratchet longboats are now carried on a number of British aerial vessels, and the Throckmorton Conveyor, a one-person flyer with a pedal-powered air screw, is in increasing use.

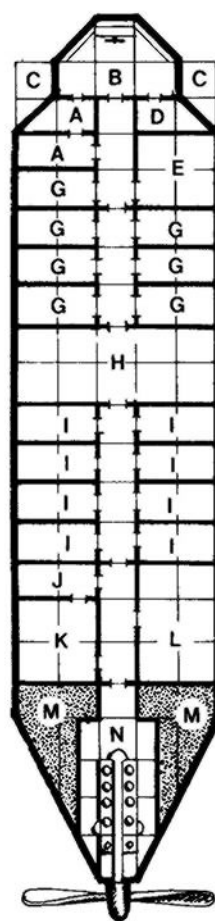
The table below gives the distance travelled per day and the price per day for passage by aerial transportation. No price is given for dynamic lift craft, as none are commercially for hire. If players invent or otherwise acquire one, however, use the travel times listed.

For long voyages, the characters will have to have proper quarters, just as with long sea voyages. First-class quarters again cost five times the listed rate.

AERIAL TRANSPORTATION TABLE

<i>Vessel</i>	<i>Miles/Day</i>	<i>Price/Day</i>
Zeppelin	300	10s
Steam Flyer	300	10s
Kite	200-400	6s
Screw Galley	200-300	4s
Long Boat	100-200	—
Conveyor	100-200	—
Glider	400	—
Aeroplane	100/hr	—

Additional Rules on Travel Time: Man-powered vessels (screw galleys, long boats, and conveyors)



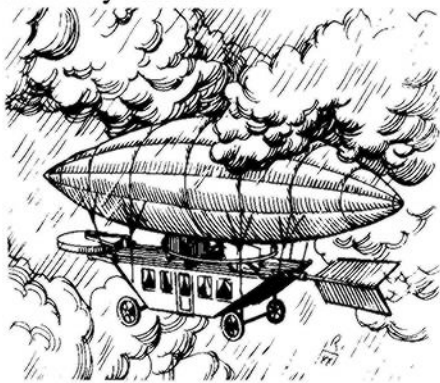
- A. CAPTAIN'S CABINS
- B. BRIDGE
- C. FLYING BRIDGE
- D. CHART ROOM
- E. WARD ROOM
- F. OFFICER QUARTERS
- G. FIRST CLASS CABINS
- H. PASSENGER LOUNGE
- I. SECOND CLASS CABINS
- J. GALLEY
- K. CREW'S MESS
- L. CREW'S QUARTERS
- M. FUEL
- N. ENGINE ROOM

COMMERCIAL ZEPPELIN

have two speeds listed. They may travel at the lower speed indefinitely. The crew may exert itself particularly hard and travel at the higher speed for one day, but its members must then roll for fatigue. On a roll of 1 or 2, the crew is fatigued. In the case of a conveyor or longboat, roll against the Endurance of the crewmen. Fatigued crews may only travel at half their lower speed until one full day is spent resting.

Kites have two speed listings as well. The lower speed applies to sailing against the prevailing trade winds, while the second applies to sailing with the prevailing trade winds. Prevailing winds blow from west to east on virtually all parts of Mars.

Hazards: Aerial travellers also face many hazards.



Storms: On Earth there is a one-in-six chance of a storm. On Venus storms are almost continuous, while on Mars they are nearly nonexistent. Weather changes on Venus and Mars are treated in the "Encounters" sections of this chapter. If there is a storm on Earth, roll again to determine its severity. On a 1-4, it is a mild storm; on a 5-6, it is a severe storm. On Mars cloudy weather is treated as a mild storm, and all windstorms are severe storms. On Venus all torrential rain counts as a severe storm, while all rain and drizzle count as a mild storm.

Liftwood flyers seldom venture out in a storm, as the turbulence of the air tends to tip the craft and cause it to lose trim. To fly and retain trim in a mild storm, roll the trimsmen's Trimsmen skill dice for a Moderate task; in a severe storm roll for a Formidable task. Failure of the roll means the craft has lost trim and plummeted to the ground. The trimsmen rolls to recover trim at one difficulty level higher than before. If he fails, the craft crash-lands and is damaged beyond repair. If he succeeds, he manages to land safely but will decide the storm is too difficult to continue in and will wait out its passing (or at least not make another attempt that day).

Zeppelins are also vulnerable to storms. A Zeppelin, however, cannot easily land and wait out the storm, since it is nearly as vulnerable on the ground as in the air. To escape damage while flying, roll the pilot's Zeppelin Piloting skill dice for a Moderate task in a mild storm and a Difficult task in a severe storm. If secured at a normal landing site, no damage will take place. If landed in the open, make the skill roll anyway but reduce the difficulty of the task by one. If the task roll is failed, the Zeppelin crash-lands and is damaged beyond repair.

Gliders and aeroplanes avoid damage by rolling the pilot's Aerial Flyer Piloting skill dice for an Easy task in a mild storm and a Moderate task in a severe storm. If the task roll is failed, the craft crash-lands and is damaged beyond repair. Gliders and aeroplanes on the ground are, fortunately, not damaged by storms to any extent.

Hostile Encounters: Pirates, hostile sky navies, and large flying animals are all possible hostile encounters in the air. These are covered in the "Encounters" section of this chapter.



ENCOUNTERS

MUCH OF the thrill characters experience when they venture into the unknown is due to the fact that they do not know what they will encounter. The encounters in an adventure have to be carefully balanced. If there is nothing but random encounters generated from tables, the landscape will eventually take on a rather mathematical feel. "Let's go over here, we only have two chances in six of a..." On the other hand, requiring the referee to make up every encounter will soon overtax his imagination, and encounters either will be infrequent or will begin having a certain predictability about them.

What we try to do in **Space: 1889** is chart a middle course. We provide a number of encounter tables that cover a wide variety of encounter types and terrain types on several worlds. These tables are intended to be complete as presented, and thus require no input on the referee's part to make them work. However, the referee is strongly encouraged to use these tables as a starting point, not a finished product.



REFEREE INPUT

HOW DOES the referee expand upon these tables? There are three main ways: altered encounters, mandated encounters, and invented encounters.

Altered Encounters

ALTERED ENCOUNTERS are modifications of those shown on the table. Perhaps the players shot their mouths off so much that twice the normal numbers of bandits show up. Perhaps the elector of Astrapsk is personally leading a force of troops in an area; you might roll for encounters normally, but have the elector be present with the first group of soldiers you roll.

Altered encounters have several very genuine advantages. First, they are extremely easy to come up with, and that's a virtue that cannot be overemphasized. Let's face it. If you are like 99 percent of all RPG referees you have a limited amount of time and energy that you can spend getting ready, but you will spend all of it every time, no matter how easy or how hard the preparation, and no matter how much or how little is done for you in advance. That being the case, every easy encounter you come up with is that much more time you'll spend on something else, and that much more detail there will be in your game.

A second advantage of altered encounters is that they can take the routine out of routine encounters. Here's a troop of Oenotrian cavalry out patrolling the road, just like every other troop of Oenotrian cavalry you run into out patrolling the road—or is it? Last bunch of cavalry we ran into had Winchesters. Hmmm.

Mandated Encounters

MANDATED ENCOUNTERS are also taken right off the encounter tables, although sometimes you may want to alter them a bit as well.

However, instead of rolling (or, better yet, after rolling but regardless of what you roll) you announce the encounter. This type of encounter can occur as a deliberate plot device by you or, more commonly, in response to the actions of your characters.

Plot devices should be used sparingly, but should definitely be used. Remember that your characters want danger and adventure, so giving them some is certainly acceptable. Just remember that they also want to chart their own course. If you want them to check out the beautiful city ruins you've spent all week preparing, provide them with a rumor, or a stolen map, or the whispered, dying words of desert/mountain/swamp explorer, which tell of this exciting and unknown find. That's your job. But if they decide to go pirate bashing instead, do not have them jumped in an alley, tied up, thrown in the hold of a ship, and then dumped in the city, so there!

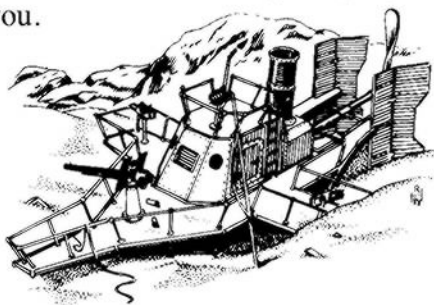
The actions of your characters should often cause you to mandate encounters. Did the players shoot their mouths off in Umbra about how much spice they were carrying? Well, time for the bandits to put in an appearance. If the players set out to meet bandits, or pirates, or something, don't stall the adventure for half an hour just because you never roll a 6 or whatever on the right encounter table. This is the very heart of role playing. It teaches the players that wisdom is rewarded with success and foolishness with setback. But most importantly, it teaches them that their actions in the game world produce appropriate reactions, and that above all else will make the world real for them.

Invented Encounters

INVENTED ENCOUNTERS are those completely made up by the referee. These are absolutely necessary in two cases: unusual encounters and natural finds.

Unusual encounters will happen every adventure session, in all likelihood, and you won't have to spend much time figuring them out. Are they looking for the lost Prince? That's odd; no "wandering lost prince" on the encounter table. Searching for the wreck of a Boreosyrtan kite carrying secret dispatches to the German agents in Thoth? Hmm. No wrecked kite with secret papers, either. These are usually obvious sorts of things, and all you will have to do is determine whether you will mandate the encounter or make it semirandom. Looking for the prince, for example, would probably be treated as a Tracking skill task, while the kite might be specifically placed by you in a map hex, and the players would have to enter the hex, and perhaps search if it was concealed, to find it.

Natural finds are those placed by you on the map so the players will discover them as they explore. These are things like spectacular vistas, ancient ruined cities, underground grottoes, liftwood groves (in the mountains only, of course), and so forth. No random table can do a very convincing job of creating these, so this part, at least, is completely up to you.



RANDOM ENCOUNTERS

RANDOM ENCOUNTERS are particularly appropriate to the unsettled wilderness regions of a world. Once per day the referee should roll a die to see if there is an encounter. Separate encounter tables are provided for the various types of terrain found on Mars, Venus, and Luna. Each table has the type of terrain listed first, followed by an encounter number. If the referee rolls the encounter number or less, there is an encounter. Immediately under this is a short table showing the results of a second die roll and a corresponding encounter type.

The explanation paragraphs cover each of the sentient encounters listed on the tables and give the information necessary to run the encounter. This will include the number in the party, how they are armed (if appropriate), their NPC experience level, and how they are likely to react to the players. For animals, the animal charts tell the number of animals in the group, their speed, their chance of attacking, their wound capacity, their saving throw modifier (when saving against a hit inflicted on them), and the hit number and wound value of their weapon(s). If multiple weapons are available, they may use all of them at once unless otherwise noted.

Weather

WHENEVER A 6 is rolled for the daily encounter, there is a change of weather. On Mars, this means that some sort of weather (other than "clear and dry") takes place. On Venus, it means that the current weather condition changes.

Mars: Roll a die and consult the

Mars Weather Table (page 207). The result is either "clouds" or "windstorm." The effect of clouds is that of a storm for aerial travel. On the ground the effects are purely visual, except in the mountains or on the polar icecap. In the mountains the result is drizzle, while on the icecap it is snow. A windstorm is a severe storm for aerial travel. No land travel is possible in a windstorm.

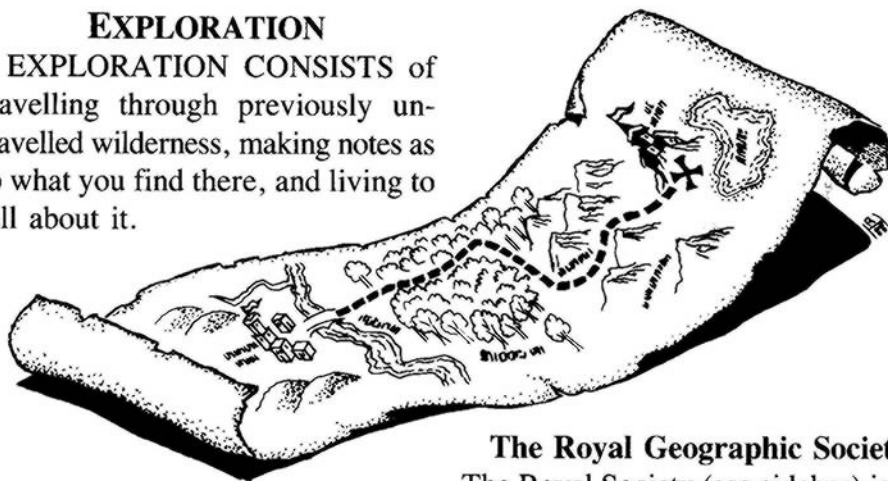
Venus: Roll a die. On a roll of 1-3, the current weather level goes down one level; on a 4-6 it goes up one level. If it is already at the top or bottom of the scale, then any weather change result automatically moves it one level in the opposite direction. The six weather levels on Venus are clear, overcast, mist, drizzle, rain, and torrential rain.

Weather Effects: All weather conditions have an effect on visibility, land travel, and a storm rating, as shown on the Weather Effects Table (page 207). Visibility will indicate the maximum visibility possible in the condition. Travel will either indicate no effect, land travel speed halved, or land travel not allowed. Storm effects will either be storm or severe storm.



EXPLORATION

EXPLORATION CONSISTS of travelling through previously untravelled wilderness, making notes as to what you find there, and living to tell about it.



Financing an Expedition

AN EXPEDITION for exploration costs money—a whole lot of money. Whether it is to cut its way through the Congo rain forests or risk the myriad perils of a walk in the red deserts of the Martian hinterlands, it needs cash. Gordon Laing's budget for a crossing of the Sahara included hefty sums for bribery and thefts of his goods as well as more obvious needs; as it was, he was killed by the Tuareg anyway. Backing can come from several sources:

H. M. Government: The government might disburse funds for an explorer who could make a case that information of a strategically and politically useful nature would be forthcoming. The government is not likely to trust random civilians to do its work; a serving officer, however, might persuade his superiors of the benefits of his journeying and, ideally, make them think they had devised the plan themselves. An official blessing might bring not only a handsome cash advance, equipment, soldiers, and the support of Imperial administrators, but the active assistance of local potentates anxious to curry favor in the eyes of a power with big guns and a long memory.

The Royal Geographic Society:

The Royal Society (see sidebar) is at the height of its influence, and annually selects a number of expeditions to support with its money and good wishes. For a fairly small party this is ideal, as the R.G.S. carries a lot of "clout"—native princes assuming it to be a branch of the government—without any of the restrictions of working for H.M.G. Indeed, on returning from a venture, the acclamation of the Society can set a man up for life, and certainly guarantees success for his books and lectures. Those who travel for the Queen, in contrast, are generally forbidden to discuss their exploits at all—hardly likely to please a voyager just back from outer Pan-Aeria with a tale to tell.



Private Sponsorship: Sponsorship by a newspaper or trading company offers not only ample resources at the outset, but reward and possibly fame at the end; the *New York Herald* paid for Stanley to go in search of Livingstone as part of a roving commission which began with a journey "to Jerusalem, Constantinople, the Crimea, the Caspian Sea, through Persia as far as India," and did the same in 1883 when he led the party to rescue the Welsh missionaries from their High Martian captors in the Astusapes. The disadvantage is that official help is generally withheld from such a private venture.



Public Subscription: This is a slow, difficult process of lecturing and fund raising available only to those with a firm reputation (high renown) and a goal that would seize the public imagination. The advantage to it is that the explorer has a free hand and an audience to cheer him on, or demand help for him if he falls victim to mischief.



THE ROYAL GEOGRAPHIC SOCIETY

IN 1859 two organizations, the Geographical Society of London and the Raleigh Travellers' Club, combined to form the Royal Geographic Society; shortly afterward the African Association, founded in 1788, also joined to make the R.G.S. the most important sponsoring body in the sphere of exploration. Its object was "to advance geographical knowledge through lectures and publications, through its library and public map room, and through instruction in surveying and support of exploration and research."

The society is governed by an annually elected council served by a permanent staff; it is part of the British Association for the Advancement of Science (founded 1834), "Section E" to be exact, and since the 1860s its public meetings have been "standing-room-only" affairs. There is fierce competition for R.G.S. sponsorship of expeditions. Many of the most famous British explorers of the 19th century—Franklin in the Arctic, Schomburg in South America, Livingstone, Burton, and Speke in Africa—had Society backing, while the works of the eccentric German D. Leitner on the language and culture of the Dards of Dardistan in the Hindu Kush were faithfully printed under the R.G.S. banner, secure in the knowledge that their scientific importance far outweighed their astounding obscurity.

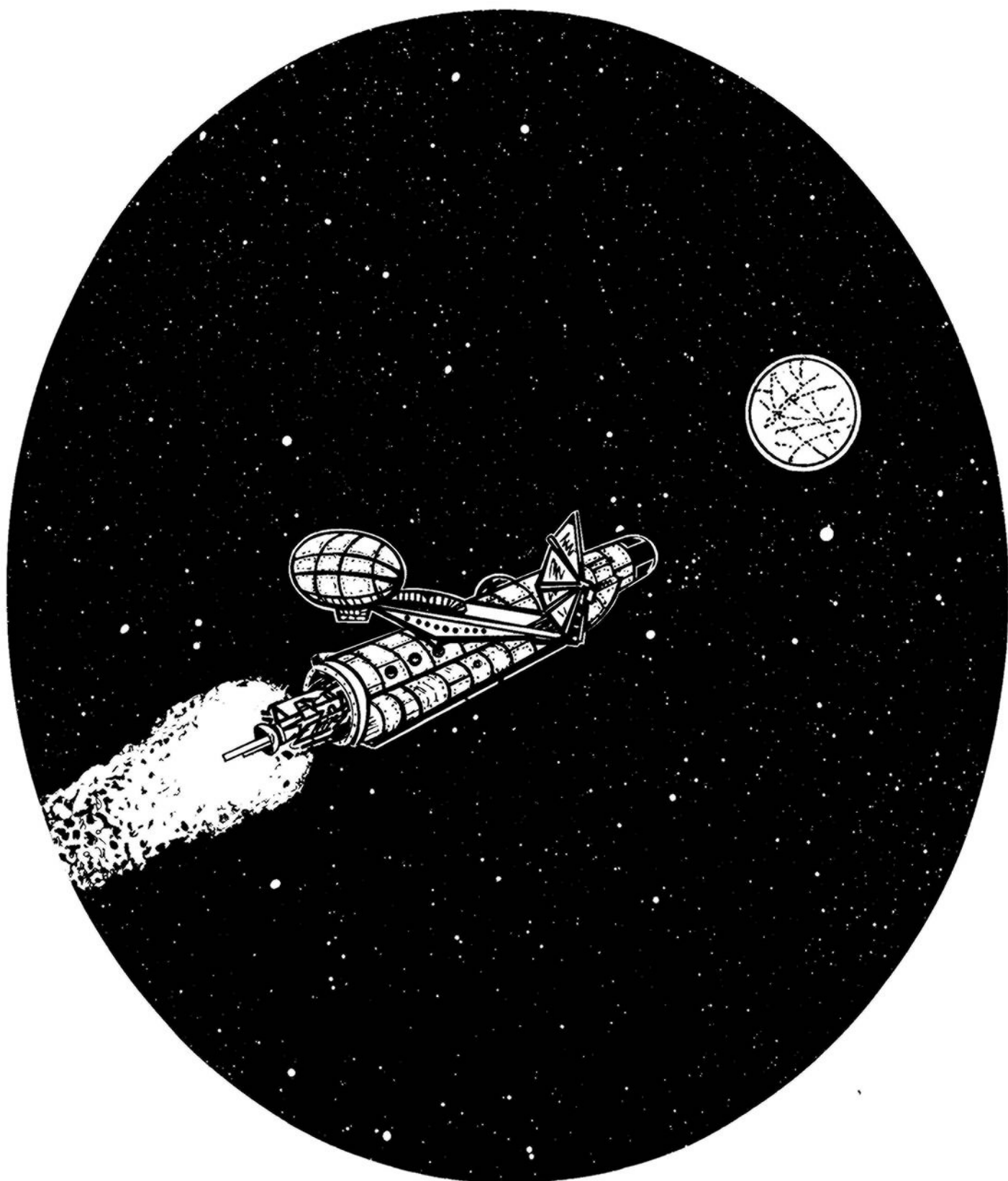
The Society gives two gold medals each year, the "Founder's" and the "Patron's," of equal merit and value. These are, in many ways, the greatest accolades of the world of exploration; even men more concerned with paying off debts from a completed journey and raising funds for the next recognize the value of an R.G.S. award, for it brings public acclaim, excellent book sales, and the prospect of substantial private donations; a knighthood, too, might follow. In 1888 the medals were presented to Clements Robert Markham for his Polar work, and to a German, Leutnant von Wissmann, for exploration in Central Africa. In 1889 it was clear that Arthur Carey was due recognition for his travels in Sinkiang, but the second recipient was a toss-up between Dr. Radde, also an "Inner Asia" man, and Dr. Peel for his pioneering survey of the Shistomik Mountains.

BECOMING LOST

EACH DAY that a 5 is rolled for an encounter, the party may become lost. The referee secretly rolls against the Wilderness Travel (mapping) skill of the party's guide or leader for them to avoid becoming lost. If the party is lost, they either do not move at all or move one hex in a random direction, at the referee's discretion. They are not told that they are lost. In subsequent days they move normally.

Normal compasses do not work on Venus, the nearly continuous mist and rainfall make landmarks almost always invisible, and neither the Sun nor stars are available for navigation. It is, therefore, extremely easy to get very, very lost. There is a chance of getting lost every time a 4 or 5 is rolled for an encounter. Each time that the party actually gets lost the referee changes their direction of march randomly but does not tell them. This remains their new march direction from then on. If the party has an inertial compass, there is still a chance of getting lost each time a 4 or 5 is rolled, but the effects of being lost are the normal ones, not the special Venus effects.





SPACE TRAVEL

The Ether

THE ETHER is the substance that fills all space, even the volume also filled by ordinary matter. Ether is the medium through which a variety of forces are transmitted through space, just as air is the medium through which sound travels to our ears.

A vacuum insulates against heat or cold because there is no way for them to jump across the intervening space. Light and gravity can be felt despite the presence of the vacuum of outer space precisely because the ether is present (and can transmit those energies) even in a vacuum.

Without the ether, gravity would be unable to maintain the mutual at-

traction of bodies at a distance and the entire Solar System would fly apart. Without the ether, light could not travel through space, and we would not be able to see the stars.

Travel Through The Ether

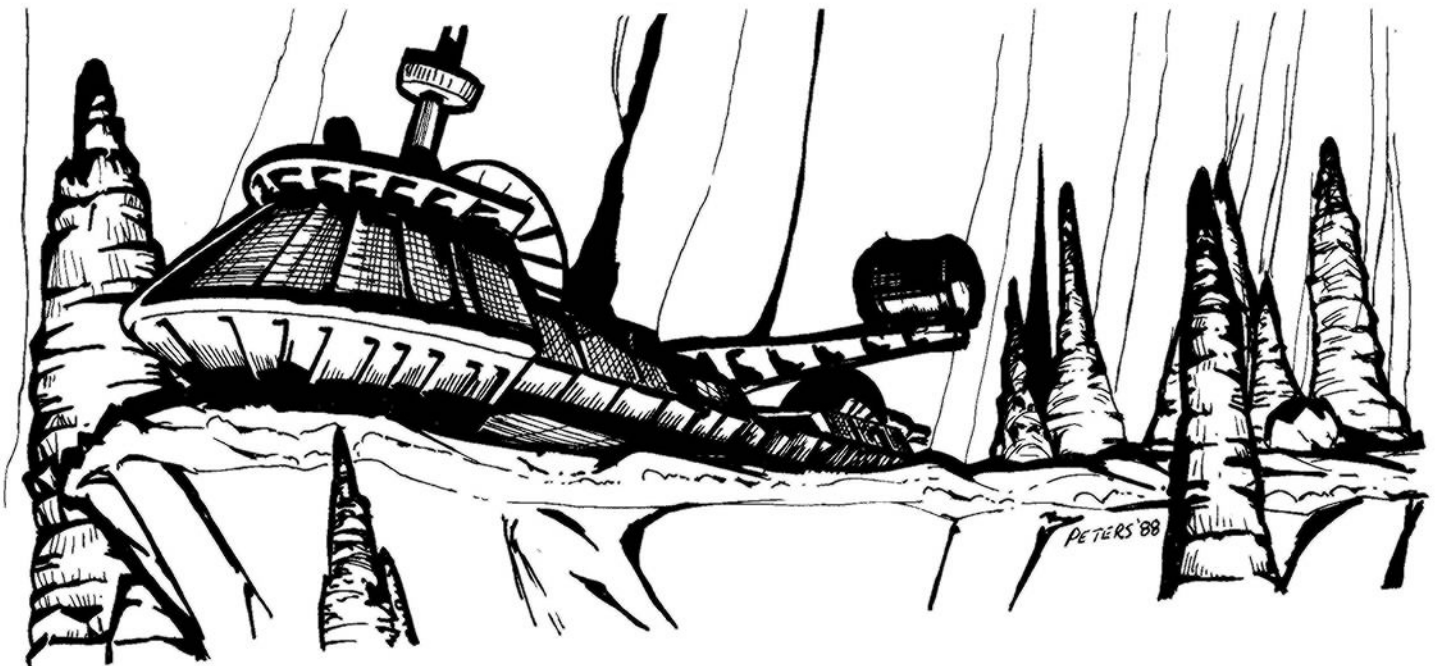
ONCE THOMAS EDISON perfected the ether flyer prototype in 1868, humanity was ready to embark on this new type of voyage and sail in the totally alien ocean of the ether. And although the ether has an analogue in the oceans of Earth, there are also profound differences.

The first explorations of space brought the full force of Victorian science to bear on unique problems heretofore never encountered in the

history of Earth. They included:

- Computing planetary orbital positions,
- Sealing ether flyer hulls against vacuum,
- Protecting windows against meteor strikes,
- Providing a power source which could work without air, and
- Developing methods of entering and leaving atmospheres.

The challenges that faced the ancient mariners were nothing to those that faced the Victorian astronauts. But the heroism and sacrifice of the early pioneers cleared the way for an entire fleet of modern spacecraft, and ether flyers today range the entire Solar System.



THE HISTORY OF THE ETHER THEORY

UNTIL ABOUT 1600, scientists' understanding of the world was rudimentary and clouded. They thought of light as small particles of energy spewed forth from a flame or a star; they had no conception of gravity at all. A few ancient philosophers had written of an intangible substance that propelled the planets in their orbits and created the domes of the heavens, and had even used the term "ether" to describe that substance. But science had not yet reached the point where scientists could understand and experiment for accurate results.

First Insights into the Ether: In 1638, Rene Descartes proposed the idea of one all-pervasive ether. He reasoned that light was not a particle, but a pressure or a wave that passed outward from a source. The Sun shines on the Earth, and for that warmth and light to pass from the Sun to the Earth, it must have a medium (the ether) through which it is transmitted instantaneously. We see the Sun in its brilliance because the energy of the Sun presses so terribly heavily on the eye of the viewer.

Robert Hooke wrote in 1667 that if light was a vibrating motion of the ether rather than a direct pressure, it was possible to explain color as different rates of vibration. In 1675, observations of the eclipses of Jupiter's moons demonstrated that light was not instantaneous. Although both of these comments refined Descartes' theory, it remained fundamentally sound.

Sir Isaac Newton (1672) addressed the entire Ether Theory and con-

sidered several alternate explanations but was not convinced by any of them. Among other things, he theorized that light consisted of particles which travelled through the ether. His famous Inverse Square Law was phrased to explain some effects of the ether, and his investigations into gravity produced the invention of the calculus. While Newton himself never published a definitive study of gravity and the ether, many of Newton's followers were convinced that gravity, like light, was transmitted by the ether.

The 18th Century: Intensive philosophical investigations into the nature of light and the ether produced several detours on the road to truth. Thomas Melville hypothesized that colors were determined by the velocity of light particles. When observations showed that the satellites of Jupiter did not change color as they wheeled in their orbits, the hypothesis was dropped. Other experiments showed that the velocity of light appeared to be independent of its source. While this was understandable for wave phenomena, it is less comprehensible if light is composed of particles. By the end of the 1700s, Newton's particle interpretation of light was disproven, and the understanding of light moving through the ether as waves gained new ground.

The 19th Century: In 1800, Thomas Young explained light activity within thin soap bubble films in terms of the wave theory of light. Colors on the thin films were related to wavelengths of the light involved; the relationship proved that light had a wavelength and thus had to be a wave phenomenon. By 1815, Augustin Fresnel successfully described the mechanisms of light diffraction and

interference using the wave theory of light. By 1816, Young and Fresnel had together produced an explanation of light as a transverse wave in the ether; it was the inevitable triumph of the wave theory of light over the ancient particle theory.

Originally, scientists thought of the ether as a tenuous fluid, far less palpable than air. Young, however, knew that transverse waves required a rigidity that a fluid cannot exhibit; he instead proposed that the ether was a solid—a rigid solid which could transmit the transverse waves that were light, gravity, electricity, and magnetism. It soon became clear that the ether was a remarkable substance unlike ordinary matter. It was rigid, yet intangible; strong, yet tenuous.

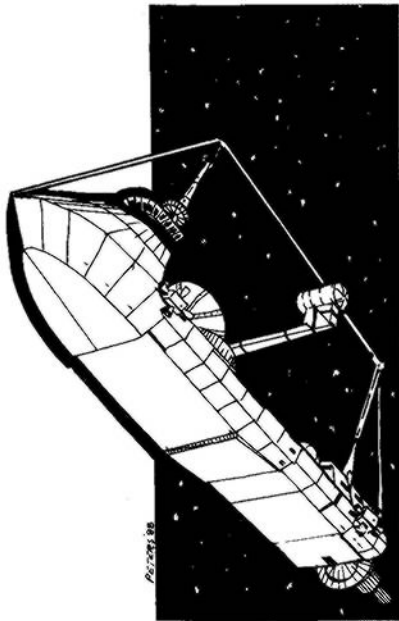
Theorists often concentrated on a single type of energy: light, magnetism, electricity, or gravity. Their writings did not make clear whether they were hypothesizing an ether for each energy type, or one grand ether through which all energy flowed. In 1820, Hans Oersted discovered that an electric current could produce a magnetic field. In 1832, Faraday and Henry produced electricity from a changing magnetic force. The fact that electricity could produce light was rudimentary. The first steps were being taken to establish the facts about a single grand ether which pervaded the universe.

In 1856, James Maxwell demonstrated that all electromagnetic and optical phenomena were explainable in terms of stresses in the one ether.

Moreau's Etheric Investigations: In 1860, Etienne Moreau hypothesized that the ether, like the matter and energy of the universe, was not evenly distributed. If it was instead

affected by its interaction with matter, it might be distributed in vortices, thin patches, and even compacted clumps.

Moreau also theorized that the interaction of matter, energy, and ether indicated that it was possible for each to be used to manipulate the other. Just as matter could be burned to release energy, and energy expended to move matter, so could matter be used to grip or grasp the ether, and energy used to manipulate it.



EXPLOITING THE ETHER

IT FELL to the practical imagination of Thomas Edison to properly explain and exploit the ether. Enthralled by Moreau's theories, he entered into a collaboration with the man and undertook the construction of a prototype device which could manipulate the ether.

When his first prototype did not work, he communicated his dilemma to Moreau, who suggested that perhaps the atmosphere was interfering with the device. Tests with small models showed that the device would operate properly at an altitude of 24,000 feet or higher.

THE ETHERIC OCEAN

THE THEORY and the reality of the ether are as different as laboratory-distilled water and oceans. Theorists worked to define what the ether was and how it interacted with energy and matter; practical explorers discovered how to use it, manipulate it, and travel through it. A simple analogy helps understand the etheric ocean by comparing it to an Earthly ocean. There are waves and turbulence in the ether just as there are waves and turbulence in the ocean.

The Sun: The greatest disruption in the ether is caused by the Sun. As the largest concentration of matter in the Solar System, it has the greatest effect on the ether. This solar disruption would remain in the immediate neighborhood of the Sun were it not for the solar rotation: As the Sun spins on its axis, it forces its etheric disruption outward in an ever-widening spiral. Solar turbulence is relatively uncomplicated; it is only when this turbulence is further disturbed that it becomes a danger.

The Planets: As the planets move in their orbits around the Sun, they cut across the lines of solar turbulence in the ether. The result is eddies and vortices invisible to the eye but dangerous to any etheric mechanism. In addition, the rotation of each planet itself creates additional disruptions in the ether.

The planetary eddies and vortices follow in the wake of each planet and are carried outward along with the solar turbulence.

Mercury has an influence on the ether far greater than its matter would imply. The planet closely orbits the Sun at high speed; its plane-

tary disruptions are implanted in the ether early and ride outward along with the solar turbulence. Moreover, because Mercury orbits the Sun once every three months, Mercuric turbulence spreads outward throughout the entire Solar System on a constant, repeating basis.

The other planets contribute their own turbulence to the ether. Each disturbance is carried outward along with the solar disruptions. Local storms are created as various planetary disturbances meet and build, and turbulence in the ether becomes extremely complex.

Navigating Through The Ether: Etheric navigators must have both a general and a specific understanding of the ether and its disturbances.

A general knowledge of the ether tells the navigator what kind of disturbances to expect in what parts of the Solar System. The navigator's tools are the orrery (a mechanical analogue of the Solar System which shows specific planetary positions and relationships) and the astrolabe (which precisely measures star and planet positions). A properly trained navigator knows to avoid the lee of planets (and the turbulence in their wake), can predict the convergence of planetary turbulences based on a knowledge of their orbits, and understands the conditions that create vortices and eddies.

But experienced pilots also have a practical understanding of the ether gained from long experience. They know that a certain kind of hull vibration signals the approach of a planet; that another type of vibration warns of a nearby vortex or eddy; that a particular feel to the etheric mechanism indicates a region of tenuous ether.

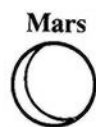
THE SOLAR SYSTEM

THE SOLAR SYSTEM consists of the Sun and all its orbiting planets and satellites. These bodies are generally divided into the Inner (or Cisasteroidal) Solar System and the Outer (or Transasteroidal) Solar System. However, the four trans-asteroidal worlds (Jupiter, Saturn, Neptune, and Uranus) are too cold and distant to have life and are beyond the current radius of action of solar boiler-powered ships, and thus are of little concern. It is the inner, cisasteroidal worlds of Mercury, Mars, Venus, and Earth that are of genuine interest.

When the Solar System formed, the planets cooled out of the primordial stellar matter individually at intervals about 150 million years apart. Consequently, the planets' geological time periods are also about 150 million years apart. The first of the inner planets to coalesce and solidify was Vulcan (now the Asteroid Belt). Following in succession were Mars, Earth, Venus, and finally Mercury.

For the Earth scientist, this relationship provides valuable information about the history and the future of the Earth. Mars shows what the Earth will probably be like in 150 million years, while the shattered Vulcan foretells the ultimate fate of all of the inner planets. Venus shows what the Earth was like 150 million years ago, during the age of the dinosaurs, and Mercury gives hints of what the distant prehistoric past resembled.

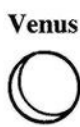
TRANS-
ASTEROIDAL
SOLAR
SYSTEM



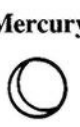
Mars



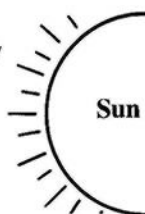
Earth



Venus



Mercury



Sun

THE INNER PLANETS

THE INNER PLANETS include Mercury, Venus, Earth, Mars, and the Asteroid Belt. The accompanying chart lists pertinent physical data concerning them.

Mercury

THE INNERMOST planet is Mercury. One face of the planet is constantly locked toward the Sun and, as a result, is a broiling desert; the other hemisphere of Mercury eternally faces the depths of space and is locked in perpetual winter. Between these two extremes is the twilight zone of Mercury—a band of temperate climate which circles the entire planet.

The twilight zone of Mercury is trapped between two extremes. To one side, perpetual dusk, night, and cold; to the other, perpetual dawn, day, and heat. The Sun sets eternally in the twilight zone, yet never moves completely below the horizon.

The Mercurian twilight zone is a band about 100 miles wide encompassing a many-channeled river which makes its way entirely around the planet. Deep river valleys lined with rocky cliffs sport exotic plant life and occasional prehistoric shelled creatures just beginning to emerge from the water onto land. Small seas are scattered throughout the zone. To one side lies a vast desert, growing hotter and hotter as the Sun climbs higher in the sky. To the other side is a vast icecap in a domain never touched by sunlight.

Venus

THE SECOND planet of the Solar System is Venus. Beneath its constant shroud of clouds, Venus is a swamp world drenched with nearly continuous rainfall and withering heat.

Venus is almost everywhere covered with water, but the average depth is less than 10 feet. The world-swamp is appropriate for this planet, for it is now in the Mesozoic Age of dinosaurs, and vast areas are the domain of lumbering reptiles.

Earth

THE EARTH, as the original cradle of humanity, is the standard against which all other worlds are judged. It has the greatest variety of life and possesses the richest of resources.

Mars

THE PLANET next outward from the Earth is Mars. Mars is an arid planet which long ago lost the water of its seas to the iron oxides of its desert sands and the ice of its polar glaciers.

Ancient civilizations dug vast networks of canals to carry what water there was to the drying, dying fields and cities. But today, even after herculean efforts, Mars is a dying planet.

One mystery which continues to confound scientists is why the surface gravity of Mars is so close to that of the Earth and Venus, both of which are considerably larger. While the orbital period of Mars indicates that it is indeed denser than its two sunward companions, it is not sufficiently so to account for this discrepancy.

Luna

OF ALL the inner planets, only Earth has a companion of any significant size: the Moon, known more properly by its astronomical name, Luna.

Luna is 2160 miles in diameter (3392 miles in circumference). Surface gravity is only 16 percent that of Earth. Luna has no surface at-

mosphere and no surface water, two aspects which make it extremely inhospitable to visitors and difficult to explore without specialized equipment. Occasional expeditions on the Lunar surface have, however, discovered numerous entrances to subterranean (or, more properly, sub-Lunar) grottoes and caverns, and some evidence of habitation. Initial forays into the grottoes discovered that within a mile below the surface of the world the gravity had risen sharply, to an estimated 30-percent of that of Earth, and that traces of atmosphere are present. Deeper still, the honeycombing caverns of the Moon are inhabited by a few varieties of animals and some fungus-like plants.

The Asteroids

WHAT WAS once a large planet, named Vulcan by astronomer-historians, orbited the Sun at a distance of 257 million miles. More than 300 million years ago, the world exploded as a natural consequence of its age, to create a band of rocky asteroids that today circle the Sun in an otherwise vacant orbit.

The individual asteroids are gathered in a swarm of chunks revealing a cross-section of the shattered world. Most of the chunks are simply rock or iron or sandstone. Some, however, are surface pieces with evidence of long-lost, long-extinct Vulcanian races, structures, and artifacts.

THE INNER WORLDS (CISASTEROIDAL)

Name	Orbit	Day	Year	Diameter	Circum.	Gravity
Mercury	36	—	88	3030	4760	40%
Venus	67	23	248	7526	11,821	100%
Earth	93	24	365	7927	12,457	100%
Luna	0.3*	28**	365	2160	3392	16%
Mars	141	24	687	4200	6597	90%

THE OUTER WORLDS (TRANSASTEROIDAL)

Name	Orbit
Jupiter	480
Saturn	900
Uranus	1800
Neptune	2800

Notes: Orbit is in millions of miles from the Sun, except that Luna's orbit (*) is measured from the Earth. Lengths of days are given in hours except that Luna's day (**) is 28 Earth days long. Mercury, since it is gravitationally locked facing the Sun, has no days. Years are given in Earth days. Diameter and circumference are given in miles. Gravity is the gravity at the surface of the planet as a percentage of that found on the Earth.



INTERPLANETARY TRAVEL

TRAVEL BETWEEN the planets, while not yet commonplace, has taken place since Edison and Armstrong first journeyed to Mars in 1870. Man now stands poised on the brink of his third decade of interplanetary travel.

ETHER FLYERS

ALL TRAVEL between worlds takes place in interplanetary ether flyers. While some small, specialized craft plying the (comparatively) short distance between the Earth and Luna use battery power, all genuine interplanetary craft are powered by solar boilers. These devices, also the product of Edison's fertile mind, utilize a large concave mirror to focus the Sun's rays on a water chamber, thus bringing the water to a boil and providing steam power for the ship.

As you venture further from the Sun, the powers of its rays decrease, and eventually are insufficient to bring the boiler water to a boil. The boilers with which most ships are equipped are ineffective beyond 300 million miles from the Sun, although this range is more than adequate to reach the Asteroid Belt. The difficulties associated with large continuous pours of molten glass, and uneven cooling of large lenses, impose limitations on the ability to improve on this performance significantly. Nevertheless the struggle continues, and recently the H.M.S. *Theseus*, fitted out with a Swiss Guildemarque lens in a new experimental gimbal mounting, managed to reach a distance from the Sun slightly in excess of 400 million miles before boiler shutdown forced

the craft to switch to battery power and retire. This is, of course, still well short of the range needed to investigate even Jupiter, by far the closest of the transastroidal worlds.



DISTANCES BETWEEN PLANETS

AS SHIPS are solar-powered, the principal limitation on their range, aside from an absolute limit on how far they can venture from the Sun, is how much food they carry. The principal issue in interplanetary travel, then, is how long the trip will take, which is a function of distance between the worlds and the speed of the spacecraft.

The description of the Solar System lists the distance from the Sun of the various planets, but since the planets travel independently in different orbits around the Sun, their relationships with each other are constantly changing. On those rare oc-

casions in which two planets are on opposite sides of the Sun they are at their furthest distance, which can be calculated by adding together the distances from the Sun of the two planets. When they are both on the same side of the Sun and at closest approach, the distance is calculated by subtracting the smaller of the two distances from the Sun from the larger.

At most times, however, the planets will be at irregular points along their orbits. The average distance between two worlds is calculated by averaging the closest approach and the furthest approach. This calculation is not strictly necessary, because it also happens that the average distance between any two planets is equal to the distance from the Sun of the farthest of the two planets. For example, the average distances between Mercury and Mars, Venus and Mars, and Earth and Mars are all 141 million miles.

Although the average distance between Mercury, Venus, and Earth on one hand and Mars on the other is always the distance from Mars to the Sun, the closer the orbits of the worlds are, the greater the possible variation in difference. The difference between Mercury's closest and farthest approach to Mars is 72 million miles, while the Earth, Mars' closest neighbor in the Solar System, has an approach difference between closest and farthest of 186 million miles. The approach difference can be calculated by subtracting the closest approach from the farthest approach, but this calculation is also unnecessary as the difference between closest and farthest approach is always twice the distance from the Sun of the closer of the two planets.

CHARTING A COURSE

THE PILOT of a ship, or some other qualified individual, must chart a course to the destination planet for an ether flyer. A character's skill in Astronomy determines how efficiently he will be able to chart a short intercept course to a world.

To chart a course, the person charting the course rolls four dice. He then subtracts his Astronomy skill from the die roll and makes any allowed subtractions due to navigational aids. These are listed on the Navigation Aids Chart. He multiplies the result by five percent of the separation difference between his current location and his destination and then adds this amount to (or, if it is a negative number, subtracts it from) the average separation of the two worlds. Note that 5 percent of the separation distance is always 10 percent of the orbit distance of the closest planet.

For example, Smedhurst wishes to chart a course from Venus to Mars. He consults the listing of the inner planets of the Solar System and notes that these two worlds have an average separation of 141 million miles (the orbit of Mars) and a 5-percent separation difference of 6.7 million miles (10 percent of Venus' orbit). Smedhurst has an Astronomy skill of 3 and has equipped his ether flyer with a telescope (-1) and an orrery (-1). He rolls a 2, 3, 4, and 5 on his four dice for a total of 14 and subtracts 5 from that for his skill and navigational aids. The result is 9. He multiplies this by the 5-percent separation distance ($9 \times 6.7 = 60.3$) and adds it to the average distance (141) for a total course length of 201.3 million miles.

LENGTH OF THE VOYAGE

ONCE THE course has been charted, it is easy to determine the length of time spent on the voyage. All interplanetary ether flyers have their speed expressed in millions of miles per day, while all courses are expressed in millions of miles. Divide the course length by the speed of the ether flyer to determine the length of the voyage in days.

Smedhurst, for example, has obtained an ether flyer with a speed of 3.2 for his trip from Venus to Mars. He divides the course length (201.3) by the speed and obtains a result of 62.9, so his trip from Venus to Mars will take approximately 63 days.

BATTERIES

EMERGENCY POWER batteries can be installed to provide power in the event of a boiler malfunction. Batteries are defined by their power level (which is used the same way as the power level of a solar boiler) and their endurance, which is the number of days that the batteries will function at full power. At the end of that time they continue to function, but at one power level lower, and do so for a number of days equal to the endurance again. At the end of that time they are reduced one more level. This continues until the power level is reduced to zero.

Multiply the battery power value times the battery endurance and divide by the power value of the recharging power plant to determine the recharge time in days. If a battery is only partially drained, use the drained portion of power value to determine recharge needs. However, any charge off of a power level requires the recharging of that full

NAVIGATION AIDS

<i>Device</i>	<i>Die Mod</i>
Orrery	-1
Analytical Engine	-1
Astrogation Computer*	-4
Telescope	-1
Improved Telescope**	-2

Notes: The astrogation computer (*) is used instead of the orrery and the analytical engine, not in addition to them. The improved telescope (**) is used in place of the regular telescope. All other devices may be used together and their modifiers added.

level. For example, a battery with a power value of 3 which had been reduced to level 2 and had one or more days of additional drain on it would have to recharge two full levels of power, not just one.

PROVISIONS

FOOD FOR the passengers and crew is required on any trip. Each passenger and crewman eats two pounds (weight) of food per day. Preserved food costs 1s per pound (weight). If a player has invented his own process for preserving food, he still must obtain the foodstuffs and supervise its preparation. While it still costs 1s per pound (weight), passengers and crew will only require one pound (weight) per day. If a player has invented concentrated food pills, they are of negligible weight but cost 3s per day per passenger and crewman.

HAZARDS OF SPACE TRAVEL

THE TWO HAZARDS to space travel are ether turbulence and meteor showers. Either of these may cause serious damage to an ether flyer.



Ether Turbulence: Each time that an ether flyer crosses an orbit trace, it passes through an area of ether turbulence. To determine the number of orbit traces crossed, first determine the length of the voyage. If it is equal to or less than the average separation of the two worlds, count the number of orbits from one world to the other, including both the starting world's orbit and the destination world's orbit. A voyage from Venus to Mars, for example, would cross three orbit traces (those of Venus, Earth, and Mars). If the voyage is greater than the average separation, then count orbits from the origin planet inward to the Sun and then back out to the destination planet, again counting the orbits of both the origin and destination worlds. The voyage from Venus to Mars in this case would cross six orbit traces (those of Venus, Mercury, Mercury again, Venus again, Earth, and Mars).

The orbit traces should be divided roughly evenly throughout the voyage. If the craft suffers major damage, it will be important to know how much time in the voyage remains.

When a vessel crosses an orbit trace, the crew rolls skill dice for a Difficult task to avoid turbulence damage. The number of dice rolled is equal to the sum of the pilot's Pilot skill and the navigator's Astronomy skill. If the flyer has an etherometer, its reliability rating is used as an addition to the skill die roll.

Turbulence Damage: If the vessel suffers turbulence damage, roll a die on the Turbulence/Meteor Damage Table to determine the exact nature of the damage. Three types of damage are possible: injury, minor damage, and major damage.



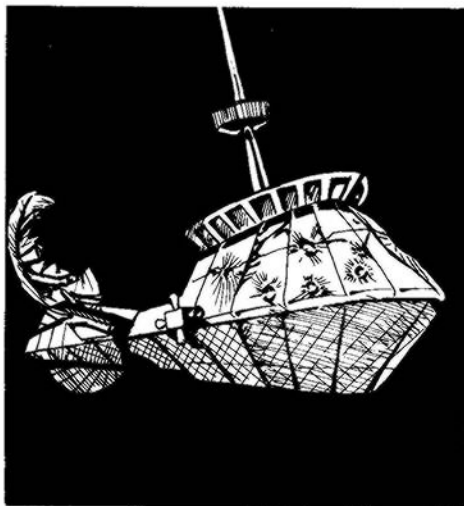
Injury indicates that a member of the crew has been injured. This may be due to him losing his balance or, more likely, to some internal component of the flyer falling on him. In either case, the character suffers one die roll worth of wounds and will be unconscious for that number of days. After regaining consciousness he will recover from the effects of the wounds normally.



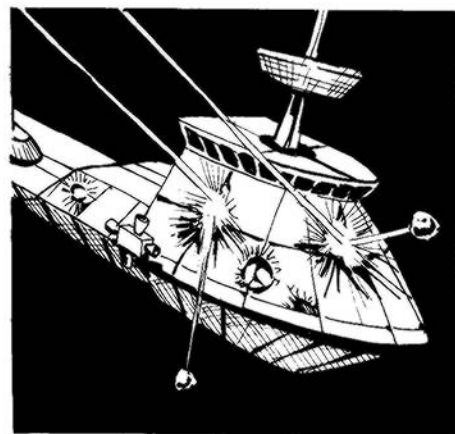
Minor Damage indicates that the ship is damaged but that the crew can repair it. The number that the above task roll was missed by is the number of days it will take the crew to repair the damage before resuming the journey.

TURBULENCE/METEOR DAMAGE

Die	Damage
1-2	Injury
3-5	Minor
6-7	Major



Major Damage indicates some major malfunction to the craft which cannot be repaired until the craft lands. The remaining length of time of the voyage is increased by half. If this will exhaust the ship's food supplies, the referee should provide some alternative destination where repairs can be made and additional food brought on board.



Meteor Shower: Meteor showers are randomly occurring events. The referee will roll a die once during each voyage at any time he wishes. On a 5 or 6 the vessel encounters a meteor shower. The pilot of the vessel must roll Pilot skill dice for a Moderate task to avoid damage. If the craft suffers damage, roll on the Turbulence/Meteor Damage Table but add 1 to the die roll.

BOOKING PASSAGE

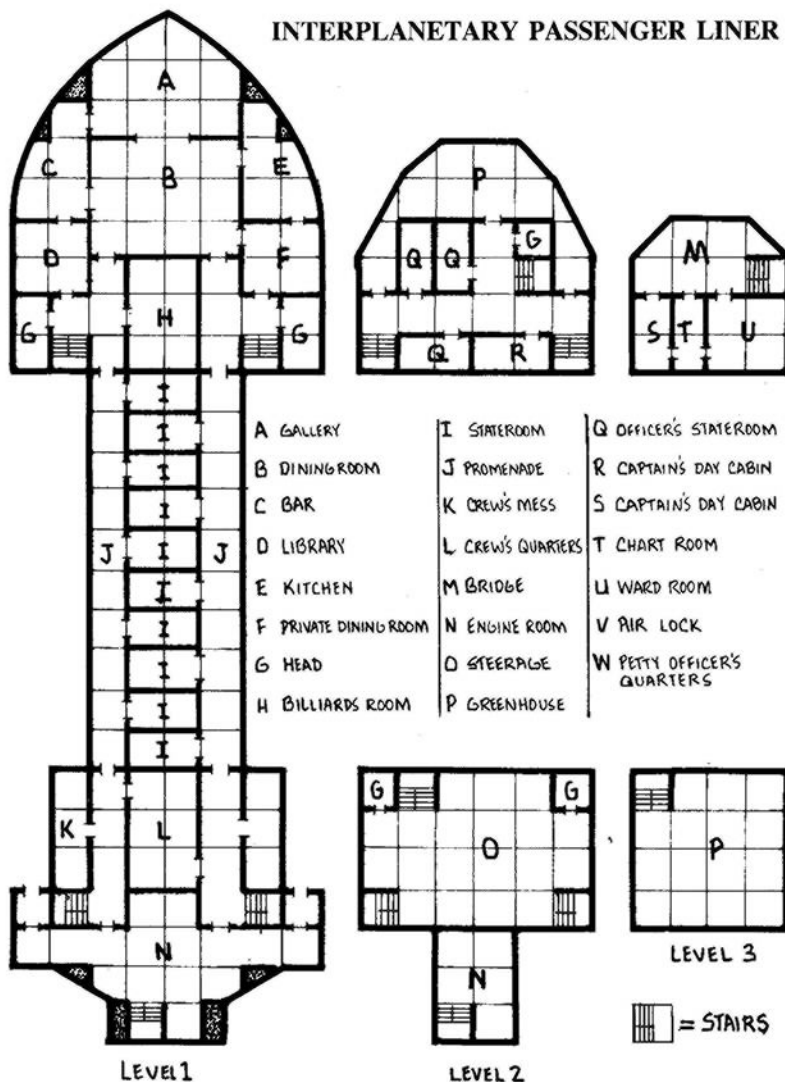
IT IS always possible that the players will not have an ether flyer of their own, and thus will have to obtain passage on a commercial vessel. Commercial vessels do make regular runs to and from Mars and Venus. There are no regular runs to Luna, Mercury, or the asteroids. Both passenger and cargo vessels make the Mars run, while the Venus run consists entirely of cargo vessels with a few staterooms available for passengers. The difference is one of speed and price. The length of the voyage is calculated normally, as-

COMMERCIAL SPACE TRAVEL

Vessel	Speed	Price
Liner	2.5	£60
Cargo	2.0	£40

suming a navigator with an Astronomy skill of 6 (including navigational aids modifiers). The time taken is then determined by the speed of the ship, as shown on the Commercial Space Travel Table. The price of a trip is constant and based on the type of interplanetary vessel, not the length of the trip.

INTERPLANETARY PASSENGER LINER





LUNA

ALL INFORMATION on this page is general background information available to the players. The rest of this chapter constitutes an introductory adventure, and information in it should be made available to the players only as needed.

The Earth's nearest neighbor, circling resolutely a mere 300,000 miles away, has to date been far more elusive than the much more remote worlds of Venus and Mars. Ethereal navigators have been put to the test merely setting their vessels down on a world with no atmosphere, and every indication is that Luna has no particular wealth or prospects to offer the ambitious Earthmen buzzing past in favor of richer worlds. Telescopic observations from the Earth have been confirmed by firsthand examination of the facts: Luna is a barren world without atmosphere or water, trod upon for the first time by scientists wishing to unlock the doors of knowledge with Edison's remarkable key.

Specifically, Luna is a ball of rock 2160 miles in diameter with a surface area of 14.5 million square miles, approximately equal to that of Asia. Its terrain, as can be seen from Earth, is mostly mountainous and cratered, and speculation that much of this is due to meteor impacts over time appears to be correct. The gravity at the surface of this tiny world is only one-sixth that of the Earth, allowing for tremendous acrobatics for those willing to brave the deadly vacuum in specially adapted suits.

NAVIGATIONAL DIFFICULTIES

ETHER FLYERS used for commerce between Earth, Mars, and Venus generally take advantage of the atmospheres of those worlds to get from orbit to surface. Both liftwood and hydrogen help make the vessel "lighter than air," letting it settle to the surface or rise to orbit using the atmosphere as a buoyancy medium. Luna, however, has no air to be lighter than, rendering liftwood and hydrogen useless. The only alternative for getting to its surface is to use the ether propeller, a device whose speeds are measured in millions of miles per day, to navigate the delicate distance between orbit and surface. Obviously, the typical ether propeller is hardly sensitive enough for such precise maneuvers, and only the very best pilots will even attempt a landing on a vacuum world like Luna.

EARTHMEN ON LUNA

LUNA WAS first visited by Sir William Otterbein, in an ether flyer designed by himself and his Italian assistant, Luigi Piachetti, and financed by his estates and by industrialists in London wishing to find cheap sources of iron ore. Otterbein managed to land his flyer in Mare Imbrium without significant damage. He and his assistant then set out to establish that Luna does suffer from "Moonquakes," that the surface, at least in the so-called "seas," is very dusty and difficult to traverse, that the surface gravity is quite low, and that there is no atmosphere. After his return trip, analysis of samples found them almost barren of useful materials, and Otterbein's industrial back-

ers pulled their support out from under him. He never returned to Luna.

Others have, however, including Brian Masterly of Great Britain, the Davis brothers of Philadelphia, and Vladimir Tereshkova of Russia. The latter made a total of five trips to Luna for the Czar, the final one (from which he never returned) in 1887. All the scientific data gathered have confirmed suspicions that Luna is of little value. No permanent facilities exist on Luna, and by 1889, visits there are extremely infrequent.

THE GLOW

RUMORS ABOUT hidden treasures, great wealth in diamonds, and indeed the existence of so-called Selenites, or Moonmen, have passed between space mariners for years. To date, none of them have been borne out despite several visits to Luna over the last two decades. Still, such rumors die hard, and many people persist in their belief that there is more to Earth's Moon than meets the eye.

"The glow" is a particular event which many explorers and ether pilots claim to have witnessed on the far side of Luna. They claim that, if one is in the right position, a faint glow can be seen on a particular part of the far side. The glow is barely a pinprick as seen with the unaided eye, but telescopic observers claim the glow area may actually be anything up to a mile across. Its greenish-white light has never been scientifically examined. Rumor has it that the Russians have more information about the glow, but, frankly, they aren't talking. It is also rumored that Vladimir Tereshkova was investigating the glow on his fateful trip of 1887.

ON GOSSAMER WINGS

IN THIS adventure the players will come in contact with an American inventor named Cyrus Grant who is planning an expedition to Luna. This contact can be established in one of several different ways. If there is an inventor in the party, he will have heard of Mr. Grant and already have started a correspondence with him as

to possible means of finely tuning the thrust of an ether propeller. If there is a reporter, then a newspaper will offer Grant financial backing if he will take the reporter (and several other qualified observers, such as the other players) along on the Lunar expedition. Or, some other similar excuse for an association can be invented. The point is that Grant and the player characters meet, and Mr.

Grant invites them to accompany him on an expedition to Luna.

There are italicized sections scattered throughout the text. These are descriptions of the scene or conversation from one of the non-player characters and should be read aloud to the players.

The characters will board Grant's ether flyer and take off for the Moon, a journey of no more than six hours. You should show them the deck plan of Grant's flyer and perhaps have them get to know Grant better. He will be happy to discuss his new Ether Propeller Governor, which uses several diamonds to focus the ether flow with greater precision, allowing him to maneuver with great precision using only the propeller itself.

Cyrus Grant (Trained NPC)



CYRUS GRANT is an inventor of some repute in the Arizona Territory. His contraptions have gained him quite a reputation among the ranchers he's helped out, the small towns he's worked for, and the awestruck onlookers who've followed his career. But no one was quite prepared to believe that he'd actually constructed a device which would allow acrobatic maneuvers close to the Lunar surface. This time he'd gone too far, and the public turned their collective backs on him. So when he took his group of fellow adventurers on a trip he claimed would explore the far side of the Moon, there was no one around to watch them take off.

Attributes

Skills

Str: 4	Fisticuffs 1, Throwing 2,
Agl: 6	Stealth 5, Mechanic 4 (machinist),
End: 1	
Int: 5	Observation 4, Science 4 (physics), Engineering 4 (naval architecture),
Chr: 2	Eloquence 2,
Soc: 3	Riding 3 (horse)

Motives: Adventuresome, Curious, Friendly.

Appearance: Cyrus Grant is a very heavy man, over 300 pounds, and his distant, unsympathetic expression makes him unattractive at first. He wears spectacles and is balding, and his usual attire is a rumpled black suit. His distance, however, is actually shyness, and although he is not blessed with good "people skills," he is actually a very friendly man and will prove a talkative companion once the initial barrier of awkwardness is overcome.

Grant carries a revolver when necessary.

APPROACH FROM THE FAR SIDE

GRANT ANNOUNCES, "I've been gathering eyewitness accounts of this mysterious glow for five years now. According to my calculations we should be approaching its exact position." You are cruising at an altitude of about a mile. The Lunar surface stretches out below you, jagged, gray, and dead. In the distance you can see a soft smudge of light in the blackness. It seems to have a faint greenish tint.

As the flyer approaches the source of the light, Grant descends to an altitude of 200 feet and sweeps the ground ahead with the flyer's searchlight. He brings the ship over the source of the glow. It is escaping from a deep gorge, perhaps 100 feet wide, which cuts down into the heart of the planet as far as the eye can see. After any discussion as to the next course of action, Grant says:

"We have found the glow. Since we came here, at least in part, to investigate it, it makes no sense to leave without doing so. The controls are working even better than I expected, and we can easily descend down into the gorge."

A SLIGHT MISCALCULATION

THE GORGE is a very jagged and dangerous passage leading straight into the Moon itself. Grant will be able to pilot the ether flyer carefully through the gorge, sinking ever further into the body of Luna. The speed of descent will be a cautious 10 miles per hour. The first several hours' descent into the Moon will bring the glow ever closer, but its source seems still miles deeper. The player with the highest Observation skill will be the first to notice that the rate of descent is gradually increasing, and the flyer is drifting dangerously close to one of the walls of the gorge. Grant notices at the same time and begins adjusting the controls.

"Suddenly this thing isn't handling right," Grant says, as he begins struggling with the controls. The flyer lurches drunkenly away from

the approaching gorge wall, but then nearly hits the opposite wall, pulling away just in time. It begins bobbing up and down as well. Grant hurriedly exclaims, "Something's interfering with the propeller's operation, lowering its efficiency. Listen! Hear that whistling on the hull? Good God, there's an atmosphere out there! We'll have to inflate the hydrogen gas bag."

Grant lurches for the gas generator controls, but too late. The flyer snags on the gorge wall, nearly tips over, and begins plummeting into the gorge. Grant exclaims hastily, "Gas bag's ripped. Hang on. I'll try to hit a ledge to break our fall. Otherwise we're goners!"

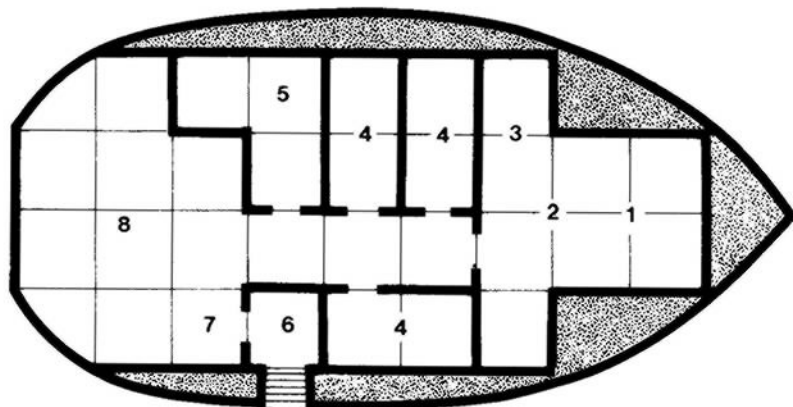
The flyer finally smashes into a ledge, and all of the characters are thrown to one end of the cabin in a heap, along with all of the loose furniture and equipment. The flyer totters for a moment, then rolls off the ledge and falls again, but this time for only a short distance. It hits the next ledge with a solid, bone-jarring finality. Have the players make quick rolls against Agility to avoid having suffered a wound in the fall.

ASSESSING THE DAMAGE

AS THE players sort themselves out, they will feel a slight breeze. Several plates have popped their rivets and fallen off of the hull, and the atmosphere of the gorge is blowing in. It is cool and damp, but breathable. The characters will also notice that the gravity is considerably higher than on the surface of the Moon. There it is only one-sixth that of Earth; here it seems to be nearly half of Earth's.

The flyer's hull is severely damaged, but reparable. However, though undamaged, the ether propeller will not budge the ship from down here, as the atmosphere is too dense. The hydrogen bag is torn, but temporary repairs would probably be sufficient for a quick ascent up the gorge to where the atmosphere is thin enough for the ether propeller to take hold. But then comes the final blow; Grant's Ether Propeller Governor is disabled, the large diamond used as an ether lens having shattered when the flyer hit the ledge. (If questioned, Grant will explain that the diamond was badly flawed, nearly worthless for jewelry, which is why he could afford it for his governor.)

All the while the greenish-yellow glow from within Luna bathes the ship in a curious light, mysteriously compelling and repulsive at the same time.



DOCTOR GRANT'S ETHER FLYER

1. CONTROL ROOM
2. COMMON AREA
3. GALLEY
4. STATEROOMS
5. GREENHOUSE
6. AIR LOCK
7. WORK AREA
8. ENGINE ROOM

THE EXPEDITION CONTINUES

SALVAGE FROM the ship will provide sufficient food for two weeks, plenty of ropes and climbing equipment (Grant was very careful to get survival gear ready in advance), and whatever special equipment the characters brought along. The logical course of action is to continue the descent, since there is nothing above the characters except vacuum, and remaining with the ship merely means slow starvation. As Grant points out, however, a fresh, breathable atmosphere implies an active life cycle of some sort, and at the very least that might mean food.

DESCENT INTO THE MOON

THE EXPEDITION will be able to make progress toward the center of the Moon using ropes and rappelling skills. Progress will be measured in miles climbed downward. Consult the mountain-climbing rule in the "Travel" chapter (page 115). Each mile of descent is treated as if it were a mountain, and the referee makes a roll to see how many rock faces must be descended. However, since gravity is only half that of the Earth, rappelling is much easier and safer, even for inexperienced climbers, and players will descend twice the number of faces per day as normal.

The actual descent is examined below, one day at a time. New things will be learned about the subsurface Lunar environment each day. In some cases these discoveries will take the form of a mandated encounter. Animal statistics for the encounters are found on the Lunar Animal Chart on page 212.

Day One: The light from the glow will be sufficient to allow the characters to dispense with any hand lamps or lanterns. This makes the climb easier, but the very slippery nature of the rocks makes it more difficult. The gorge walls are damp and coated with a fine coating of mud, almost slime. Many small stalactites are attached to rock outcroppings. Grant reasons that moisture evaporates deep within the Moon, and the vapors rise until they condense on the gorge walls. The slime is a combination of water vapor, rock dust, and what appears to be organic matter.

Late in the day a variety of small fungi are discovered living in the cracks and crevices of the gorge. This accounts for the organic matter in the gorge muck. These fungi tend to be gray or brown in color and are spongy to the touch, much like fresh mushrooms. They have a faintly musty smell. Grant volunteers to begin sampling them a little at a time.

"With my bulk, they aren't liable to do me much harm even if they are poisonous. We'll know in a day or two if we've licked the food problem."

Day Two: With the light drawing ever closer from below, its eventual source is revealed today. A new variety of yellow-green fungus is discovered, and it has a phosphorescent glow. Though faint, in large amounts it could very well be the ultimate source of the glow. A hazard is also discovered, though. When broken open, the glowing fungus leaks a mild acid. It will eat through cloth and other fibers but is only a mild irritant to skin.

One of the party suffers a climbing accident when his rope rubs through a patch of the glowing fungi

and the acid cuts the rope. Roll a die to determine which character is involved. All he will know is that the rope suddenly breaks, and he is falling. Have him make a quick roll against his Agility attribute to grab a rock outcropping to break his fall. If successful, he is dangling by a precarious handhold and the rest of the party must hasten to reach him with a fresh rope. If he fails, he lands on a ledge and may suffer an injury. Roll on the Climbing Accident Table to determine the extent of the injury. Examination of the rope will determine the cause of the trouble. From now on, all glow-fungus will have to be cleared away from the area around the ropes.

Day Three: The party is attacked by a swarm of shrieking flying creatures. Each animal weighs about two pounds in the current gravity, but would have a mass of five pounds on Earth. They have sharp little teeth and talons with which they will tear at the characters. No one of them has the strength to do any serious damage, but in a mass they are dangerous. This is resolved as an animal swarm attack. After one or two turns of combat, with the players frantically attempting to drive them off, the shrieking will change pitch, and the animals will immediately leave. As the group pulls itself together and tends to its wounds, it discovers why the flying animals, which Grant dubs "Lunar bats," left.

There are a fair number of dead flyers on the ledge, and Grant is very interested in them. "Look at this here," he says, and points to a group of three of the dead animals. Even as you watch them, their flesh is dissolving and sliding from their plate-like bones. "It's that glow-fungus,"

Grant says. "My revolver was empty so I grabbed a handful of the stuff and threw it at them. These three just dropped like rocks. That's when the shrieking changed pitch, and they left."

Day Four: Descending until about midday, the expedition makes a startling discovery—on a ledge below them is another wrecked ether flyer!

As you look over the lip of the ledge, you see a wrecked ether flyer, its back broken and hull split open, on a large ledge 50 feet below you. It is slightly larger than Grant's flyer, but in much worse shape. As it probably fell farther, its crash was more violent. Grant nods after a moment's thought and says, "This must be Vladimir Tereshkova's ship. He disappeared in '87 and no one's ever found the wreck."

Closer examination of the wreck uncovers no bodies, but there are some other factors which are slightly curious. First, many portions of the flyer have been hauled away, such as the furnishings and almost all of the electrical and mechanical equipment. The guts of most non-removable mechanical systems have been ripped out. Second, around the vessel are several empty crates stamped with the name "Remington"—each of the six crates once held five rifles. Grant is puzzled.

"Why would Tereshkova want 30 rifles? He can't have had even half a dozen men in his crew."

Where Tereshkova is now remains a mystery, but a broad descending section of the rock face below the ledge has been cleared of glow-fungus. It's logical that Tereshkova and his men went that way. At least the descent will be easier now since the glow-fungus is cleared out. Add

one to the number of rock faces the players may descend each day.

Day Five: Grant prepares a hearty breakfast for the players: brown and gray fungus, which he declares to be free from poison. The gray fungus is firm to the teeth and has a pleasant, almost crunchy, texture. It smells and tastes like soured milk. The brown fungus has a moist, rather slimy, texture. It is extremely sweet, with a very metallic aftertaste. The players spend most of breakfast trying to find the best combinations of the two to mask the worst of both their flavors.

In the early afternoon one of the party startles several small creatures, apparently feeding on the gray and brown wall fungus. They are about six inches long and have a vaguely insectile appearance, probably due to what appears at first glance to be an exoskeleton. Upon closer examination, this will prove to be a lightly armored carapace, similar to that of an armadillo. The animals have large, black, protruding eyes and small mouths. Grant dubs them "Lunar rats." They, too, may become a source of food, as the expedition's supply is almost half exhausted.

Day Six: The party is attacked by a large burrowing animal, which they will later call a giant caterpillar. It is grayish-brown and nearly three feet in diameter. Its body is composed of multiple segments, ending in a large, dangerous head. The face has two bulbous, black eyes and a wide, gaping maw with a powerful pair of sharp, pinching mandibles. These mandibles are the animal's only weapon. It will attack using the mandibles as fangs until a character is wounded by them. That character is then caught in the mandibles, and

the animal will continue to attack using the mandibles as coils. Once a character loses consciousness, the caterpillar will drop him and attack another character.

Once the caterpillar is dead, the players will find that it is inedible. If they cut it open, it will appear to be full of a horrible-smelling, viscous liquid. The players will probably not want to sample what solid organs are floating in this reeking mess. Grant certainly won't.

Subsequent Days: As the players continue their descent, they will have additional animal encounters. Roll once on the Animal Encounter Table below to determine the type of animal encountered each day.

ANIMAL ENCOUNTER CHART

Die	Type
1-3	Lunar Rat
4-5	Lunar Bat
6	Caterpillar

Bats will be easy to deal with, as all that players have to do is throw a handful of glow-fungus into the air, and they will flee. Rats will prove elusive but harmless. Given enough time, the players will find them to be edible; they have a flavor similar to pork but with an oily, fishy aftertaste. Caterpillars are a more serious problem, but can be dealt with using firearms.

After the players have descended a total of 10 miles from their original crash site, they will come to a broad ledge that fronts on a large cavern opening. It appears that Tereshkova and his men went into the cavern, as the glow-fungi are not cleared away below the ledge.

EXPLORING LUNA

ONCE THE CHARACTERS enter the large cavern, they will have truly entered the sub-Lunar world. There will be no clear trail to follow, and so the characters will be reduced to wandering and exploring, gradually making their way further and further down.

Luna experienced a planetary evolution unique among the worlds of the Solar System. It coalesced from an ancient mass of rock and debris with a high proportion of gases. These gases permeated the molten young planet, and, as the rock cooled and hardened, the gas bubbles remained intact, honeycombing the world. Eventually these gases leached out of their separate caverns and combined to become Luna's subterranean atmosphere.

THE SPHERICAL CAVERNS

THESE CAVERNS, and their connecting tunnels and passageways, formed around gas bubbles when the Moon cooled and hardened. They are now the habitat of all life on the world.

Dry Cavern: Each dry cavern is from 50 to 1000 yards in diameter. Although spherical in general shape, their interior walls are very uneven due to large pieces having broken off and fallen to the floor during cooling. Over the ages the water vapor in the atmosphere has condensed on the roofs of the caverns, triggering the formation of stalagmites and stalactites.

Quite often the bubbles that formed the caverns touched, and the points of contact now form openings between the spheres. There are numerous cracks which formed during

the planetary cooling as well, and water flow from one cavern to another has gradually enlarged these. Given the number of caverns and connecting passageways it is almost certainly possible to circle the Moon travelling through these tunnels and caverns.

Water Cavern: This cavern is identical to a normal cavern except that it is partially full of water. Water will enter the cavern from either a tunnel or small cracks in the ceiling. However, there is no exit for the water at the bottom of the cavern, and so it fills up until the water level reaches a suitable exit. This exit may be an opening to another cavern, or it may be a water tunnel.

Water Tunnel: Water tunnels are rock fissures which have been widened by water-flow erosion. They angle downward, usually at about 25 degrees, but may be shallower or steeper. Unlike the broken cavern walls, tunnels tend to be smooth and slippery, with at least a trickle of water through them (sometimes considerably more). Water tunnels will empty into either a water cavern or a dry cavern. If they empty into a dry cavern, there will be a large mass of muddy sediment at the point where the tunnel empties, and around it will grow a great deal of fungus.

Crevice: A crack in the Lunar rock caused either by cooling or by a Moonquake. It is usually very narrow, dirty, and jagged, as there is little or no water flow through it. Characters will have to remove most heavy equipment to wriggle through and then pull the equipment behind them by rope.

TRAVEL WITHIN THE CAVERNS AND TUNNELS

TO CONTROL the wanderings of the characters through the maze of caverns and tunnels, it will be necessary to make a map. It is not necessary to do so in advance; just make one up as you go. Since the players will probably be making one up, you may want to just make sure they are doing an adequate job and then use it.

Each time that the players enter a new cavern, you will have to determine the type of cavern entered, the number of exit points, and the types of exit points. Roll a die and consult the Lunar Terrain Table to make each of these determinations. A separate die roll is made for type of cavern, number of exits, and for each of the characteristics of each exit. Caverns may be wet or dry. Each exit from a cavern may be low, level, or high, may lead ahead, right, or

LUNAR TERRAIN TABLE

Die Roll	Cavern Type	Exit Number	Exit Type	Exit Angle	Exit Direction
1	Dry	1	Open	Low	Right
2	Dry	1	Open	Low	Right
3	Dry	2	Open	Level	Ahead
4	Dry	2	Tunnel	Level	Ahead
5	Dry	3	Tunnel	High	Left
6	Wet	4	Crevice	High	Left

left, and may be an opening (a roughly circular hole in the wall between two caverns), a water tunnel, or a crevice.

The apparent difficulty of moving about in the maze of caverns and passageways is partially offset by the low gravity. Remember that the gravity at this level is about half that of the Earth, so falls are easier to avoid and not as serious when they do occur. Characters will spend about a half-hour in each cavern they enter. Each level or high water tunnel traversed will take another half-hour for the entire party, while each crevice traversed will take an hour. Spelunking is very exhausting work and so the party should not attempt more than eight hours of travel a day. Animal encounters will continue as in the "Subsequent Days" section.

When moving between caverns by way of openings, some care is required. If the opening is level (the two caverns are at the same depth), then passage is easy. If the opening is a low exit, then it will enter above the equator of the next sphere, and characters will have to climb down the stalactites or the broken rock faces of the cavern to enter it. Lowering characters by rope is safer, if ropes are available. If the opening is a high exit, then the process is reversed: The players need to find a way to climb up out of the cavern.

Water tunnels are extremely easy to move through if they lead down from a cavern; they are just a nice long mudslide. They are also easy to move through if they are a level exit, although they are generally small enough that players will have to proceed on hands and knees. If they lead up out of a cavern, they are nearly impossible to climb due to the slip-

pery walls and lack of handholds. A player may do so by rolling successfully against Agility five times in a row. (Each time he misses he slides back down and has to start over again.) If a water tunnel exits a water cavern levelly, the tunnel will be partially or completely full of water (at the referee's discretion) and will always lead to another water cavern.

The map on page 143 displays a section of the Lunar subsurface, an area which will be encountered later in the adventure. However, it is fairly typical and should be examined as an example of Lunar mapping. There are two views given, one from the side and one from the top, to make the spatial relationship of the caverns more apparent.

ENCOUNTER IN THE OUTER CAVES

AFTER SEVERAL days (the exact number being up to the referee) of wandering, the players come upon a cavern which has a well travelled path through it, and from which large boulders and stalagmites have been removed. The rising edge of the spherical cavern has grooves and steps carved in it to assist climbing, but the steps are very narrow and set close together, making them difficult for humans to use. What the player characters do not know is that they have come upon the outer caves of a large "nest" of Selenites, or Moonmen. The Selenites do not patrol these caves, since no other

Selenites ever come this way. However, the player characters will stumble upon some Selenites in the caves and will probably be captured by them.

Set up the situation with the exhausted player characters resting in the well travelled cavern. They will hear scraping sounds coming from one of the exits of the cavern. When they investigate, they will find steps leading up to a high opening.

As you begin to climb up the narrow, notched steps, Grant looks up and freezes in stunned amazement. You all look up and see, crouching at the lip of the opening and behind the natural breastwork that it forms, four hideous, six-legged alien creatures. Each one is roughly five feet long and stands three feet tall from feet to head. They appear to weigh about 60 pounds each (which would be 30 pounds in this gravity). Their bodies are covered by a translucent, milky-white exoskeleton, and their faces have two saucer-sized, multifaceted eyes and large, vertical mouths. Each of them holds a Remington breech-loading carbine in its front set of limbs. They make a series of whines and clicking noises, and gesture to the party to throw down their weapons and surrender. Grant throws down his revolver and comments, "Well, they've got their rifles trained on us, they're behind cover, and they have the height advantage. I'm for going along peaceably. How about you?"

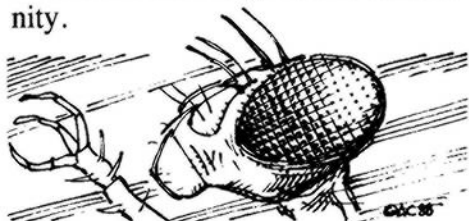


CAPTIVES WITHIN LUNA

UPON CAPTURE, the expedition will be taken directly to Tereshkova's cavern for questioning. On the way, they will pass through the Selenite main settlement, centered on the pictured series of connected spherical caverns.

Evolved in the depths of Luna, the Selenites can best be likened to Earthly insects. Indeed, they most closely resemble a cross between a human being and a beetle, and their social habits are as bizarre as those of any insect community.

The Selenites live all through the area of caverns on Luna. The community encountered in this adventure, the one nearest the great gorge, is typical of an individual community, usually isolated by many miles from the next independent community.



SELENITE SOCIETY

THE SELENITES, though physically indistinguishable to human eyes, all perform distinct tasks within their group which are predestined from the time they emerge from the hive. There are three broad classifications of Selenite: drone, custodian, and specialist. They are described briefly below, and their relevant at-

tributes are given in the Selenite NPC Table. Selenites have no Charisma or Social Level attributes, these being meaningless to Selenite society.

Drones: The drone is the basic working unit. Drones are in charge of growth and collection of food.

Custodians: Custodians are in charge of the young, from their time in the hive through their emergence and on into their first few weeks of life. The custodians are generally slightly more intelligent and agile than their drone counterparts, having an Intellect of 2 and an Agility of 3. Custodians also have the ability to secrete nutritious by-products of their own fungus intake which are particularly helpful when feeding the young in the hive.

Specialists: These Selenites are rare, so much so, in fact, that sometimes only one or even none of a particular specialist type exist in a given community. They include such things as hive builders and retainers of knowledge. Apparently the community knows when it needs a specialist, and one is immediately produced in the hive. Specialists have an overall Intellect of 4 and an Endurance of 3, but are otherwise the same as custodians.

Communities have no specific leader. All functions are performed seemingly without direction, though there must be some sort of low-level communication between all members of the community.

SELENITE PHYSIOLOGY

THE SELENITES are sentient beings who have evolved in a very different environment. Their bug-like appearance makes them quite repulsive to the human eye. The lesser gravity of Luna has made them rather weak by human standards. As their intelligence is quite low, their community organization does not require tremendous personal initiative.

Selenites are roughly five feet long from head to bottommost feet, and stand about two feet high when on all their limbs. They only weigh about 30 pounds on the Moon, or 60 pounds on Earth, since much of their outer skeletal structure is hollow. The Selenite face has two saucer-sized, multifaceted eyes and a large vertical mouth. The teeth are not for tearing or cutting, but for grinding, since their chief sources of food are the brown and the gray fungi. Their six limbs are identical, each with three "elbow" joints and a bony hand with three fingers.

Selenites are hermaphroditic; that is, they have both female and male sexual organs in each individual. Individuals give birth in a cell of the hive when the community needs additional drones, custodians, or specialists. The incubation process takes three weeks until a new young Selenite is ready to emerge from the hive. Once it emerges, the young Selenite must be nursed for three more weeks until it is ready to function on its own.

A Selenite is likely to live for no more than 10 Earth years before its body eventually gives out, and it dies. It will spend all of that time performing its function for the community—Selenites have no sleep cycle.

SELENITE NPC TABLE

Type	Str	Ag	End	Int	Cbt	Marksman
Drone	1	2	3	1	1	0
Custodians	1	3	2	2	3	3
Specialists	1	3	3	4	4	3

SELENITE CIVILIZATION

THE SELENITES have evolved virtually no technology of their own. They had no concept of it until Tereshkova arrived with rifles. As it is, the armed Selenites do not have the required Strength to fire the carbines effectively.

The only history of the Selenites is a remembered history passed down by the retainers of knowledge. If a retainer dies without being replaced in advance, all that knowledge is lost, since other Selenites do not have the memory capacity necessary to carry on these historical traditions. All history is lost, and the community must start virtually from barbarism. (K'chuk, whom the players will encounter while in captivity, is a retainer of knowledge, and his death would constitute a catastrophe for the Selenite village, although characters might not determine this right away.)

THE SELENITE VILLAGE

THE SELENITE VILLAGE is scattered throughout a series of connecting spherical caverns, as shown on the accompanying map.

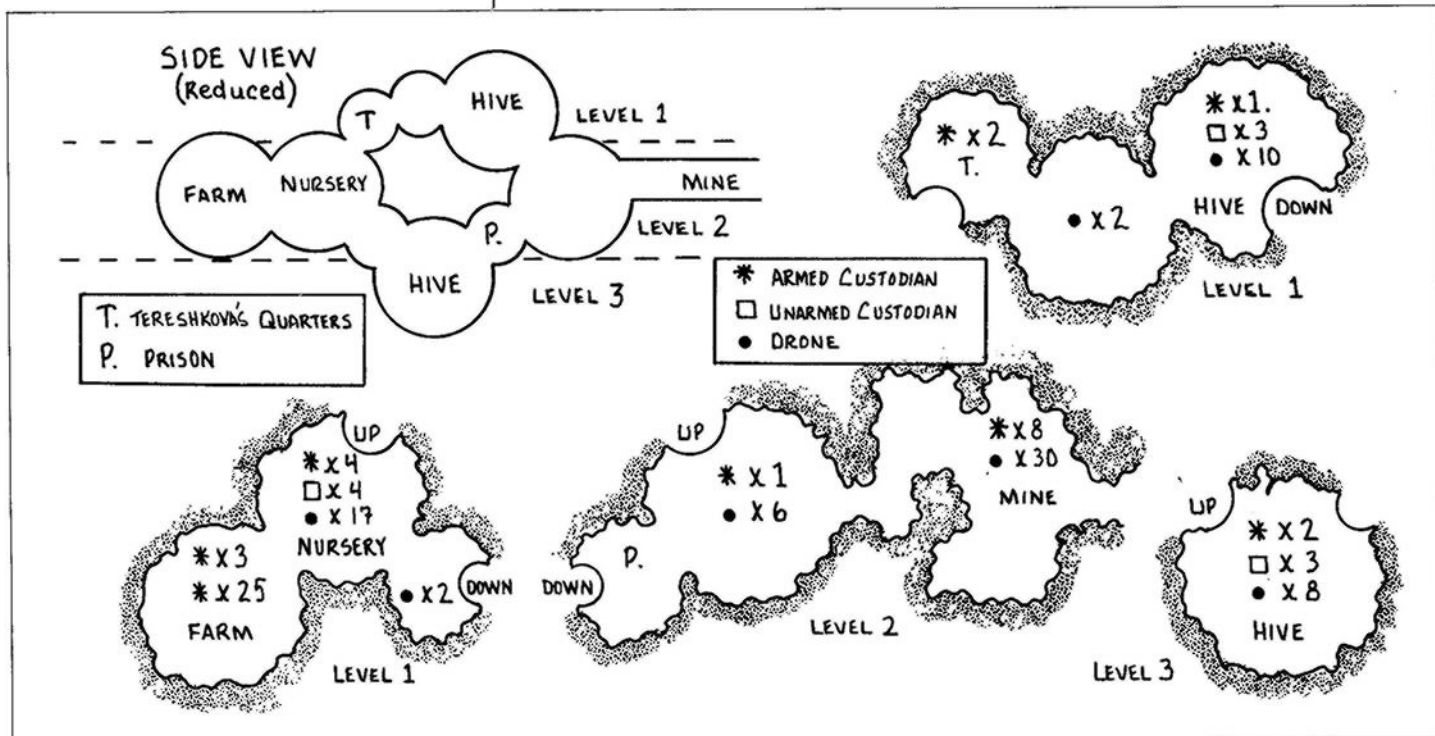
Outer Caves: A large number of Selenites are being directed to mine the cave walls. They have no sophisticated machinery and are simply using their clawed hands to scrape away at the rock. Other Selenites, with carbines, are apparently in charge, forcing the others to work.

The Hives: There are two large spherical caverns devoted to the hives. On first examination, they appear much like giant beehives, except that the hive cells are square rather than hexagonal and are made of some ceramic material, not wax. The humans may witness several of the cells lit from the inside with glowing fungus, and perhaps see the gyrations of a young Selenite about to be born. They might also see newly emerged Selenites cleaning themselves with the help of the custodians of the hive.

The Nursery: Also unlike bees, Selenites apparently are not fully capable of functioning in their society upon emerging from the hive, as evidenced by this nursery. Dozens of young Selenites, though of full size, are being tended to here. They are being given food and are being trained to care for themselves by more custodians.

The Fungus Farm: The fungus farm (for lack of a better term) contains a few dozen Selenites, again under the direction of other armed Selenites, tending to and harvesting the food fungus. Selenites working here move the fungus on their backs to the hives and nursery and out to the outer caves where the mining is taking place.

Tereshkova: This cavern is the office and living space of the only human resident of Luna, Vladimir Tereshkova.





RUSSIAN TIRADE

YOU ARE securely bound and, accompanied by four armed Selenites, taken to a chamber fitted out as a study and office for Tereshkova. It has a desk, bookshelves and books, a torn, but comfortable, leather

chair, an orrery, and considerable quantities of scientific apparatus. Tereshkova is seated at the desk. His hair and fingernails have grown quite long, and his complexion is pallid from lack of sunlight. He looks thin and sickly, but his eyes burn with the feverish energy of madness.

He rises as he greets you. "You don't know how happy I am to see you, Mr. Grant. As you no doubt stumbled across my ether flyer, it must be obvious that I have been stranded here for some time. I'm not exactly sure how long; the days are so hard to measure down here," he says sarcastically, gesturing to his walls of eternal light.

"When I stumbled upon these caverns the first time, I was struck with the great riches here. Diamonds. Diamonds!" He reaches into his desk drawer and pulls out a black leather bag, dumping the contents onto the desk. He has about 50 diamonds, some huge. Grant flashes you a look as if to say, "That big one will suit our purposes."

"Of course, I had to return to Earth to get further supplies. I also found that these Selenites were unwilling to work for me until I had some 'muscle,' if you will, to back me up. The rest of my crew wouldn't cooperate, intending to 'serve the Czar.' I had to kill them, of course." He shrugs and gestures to the armed Selenite guards around him. "Fascinating creatures, but their discovery alone would not make me rich, now would it?"

He reaches into a canister on his desk and grabs a handful of gray fungus, shoving it hungrily into his mouth. "Oh, you'll learn to adapt. It's not that bad, really, and it's all there is to eat." Giggling to himself, he continues, "You'll have plenty of time to adapt, too. You see, you've given me a ticket back to Earth. I knew someday someone would come this way again, and I would be able to escape. My guards are out searching for your ether flyer now. Once they find it, I'll repair it and be on my way. They think that I'll return with more technological treasures for them; they are quite gullible. I shall leave you to puzzle out a way to make my excuses for me, eh?" He scoops his diamonds back into his bag and shoves it back into his desk. "Au revoir, gentlemen." Tereshkova then issues some clicking commands, and the guards lead you away.

Vladimir Illyich Tereshkova (Veteran NPC)

AN INVENTOR of some renown in Russia, Tereshkova was in the

forefront of the research on precision modulation of the ether flow and made several trips to Luna testing his governing devices. After discovering the Selenites and the diamonds embedded in the rock walls of the caverns near them, he returned to Earth and obtained a supply of breech-loading carbines. In 1887 he returned to Luna but crashed on arrival and has been stranded here ever since. He has gone quite mad and murdered his own crew gradually over the course of the last two years. He has also grown physically weak, as the fungus diet he has subsisted on is lacking several vitamins



and nutrients important for humans.

Attributes

Skills

Str: 3	Fisticuffs 4, Throwing 1,
Agl: 5	Stealth 4, Mechanics 4 (machinist), Marksmanship 4,
End: 2	Wilderness Travel 3 (mountaineering),
Int: 5	Observation 4, Science 4 (physics), Engineering 4 (naval architecture),
Chr: 3	Eloquence 3, Linguistics 3, (English, German, French)
Soc: 5	Riding 4 (horse)

Motives: Greed, Madness.

IMPRISONED IN THE DEPTHS OF LUNA

TERESHKOVA HAS the characters taken to the small chamber between the two hive chambers (see map). Four Selenite guards will remain with them. All equipment in excess of their individual clothing will be taken from them, to remain in Tereshkova's cavern.

Grant speaks up, "Those diamonds he has will do the trick for repairing the Ether Propeller Governor. Tereshkova must be pretty far gone or he'd see that those diamonds are badly flawed. Not worth £10,000 for the lot, but the big one will get us back to Earth." Grant adds, *"And if we can get some of these critters to lead us back out of this maze to the gorge, we're in business. We're home free if we can get rid of Tereshkova!"*

"Kyou klar not kuman like k'Doc-tor?" The voice is a horrible abomination of English, speaking with the inset sideways jaws of one of the guards.

K'CHUK'S STORY

THE SELENITE GUARD who can speak English (the only one of his kind that can do so) will tell the humans that his name is K'chuk. His command of the language is fair, but his inability to form certain words will restrict him, and he will be difficult to understand at times.

K'chuk is a "retainer of knowledge," a specific subgroup of Selenite devoted to the pursuit of



knowledge through memorization. He was therefore able to pick up much of the English language from Tereshkova, who speaks it occasionally, and from the English books the Russian has in his cavern. Obviously Tereshkova, despite his contact with the Selenites over this long period of time, is too consumed with his madness and greed to have noticed these subtle differences between the creatures, and has no idea that K'chuk understood his rambling soliloquy to the players.

K'chuk will explain that he has no quarrel with the characters and is simply following orders. The Doctor (Tereshkova), he explains, has been a benefactor to K'chuk's community. He gave them improved techniques for growing fungus, which freed drones to work in the mines. This has proven to be hard and dangerous work, and after several drones died as a result, the rest refused to continue the work. Tereshkova left and then returned with rifles, armed a group of Selenites, and seized power. The Selenites he armed are all former custodians, and he appealed to their sense of duty to the community as a whole. The mine would produce stones which Tereshkova would trade to the first Earthmen who came to visit to receive technological devices which would further improve the Selenites' lot.

Now, however, K'chuk suspects that Tereshkova has lied to him all along and that he intends to abandon the Selenites and never return. Too many of K'chuk's nestlings have died in the mines in the name of progress for him to allow Tereshkova to make good his escape without at least trying to defeat him. K'chuk is a reasonable Selenite who will no doubt

see the wisdom of making common cause with the characters, provided they can convince him that they are not as treacherous as his erstwhile master. If so, he will be willing to aid the players in gaining the support of the rest of the community and in bringing Tereshkova to "justice."

Because of their brief tour of the Selenite community and their conversations with K'chuk, the expedition will gain quite a bit of knowledge about the Selenites. The referee should make available the information presented so far on the layout of the caverns and the structure of Selenite society. A vital piece of information concerns the forces available to both parties, and K'chuk will provide complete information on the Selenite community and its probable loyalties.

The total population of the community is about 150, of which over 100 are drones. Of the 40 custodians, 29 are armed and loyal to Tereshkova, and can be expected to fight. The remaining 10 custodians are less satisfied with the direction of Tereshkova's "progress" and would certainly join in the revolt if K'chuk were part of it. As a retainer of knowledge, K'chuk's judgement is highly respected, and his support for Tereshkova has had much more to do with Tereshkova's success than he imagines. The drones are almost universally disaffected and can be expected to join any fight which K'chuk leads. Finally, K'chuk tells the players that Tereshkova and five armed custodians have left the settlement to find Grant's ether flyer, leaving the remaining guards leaderless. Their numbers and weapons are still formidable, but the revolt begins to look like it has a chance.

ESCAPE FROM THE HEART OF LUNA

THE ESCAPE from the clutches of Doctor Tereshkova will be a two-part process. First, with the help of K'chuk, the players will have to overpower the three other guards in the prison chamber. This move will give them four Remington breech-loading carbines as armament, with 20 rounds of ammunition each. Next, they will have to recruit assistance from the drones to overpower Tereshkova's armed Selenites.

TOTAL FORCES

BESIDES K'CHUK, who has already changed sides, Tereshkova has 29 former custodians armed and loyal to him. These Selenites may not be recruited, but must be fought. Three will have been overpowered in the prison chamber and five more are outside the settlement with Tereshkova, leaving 21 present to be dealt with. These custodians will be referred to as armed Selenites, and their location at the time of the escape is marked on the map.

There are another 10 custodians in

the hives and nursery who can be convinced to fight if merely contacted. K'chuk, obviously, will have to do the talking. Their positions are also given on the map provided.

Over 100 drones work in the settlement. They can be recruited, but it is difficult to get their attention and elicit a quick response. When K'chuk enters a chamber with the humans, he may begin shouting to the drones to join the rebellion. They will begin moving and fighting on the second combat turn after that, and only one die's worth will join the fray per turn. For example, K'chuk and the humans enter the nursery on turn 1. That same turn the custodians in the room may move and attack with the humans. On turn 3, one die of drones will also join in, and an additional die's worth will join in each turn after that until all 17 have joined in.

Tereshkova and five armed Selenites are out of the settlement searching for Grant's ether flyer in the gorge when the expedition makes its escape attempt. Whatever the outcome of the attempt, they will not return to the settlement until after all combat is completed.

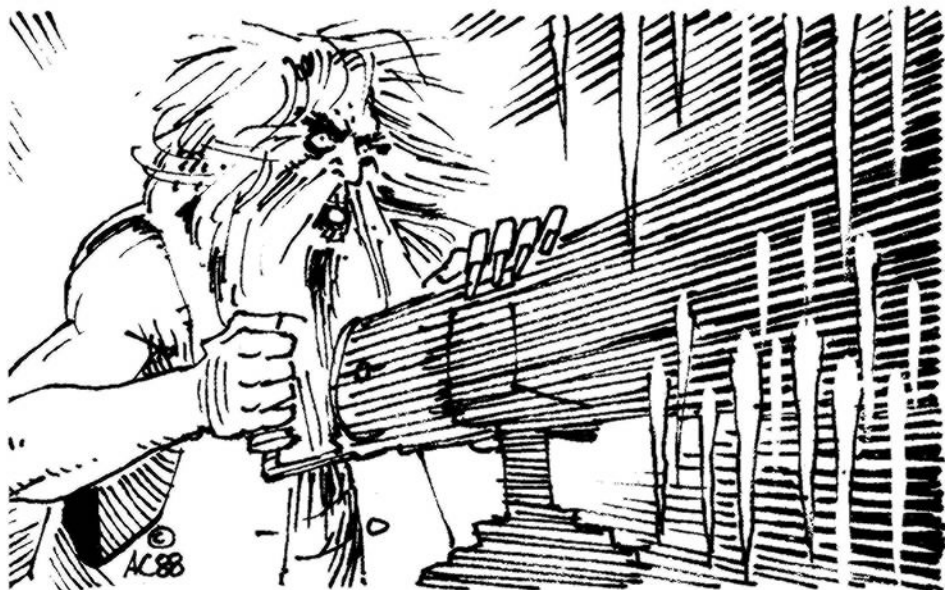
Administering the Escape Attempt: Allow the humans to move from connected chamber to connected chamber. Administer the encounters in each chamber according to the example provided above. Selenites are not terribly intelligent creatures and have very little experience in combat situations. Even though the ruckus caused in one chamber would normally alert others nearby, Selenites find it hard to deal with problems so remote—encounters will be handled one chamber at a time.

Conclusion of the Escape Attempt: Once all of the armed Selenites have been eliminated, the grateful drones and custodians will begin repairing the damage to the village and caring for the injured. The humans have their freedom and most likely all of their original equipment back. They need only wait for the inevitable return of Tereshkova and the final struggle against his evil plans. The diamonds are found in the mad doctor's desk when the players go and search it.

THE RETURN OF TERESHKOVA

EVENTUALLY THE doctor will arrive back at the outer caves with his five remaining armed Selenites. He will be confused and outraged to find there are no workers digging or guards guarding. He will encounter the humans, the surviving Selenite drones will attack him, and a running fight will begin. The five armed Selenites may be of little actual help in the fight, but Tereshkova has numerous tricks up his sleeve.

As a defense against a possible rebellion, Doctor Tereshkova has rigged many of the stalactites in each chamber to fall on his command.



They are triggered by a small explosion which he in turn triggers from a pocket device. All of the rigged stalactites in a chamber (or an outer cave) must be triggered at once, and they will strike any characters (including the armed Selenites, who don't know where to get out of the way) who cannot make a roll against their Agility. Characters hit take one die roll's worth of wounds. In the confusion following his first use of the stalactites, Tereshkova will be able to escape into the settlement to set up other ambushes. He must be in the chamber which he wishes to "set off."

The doctor's final defense, when cornered near his study, lies in his latest invention, a freeze ray. Consult the equipment list elsewhere in this book for details of its operation. He will make his last stand at the freeze ray and may incapacitate one or more players temporarily, but the sheer number of Selenites now part of the rebellion will swarm the gun. Tereshkova will detonate one last set of booby traps and make his escape.

The characters will pursue him through the maze of passageways and discover that there is a very short route to the gorge they first crashed in (although it comes out considerably below where the players first entered the caverns.) Tereshkova begins climbing down into the gorge through the glow-fungus, which is much brighter and has a more yellow cast to its light at this depth. After several hundred yards the players will notice that the acid from the glow-fungus is much more painful and is beginning to raise welts where it has eaten through their clothes. At this point they stop descending, but Tereshkova continues, cackling in-

santly as the flesh on his feet and hands bubbles and peels. Eventually, his hands lose their strength, and he falls into a large patch of the bright yellow glow-fungus on an outcropping. He screams and rants as the acid literally dissolves him before the characters' eyes. A fitting end for a villain of such magnitude.



REPAIRING THE ETHER FLYER

GRANT WILL be able to use the diamonds mined to fix the ether propeller controls while the rest of the expedition repairs the hull and gas bag. These repairs will take only a couple of days. Grant then proposes that the proceeds of the sale of the remaining diamonds be put in trust for K'chuk's people to finance importation of some technological equipment more appropriate to their needs than Remington .50-caliber breech-loaders. Assuming the characters agree, K'chuk's gift (see below) will be presented to all of them. If the players do not agree, then Grant will pledge his share at

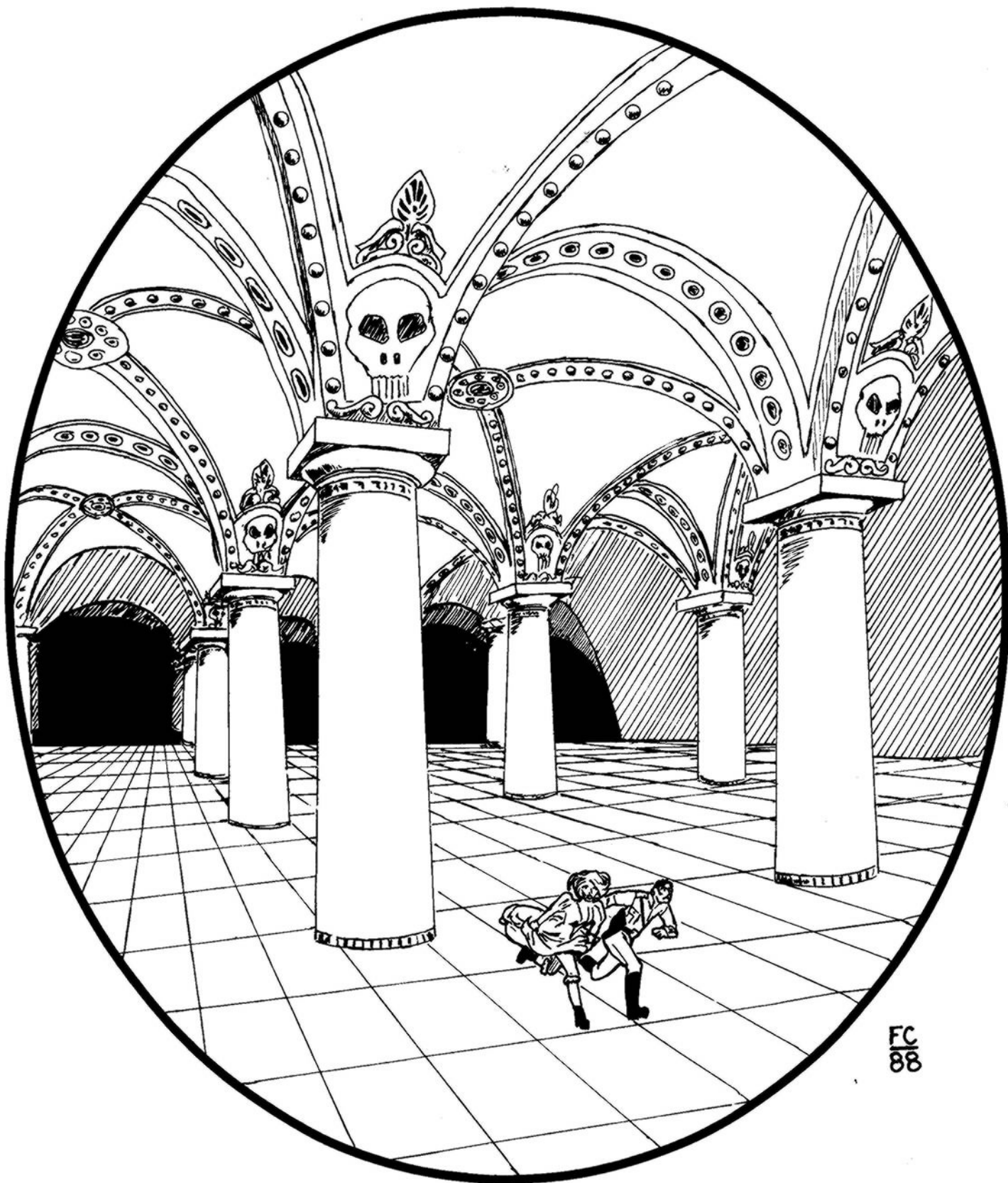
least, and K'chuk will present the medallion to him.

FURTHER ADVENTURES ON LUNA

LUNA REPRESENTS a vast potential for further exploration. Maps similar to those shown here can go on virtually forever, taking adventurous characters deeper and deeper into the Lunar surface, to come face to face with the heart of the Selenite world. Their riches can be discovered, their knowledge learned, and their whole world mapped out for the glory of the crown.

Setting up individual provinces within the Moon will be tricky, but possible. It might be possible to make the gray or brown fungus or Lunar rat meat a delicacy in countries like France, and tremendous profits could be made. The diamonds on Luna seem to be universally flawed, but they will be in demand for industrial use. A few additional adventures on Luna might finance bigger and better adventures to come.

Finally, as the players take their leave of the Selenites, K'chuk takes a moment to thank them for all that they have done, and as a token of his gratitude, he presents them with a medallion of a highly polished, silvery metal which distinctly casts a yellow-red glow. The medallion is clearly not the work of K'chuk's people, and, aside from the designs and runes carved into it, it would appear to be machined. K'chuk does not know its origin, only that his people have had it since before the memory of the retainers of knowledge. Perhaps the answer lies deeper in the interior of the Moon, if someday a party can brave the dangers of the deadly, yellow glow-fungus.



MARS

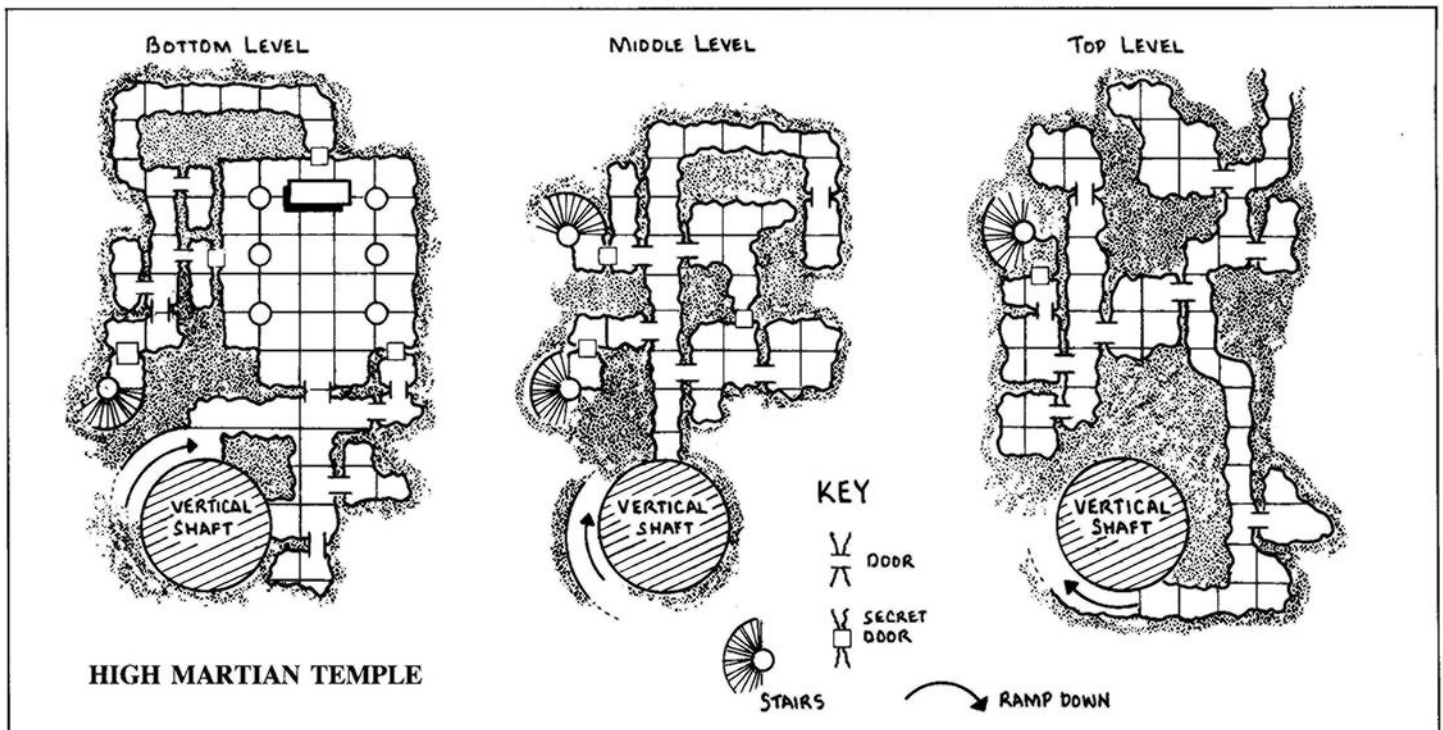
FOR CENTURIES the dark red mystery of Mars has excited the imagination of humanity, and so it was little wonder that Edison chose the red planet as the destination of the first interplanetary ether flyer expedition. Accompanied by Jack Armstrong, an intrepid Scottish explorer and soldier-of-fortune, Edison set out on January 6, 1870 and arrived on Mars on March 9. The landing was a rough one and tore open the hydrogen balloon used to lift the ether flyer into the atmosphere. The two explorers would have been stranded on Mars forever were it not

for the fact that the planet was inhabited.

Edison and Armstrong landed just outside the city now known as Syrtis Major, and they were taken prisoner by the Amraamtaba IX, the local potentate. Armstrong soon learned the Syrtan language, however, and Edison impressed the Martian ruler with his tremendous technical knowledge. The pair were soon freed, and Edison was provided with the materials necessary to repair his balloon and generate the hydrogen needed to fill it. Within months the repaired flyer was ready to carry

Edison, Armstrong, and a curious Martian back to Earth. The return trip was without incident, and the expedition landed outside of Cincinnati, Ohio, on August 7, 1870.

The Earth was electrified. Edison and Armstrong received fame and fortune. Within a year dozens of companies were manufacturing Edison Flyers, and vessels of several nationalities were soon making regular trips to Mars, with rapid and dramatic changes for both worlds. Martian liftwood met the Industrial Revolution, and neither planet would ever be quite the same again.



PHYSICAL CHARACTER AND PREHISTORY

MARS HAS a diversity of terrain fully equivalent to that of the Earth. In broad terms, the world is divided into the ancient seabeds, the vast deserts, the craggy mountain ranges, and the polar icecaps. The most salient feature of the red planet, however, the one which has shaped what the world is today, is the lack of rainfall.

It never rains on Mars. The free water of its ancient seas vanished long ago and is now frozen in the glacial wastes of the polar icecaps or chemically locked in the rust-red deserts. Without free water, there is no evaporation cycle to feed clouds, and therefore no rain.



Flora, Fauna, and Flight

THE DRYING of Mars millions of years ago spelled the end for most

mammalian life forms, and with their extinction came the next step in Martian evolution: the flyers. Flyers could range far and wide in search of water and in search of the prey that water could support. Natural selection and little-understood components of the soil led some plants to develop lifting effects that negated the effects of gravity. Absorption of these elements in the diets of some animals led to the emergence of a lifting gland in these beasts. These animals can float in the air by shifting the orientation and strength of their lifting gland's power, using wing-like flaps of skin for propulsion, steering, and fine maneuvers.

Physical Data

MARS HAS a diameter of 4200 miles and a surface area of 55.4 million square miles. Mars has only 25 percent of the surface area of the Earth, but its dry land area is roughly equivalent to that of Earth. Although Mars is much smaller than the Earth, its surface gravity is only about 10 percent less. A 200-pound man would weigh about 180 pounds on Mars. The Martian atmosphere is a breathable one and is very similar to Earth's. Its most distinguishing feature is its lack of humidity, which reflects the overall dryness of the entire red planet.

The Martian day is 24 hours and 37 minutes long. This length is within three percent of the length of the Earth day, and most Earthmen find that the slightly longer day presents no problem in acclimatization. Although special pocket watches which keep Martian time are manufactured, most visitors simply use their own watches and clocks, adjusted to run three percent slower.

The Climatic Spasm

SOME FORTY PERCENT of Mars was once covered by seas. More than 50 million years ago, those seas dried up. The dry land, once filled with lush vegetation which rivaled that of Earth in variety and number, became a trackless desert, a barren wasteland.

About 35,000 years ago, a momentary spasm in the Martian climate melted the polar icecaps, driving the proto-Martians from their habitats on the seabeds. These gregarious beings found the spark of intelligence, and over several thousand years established first agricultural settlements and then mercantile cities all along the shores of the sea. As the Martians settled into the routine of agriculture, made possible by the abundance of water, they lost their ability to fly because they no longer needed it.

The Brifanoon—the Age of Water—lasted about 10,000 years. Canals were dug to carry water to the deserts and to expand agricultural civilization beyond the coastal zone. Ultimately, however, the climatic spasm that produced the Brifanoon (as well as the rise of intelligence on Mars) closed, and with it ended the Age of Water. Over a period of 10,000 years, the seas dried up once again. Every year, the shoreline moved farther out; every year, more canals were dug to carry water from the dwindling seas to the existing croplands. Eventually, it became clear that a coordinated effort was necessary, and a massive project was launched to channel water from the polar icecaps to the seabeds.

When the naBrifanoon—the Age of Drying—ended, the Martian civili-

zations had moved from their shore territories to the bottoms of the dry seabeds. Immense Grand Canals stretched from pole to pole, connecting individual city-states that arose at the junctures of the canals.

In the Martian deserts, the Grand Canals provided water for land up to five miles on either side. In the seabeds, the quality of the ancient seabottom soil made agriculture possible within 50 miles of the canals.

As with all things, however, Martian civilization reached maturity, then old age. Agriculture in the seabeds became increasingly difficult, and agriculture in the deserts became almost impossible. Populations gradually withdrew from the dying deserts, and as they did, the Grand Canals of the deserts fell into disrepair. Scattered city-states squabbled over water rights, and eventually even some of the seabed canals silted up and were abandoned.

Seasons

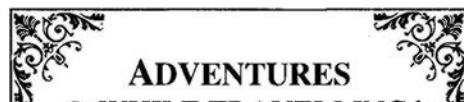
MARS ORBITS the Sun at a distance of 141 million miles and has a year of 687 days. The Martian year is divided into seasons determined by the level of canal water.

Flood is the short season in which polar meltwater rushes down the canal, and it marks the beginning of the growing season. It begins with the first swell of meltwater and lasts until the water level has again receded below the level of the canal promenades. Especially in regions closer to the poles, this rush of water overburdens the capacity of the canal, often reaching to the tops of the levees and overflowing to the crop-lands and fields beyond. Navigation is often difficult during this time.

During the season called *flow*, water fills the Grand Canals to within a few feet of each bank, but there is no surge, and navigation is easy and unimpeded. Flow continues through most of the year and is equivalent to summer and fall on Earth.

Low flow is the dry season on Mars. The icecap providing meltwater has almost completely melted and can provide no more water for the canals; water in the Grand Canals is reduced to a mere trickle. To enable traffic to continue during the dry season, low flow channels were cut into the bottoms of the Grand Canals to contain what little water remained. These low flow channels measure 50 to 100 yards wide and 30 feet deep, sufficient for almost any canal boat or barge. The channels remain full during low flow, but the rest of the canal bottom is almost completely dry. The low flow channel snakes its way along the bottom of the Grand Canal, first touching one bank, then angling over to touch the opposite bank some two or three miles downstream. This meandering of the channel is not random, but intentional, and serves a useful purpose, reducing the distance merchants must move their goods across the dry canal bottom before they can reach a bank.

Surge is a short season which occurs sometime during low flow. As the low flow season progresses in one Martian hemisphere, the flood and flow seasons are taking place in the opposite hemisphere. Some of the water flow from the opposite hemisphere makes its way, eventually, to canals on the other side of the world. The surge of water that does manage to make its way to the other hemisphere produces a temporary replen-



ADVENTURES

● **WHILE TRAVELLING** by boat along one of the canals during the dry season, the group is caught in an unexpected surge, severely damaging its boat, which sinks and forces them to proceed on foot.

● The party becomes part of a scientific expedition into the hinterlands of the old seabed to locate and excavate one of the early city-states or a settlement along a long-abandoned and forgotten Grand Canal.

ishment of water in the canal beds.

Martian seasons have predictable lengths, and history has provided each city-state along the canals with an accurate record which helps the citizens to foresee precisely when the seasons will change. But because the seasons are based on the flow in the canals, they change at different times for each city-state. Travellers not acquainted with local conditions risk being caught in the deadly flow of a surge.



A mishap during a surge.

RECENT HISTORY

FOR MILLENNIA, the various city-states of Mars existed, sometimes warring, sometimes cooperating, until a great leader arose to bring Mars into a golden age.

Seldon's Empire

ABOUT 5000 years ago, Mars produced a great military leader, the equivalent of Alexander the Great on Earth. Seldon II rose to power in the small mountain kingdom of Gaaryan (before the seas receded, it was the island kingdom of Gaaryan). Seldon's father had been a great ruler in his own right, and just as Alexander built upon what his father, Phillip of Macedon, had accomplished, Seldon could not have done what he did without the solid foundation built by his father.



Seldon I.

Seldon, fired by an oracle's prediction that he was destined to conquer the world, raised and equipped an army, built a fleet of canal ships, and sailed forth to the greater glory of Gaaryan. He confronted each city-state along his route of conquest with his powerful forces, and demanded obedience and allegiance. When he

got them, he incorporated the community into his growing empire, granting the local potentates complete autonomy as his representatives. When a city resisted, he leveled it. A few such object lessons and resistance became scarce. The city leaders who cooperated became the canal princes of Mars; virtually all Martian rulers today trace their power to those original oaths of 5000 years ago.

Seldon brought more than an army, however. Accompanying his forces were massive engineer barges that dredged the silt from the canals. To supply his forces, Seldon needed the canals in working condition. His engineers repaired broken locks, patched leaking levees, and cleared tangled settling pools. Where they could, they rebuilt pumping stations; where they couldn't, they built anew, although sometimes more crudely. By whatever means, Seldon rebuilt and reopened a third of the seabed's canals, bringing a rapidly burgeoning trade and renewed prosperity.

His empire controlled more than any in history, but Seldon was never satisfied, never willing to rest. Driven by the belief that he must conquer all of the world and that he was invulnerable until that time, Seldon took risks in battle which frightened his subordinates, but he was never touched and seemed indeed to have a charmed life.

Seldon's lifestyle eventually caught up with him, however. Refusing to listen to the advice of his physicians, Seldon drove himself ever harder in pursuit of his goal of world conquest. He was struck down at the height of his power by a combination of exhaustion and illness. On his deathbed, in his temporary

capital in Syrtis Major, his last words were an angry tirade against the circumstances that had prevented him from fulfilling his destiny. His son, Seldon III, succeeded him. The dynasty lasted nearly 3000 years, until Seldon LXIX, the last of his line.

Seldon III was less driven than his father and chose to consolidate and improve rather than expand the empire. Within a generation, long-forgotten mercantile skills were relearned, and merchant barges began regular runs along the newly opened canals. Local princes acquired fabulous fortunes from taxes and vied among themselves in the construction of ever larger and more expensive public buildings. Tribute flowed into the empire's coffers, and Seldon III built the first of many imperial palaces at Syrtis Major.

His successors proved to be a mix of competent rulers, geniuses, and buffoons, and the power and influence of Seldon's empire waxed and waned in accordance with who was on the throne. Since government was held together by personal allegiance, each canal prince had to renew his oaths when there was a new emperor. Strong rulers kept the canal princes in line, tribute flowed in, and the empire was strong. Weak rulers could not control the princes, and the empire grew weaker. The cycle continued, but there was always a central ruler to tie things together.

Seldon LXVIII died without leaving a clearly designated heir. The emperor's nephew was crowned Seldon LXIX, but his rule was not recognized by all of the canal princes, and the dynastic struggle between opposing candidates for the throne soon swept the empire into a century-long civil war which was its death spasm.

As imperial power withdrew from or was forced out of an area, the canals became the responsibility of the individual city-states along them. The canals of the poorer city-states soon fell into disrepair and became marshes or dry channels as the money and resources normally used for their maintenance went to buy and equip military forces. The war destroyed some city-states and impoverished others. By the time the war finally ended, civilization on Mars was a shadow of its former self, and the magnificent empire of the Seldon Dynasty was nothing more than a few dozen petty principalities, collections of city-states under some particularly capable canal prince. These principalities occasionally labeled themselves "empire," but these "empires" at their largest were but pale shadows of Seldon's mighty conquests.

The world remained this way for nearly 2000 years, until one morning when a tiny spacecraft from a previously unnoteworthy blue-green planet plunged down from where the moons dance.

The Present Political Landscape

BEFORE THE coming of humans, the major Martian city-states were in rough equilibrium, although a few of them stood out above the rest:

Oenotria: The Oenotrian Empire was a rising star in the region south of Syrtis Major, rapidly dominating the older principalities of Deltoton, Astrapsk, Iapygia, and Avenel in diplomatic and (occasionally) military campaigns of conquest. With the coming of the humans, and particularly with the establishment of a British Crown Colony in Syrtis Major,

the Oenotrians have been thwarted in their northern expansionist plans. The present war between the British and the Oenotrians was almost an inevitable result of the political and diplomatic climate in the Syrtis plateau resulting from the human settlement there.

The Boreosyrtris League: The Boreosyrtris League is not a civil entity, but a loose mercantile confederation with many similarities to the Hanseatic League of the later medieval period on Earth. The cities of the Boreosyrtris League have a complete monopoly on the production of *bhutan* spice, the prime British export from Mars (after liftwood). The league's headquarters is presently in the city of Umbra, where the major mercantile houses and princes of the cities of the league send their representatives to the League's Grand Council.

Astusapes: The Astusapes mountains are inhabited by High Martians, ruled by a number of greater or lesser kings from their "kraags," or mountain fortress-cities. The kraags are nearly invulnerable fastnesses, carved from the heart of one of the rugged mesas or cliffs that permeate the region. The highlands are also the source of liftwood, and liftwood and the kraags are the twin pillars of High Martian power. Raiding the trade routes to the north was a minor sideline that brought them into conflict with the Boreosyrtris League and the British.

The predominant high king of the Astusapes region was the master of Kraag Barrovaar, King Hattabranx, until a British raid weakened his power in February of 1888. Since that time, the area has been in a state of flux.

ADVENTURES

● **THE CHARACTERS** uncover a plot to penetrate the closely guarded *bhutan* spice fields of one of the cities of the Boreosyrtris League, in an attempt to obtain cuttings of the spice plant and break the League's monopoly on spice production.

● The characters try to obtain a load of liftwood for themselves and brave the dangers of the highlands.

Technology

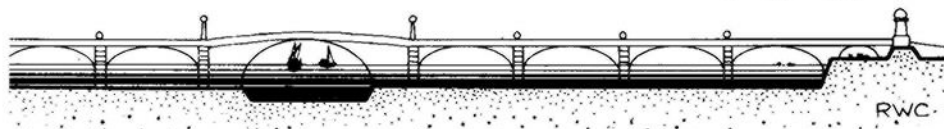
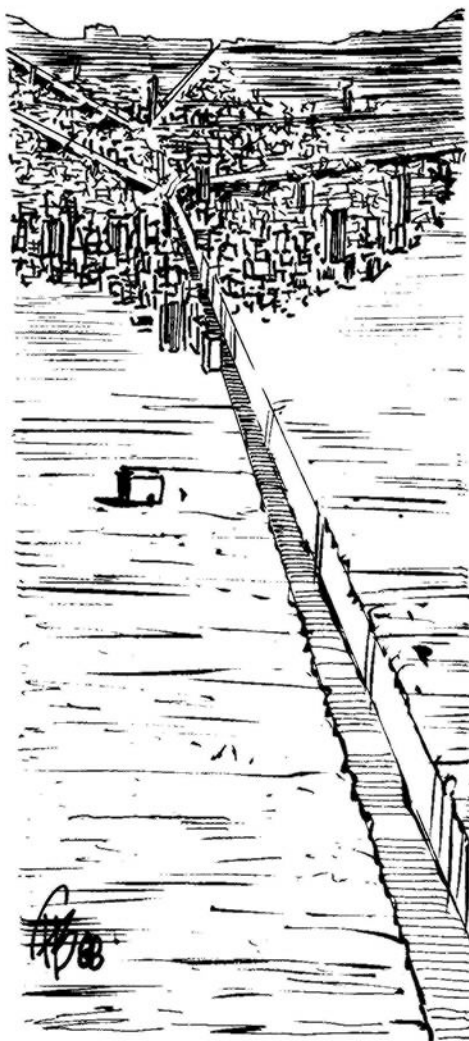
IN GENERAL, the Canal Martians are the most civilized and the most highly advanced technologically. It is they who manufacture gunpowder, cast guns (when they can get the metal), and build the largest and most advanced cloudships. Despite this, however, the Canal Martians possess a stagnant culture and have not made a single major scientific discovery in centuries.

Hill Martians are more primitive than Canal Martians, both in appearance and in technological advancement. They are still capable of relatively sophisticated creations in many different kinds of wood, although they lack the practical and artistic metal-working skills of the Canal Martians.

High Martians are a brutish lot, both physically and technologically. Although they can work metal, they prefer to obtain manufactured goods by trade or brigandage, or as tribute. As masters of the high places where liftwood grows, they have a monopoly on the most important item of trade on the planet.

THE CANALS OF MARS

WHEN MARTIAN civilization arose some 35,000 years ago, a temporary climatic spasm had melted large parts of the icecaps and flooded ancient, long-dry seabeds. On the shores of those newly refilled seas the great civilizations rose and flourished. Ten thousand years later, as the climate again shifted and the seas started to recede, the Martian civilizations struggled to reverse the flow of water. When that failed, they dedicated their energies to building the canals that would carry the melted icecap waters to all parts of their globe. It is those canals that today mark the surface of Mars.



Types of Canals

THREE TYPES of canals are encountered on Mars: the Grand Canals, the Petty Canals, and the Dead Canals. Each has its own role in the master scheme of canals and irrigation on Mars.

Grand Canals: The major Martian canals are the Grand Canals. The typical Grand Canal is about a mile wide and about 100 feet deep. In cities, the banks themselves are paved promenades serving as plazas, markets, and bazaars; in the countryside, massive earthen levees help contain flooding when the first rush of floodwaters comes in summer.

Water seeping through the bottom and sides of the Grand Canal creates an underground water table (an aquifer) which supports agriculture, forests, and animal life for miles on each side of the Grand Canal. In the ancient (and now dry) Martian seabeds, this aquifer may reach as far as 50 miles on each side of the canal; in what were once the dry land continents, the aquifer reaches less than five miles out on each side. The flourishing strips of land on each side of the canal (whether in ancient dry seabed or ancient continent) are called the banks; they contain the croplands, the orchards, and the pastures of Mars; all Martian agriculture is dependent on these banks.

Petty Canals: Branching off the Grand Canals are the Petty (or small) Canals. These small watercourses lead off the Grand Canals and extend

to the limits of the Grand Canal aquifer. They serve two purposes: irrigation and transportation.

Petty Canals carry water to the edges of the Grand Canal aquifer and help drain excess ground water back into the Grand Canal. Their primary purpose, however, is transportation: Canal barges venture off the Grand Canals to small farming communities to provide passenger, cargo, and mail service.

Dead Canals: Once upon a time all of the canals were vital, essential parts of the globe-encircling Martian canal network. Over time, however, some of the canals have fallen into disuse or disrepair; eventually they have died. These Dead Canals have filled in with blowing desert sand and become unnavigable.

Dead Canals, even though they are no longer passable for ships and barges, remain channels for water flow. Beneath the surface, water still runs in deep gravel-filled channels (albeit slowly) and creates an aquifer which supports plants and some animal life, although the fertile area is not as extensive as that created by a functional canal.

The Dead Canals are the highways of the Martian deserts. No longer carrying open water, their underground channels still support surface vegetation and occasionally provide a well or spring with cool, fresh water. The Dead Canals are the only means of traversing the vast, otherwise barren deserts on the ground.

Nomenclature

IN ORDER to better understand the function and construction of the canals, it is important to know the terms used in describing them. A canal consists of a channel which lies between two banks. Along the bottom of the channel is a deeper section called the low flow channel, which carries boats even when the canal is nearly dry. Beyond each bank and paralleling it is a long mound of gravel and soil called the levee. The stretch of land between the canal bank and the levee is the promenade, which functions as a road and a shore. Beyond the levee, the aquified swath stretches from five to 50 miles to each side of the canal.

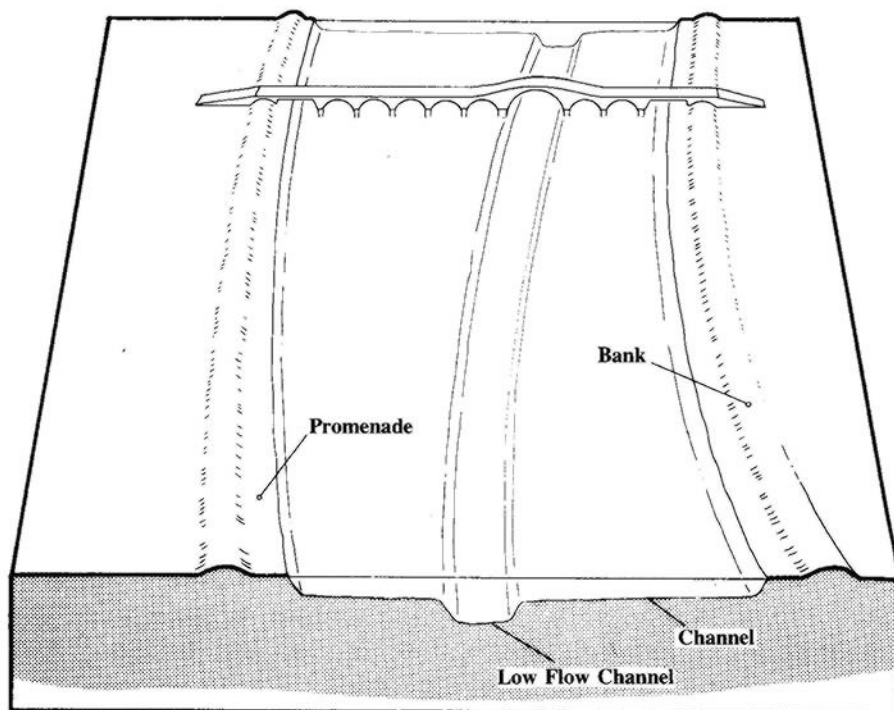
The typical canal components are shown in the accompanying diagram.

Canal Channels: The ancient Martians were masters of technology. They harnessed forces that defy the imagination to blast or burn the mile-wide Grand Canals through the deserts and the dry seabeds of Mars.[†]

Each Grand Canal has three possible water levels: flood, flow, and low flow; the names correspond to the Martian seasons of the same names (translated into English).

Banks: The banks of the canals slope steeply up from the bottom, usually at an angle of 70 degrees or more. Cut into these steep banks, however, is a constant series of accesses. Staircases allow easy descent to the current water level, or to the dry canal bottom when only the low flow channel is full. Docks (usually paired with the staircases) let boats

←—————→
AQUIFIED REGION EXTENDS 5-50 MI.



MARTIAN CANAL NOMENCLATURE

ADVENTURES

● WHILE THE characters are traversing a desert along the route of a Dead Canal, they discover that the oasis shown on the map has dried up or is surrounded by hostile Hill Martians, and they must seek out an alternate source of water or suffer the ravages of dehydration.

● A city-state has closed one of the Grand Canals to traffic. The players must be resourceful and find a way past the guard boats to continue on their journey.

● While visiting a bazaar on the bank of a Grand Canal, the characters are attracted to the canal's edge by a commotion going on near an unfamiliar barge which is attempting to beach itself there.

pull in out of the current. Broad shallow-sloped ramps cut through the banks to allow the launching and beaching of barges.

[†]Sir Basil Throckmorton of the Royal Society has calculated that a single double-turreted ironclad ship, suspended by liftwood floaters, could blast one mile of channel (one square mile of hole 30 feet deep) only by firing 250,000 one-ton projectiles at the rate of one per minute over the course of half a year. Since such an effort would take a fleet of 1000 such ships 1000 years to blast the 60,000 miles of Martian Grand Canals, and the industry required to produce the projectiles would outshine all of Earth's industrial might, the project was clearly impossible.

Professor John Smyth of Oxford has pointed out that "impossible" is clearly not the word since the canals do indeed exist.

Promenades: The flat edges of the canals are called promenades; in rural areas, the promenade is nothing more than a flat, sandy edge to the canal. In cities and settled areas, some promenades serve as markets (holding permanent shops and storefronts) or bazaars (for temporary merchant sites). Other promenades are broad plazas or parks adding to the beauty of the Grand Canals as they pass through the city-state.

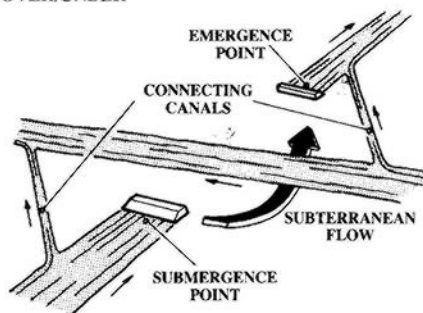
Levees: Rising above the banks of the Grand Canals are broad levees intended to contain the floodwaters of the Martian spring. In the countryside, these levees are little more than mounds of gravel and clay. In Martian city-states, they are more solidly and carefully built. On and behind the levees, the city's buildings rise in splendor.

Crossings: Innumerable bridges cross the canals of Mars. A few basic bridging principles are used to produce a great many different bridges that cross the broad Grand Canals. Almost all consist of a long causeway from each bank, meeting in a span that crosses the canal at the low flow channel. In order to accommodate barge superstructures and masts, the bridge either arches high enough to produce a 40-foot clearance above the normal flow waterline, or is constructed on a drawbridge or turnstile system.

Straits: Although the typical canal is about a mile across, there are places where this width must be reduced to 500, 300, or even 100 yards. The canal builders, in order to maintain the same water flow, were forced to dig the channels deeper at these points. These straits are often encountered as a canal passes through a rock escarpment,

through a city, or when two canals draw close together.

•OVER/UNDER



Locks: Locks help to contain the water at proper levels in the canals in spite of steep grades and slopes. Locks are placed at strategic locations along the Grand Canals and at the points where Petty Canals touch the Grand Canals.

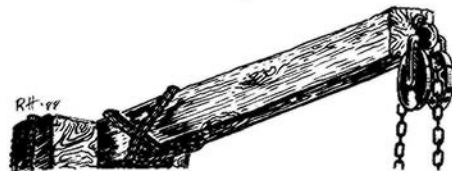
Cataracts: Water flow down over relatively great heights is, in many parts of the Martian canal network, left to gravity. The broad flow reaches an edge and simply drops the necessary distance before resuming the course of the canal.

Originally, deliberate cataracts were constructed with large pools above and below the falls and a reinforced lip for the cataract edge itself. Time and the force of tons of water have generally eroded the lip, forcing back the cataract edge in an uneven pattern. Debris below the falls makes the lower pool dangerously shallow and filled with treacherous rock fragments; erosion above the falls fills the upper pool with swift, shifting currents.

Keeping transportation in mind, the canal builders constructed by-passes around the cataracts. Small canals and stepped locks in series were common methods of providing boat channels, but other methods included crane points and slipways.

Aqueducts: In some locations, one canal moves down the center of a valley while another canal must cross the valley at a right angle. In such situations, the canal builders produced massive aqueducts which bridged the valley and carried the canal across the gap while allowing the other canal to pass below.

Cascade Pools: When water flows downhill, it accelerates. The farther it flows, the faster its speed becomes. There are sections of Martian canal where a long stretch of downhill slope would make the water flow unreasonably fast. In order to correct this, the slope is broken with a series of cascade pools: broad, flat pools that allow the water flow to be slowed to nothing before it enters the next section of sloped canal.

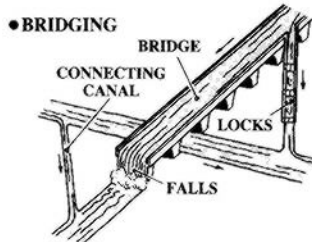


Crane Points: At certain points along the course of the canals, the designers found that boats and barges had to be transferred from one canal to another quickly and efficiently; they also found that for any number of reasons the normal system using locks would not work. In those situations, a crane was rigged to physically lift the boat or barge out of one canal and into another.

The simplest crane system moves the boat in one swing. Cranes are often employed at cataracts to lift or lower the boats the several hundred feet required.

More complete crane systems employ several (as many as 10) cranes installed in series; each in its turn lifts the boat and swings it some lateral distance and some vertical

distance closer to its destination. One such system in the Belgian Coprates shifts boats through eight pools cut into the sheer cliffs at the edge of the Ophir range. Each crane swings across a diameter of 220 yards and lifts a boat more than 500 feet. A boat travelling through this crane point travels more than a mile horizontally and about 4000 feet vertically.



Crossovers: When the flows of two canals meet, their waters may mingle or may be kept apart, depending on which system best handles the local needs for water. Crossovers allow most of the water in each canal to remain in that canal, while some surface water is exchanged in order to allow boats and barges to transfer from one canal to the other.

Slipways: Although water can drop vertically at a cataract, boats and barges need to move more gently. When the distance is not too great, gently sloped slipways are constructed to carry the vessels up or down.

Slipways may be either wet or dry. A dry slipway mounts the vessel on a roller chassis and drags it along a smooth stone-paved road from one point to another. A wet slipway allows a boat to float down a gently-sloped channel or to be pulled (by winches or beasts of burden) up the same channel.

Pumping Stations: Although the water of the canals generally flows under the force of gravity, there are many places where it must flow up

and over mountain ranges or down into valleys and back out again. The canal builders constructed strategically placed pumping stations to force water up against the force of gravity. Many different methods were used, and some can still be seen along the banks of the Grand Canals.

One type of pumping station is powered by volcanic heat which creates steam to drive water up a sheer rock shaft more than 2000 feet in height. Another uses massive carved stone waterwheels at a branch in a canal; the majority of the canal water proceeds downhill, but its force is used to divert a fraction up and over a rock escarpment and out into a desert canal.

Other pumping stations are more difficult to fathom.

One simply draws water up a massive underground channel and spews it out in a fountain more than 10 miles away. Explorers have noted extreme magnetic disruptions in compasses in the region; animals in watertight barrels have safely traversed the length of the channel with no apparent ill effects. But no explanation is forthcoming for the mechanism that still moves massive amounts of water after 25,000 years of operation.

The Memnonia pumping station, now in disrepair, once forced masses of water up the Gorgonum Sinus and into the desert beyond. Under the collapsed roofs and beams of the station can still be seen the immense cylinders, pools, and rusting conduits that once carried water up the valley. Local legends say that the ruins are haunted by the ghosts of workers who died trying to keep the station operating even as parts continually broke and could not be replaced or

ADVENTURES

● FOR SOME reason (an improperly marked chart, a bribed pilot, inattention) the characters' canal boat is directed towards a cataract instead of to the slipway or to the canal's locks. Heroic measures will be necessary to escape, and the boat might be damaged or destroyed in the process.

● The lockkeepers have been bribed by person or persons unknown, and the characters' boat is delayed or severely damaged during the transit of a lock or spillway.

repaired. When the station finally and permanently failed, it doomed the Grand Canal to Arsia Silva and Nodus Gordii to death and burial under the shifting sands of the desert.

The Aeolis pumping station, once filling canals that served Zephyria and Trivium Charontis, employed massive turbine pumps to force water up the mountain slopes. Their mysterious power source (which emits a deadly gas inside an immense chamber) has weakened over the millennia to the point that the turbines now turn only slowly and without the force needed to move water up the long conduits leading over the mountains.

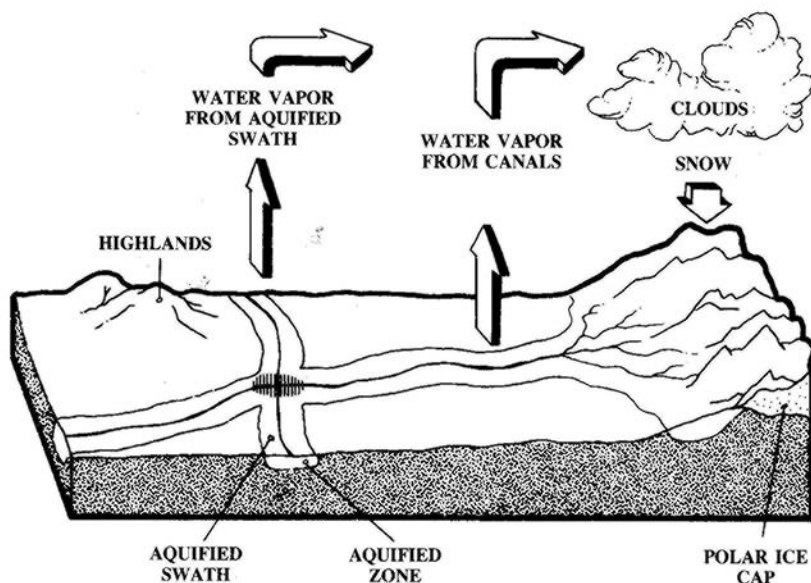
Other stations present equally mysterious mechanisms which no longer work: crumbled towers that once stood three miles high; sealed tombs filled with corrosive liquids; pumps using long slender threads on mounts and pulleys; equipment that obviously used electric current, but in ways that cannot yet be understood.

Settling Pools: At regular intervals along every Grand Canal, the banks of the main channel widen and the bottom deepens, creating a large settling pool. The bottom configuration is deliberately constructed to produce currents and eddies that will deposit debris, sand, and silt in the deeper areas where it will not obstruct the main channel.

Because the low flow season produces dry canal beds, the bottoms of the settling pools are exposed at least once every year. At these times, scavengers clear the dirt and debris from the pool floors as they search for salvage, precious metals that collect in the silt, and even food plants that grow in the lingering moisture of the soil.

Conscientious city-states send out work crews to clear the settling pools during low flow, aware that after

several seasons of no maintenance, the settling pools will start to clog the main channel and eventually ruin the canal itself.



THE MARTIAN WATER CYCLE

Destruction and Decay

CENTURIES OF use, misuse, disuse, and abuse have taken their toll on the canals of Mars. When pumping stations broke down and could not be repaired, vast stretches of canal were doomed to a sandy death. In some areas, levee repairs were neglected; eventually, the canals spilled over their banks to create vast impassable swamps or broad marshes. When conflicts between city-states halted transportation and commerce down specific canals, maintenance and upkeep were also halted; channels silted up and banks crumbled down.

After thousands of years, many sections of the canal network no longer have the finish and quality they had when they were new. Crumbled walls have been replaced with inferior-quality brickwork. Levees have been washed away and never replaced. New bridges have been built whose supports obstruct water flow in unpredictable ways. And sometimes the technology has simply not existed to replace or repair the thousand-year-old canals.

JULES VERNE

THE FRENCH science-fiction writer Jules Verne visited several of the Martian canals in the spring of 1886 and has proposed his own version of how the canals were constructed.

The grand canal blasters of the Martians best resemble a broad-beamed cargo ship suspended from a truss constructed of the Martian liftwood material. Strong cantilever girders above the hull suspend a large solar reflector which channels the rays of the sun into an orifice. That orifice, in turn, directs the solar light into an internal network of lenses and out the bottom of the hull, where it is directed toward the channel to be dug.

The modified and intensified solar rays heat the Martian soil into a kind of lava, part of which then boils away, while the remainder forms a strong, foamed volcanic glass lining for the watercourse. As this lining cools, it fractures into a sponge-like material that allows some of the water to drain into the local water table.

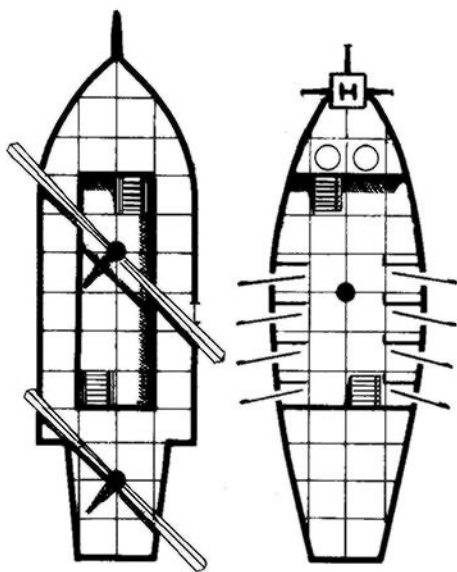
An examination of the Grand Canal through French Boreosyr-tis and of a section of the dry canal bed exposed by a winter sand-storm confirmed that the canal lining is a foamed volcanic glass. Decorative carvings in the lintels of the ruined temple at Cydonia picture just such an aerial vessel as I describe here as well.

Standard Boats and Barges

VIRTUALLY ALL of the facilities of the Martian canals are built to handle boats and barges of certain standard sizes. Vessels which exceed the standard dimensions cannot pass through the lock, cannot be picked up by the cranes at most crane points, and cannot pass beneath many bridges.

The maximum width for a canal boat is 55 feet; the maximum length is 220 feet. Maximum draft is theoretically 25 feet during flow; in practice, most vessels are built with a flat-bottomed draft of 15 feet or less. When a vessel mounts masts (for sails), they must be collapsible since about one bridge in 10 is fixed and has a clearance of about 40 feet.

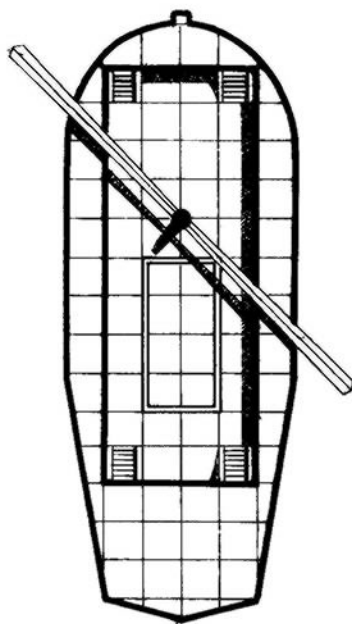
Martian canal vessels come in a variety of shapes and sizes. Typically, vessels are divided into boats (passenger carriers, utility, and patrol craft) and barges (flat-bottomed freight carriers).



Boats: Boats serve a variety of functions on the Martian canals. Their

configuration depends on that specific function. Boats have some form of propulsion. Merchant ships have sails because they are cheap and easy to use; military ships may have oars and rowers, or they may use some contrivance to transfer oarsmen's efforts to paddle wheels or underwater screws. Private ships often depend on a combination of sail and muscle power for propulsion.

Steam power is relatively rare; the expense of coal or wood is too great to justify steam's installation in watercraft.



Barges: A barge is a flat-bottomed freight boat. Built without a propulsion system other than a sail rig, barges carry cargoes up and down the canals. Where possible, barges are simply let drift with the current; where necessary, the sail rig is raised to move against a gentle current or to shift position within the main channel. On the Petty Canals and on some stretches of the Grand Canals, barges are towed by beasts of burden.

ADVENTURES

● AS THE PARTY is towed through a lock, the cable to the beast of burden breaks, and the party's vessel breaks loose, delaying the journey and potentially damaging the vessel.

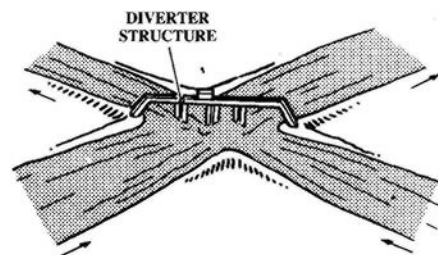
● The characters' vessel strikes a sandbar or other obstruction along an improperly maintained canal and is damaged or sunk, forcing them to continue their voyage on foot.

● The characters journey to a deserted city in search of a legendary canal-digging machine, in hopes of selling the technology or modifying it to their own purposes.

The Handiwork of the Canal Builders

THE CANALS of Mars are the greatest civil engineering project ever undertaken. No construction on Earth can even rival the canals' grandeur; no Earth construction project is visible from space the way the Martian canal network is. It is a testimony to the survival instinct of the Martians that they could undertake and complete their canal network; without it, Mars would today be a dead planet.

• MEETING



CITIES AND CITY-STATES

CITIES ON Mars tend to occur at the junctures of the canals. The junctures produce trade and serve as dependable sources of water for the inhabitants. The great cities of Mars were originally established by traders and merchants at the junctions of the Grand Canals. Wherever the Grand Canals met, some trade could be expected, and a city was the natural consequence. Over time, these cities have grown and prospered, benefiting from trade and from the cultivated land which surrounds them. A city-state consists of a central city and the arable land around it (including a number of lesser communities). The area controlled by a city-state also includes the arable land along its canals extending out as far as the military might and political acumen of that city-state allow.



Background

MARTIAN CITY-STATES are easily classified in size, power, and wealth by a simple indicator: the number of canals extending from the city. If a city is at the terminus of a canal, it has only one canal; such cities are typically small and weak. A city sited along a canal can count two canals extending from it, one in each direction; it can benefit only from trade passing through it. Cities situated at the crossroads of many canals—three, four, five—are progressively stronger and wealthier. They benefit from canal trade traveling in many directions. The strongest city-states claim seven, eight, or more canals extending outward from their territory, and are major centers of mercantile activity.

Mercantile trade brought wealth to a city-state, wealth that meant powerful armies to maintain or increase its territory, artisans and craftsmen to build ever larger and more spectacular buildings, and more power and prestige for the canal prince who ruled the city-state. Remember, however, that the canals came first—the cities followed.

The original Martian city-states were built during the Brifanoon (the Age of Water). They were wonders of Martian science, reflecting the bright optimism of an expanding, vital civilization. Clustered around the canal intersections were tall spires and massive towers that reflected the strength of Martian culture and technology. Planned cities made provision for residences, industry, transportation, and commerce, mingling them all with beauty and efficiency. Today, the planning and quality of the Martian city-states

can be seen even by the most casual observer.

Decline

THE TECHNOLOGY that built the vast cities is long vanished on Mars. When the final drying of Mars began, advanced technology became a luxury the Martians could ill afford. Labor, always in short supply, had to be committed to agriculture, and there were no longer large urban populations from which artisans, technicians, and engineers could be trained. As conditions got worse, populations deserted the least hospitable of the cities, and a general decay of civilization began. Once the canal system began to fail, this decay could not help but accelerate.

Remnants

THE SPECTACULAR Martian cities still stretch for miles beyond the canal banks. Their towers reach upward for hundreds of stories. Fabulous rooms filled with unfathomable devices remain even today. But the Martians make use of only a fraction of the assets their cities provide. Rather than climb unending stairs, they restrict themselves to the lower three or four stories of their massive buildings. Rather than travel long roads to the life-giving water of the canals, they restrict themselves to buildings closest to the waterways. Whole sections of Martian cities today lie empty, deserted, and unclaimed except by the local vermin.



Agriculture

AGRICULTURE IS the foundation of the city-state economy and is the font from which all else springs. The bulk of the population of all but the largest city-states is inevitably involved in farming or in some form of farm service. In most city-states, the land is actually owned by a small number of wealthy landowners and rented to individual farmers. Rents and taxes are paid in the form of a percentage of total produce, and a fairly laissez-faire policy over the operation of individual farms is practiced. The canal prince is usually (although not always) the largest landowner.

In some areas, mercantile clans have taken over vast tracts for the cultivation of some specific crop, usually on huge estates worked by slave labor (as is the case on the *bhutan* spice plantations of the cities of the Boreosyrtris League).

The Ecology of the City

THE ORIGINAL Martian city builders devoted their whole lives to constructing fabulous communities. They bent every effort to making their handiwork beautiful, efficient, and useful. With Martian technology at their service, their accomplishments exceeded even their own desires.

A vast city capable of containing and supporting millions of people must meet a variety of requirements. It must provide transportation, communications, sanitation, and power; people must have places to work, live, and entertain themselves. All of these requirements were met in the ancient Martian cities, but today much of the ancient technology is no

longer operational or understood. Probably because of this eventuality, the ancient builders made their cities as automatic as possible.

The essential details of each city are the same, although the architecture, layout, and style is as varied as on Earth.

Each Martian city is a self-sustaining system designed to handle all of the basic requirements of its population. Buildings have integral plumbing which conveys waste material deep into subterranean chambers beneath the city; gratings on the city streets do the same for animal waste. In these dark, underground chambers, bacteria reduce the waste to simple, fertile by-products which are then piped out into the agricultural land around the city. At the same time, combustible gases produced by the waste reduction are channeled into the city buildings where they fuel heaters and lanterns. Whatever excess there is is vented at the tops of the tallest towers, producing flames that serve as beacons for sky galleons.

The center of every city is dominated by the canals that flow through it. Along the canal banks, merchants set up their bazaars and markets; they are ready buyers for new goods arriving on incoming ships, and they are ready sellers to ships leaving for the next city-state down the canal.

ADVENTURES

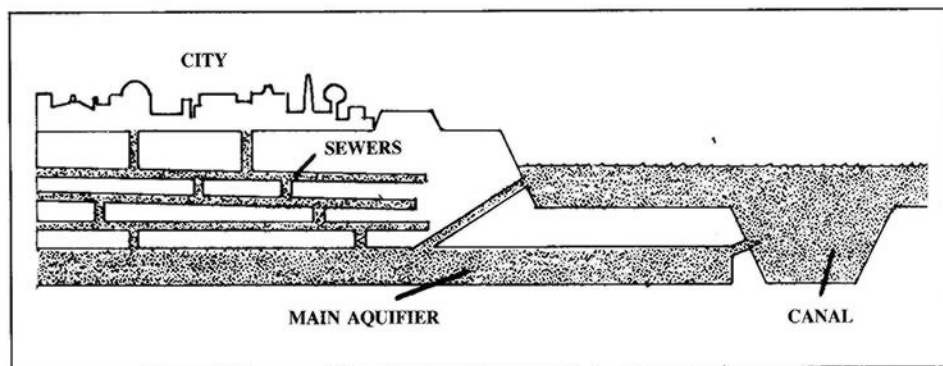
● THE CHARACTERS become trapped in the upper stories of a deteriorating spire by the collapse of a key staircase, necessitating heroic measures to escape.

● An intrepid inventor or archaeologist organizes a group to explore some abandoned Martian buildings in hope of rediscovering lost Martian technology or learning more about the Martian past.

● One of the group's enemies is holed up in, or has kidnapped someone and is hiding them in, one of the ancient spires.

Politics

EACH MARTIAN city-state rules as much of the territory which surrounds it as it possibly can. In practice, however, that rule extends to the edge of the arable belt neighboring the canal. Extending political rule beyond the cultivated area is an impractical proposition, and most city-states ignore it. City-states generally rule along the lines of the canals about halfway to the next city-state in each direction. Conflicts between city-states over the precise location of the boundary are almost a way of life in some areas.



SYRTIS MAJOR

THE CITY of Syrtis Major is situated at a major junction of several grand canals and was a major city-state and mercantile center for centuries before it became the capital of Seldon's empire. The remains of the Imperial palaces are still imposing, although most of them were abandoned long ago. One of the smaller palaces is now inhabited by Amraamtaba X, Prince of Syrtis Major, deposed by the British in 1880.

The City

THE MAJOR points of interest in Syrtis Major are shown on the opposite page and detailed below.

The Old Barracks: Originally one of the government buildings of Seldon's empire, it has been heavily rebuilt inside and out. The 5th Martian Foot is quartered here.

The New Barracks: This building was constructed by the British in 1887 and incorporates part of the old Martian Imperial Mint. The South Wales Borderers are quartered here, and this is the location of the main British arsenal on Mars.

contain the offices and quarters of the governor-general of the colony. The residency is the administrative center of the colonial government. The buildings are of human construction, and plants from Earth were imported to make the place as comfortable as possible for the families of Her Majesty's officials.

The Emerald Palace: Constructed completely of the pale green Meroe limestone (hence its name), the Emerald Palace is now the residence of Amraamtaba X, Prince of Syrtis Major. The Prince holds no power and is the last of his lineage. When he dies, his lands become crown property, and his children will be forbidden to call themselves "Prince" by the Treaty of Parhoon, which ended the Second War of Parhoon Succession and legalized the annexation of Syrtis Major (among other city-states) into the British colony. Amraamtaba's lands are already under the direct administration of the British governor, and his only income is a British subsidy. Amraamtaba quietly hates the British and plots against them endlessly and incompetently.

area is a mixture of new human-built buildings and older buildings of Martian construction. The compound is surrounded by a low wall and contains the diplomatic representatives of several nations. The following nations maintain embassies: the Empire of Germany, the Republic of France, the United States of America, and the Empire of Russia. The following maintain consulates, or ministries of less than full embassy status: the Kingdom of Italy, the Empire of Austria-Hungary, the Kingdom of Spain, the Kingdom of Portugal, the Kingdom of Holland, the Holy See, and the King of Siam.

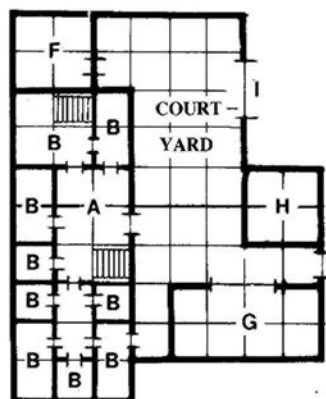
The Shipyards: This facility is the only fully equipped European shipyard on Mars, and is the only place where modern aerial gunboats can be built on the planet. Vessels of other nations must either be purchased from the British or imported in pieces and assembled.

The Harbor District: Located at the junction of the canals, the Great Harbor once serviced the fleets of canal boats that came to Syrtis Major. Now it has become a criminal quarter, home for every sort of low character and wretched ne'er-do-well imaginable.

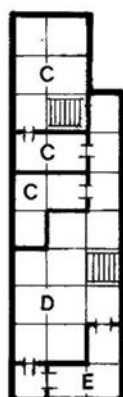
The Bazaar: This is the market for all the wealth and treasures of the world. Here, for a price, one can buy anything from a paper of dress-maker's pins to 100 Winchester Model 1886 repeaters.

The Explorer's Club: This rebuilt Martian building once housed the Martian canal excise offices under the Seldons. It now serves as a home away from home for members of the Explorer's Club. Membership is restricted to British subjects, and the dues are £5 per annum.

Ground Floor



Upper Floor



- A. RECEPTION
- B. OFFICE
- C. BEDROOM
- D. DINING ROOM
- E. KITCHEN
- F. GUARD HOUSE
- G. STABLES
- H. BLOCKHOUSE
- I. MAIN GATE

GERMAN LEGATION

The Residency: These buildings

The Legation Compound: This

Local Conditions

SEVERAL ELEMENTS of life combine to form the current local conditions.

Politics: Conditions are somewhat disrupted by the present war, and a spy scare is currently in effect. The majority of the population is still Martian, and it is feared that many of them harbor secret anti-British and antihuman sympathies. Some quarters of the city are not safe for humans in parties of less than four, and they must be heavily armed even in such numbers.

Crime: Crime is about the same as in London back on Earth: rampant. It is mostly crime against possessions, however. In most cases the criminals are more interested in knocking their victims unconscious and making off with their goods than in killing them. Cases of out-and-out murder of humans are still fairly rare, but people do disappear, es-

pecially from the harbor district.

Encounters in the Harbor District:

While in the harbor district, roll for an encounter once per hour (1 die for 5+). If an encounter occurs, roll on the table below.

Thugs can be Martian or human, and will not attack if they are outnumbered or outmatched (they will almost never have firearms). Thieves will attempt to distract the party with some ruse while picking a pocket or stealing some small, easily concealed item. A victim will either be found

ADVENTURES

● THE CHARACTERS save an old Martian being beaten by a gang of human thugs. In gratitude, the Martian presents them with a map to a hidden tomb filled with treasure.

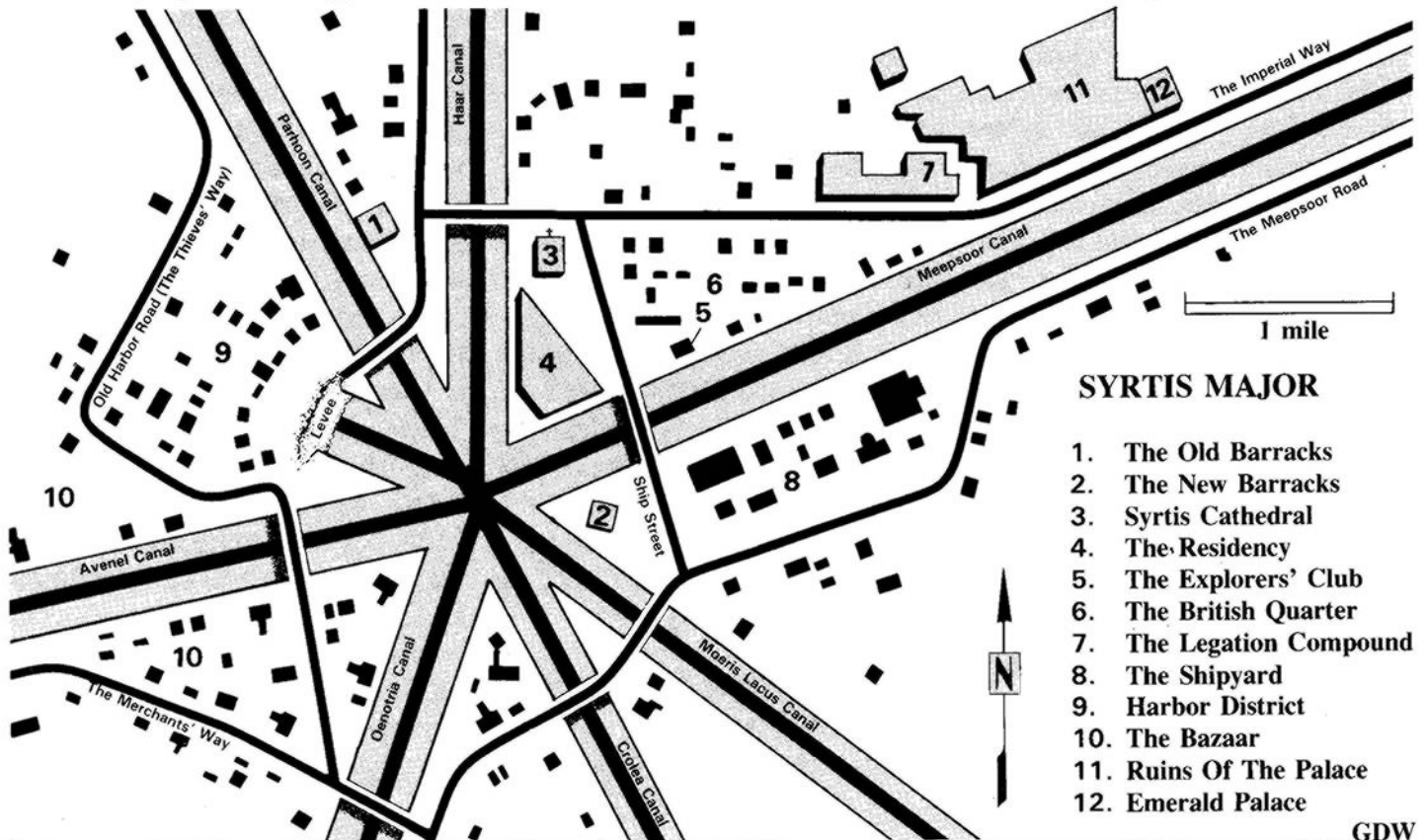
● The characters rescue the daughter of an American financier, who rewards the group with a sizable gift of cash (or an aerial flyer, at the referee's option).

under attack, in which case the players are honor-bound to intervene (the victim will be grateful for being saved), or lying wounded in the street (perhaps with a cryptic last message).

At the referee's option, the attack may be motivated by political considerations (anti-British activity by the Irish or Germans, or an anti-human attack by Ground Cleansers).

HARBOR ENCOUNTERS

Die Roll	Encounter
1	One thug attacks
2	1D thugs attack
3	One thug caught in the act
4	1D thugs caught in the act
5	Thief caught in the act
6	Victim



BRITISH MARS

THE BRITISH ON MARS

ONE OF the first men on Mars was British, and the British were to play a major role in the settlement and exploitation of Mars.

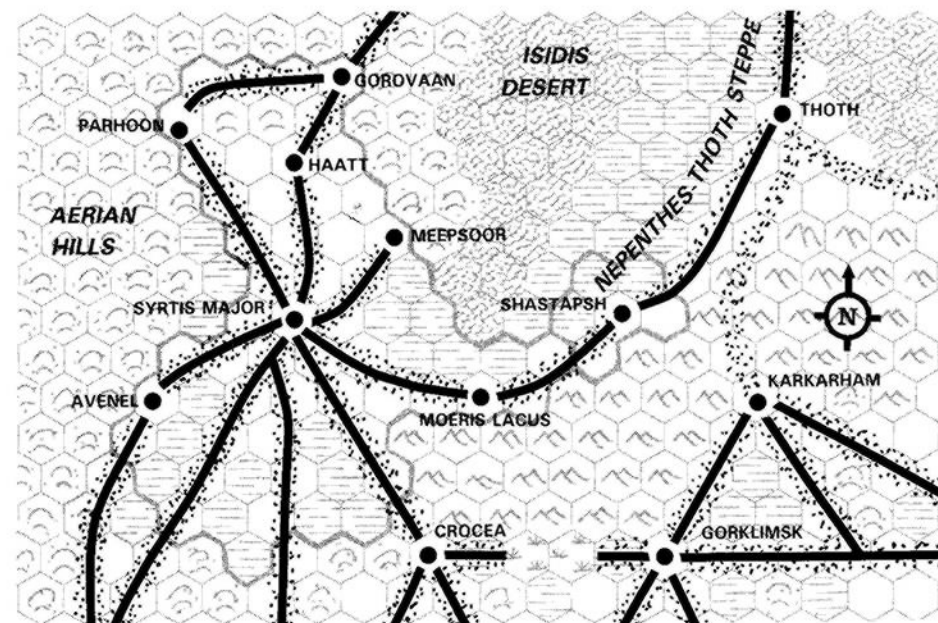
Beginnings

THE BRITISH first landed on Mars in 1872 on the Parhoon Plateau, about 500 miles northwest of the great canal junction of Syrtis Major. British relations with the Anwaak of Parhoon were cordial, and a thriving commercial colony was soon established within the city. Intrigue within the court, however, led to the assassination of the Anwaak and his son in 1878. Although the British stepped in and crushed the coup in less than a day, the next surviving heir was a three-month-old infant. Establishing the infant on the throne, Queen Victoria assumed the regency of Parhoon, to be administered by a British commissioner.

The first Regent-Commissioner to Parhoon was Sir Phillip Adelaide, and his first job was to reassure the population that Britain had no designs on their homeland. Fortunately, continuing bad blood between Parhoon and the powerful city-state of Gorovaan led to an invasion by the Gorovaangian Army and fleet, which gave Adelaide an external enemy to fight and gave the British and Parhoonese a common foe to fight together. The Gorovaangian War was a complete success, witnessed the combat baptism of the Parhoon Rifles[†], and resulted in the annexation of Gorovaan to Parhoon.

In 1880 war again broke out, and

[†]Now the First Battalion, Queen Victoria's Own Martian Rifles (The Parhoons).



this time saw British regulars in the field in significant numbers. As Great Britain was a formal belligerent at this time, the conclusion of the fighting saw Syrtis Major, Haatt, and Avenel incorporated as the Crown Colony of Syrtis Lapis. Parhoon and Gorovaan continued to be ruled by the Commissioner-Regent (a post now held by Lord Dundas), who was also the Governor of the colony. By 1882, both Moeris Lacus and Meepsoor were treaty dependencies of the colony with their rulers supported by British subsidies and the British controlling their foreign policy as well. The "punishment" of Shastapsh in 1884, followed by an overland campaign in 1887, brought that city-state reluctantly under British rule. In an incredibly short time the British had carved out a colonial empire of considerable dimensions. The British holdings remained roughly the same until the outbreak of the Oenotrian War in 1889.

British Colonial Aims

THE BRITISH have three main policies on Mars: first, to obtain con-

trol of a major source of liftwood; second, to ensure the security and continued existence of the Crown Colony of Syrtis Lapis, and increase its territory if possible; third, to ensure the continued stability of the Boreosyrtris League, maintain its monopoly over production of *bhutan* spice, and continue to be the sole purchaser of the League's spice production.

The prime threats to British aims are Germany and the Oenotrian Empire. Bismarck's colonial aims are diametrically opposed to those of the British, and the persistent attempts to destabilize the Boreosyrtris League and to weaken British control and influence there are a constant source of vexation for the British governor. The recent defection of a high German official, who brought with him details of German actions in the north, has been a tremendous victory for British interests, and temporarily defused the German threat. This is fortunate, as the simmering conflict with the Oenotrian Empire has recently boiled over into a full-blown war.

The Oenotrian War

THE RULING nobles of the Oenotrian Empire had long been irritated by the presence of the British in what they viewed as their rightful and private domain. Blocked in their plans of conquest by the British, the Oenotrian oligarchs were able to tolerate conditions until the raid on Kraag Barrovaar by British gunboats.

Kraag Barrovaar is the home of Hattabranx, principal chief of the High Martians inhabiting the Astusapes Highlands. The highlands had for centuries been the main source of liftwood for the whole Syrtis Major Region, including the city-states of the Oenotrian Empire. Hattabranx controlled the highlands and was willing to sell to all comers, until the coming of the Red Men changed things. Hattabranx, a follower of the Cult of the Worm, hated the red devils (as Martians call Earthmen) but loved the trade goods they could give him, goods that no Martian could offer. The situation would have remained relatively stable had not Hattabranx captured an American diplomat and his daughter bound for Oenotria. Hattabranx declared his intentions to kill his captives unless the

British (all red devils look alike, after all) met his demands, which included evacuating the planet, among other things.

With the full support of the American government, the British sent a raiding party to rescue the hostages, nearly killing Hattabranx in the process.

When the news of the raid reached Oenotria, the oligarchs were outraged. Although the Oenotrians have no great love for Hattabranx, the thought of Kraag Barrovaar—the greatest and most impregnable of the mountain fastnesses called *kraags*—being within the reach of British power meant that the High Martian stranglehold on the liftwood groves of the Astusapes might be loosening. The raid was obviously a thinly disguised assassination attempt, part of a greater British plan to annex the highlands and then take over the Astusapes.

It was humiliating enough that civilized people had to deal with High Martian thugs like Hattabranx in order to obtain liftwood. To be forced to deal with the red offworlders was unthinkable. The red devils had to be stopped. The surface of the world must be cleansed of every vestige of their presence, in-

ADVENTURES

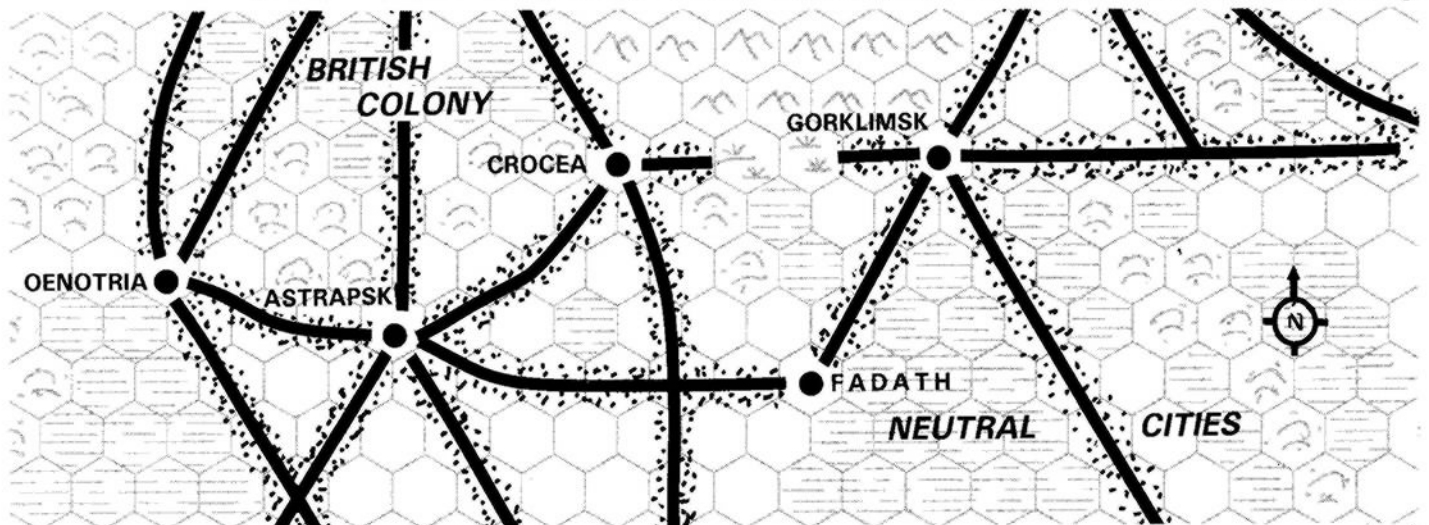
- THE CHARACTERS become caught up in the war, possibly as part of a military mission to try to break the stalemate.

- The characters are hired to guard a vital caravan of supplies to a besieged outpost.

- Taking advantage of the chaotic situation in the Astusapes Highlands, the characters try to obtain a large supply of liftwood without going through the High Martian middlemen.

cluding their very footprints in the sands.

So far, the superior British gunboats have managed to keep the fleets of Oenotria away from their holdings, and the thin red line of British and local garrisons has managed to hang onto the vital canal routes into the Crown Colony. Despite several resounding victories, however, the British have been unable to mount an offensive, and the Oenotrians are unwilling to risk any more of their scarce sky galleons in combat. A stalemate of sorts has been reached, but neither side can quit. Meanwhile, the rest of Mars looks on, waiting.



THE RED CAPTAINS

BY THE late 1870s a small supply of human ex-officers on Mars were completely captivated with its exotic culture and environment, so much so that they began making their way as private citizens. Most of these men combined their military and aeronautical skills with a natural bent toward adventure and soon became a small brotherhood of human captains of Martian ships. The Martians called them the "Red Captains" because to a golden-skinned Martian, a European's complexion is ruddy to the point of being red. They are accepted by the piratical Cloud Cap-

tains of the Shistomik Mountains as equals, albeit grudgingly, and are hated and feared by the High Martians of the Astusapes and further west. The British captains are the most numerous, and their outward independence does little to mask their basic loyalty to the crown. In many respects they occupy a place similar to that held by the Elizabethan Sea Hawks, and in a fairly short time they have largely displaced gun-fighters as the most popular subject for American dime novels. The most famous of the Red Captains, and the one who has come to symbolize their essential panache, is Frederick Gustavus Burnaby.

THE LEGENDARY FIVE

THE FIVE highest-scoring Red Captains as of January 1, 1889:

Frederick Gustavus Burnaby:

Steam Ram *Penelope*

27 prizes, 43,200 tons

Alonzo Quinton Freer:

Steam Gunboat *Baron Lortmore*

21 prizes, 34,900 tons

Frederick Armand LeBég:

Screw Ram *Gloire*

17 prizes, 21,400 tons

Michael Paget-Smith:

Gun Kite *Lismore*

15 prizes, 16,000 tons

Arturo Diego della Mora:

Screw Ram *Gato*

17 prizes, 12,200 tons



BURNABY

FREDERICK GUSTAVUS Burnaby was born to well-to-do parents in England and became interested in aerial matters at the age of 22, when he made an ascent in a balloon. The first trip to Mars in 1870 electrified him and, already an officer of the British Aeronautical Society, he became a frequent writer in the pages of *The Times* on aeronautical matters. In 1882 he became the first man to cross the English Channel in the steam-powered liftwood flyer *Vivian*, which he had designed and built at his own expense.

After serving heroically in the campaigns against the Mahdi in the Sudan, Burnaby fell out with the government and retired from the army. Actually, Burnaby was facing a forced retirement anyway due to continuing heart problems. Emigrating to Mars in the hopes that the slightly lower gravity there would aid his health, he was immediately drawn to the Red Captains and before long was commanding his own ship (the *Penelope*, named for the vessel lost at Khartoum). Idolized by most of the younger British officers, Burnaby was also soon accepted in Martian society as well. His facility with languages soon enabled him to add Oenotrian, Low and High Syrtan, and Umbran to his existing linguistic catalog of French, German, Italian, Spanish, Russian, Turkish, and Arabic. His unusual height (six feet, four inches) and massive 46-inch chest suggested a physical similarity to Martians that became the source of numerous crude, but good-natured, jokes.

Although he has only been on Mars for four years, Burnaby has come to symbolize everything good about the British Red Captains, and has become something of an elder statesman for them.

Anti-Piracy

WITH THE outbreak of the Oenotrian War, Britain's meager colonial forces on the red planet are locked in a war with the armies and fleets of the Oenotrian Empire. Although the British have won early victories in the air and have maintained the initiative, keeping aerial superiority requires skillful and continuous use of nearly all of their aerial gunboats. And aerial superiority is essential, as it is the only thing that keeps the Oenotrian host from crushing the handful of colonial troops and British battalions that hold the vital canal routes to Syrtis Major.

But while Britain's aerial squadrons are otherwise occupied, a renewed outbreak of piracy threatens the Umbran spice trade, forcing much of it to take the longer route through Alclyon. However, an uprising in Shastapsh, encouraged by the Oenotrians and possibly funded by the Germans, has destroyed the garrison there and closed the canal to traffic. This blockade has forced much of the spice trade to risk either pirates along the Nilosyrtis Valley or desert raiders along the old caravan trails across the Nepenthes-Thoth Steppes to Moerus Lacus, now the easternmost outpost of British power. While hastily raised new squadrons of the Meepsoor Lancers are hurried east to guard the caravans, for protection of the skies the British have turned to the Red Captains.

The Red Captains have been of vital importance in the pursuit of war. Using letters of marque and reprisal, the Red Captains have captured more than a dozen pirate vessels and driven the scum from the skies over several outlying city-states.

OTHER BRITISH SUBJECTS

IN ADDITION to those British subjects in Her Majesty's service on Mars (soldiers and diplomats), there are many others.

Merchants

THERE ARE many wonderful products on Mars, including liftwood, *bhutan* spice, precious gemstones such as the Moabite fire jewels, skins and leather from strange and wonderful creatures, and works of art and native craftsmanship. Millions on Earth are clamoring for these and other treasures. Likewise, the products of Earth are in equal demand. Metal is scarce on Mars, and the greatest demand is for good steel from the furnaces of Birmingham or Sheffield, in the form of blades, tools, and firearms (although it is the policy of Her Majesty's Government not to sell the most advanced weapons to Martians).

Explorers

ANY WILDERNESS cries out to be explored. There are those in every culture who simply must see what is on the other side of the horizon, and Mars has attracted such people by the thousands. Besides the lure of the unknown, fame and fortune also call. Much of Mars is unexplored, and who knows what treasure may lie over the next hill? At the very least, the prospective explorer gets to name his discoveries, a chance to become immortal that few can pass up.

Engineers

THE CONSTRUCTION of various human installations and major civil engineering projects (such as the repair of various canal facilities) has

ADVENTURES

● THE CHARACTERS become Red Captains and come to the aid of the Empire in its hour of need (making a tidy fortune in the bargain).

● The characters are hired as caravan guards or guides for a merchant party.

● The characters are sought out to provide special skills or local expertise for an engineering survey party from the University of Edinburgh.

● A missionary society hires the characters as bodyguards or guides for an expedition to some unconverted city-state.

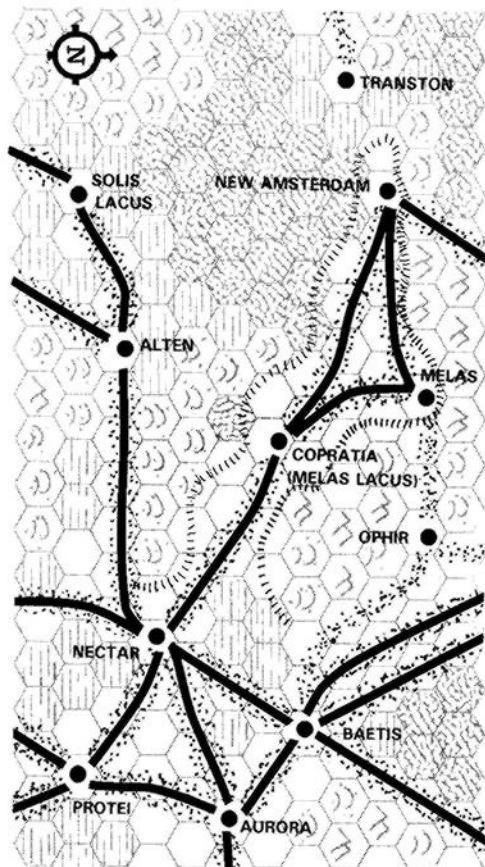
generated a demand for human engineers. In addition, other organizations on Earth (most notably the University of Edinburgh) have sent members of their staff to study the various works of old Martian technology, especially the pumping stations, in the hopes that some of their secrets can be brought to light.

Missionaries

THE MARTIAN MISSIONARY Society (Church of England), the Wesley Society (Methodist), and the Sisters of Saint Barbara (Catholic) have all sent representatives to Mars in an attempt to convert the inhabitants. Their reception has been varied, but their efforts have for the most part been unsuccessful. These organizations have achieved their greatest success among the inhabitants of the less powerful city-states, but cultural and societal barriers have proven extremely difficult to surmount. They persist, nevertheless.

EUROPEAN COLONIALISM

SEVERAL EUROPEAN powers besides the British have small outposts and numerous diplomatic missions scattered across the face of the planet. Also, commercial interests from the Earth are becoming well established, and a small but growing military presence is manifesting itself in some of the principalities allied to, or bribed by, the colonial powers on Earth. Aside from the British colony of Syrtis Major, there is only one other sizable colonial possession, the Belgian Coprates.



Belgium

KING LEOPOLD of Belgium was a one-man imperial enterprise. His was a small country, squeezed between France and Germany, and not much concerned with colonial ventures. The king, however, was; he wanted to be rich and famous, "rich"

being the crucial part of the phrase, and colonies (particularly extraterrestrial ones) seemed the best way to accomplish this aim. Leopold was a skilled publicist and managed to persuade the major powers to give him a free hand in the Congo in 1876. The Belgian presence on Mars was handled with slightly less skill.

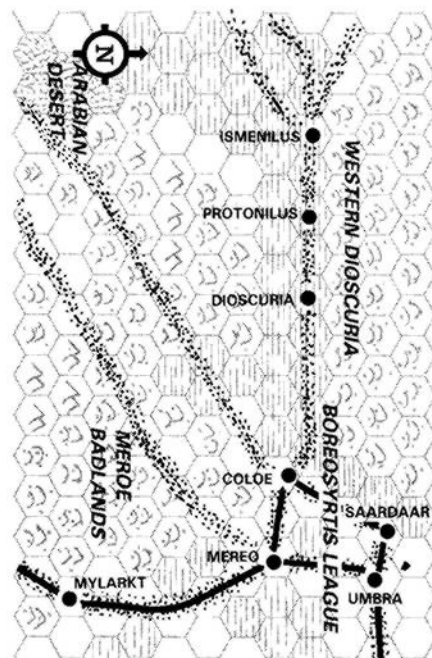
The Belgians first sent an expedition to Mars in 1876 and followed it with several more in short order. The early expeditions were ostensibly scientific and exploratory in nature but were heavily protected by Belgian soldiers. The purpose of the various expeditions was to study and explore the Great Coprates Rift Valley, and if the inhabitants of the valley were suspicious of the true intentions of the Belgians, subsequent events did little to contradict their suspicions. By 1884 there were frequent skirmishes between the Belgians and "Coprates"† up and down the length of the valley.

The Belgians protested vigorously the practice of American arms merchants selling the most modern rifles to the Coprates, a complaint that had little impact on American public opinion and none whatsoever on the arms trade. In any event, the American arms merchants could point with some moral justification to the fact that, insofar as modern arms might drive the Belgians from the valley, many would consider that a good thing. Although news reports

†The collective term Coprates has been applied by the Belgians to the inhabitants of the valley, although there are virtually no ethnic, linguistic, or cultural similarities between the inhabitants of the Upper and Lower Coprates Valley, the approximate dividing line being the shattered lowlands of Melas Lacus.

were scarce from the Coprates, those which made their way out indicated that Belgian colonial rule there was even more brutal and bloody than in the Congo on Earth, if that was possible.

By 1889 the Belgians had completed the conquest (for it was nothing less) of the Great Coprates Rift Valley, and an uneasy peace has settled there. The flood of refugees into Tithonius, Ophir, and Aurorae Sinus, and their frequent forays back into the valley to raid Belgian *gumma* plantations, threatens to spread the violence. All of this fans anti-human feelings throughout Mars and is used as further evidence by the Worm Priests, Ground Cleansers, and other fanatical groups of the need to drive the red devils off Mars forever.



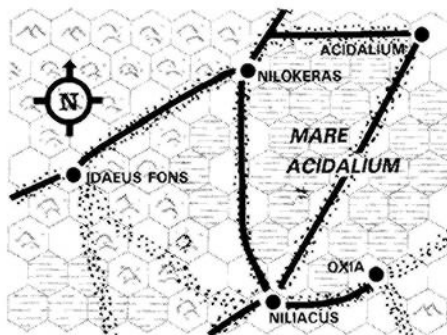
Germany

AFTER THEIR humiliation of the French in 1870, Germany's political star was on the ascendant, but it was having domestic difficulties. Bismarck sought extraterrestrial col-

onies for the national pride and prestige they would bring, as well as the boost that Venus provided to the German chemical industry, already one of the largest in Europe. They would also deflect internal dissent and provide a focus for the resurgent German nationalism that philosophers were beginning to expound. The income from Venus was gigantic, and its effect on the German economy was to relieve some of the burdens on the small taxpayer, but the German "man in the street" cared little for Venus—it was Mars that caught the imagination, and a major Martian colony was what the German people demanded.

Militarily, there was another, more important reason for a colony on Mars: liftwood. Without the aerial gunboats that liftwood made possible, Bismarck told the Kaiser, Germany would be as helpless against other powers as the primitive natives of Africa were against machineguns and magazine rifles.

Until recently, the Germans were unable to obtain any significant colonial possessions (their most extensive settlements to date are the trade stations in Western Dioscuria, and the military posts necessary to protect them). The Germans have two main aims on Mars: to acquire a stable and secure source of liftwood and to break the British monopoly on the *bhutan* spice trade, securing all or a portion of it for themselves in the process. To accomplish these aims, Germany has been financing British opposition movements inside the Syrtis Major Colony, attempting to destabilize the Boreosyrtis League (growers of the spice), and encouraging Martian anti-British secret societies.



France

THE FRENCH sought colonies on Mars to restore the national prestige lost by their catastrophic defeat in 1870, and the appalling corruption and chaos that marked the affairs of the Third Republic. The colonial party was, however, in a minority against the strident voices for *revanche*, the forcible return to France of the provinces lost in the Franco-Prussian War. To the Revanchists, any attempt to focus attention away from the eastern border was foolish, and thus any advancement of colonial adventures was likely to be met with a great deal of criticism.

Ambitious French officers followed a policy of *fait accompli*, acting on their own, without instructions from Paris. National pride would prevent the government from giving anything back, and promotion and fame would be showered on the successful. The fact that colonies were administered by the Colonial Department, while soldiers took their orders from the rival Ministry of the Marine, only served to complicate matters.

French presence on Mars is limited to the Idaeus Fons region, but France's influence is widespread. It is only the lack of political support on Earth that keeps the French from claiming a larger area on the red planet.

ADVENTURES

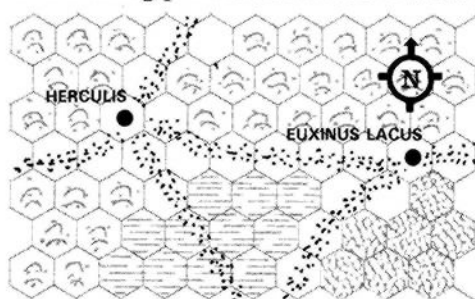
- THE CHARACTERS accompany a mercantile or scientific expedition as bodyguards, guides, or part of the expedition itself.

- The characters uncover some nefarious anti-British political scheme and foil it.

Japan

THE JAPANESE are on Mars for the simple reason that, still smarting under the humiliating Treaties of Commerce and Navigation of 1858 (which gave foreign nations a variety of privileges), they want to prove themselves a "modern" state and a power to be reckoned with. Clearly, the only other alternative is to go the way of the fast-fading Manchu Empire, now being slowly consumed by the major powers. In a period of 20 years, under the slogan "A rich nation, a strong army," Japan has developed into a vigorous and increasingly aggressive nation, taking advice from established powers and adding a samurai will of their own. Japan is clearly about to join the small circle of "dominating influences."

Japanese presence on Mars is still small and mostly limited to the experimental scientific research stations and trading posts at Euxinius Lacus.



America

AMERICAN INTERESTS on Mars were twofold. First of all, and most importantly, there was a great deal of money to be made on Mars, and Americans have always managed to show up whenever there was a penny to be squeezed out of something. Second of all, and only slightly less important, there was the question of national prestige. Edison was an American, after all, and had led the way. A country like the United States could not afford to be left behind scientifically or militarily.

Americans concentrated in no one place on Mars. Indeed, as one British administrator put it, "The bloody Yanks are like mice...they are everywhere, and you can't get rid of them!" American merchants can be found almost anywhere there are human settlements, and American diplomatic legations are maintained at every major human colonial enclave. The main military presence is the contingent of U.S. Marines with the legion at Syrtis Major.

American merchants will sell Martians anything, up to and including modern repeating rifles and ammunition, a fact that is a sore point with most nations, but one which the Belgians are particularly disturbed about.

Russia

THE RUSSIANS are on Mars, it seems to most observers, because the British are. Russian presence on the red planet is evidently a continuation of the Great Game, and many assume that the Czar's ministers, in their obtuse way, intend to use Russian presence as a bargaining chip for the lands they really want in Asia—per-

haps as guarantees of a free hand in Persia or Sinkiang.

Others, however, impugn darker motives to the Russian presence: The *Ochrana* (the secret police) has already transported a hundred or so political exiles to Hecates Lacus, and it would seem that more will soon follow. Russia does not seem to be in a position to exploit the resources of Mars, and it has a vast, ill-explored region of its own on Earth to occupy it for years to come. What Russia does have, however, is a very large army, an autocratic ruler, and a reputation for dealing roughly with primitive peoples. It is not for nothing that Kipling calls the Russian Empire "The Bear that Walks Like a Man."

INTERNATIONAL RELATIONS:

A BRIEF SUMMARY

THE 1880s were a period of relative stability. There had been no war between European powers since the Franco-Prussian conflict of 1870-71, and the economic and political power of the British Empire dominated the international landscape. Here is a short summary of general conditions, by nation:

Great Britain

THE BRITISH EMPIRE was powerful enough to do without formal allies during this period. France was a historic rival, while the Russian Empire was regarded as a natural enemy, the war scare over the Russian-Afghan border incident of 1885 having barely died away by 1889. The Germans were generally admired until German actions on Mars brought about a cooling of the relationship between the two coun-

tries. The Japanese were seen as very capable (for Orientals). Britain was the traditional guarantor of Belgian neutrality, but this did not apply to the Belgians' demented king's private adventures in Africa or on Mars. The Americans were well regarded, being fellow Anglo-Saxons. The feeling is widespread that they will do quite well for themselves once they lose some of their brashness. Kitchener is said to have remarked to Edison, "You Yankees beat all creation," and this fairly well sums up the British attitude.

France

FRANCE HAD no real allies entering the 1880s, largely due to the incompetence of Emperor Napoleon III and the machinations of Bismarck. France's defeat by Germany had brought down the Second Empire, but the Third Republic which succeeded it seemed no better. Germany, expecting a renewed conflict over the provinces seized in 1871 (Alsace and Lorraine), had a complex web of alliances, and it was clear that France must also acquire allies if disaster was to be avoided. From 1880 on, French bankers had been investing in Russia, and, while the two nations had little in common, both were looking for support. An informal friendship was beginning, which, by 1889, looked set to blossom.

Germany

GERMANY SAT at the center of Bismarck's web of schemes. The Chancellor of Germany, Otto von Bismarck, was an old hand in the chess game of international relations: His cynical system of alliances, threats, and bargains had overseen

the unification and preservation of the Prussian-dominated German Empire. The "Iron Chancellor" had given Germany allies, ensured that France had none, kept a lid on the Balkans—a region of volcanic instability—and made sure that the British had no reason to be concerned with the continent.

The League of the Three Emperors, designed to isolate France, was followed by the stronger Dual Alliance of Germany and Austria-Hungary in 1879. The ancient enmity between Prussia and Austria was broken by focusing Austrian attention eastwards to the crumbling Ottoman Empire in the Balkans. The Italians joined the Alliance in 1883, but it was too good to last; Austrian hopes clashed with those of Russia and Italy, and Berlin had to play mediator. By 1889 the alliance was crumbling, and only Bismarck could hold it together.

In 1888, a new factor entered the equation: Kaiser Wilhelm II. For a time before his accession, it seemed that he and Bismarck were constantly at loggerheads, but more recently it seems that the main bone of contention—national prestige and the need for colonies—has been done away with, and the new Kaiser and the old Chancellor have made their peace.

Russia

AT THE beginning of this period, the Empire of the Czar had a set of treaties which, in the light of later developments, seemed to bear no relation to its needs. Bismarck had played on the fear of revolution to bring together Germany, Austria-Hungary, and Russia in the League of the Three Emperors in 1873 (renewed in 1881 and 1884). The

alliance had not helped when the Russian victory over Turkey (in 1877) was challenged by Britain and Austria, and it was clear that Austrian and Russian ambitions in the area were on a collision course. Certainly Vienna's stand alongside the British promised no good. Britain was clearly the Russians' primary enemy, especially considering Britain's selfish attitude towards central Asia; German friendship began to seem less sincere, and the Japanese were a growing threat in the Far East, where Russian territory was highly vulnerable. In the light of these factors, France, republican or not, appeared a potential ally.

America

AMERICA HAD no interest in the complications of European alliances. There was some sympathy for France as a fellow republic, ally in the Revolution, and donor of the newly erected statue of Liberty Enlightening the World. Germany attracted admiration because of its drive and vigor. The British were regarded with a mixture of profound admiration and tremendous annoyance, as befitted an estranged family relationship (mother country, and all). Mainly, however, Americans considered the old European states as moldering relics of a bygone era, on the way to collapsing under their own weight.

Americans had no colonial interests to speak of (although they tended to regard Central and South America as somehow "theirs"). American merchants were everywhere, and American diplomatic policy was for what they called an "open door" policy of free trade and cutthroat competition.

ADVENTURES

- HER MAJESTY'S Government hires the characters to uncover a spy or to deal with one already discovered.
- The characters accidentally come across a letter of extreme diplomatic importance and become the target of assassins because of it.

Japan

JAPAN WAS interested in proving itself in the eyes of the world, and most of the great powers other than Russia approved of the modernization of the island power. The British Navy was used as a role model after an incident in the 1850s when the British fleet bombarded Kagashima after the murder of an English merchant, to "teach the Japanese a lesson," which, indeed, it did.

The Japanese had a special affinity for Germany (whose authoritarianism evidently appealed to similar factors in the Japanese mind), and the latter's political structure heavily influenced Ito Hirobumi in writing the constitution of 1889.

Belgium

BELGIUM WAS "an independent and totally neutral state," according to the Treaty of London of 1839, her neutrality guaranteed by the five signatories to that treaty. King Leopold was concerned with keeping on good terms with everyone, as befitted a man whose kingdom was the traditional "cock pit of Europe" and whose business methods could not survive close scrutiny by any jury.

MARS' TREASURES

MARS IS a world of a great many resources, and it is not possible to outline all of its products here. We can, however, discuss the more interesting and valuable treasures of the red planet.

Liftwood

THE GREATEST single resource that Mars produces is liftwood—the fabulous sapwood that carries within it the ability to defy gravity.

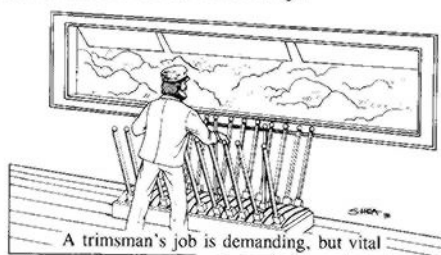
The Martians have always used liftwood. The earliest civilized Martians built simple rafts of liftwood to carry heavy loads or to travel into the trackless wastes. Their famous sky galleons are utterly dependent on liftwood for their flying abilities. But liftwood is scarce and expensive. The small liftwood trees take years to reach maturity, and they only grow on remote mountain plateaus. Liftwood trees grown in cultivated valleys or along the Grand Canals are outwardly identical, but they lack the vital spark, the essential combination of nutrients and minerals available in the highlands.



Gathering liftwood is a dangerous proposition. First, a suitable grove must be located. Second, an expedition must be mounted to reach the grove and cut the mature trees. Immature trees quickly lose their lift and are a waste of time. Third, the expedition must safely escape back to civilization, avoiding or fighting the High Martians who invariably

consider the trees to be part of their territory, for harvest and sale by themselves only.

Liftwood is a natural product, saddled with the imperfections and variations that natural resources always have. Using liftwood is not a simple process. A liftwood log is a knotty, gnarled piece of wood infused with a sap that imparts its lifting properties. But those properties are not uniform or easily understood. In a specific piece of wood, the sap may exert lift in one direction, but not in another; when properly oriented, the wood produces a great deal of lift, but when twisted even a few degrees, the lift is reduced, sometimes dramatically.



Using liftwood requires careful construction. Liftwood panels are mounted on pivots or in gimbals which allow them to be adjusted for proper lift. Cables connect each liftwood panel with the trimsmen's levers. The trimsmen is responsible for maintaining the proper balance of liftwood throughout the vessel. By twisting individual panels, ship lift can be increased or decreased, and the ship rises or falls.

Liftwood deteriorates as its sap loses its vital power. A good, seasoned piece can last up to 10 years, but over time every single piece must be replaced. The magnetic field of Venus, it was discovered, causes liftwood to decay completely within a few days, and the first expeditions there were stranded because of this.



Liftwood grows only in small groves on remote plateaus in certain high mountain ranges, called liftwood highlands. These are the same highlands inhabited by the savage and bestial High Martians. The result has been a constant conflict between the savages of the highlands and the shipbuilders of the canals. There is never enough liftwood to meet all of Mars' needs. Expeditions to buy logs from the liftwood highlands must be large and well-armed. They are vulnerable to attack at any time and from any quarter by those who wish either the valuable trade goods that the High Martians demand (attacking the caravans on the way in) or the liftwood itself (attacking on the way out).

Ships of ordinary wood sail the seas of Mars, while cloudships of liftwood fly the skies. Some explorers have thought that all transportation should be by cloudship, but the practical matter is that cloudships are expensive and liftwood is rare. Canal ships are a cheap, simple alternative to cloudships.

Bhutan Spice

BHUTAN IS a flavorful and mildly narcotic product of the *bhutan* plants, which are presently grown only by the cities of the Boreosyrtris League. The plant itself is little studied, because of the difficulty of obtaining samples. The *bhutan* plantations are fenced in, heavily guarded, and worked by slaves. Access to

a plantation has only been granted to a few humans, and then only for a few hours under heavy guard.

The spice is in very high demand, both on Mars and on Earth, and is high-priced. The British have managed to conclude treaties of protection with the Boreosyrtris League, and now are the sole dealers in the spice, a fact that angers Martian and non-British human alike. Several nations, Germany in particular, have made several attempts to break the British monopoly on the spice trade, but they have not been successful.

Gumme

GUMME IS a substance similar to rubber, but which retains its pliability and elasticity at lower temperatures, down well below freezing. It is also much less likely to break down chemically under high heat, which makes it usable under a wider variety of circumstances than rubber. Like rubber, *gumme* is a plant sap, but unlike rubber, *gumme* is not easy to cultivate. Its leaves are razor-sharp, and the bark is incredibly tough. The sap itself is a skin irritant before processing (to Martians, anyway...humans do not seem to be affected as severely). *Gumme* occurs only in the area called the Coprates and was not a popular crop in the time before the coming of humans. The Belgians, whose seizure of the Coprates area was perpetrated largely in order to establish large *gumme* plantations using forced labor, control virtually the entire harvest, as other nationalities are unwilling to use the Belgian methods of agriculture.

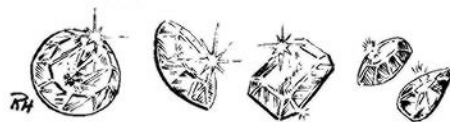


Products of Belgium's *gumme* plantations.

Moabite Fire Jewels

THE PLAINS of Moab are the source of one of the most prized precious stones on Mars after the diamond: the Moabite fire jewel. These stones are found in alluvial deposits throughout the Moabite plains, washed there by titanic floods at some time in the distant past. Until heat-treated they are colorful, but not spectacular, and can easily be passed over by the inexperienced traveller.

When heated in a fire, and suddenly cooled, however, the stones fracture into millions of internal crystals. Most stones shatter into useless shards. About one in 10 keep their crystals interlocked but become translucent and refract light in patterns of breathtaking beauty. Easily worked with files and gravers before fire treatment, they can be shaped into almost any pattern desired, and Martian craftsmen are capable of astoundingly beautiful works of art.



Jewels from the mines of Meroe.

Minerals and Metals

METALS ARE scarce on Mars, with copper, tin, zinc, gold, and silver occurring with about equal rarity. For this reason, any metal object on Mars is prized (although gold, because of its color, is valued the most), and chieftains and kings of the High Martians can often be found with copper as well as gold and silver ornaments.

Petroleum is extremely rare and has never been found in economically recoverable quantities. Coal is present in some areas, and is the fuel of choice for powering steam engines such as those on aerial flyers.

ADVENTURES

● **GROUP MEMBERS** are offered a map to the location of a hidden tomb, possibly by their guide (or by Kaaraahn Kaashneek—see page 42), who obtained it from a very reliable cousin.

● The group journeys to the Plains of Moab in search of fire jewels or to the highlands to obtain a cargo of liftwood, running into numerous dangers along the way.

● The group is with a trade caravan and is ambushed.

Rumors and Reality

AS ALWAYS, there are stories of great ruined temples inlaid with gold and precious stones, and rich treasures hidden in the tombs of ancient kings. The Noachis Highlands are supposed to contain a volcano that spews diamonds from the depths of the planet, and the Tharsis Plain of Lunae Lacus is said to be the site of a source of emeralds and sapphires of unbelievable size.

These and hundreds of other rumors may be as insubstantial as the Martian winds, but unbelievable finds (such as the tomb of Jemba-thranx III found in the southern mountains of Moab, which yielded over £24,000,000 in treasures) occur often enough to fuel the dreams of a continent full of fortune seekers.



Relics of a vanished civilization.

THE SKRILL RIDERS

IN THE ruddy wastelands far to the west of Syrtis Major live a people not restricted to the gashant beasts for their mounts. These people have perfected the handling and husbandry of a beast more ferocious, more deadly, and far more terrifying—the razor-taloned skril of the caves and crags of the Martian highlands—to rule what would be the broadest domain on the blood-red face of Mars, if they had a single ruler.

The Queln—People of the Sky

THE DATE of the first mastery over wild skril is a matter undocumented in the prehistory of the Queln (as they call themselves), a people whose song-tradition harkens back to the time before Seldon's empire. According to Queln tradition, one night the Bright Moon got drunk

and was captured by a Queln warrior when she flew too low. In return for her release, the warrior forced her to teach him the secret words of control over the skril, a secret which his descendants retain to this day.

As a society of warriors mounted upon fast, sleek beasts of the air, it is only natural that the Queln riders would become raiders and plunderers, preying upon the canals, caravans, and city-states of their civilized brethren. Attacks by war-parties of skril riders upon an unsuspecting canal city have been the Queln child's dream and the canal child's nightmare for many centuries.

Queln bands base themselves in practically every one of the remote mountain regions of Mars where their mounts can breed and feed on the shrubs vital to maintenance of a functioning lift gland. Their range, however, is vast, and raiding parties

can be found almost anywhere from the rugged peaks of the Noachis Mountains to the vastness of the Plains of Aeria. Especially troubling are the groups that have settled into the Astusapes Highlands in the last year; their raids have begun to take a significant toll on the spice trade. Some suspect the hand of Bismarck is involved in this.

Society

EACH CLAN (consisting of several dozen family groups) is governed by a skylord (*rithall*) and his council of elders. The skylord gains his position through continued championship at the games of succession, held once every year. Should he die in office, his successor is appointed by the seven elders, who hold their positions only by virtue of age. As with most Martian societies, females are not allowed access to positions of power.

All young males are trained in the use of the *khivatt* (a short spear or javelin) and the riding of the skril after they have lived through their eighth flow. This training is brutal and enforced without pity. Only three out of 10 males live through the two-year training period. Once they are finished with their training, young males are encouraged to practice their skills on the hunts, which can take the males far and wide across the desert face of Mars in search of herds of *ruumet breehr* or the more elusive and prestigious prey, the *eegaar*. Organized hunts led by the skylord take place once per season and involve virtually the entire clan's warrior population. Outside of hunting and warfare, the male Queln have very little function in the clan.

RIDING SKRILL

A HUMAN may find himself in a position where he either wishes to or is forced to ride a skril. Skril mastery is a lifelong achievement for a Queln rider, but the basics can be mastered by humans. A character can learn skril riding in one of two ways: through study or "stone cold."

Study: Only the cage masters or a warrior can teach a human the art of skril riding, and they will only do so if he has proven himself worthy. Flying Skril Riding is a cascade skill under Riding and begins with level 0. To attain the next level of skill, roll a Difficult task with Riding skill dice, modified by Strength. Roll once per month spent in intensive training; no other activities may be undertaken or the opportunity to roll is lost. Humans may attain a maximum skill of 4.

"Stone Cold": A human who finds himself in a position where he must ride a skril without training does have a remote chance of success. Only a skril which has been trained may be ridden—a wild skril will attack. To approach and mount the skril, the human must roll an Impossible task with Riding dice, modified by Agility. He must then roll a Difficult task with Riding skill dice, modified by Strength, every combat turn to get the skril to fly. Direction of flight will be random. In a combat turn in which the task is failed, the skril will simply land.

Females are in charge of preparing the hunted animals for nightly feasts and gathering wild roots, berries, and other plants to round out the Queln diet. In the seemingly endless desert, such gathering would be all but impossible without the assistance of the skrill. Older beasts, no longer fit for war or the hunt, are turned over to the females.

Taming and Use of Skrill

ONCE IN captivity, the skrill will not voluntarily reproduce, so every animal required by the cage masters must be captured after birth, taken away from its ferocious mother, and brought back to the cages. Missions to gather young skrill are among the most dangerous that a young rider can face.

Once captured, the young skrill are penned and blinded by hoods over their heads. They are fed gathered leaves and shoots and allowed to exercise in the larger pens or tethered to the ground. After several months the skrill attain their full size, and their blindness brings them out of their wildest state—however, about one in three skrill are never tamed sufficiently for use. These animals are ritualistically sacrificed.

Skrill are commonly mounted with a saddle and stirrups. The saddle has complicated strands of hide which are permanently drilled into the animal's jaw; these are used to steer when in flight. The saddle also harnesses the rider to the beast to keep him on the skrill through complicated maneuvers. Skrill are often brutally modified for greater efficiency as well. Some have their skull skin flap hacked off; others have their talons painfully fitted with metal or stone shards.

During combat, the skrill and rider fight as a team. The riders learn a complicated "language" of clicks and screeches which convey a simple series of commands to the animal. For instance, one such screech tells the skrill to rear back and attack with the talons, most often allowing the rider to disengage and throw his khivatt.

The Games

MUCH OF male society is built around two games. The first is the annual succession game fought between the skylord and any one worthy adversary. This is a personal combat fought on skrill over a field of stakes in the desert floor. The Martians themselves are unarmed, and victory is most often attained by forcing the other rider onto the stakes. This combat is a test of riding skill rather than weapons proficiency—riding skill is held to be the most prestigious of all skills.

Sport games are held between teams wearing different colors, within a giant dome made of a wooden frame. Each color is supported by a different elder, who uses his influence and what wealth he has to further his team in the games. The cage masters also use the games to test their birds and new riding techniques.

In a sport game, each team has two riders and two Martians on foot. They are armed as each team member desires, and though weapons are blunted, casualties are commonplace. The object of the game is to secure a token (usually a skull taken on a recent raid) placed in the center of the field at the start of the game and hold it among the team members until a sand timer runs out. The sport

ADVENTURES

● THE CHARACTERS are part of a trade caravan through Queln-infested territory, and are attacked.

● The characters are taken captive by the Queln and forced to participate in the games.

● The group is sent to rescue a captive of the Queln.

● The characters are hired by one of the rare merchants allowed to trade with the Queln (usually by doing well in the games).

games are held often and give males one more outlet for their skills and violent tendencies.

Encountering The Queln Riders

TRESPASSERS TO a Queln village are rare because of the remoteness of these settlements. However, all travellers on the face of Mars are subject to Queln raids, especially if they are in small groups and carrying valuable objects, such as firearms. Prisoners are universally dealt with in the same manner—brought before the skylord for judgment and execution. However, remember that a skylord is subject to the same motivations as other Martians, and if captives can convince him that they would be useful in his service, or that they have some knowledge or item that would be useful to him, they might be spared. Also, particularly good fighters among the captives are sometimes organized into slave teams for the sport games. Slaves who do well in the games are sometimes set free and sometimes are adopted into the clan.

THE SAVAGE High Martians are the rootstock from which the other two varieties of Martian descended and are the terror of Canal Martians, Hill Martians, and humans alike.

PHYSICAL APPEARANCE

IN THEIR physical appearance as in their behavior, High Martians are quite repulsive. They are short, compared to the other Martians, and have a stooped, apelike posture. Their coloring is much darker than that of the Hill Martians, and their hair is almost uniformly black, growing thickly over their backs and shoulders. They have wing membranes, which they use for propulsion and steering (as their lifting gland provides the basic flight capability).

Like other Martians, their hands have only three fingers, but they are otherwise similar in form to the human hand. Their three-toed feet are grasping appendages very much like their hands.



On the basis of comparisons with the other Martians, it was presumed that High Martians and humans could subsist off the same types of food. This theory was confirmed by the experiences of rescued prisoners, who report that most High Martians cook their food (when they bother to do so) by placing the entire animal in the fire until its hide has been burnt off, and then ripping it apart into individual servings. Miss Elizabeth Boynton, recently rescued from captivity with Hattabranx, the High Martian Lord of Kraag Barrovaar, reports that the High Martian warriors fought over her small supply of lemon drops and found her digestive biscuits enjoyable but could not be persuaded to eat her chocolate bonbons after a single bite.

GOVERNMENT

SEVERAL HIGH MARTIAN family groups form a clan, under a single sky leader. A number of clans will band together under a king. The monarchy is usually hereditary in the more "advanced" tribes, but the most primitive High Martians are ruled by whoever can best all comers in single combat. The advanced tribes of High Martians (such as those in the Astusapes Highlands) use lowland slaves to tend their liftwood groves (which, with brigandage, are their main source of income).

LANGUAGES

THE LANGUAGES of the High Martians have not been an easy subject for study. High Martians deal with the Canal Martians on a regular basis and are able to learn a smattering of their languages, most commonly Koline, the trade language.

CULTURE

OF THE three types of Martian, High Martians are least affected by civilization; they live in remote kraags (mountain fastnesses) and mountaintops, venturing out from time to time to capture slaves or to loot passing caravans. High Martians are like intelligent apes when compared to the Canal Martians, but with a difference: They can fly. High Martians (so called for their "altitude" rather than their accomplishments) never lost their lifting gland or its ability to carry them through the skies of Mars. Their behavior is bestial and barbaric in the extreme.

Although they can work in wood when they need to, the High Martians prefer to buy their ships from the Canal Martians, paying in liftwood. Their ships are exclusively screw galleys, and their turncranks are exclusively slaves, captured from caravans or from nomadic Hill Martian clans. Humans are often put to the cranks when they cannot be ransomed.

DRESS

HIGH MARTIAN dress consists of a loincloth. Warriors wear a leather harness to carry their equipment and often wear items taken forcibly from their enemies as records of the combats. Bracelets, anklets, rings, and necklaces of crudely beaten gold set with gemstones, silk ribbons, animal bones, teeth and hair, spent brass cartridge cases, scissors and other booty have all been seen as decoration. Miss Boynton reports that King Hattabranx was particularly taken with her father's nightcap and wore it constantly after it was brought to him.

THE KRAAGS

KRAAG IS the Koline word for the mountain fortresses of the High Martian kings. A king, his family, and one or more clans closely related to him are usually the occupants, although the older ones (such as Kraag Barrovaar) are often large enough to contain every subject of a High Martian king.

Kraags are laboriously carved out of the solid rock (by slaves, of course...no High Martian would soil his hands with tools). The entrances are high up the sides of a mountain and accessible only from the air. Inside, there are one or more large shafts running up and down in which the masters fly from level to level. Slaves use the narrow stairs that spiral up and down along the outer edges. The largest room in each kraag is the throne room of the king, which is usually hung with priceless tapestries and booty from the king's raids and littered with gnawed bones and refuse.

HIGH MARTIANS

HIGH MARTIANS are the rootstock from which the other two varieties of Martians descended. Comparative anatomical studies prove this beyond a shadow of a doubt, as each type of Martian shares certain basic characteristics with the other two. Hill Martians have remained in the highlands where liftwood grows, and have retained their lifting gland because of association with the same nutrients and trace elements that give liftwood its power to defy gravity.



High Martian king.

The greatest kraags contain living quarters for all of a king's subjects and their slaves, along with arsenals, treasure rooms filled with booty, storerooms, well shafts, dining halls, slave pens, and dozens of rooms which cannot be described.

Each kraag is also honeycombed with secret passageways known only to the slaves, and most of them have secret entrances for use by the slaves. At one time, all of these passages were known to the masters of the kraag, but over generations they have been forgotten. Hatta-branx, for example, believed that only fliers could enter Kraag Barrovaar—he was totally unaware of the slave entrances through which the slaves brought bulky objects that the High Martians often could not be bothered to fly in.

In most kraags, the slaves are only loosely watched, since they cannot leave (it is believed), and they would have nowhere to run anyway (most kraags are so remote that there is no way to escape from their vicinity on foot). Captives in the kraags report that there is often a hidden network of slaves that can smuggle messages in and out, create diversions to allow an escape, and (rarely) serve as a basis for a revolution.

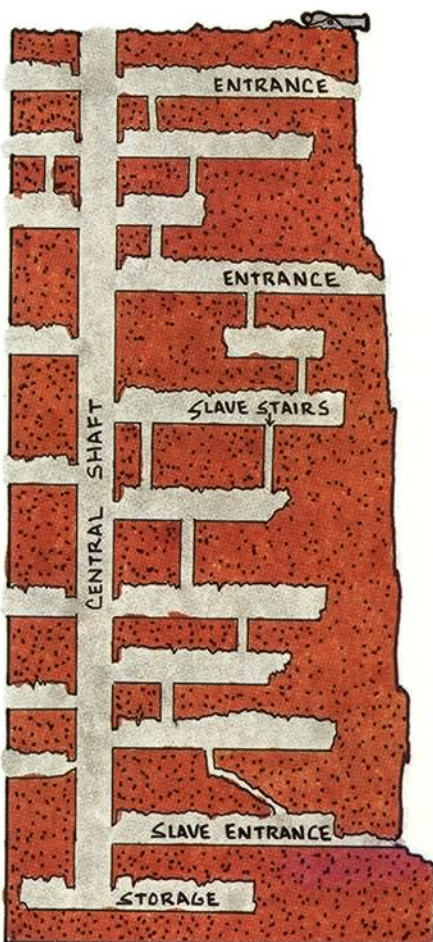
ADVENTURES

- **THE GROUP** attempts to steal a load of liftwood from one of the High Martian liftwood groves.

- The group is taken captive by the High Martians, as a result of a raid on a caravan or cloudship, and made prisoners in a kraag or "put to the crank" as galley slaves.

- The group is part of a trading party travelling into the highlands for mercantile purposes.

Cross-section of a typical kraag.



OF THE THREE types of Martian, the less genteel Hill Martians are the frontiersmen of Mars, living on civilization's edge.

PHYSICAL APPEARANCE

IN EXTERNAL appearance, the Hill Martians are slightly smaller than Canal Martians, which leaves them taller than all but the largest of humans. In overall appearance, they are stockier and somewhat closer to human proportions, but they still more closely resemble Canal Martians than humans. Their most notable feature (aside from their coloration) is the fatty mass or hump between their shoulder blades, which is a water storage organ and an adaptation to their arid habitat. This hump does not stick out to any great degree, but it does serve to give them a more massive appearance about their shoulders. Their ear flaps are larger than those of Canal Martians, and possess a definite ribbing pattern, in common with the High Martians.

In color, they are darker than the Canal Martians, tending towards brown or red hair (occasionally black). Their skin is a deeper ochre tone than the Canal Martians, more of a golden brown than a pale yellow. Their foot has a more pronounced thumblike appendage, but it is not opposable like that of the High Martians.

Hill Martians have hair over a larger portion of their bodies than the almost hairless Canal Martians, particularly over their shoulders.

Like Canal Martians, Hill Martians' hands have only three fingers, but they are otherwise similar in form to the human hand. The foot of a Canal Martian has on it a vestigial

"thumb" located proximal to the metatarsal bones, on what would be called the heel on a human foot. Hill Martians retain a much less atrophied version of this "thumb," one proof of the fact that Canal Martians are descended from the barbaric Hill Martians.

Their digestive and respiratory systems are nearly identical to humans', and both can eat the same sort of fare (although Martian cuisine is too spicy for most palates, and Martians find most human dishes unpalatably bland).

CULTURE

HILL MARTIANS live on the edges of civilization; they are the frontiersmen of Mars, living in regions beyond the reach of the canal princes' power. They have no single culture, because each group has adapted itself to a different locale, and each group must modify its customs and behaviors as it travels.

The Queln have adopted an aerial lifestyle which makes their culture more like that of the High Martians. Other groups of Hill Martians have settled more or less permanently in one spot and taken up agriculture.

The Wagon Masters of Meroe:

This is a hill and plains society which follows the migrations of the ruumet breehr herds for their livelihood. They use the beasts for everything and move about in huge single or multifamily wagons pulled by the gigantic beasts. Each evening, they form the wagons in a giant circle.

The Riders of the Nepenthes-

Thoth: The lifestyle of these Martians is very similar to that of the classic horse-tribes of Earth, approximating a cross between the Sioux of North America and the Tartars of Asia. Naturally, they ride gashants instead of horses and roam the vast Nepenthes-Thoth and Neith Steppes. They hunt, trap, and raid caravans and their more settled cousins.

GENERATING A CHARACTER

TO GENERATE a Hill Martian character, use the standard character generation rules with the following modifications:

Attributes: Determine physical attributes normally, but 4 is the maximum Strength, and 2 is the minimum Endurance. Social Level is measured in respect among other Hill Martians (meaningless to the British and to Canal Martians).

Skills: Default skills are acquired normally. Career skills are discussed below under each possible career. Hill Martians may use skill points to purchase skills, but may not purchase any human technical

or weapons skill other than Marksmanship.

Careers: Two careers are open to Hill Martians: Nomad/Warrior (the typical, unmarried Hill Martian), and Free-Lance (a wanderer who will return to his clan after earning a large enough reputation).

Nomad/Warrior: Str 4-. End 2+.

Riding (gashant) 2, Riding (ruumet breehr) 1, Marksmanship (bow) 1, Foraging 2.

Free-Lance: Str 4-. End 2+.

Riding (gashant) 2, Marksmanship (bow) 2, Marksmanship (rifle) 1, Foraging 1, Fieldcraft 1.

GOVERNMENT

CALLING THE primitive tribal and clan organizations of the Hill Martians a government is perhaps a misuse of that word. Many clans are bound together under some form of higher association, and the leaders of these loose associations are called kings but hold little real power.

The attitude of the individual Hill Martian varies greatly. Most have had no association with humans but harbor a mild dislike based on rumors of the Belgians. Some will exhibit a mild curiosity about the "red ones." A great deal will depend on the first impression: Hill Martians respect courage, determination, and skill with weapons. Demonstration of these qualities will go a long way toward impressing them.

ANCESTRY

CANAL MARTIANS are descended from the primitive Hill Martians, and both are descended from the positively bestial High Martians. Comparative anatomical studies prove this beyond a shadow of a doubt, as each type of Martian shares certain basic characteristics with the other two. Hill Martians have lost all trace of their primeval lifting gland. In some Hill Martians, a small webbing extends a few inches down the armpit, a vestigial remnant of the winged skin flaps with which their forebears once flew. This feature is considered a bad omen unless it is also accompanied by black hair, in which case it foretells great success in battle for that individual.

DRESS

HILL MARTIANS who live near civilization and who are in contact with the city-state merchants sometimes wear clothing similar in cut to Canal Martians' but usually much less expensive and poorly cared for. Most of them wear some form of primitive homespun made from plant fibers of the steppes, or clothing fashioned from the skins of animals. Those inhabiting the warmer steppes near the equator often wear no garment but a loin-cloth.

Because of the altitudes at which they fly their skril, the Queln (see pages 174-175) wear skins and a heavy cloak which they can discard when they descend to warmer altitudes.

ADVENTURES

● THE CHARACTERS accidentally kill a Hill Martian and provoke a blood feud which can only be satisfied by a duel with the Martian's closest male relative or payment of a large death price.

● The characters present a local chief with a gift of some small trinket, provoking a quaint local custom of accelerating gift exchanges until one party or the other admits defeat by reclaiming the original gift.

● The characters violate some curious local taboo (such as leaving before the complete cycle of a gift exchange can be completed) and provoke a duel.



Steppe nomads
of the Nepenthes-Thoth.

THE CANAL MARTIANS are the most advanced of the three Martian races, but their culture, though responsible for Mars' highest cultural and scientific achievements, has begun to decay.

PHYSICAL APPEARANCE

IN EXTERNAL appearance, the Canal Martians present a most pleasing (albeit still quite alien) picture. Their general form is similar to that of humans: They are upright bipeds, with two arms freed for use as manipulative appendages. They are quite tall and slender, with a massive chest cavity (necessitated by the atmosphere of Mars). In coloring, they are most fair, having fine hair and pale

other skin. Some humans feel their large, pointed ears give them a faint resemblance to the elves of human myth.



Citizens of Oenotria.

Their hands have only three fingers, but they are otherwise similar in form to the human hand. Their three-toed feet are roughly similar to human feet with one major difference: They were originally grasping appendages very much like their hands. The foot of a Canal Martian has a vestigial "thumb" located proximal to the metatarsal bones, on what would be called the heel on a human foot. Comparisons with the anatomy of Hill and High Martians demonstrate conclusively that this was once a grasping as well as an ambulatory appendage.

Their digestive and respiratory systems are nearly identical to humans', and both can eat the same sort of fare (although Martian cuisine is too spicy for most human palates, and Martians find most human dishes unpalatably bland).

Canal Martian dress is too varied to be easily described, but it strikes many observers as reminiscent of the garb of the ancient Egyptians.

CULTURE

CANAL MARTIANS represent 35,000 years of civilization. While consummate farmers, accomplished builders, and skilled artisans, they are nevertheless obviously a society in decline, to which their inability to maintain the more complicated machinery found in many canal pumping stations is ample testimony. The culture of the Canal Martians is stagnant and unchanging, their arts have become incomprehensibly baroque and degenerate, and their science is without the innovative spark which characterizes human intellectual activity. The Martian inventive genius, which built the magnificent Grand Canals, is a little-used faculty of late.

GENERATING A CHARACTER

TO GENERATE a Canal Martian character, use the standard character generation rules with the following modifications:

Attributes: Determine physical attributes normally, but 4 is the maximum Strength, and 2 is the minimum Endurance possible.

Skills: Default skills are acquired normally. Career skills are discussed below. Canal Martians may purchase skills, but human skills (riding a horse, for example) will cost three times the number of skill points, to represent the obvious reluctance of humans to teach these skills to Martians.

Careers: Noble Canal Martians are involved in government and lead quite boring lives. Lower-class Canal Martians are all involved in hard physical labor not suitable for adventurers. All Canal Martian player characters are from

the middle classes and can enter one of three careers: Mercenary Soldier, Cloud Sailor, or Merchant. Canal Martians cannot have two careers. Players receive initial funds as if they were middle-class humans. Martians purchasing human languages pay double the normal price, except for Merchants.

Mercenary Soldier: Str 3+.

Marksmanship (bow) 2, Marksmanship (rifle) 1, Close Combat 1, Foraging 1, Fieldcraft 2.

Cloud Sailor: Str 3+.

Trimsman (cloudship) 2, Close Combat 2, Gunnery (muzzle-loading cannon) 1, Marksmanship (bow) 1.

Merchant: Int 4+.

Bargain 2, Riding (ruumet breehr) 1, Fisticuffs 1, Marksmanship (bow) 1, Wilderness Travel (foraging) 1, Marksmanship (pistol) 1.

GOVERNMENT

THE PRECISE details of local government vary from city to city, but there are many general similarities. Almost all of the city-states of the Canal Martians are ruled by hereditary monarchs called canal princes. In many cities, there is a governing council of nobles (also hereditary) in addition to the prince. Mercantile families are a palpable power in the larger city-states, and they are often at loggerheads with the princes and the noble families.

Governmental power is based on a network of oaths of allegiance, some dating back to the time of Seldon II. A complex bureaucracy has grown up in the larger city-states, in some places appointed by the prince, in others filled by competitive examinations similar to those of the ancient Chinese. In all cases, the higher levels of government are unalterably corrupt, and it is nearly impossible to do anything without multiple payments to a series of local officials, inspectors, and bureaucrats (travellers with experience in the Ottoman Empire should encounter few difficulties).

ANCESTRY

CANAL MARTIANS are descended from the primitive Hill Martians, and both are descended from the positively bestial High Martians. Comparative anatomical studies prove this beyond a shadow of a doubt. Canal Martians have lost all trace of their primeval lifting gland and the winged skin flaps with which their forebears once flew.

LANGUAGES

NEARLY 200 Canal Martian languages and dialects have been cataloged by Professor Forbes-Hamilton of the British Museum, although only about a dozen are in common use and, of these, only three are likely to be encountered in the British colony. These are:

High Oenotrian: High Oenotrian is believed to be descended from the original language of Syrtis Major (prior to its occupation by the armies of Emperor Seldon II thousands of years ago). It is now spoken by the cities of the Oenotrian Empire and is understood in most of the neutral city-states of Syrtis Major.

Parhooni: With English, this is the official language of the British Crown Colony of Syrtis Major. It was originally the language of the northern half of Syrtis Major, and is a much-changed descendant of the language of Seldon's empire (*Son-Gaaryani*, or old Gaaryani). Parhooni is understood by most of the neutral city-states of Syrtis Major. Parhooni is the label attached by English lexicographers; its native speakers call the tongue Gaaryani.

Koline: Koline (trade-speech) is a pastiche of Son-Gaaryani (the archaic dialect of Seldon's empire) and several other tongues. It is the trade language of Mars, spoken by almost all canal boatmen, merchants, and

ADVENTURES

● THE GROUP becomes involved (accidentally or otherwise) in political intrigue in a city-state.

● The group manages to offend or otherwise fall afoul of some local noble, bureaucrat, or potentate, and makes an enemy who will hound them for years to come.

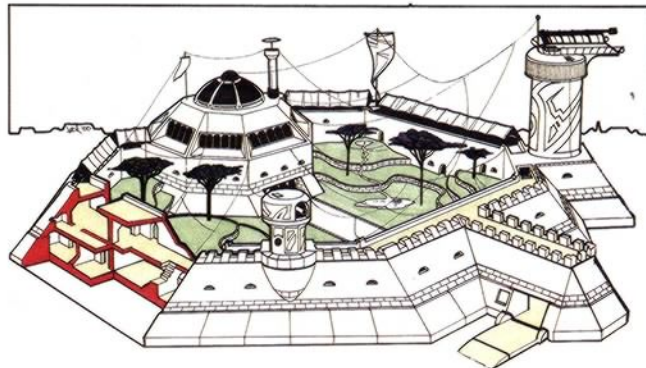
● The group fails to properly bribe a Martian official and encounters administrative difficulties accruing therefrom.

cloudship crewmen throughout the planet. It is a primitive language, but it is easily grasped and serves its purpose well.

Umbran: Umbran is the name applied to a number of similar dialects spoken by the inhabitants of the constituent city-states of the Boreosyrtis League. Its roots are uncertain, but it bears no resemblance to Parhooni/Gaaryani.

Other widespread Canal Martian dialects are Hellan (spoken by the southern kingdoms in the great basin of Hellas), Noachan (spoken by the city-states north of the Noachis Highlands), and Khallan (a dialect spoken by engineers and craftsmen, and now, unfortunately, largely extinct).

Martian
fortress-villa.



THE ANIMAL LIFE of Mars is diverse and too large to be properly detailed in the space available. We present, therefore, a brief catalog of the more interesting or dangerous creatures, and a short discussion of legendary and extinct life.

PREDATORS

MARTIAN PREDATORS vary.

Steppe Tiger: Among the most impressive of Martian animals is the fierce steppe tiger. It is a cunning hunter and will attempt to get very close to its intended prey before making a quick charge and a kill. It can run very quickly for perhaps 10 or 15 seconds, but its speed drops off rapidly after that, and it relies on surprise and its one quick sprint to make the kill. Its primary means of defense are its claws, which can slash even the hide of a ruumet breehr badly. For the kill, however, it relies on its massive jaws to snap the victim's neck or spine. It will not generally seek out trouble unless hungry, but it is quite territorial and will tend to attack any interlopers, particularly humans.

Green Koko: Large, predatory water snakes, green kokos as much as 20 feet long have been sighted. They are not venomous, although they have impressive fangs with which they grab and hold their prey. Their main means of attack is by constriction, and their coils, once placed, are extremely difficult to remove.



Cissawaan: A lithe, fast water lizard which feeds on fish but which will attack almost anything in sight, including ruumet breehrs. Cissawaans are usually found in groups of up to 50, and they have been known to tip over canoes. The best defense seems to be to climb a tree, as they are clumsy out of water, cannot climb at all, and will soon lose interest and wander off.



Eelowaan: This long, snake-like, flying predator is a particularly vicious animal, which will apparently attack for the sheer pleasure of it. It mainly feeds off of small herbivorous animals, but it will attack very large prey as well. Its means of attack (nonpoisonous fangs, constriction), size (up to 20 feet in length), and general look suggest that it at least shares a common ancestor with the green koko. But its capacity for flight, by manipulation of lifting membranes biochemically similar to liftwood trees, is clearly the product of radically divergent evolution.



SCAVENGERS

SCAVENGERS, tend to live off others' kills for the most part (although not always).

Great Kommota: Long thought to be extinct, this gigantic flying scavenger has been sighted numerous times recently, and it has shown a disturbing tendency to attack small ships by dropping boulders on them, which has caused the crash of at least one vessel and may account for other disappearances over the years.



Roogie: Smallish beasts, roogies are actually as much predator as scavenger, but prefer to have some other animal or Mother Nature provide them with a meal. If hungry, however, they will attack. They generally travel in packs of up to 20, although they will often split up into smaller foraging parties if kills are scarce. When they find a kill or potential kill, they will give out with their peculiarly screeching bark to summon the rest of the pack.



Knoe Shoshu: Rumors of this terrifying animal had been told and retold by Martian canal pilots for years but were largely discounted as native superstition. Recently a French expedition actually killed one and returned with its carcass. It is apparently a scavenger, although, like the roogie, it will attack if hungry. It consists of a central body chamber, roughly like a slightly flattened and elongated sphere, covered with fat and a rubbery, gray-brown hide. It moves by means of four large, heavy flipper feet and grasps its prey with four long tentacles. It appears to eat small creatures alive and whole when forced to hunt, but it will inject a poison through its mouth stinger into larger prey and take the carcass back to its lair for consumption at its leisure. Fortunately, this poison is

ADVENTURES

● **DURING** A trip across one of the dry grasslands on the edge of the fertile regions, the group is attacked by a steppe tiger.

● During a flight across the desert, the characters' flyer is attacked by a great kommota and damaged or destroyed.

now known not to be fatal to Earth humans, although it does cause unconsciousness followed by a period of disorientation and weakness. (One member of the French expedition was stung and carried off to the creature's lair; he later revived, escaped, and was finally found wandering, tired, battered, and partially incoherent, in the swamp.)



PLANT EATERS

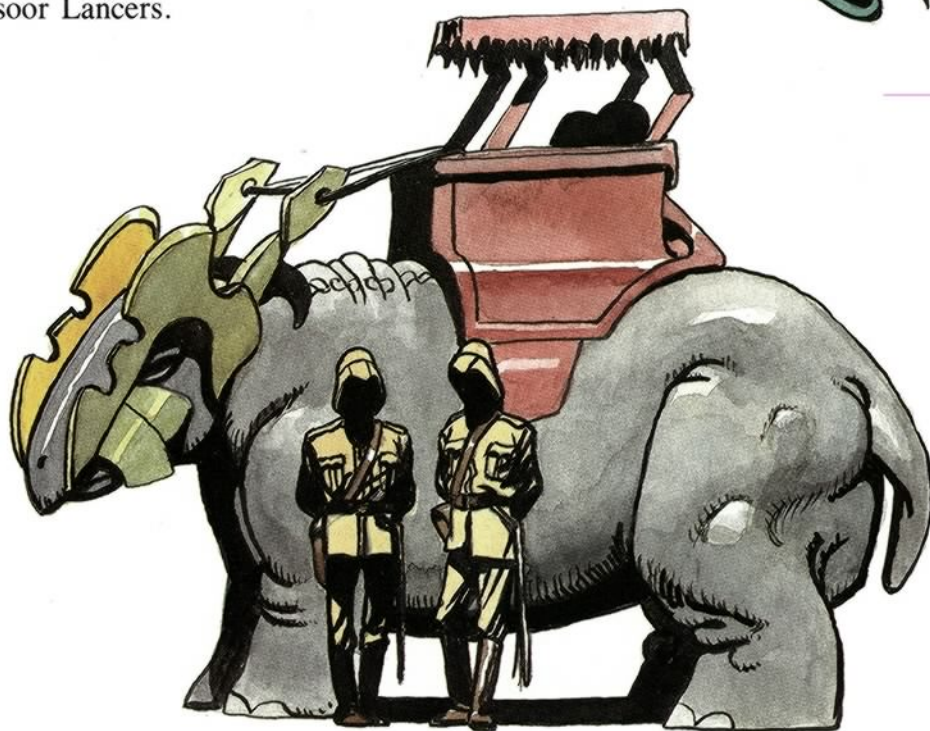
PLANT EATERS are usually not violent, but exceptions are found.

Gashant: Gashants are upright quadrupeds generally found in herds of from 20 to 70 animals. They defend themselves, when cornered, with their thick, hard forelegs (which have atrophied into blunt stumps), their heavy tails, and their teeth, although none of these are particularly effective weapons. A gashant's main defense lies in flight, and although its speed is less than that of an eegaar, it has powerful legs and impressive endurance.

While still found in the wild in large numbers, the domesticated gashant is also ubiquitous, being the principal draft animal and exclusive cavalry mount in use by Martian troops. The tough, wiry gashants of the Nilosyrts Hills are particularly prized by troops who have to operate in difficult or arid country, and are the only gashants used by the Meepsoor Lancers.



Flying Skrill: This flying plant eater, which appears to subsist off of the leaves of liftwood trees and bushes, grows to be quite large and has sufficient lifting ability to carry a man. Domestication of the skrill has proven elusive, however, and only the highland folk known as the Queln have thus far proven successful.



Ruumet Breehr: Although these giant vegetarians are native to the wetlands of Mars, they have proven surprisingly hardy when used in the dry canal caravans, and now wild ruumet breehr herds are fairly common in the desert as well. The domesticated version is used in many caravans to the near-total exclusion of gashants, and ruumet breehrs can be seen from a great distance towing giant carts or majestically carrying the weight of a large howdah on their backs. Unaggressive for the most part, ruumet breehrs will attack if they perceive a threat to their young and will usually charge rather than flee if they are attacked.

Eegaar: Named for their frequent danger cry, the eegaar are the swiftest of Mars' land animals. They rely on the vigilance of their long-necked sentries for protection of the herd and can usually escape the first rush of a predator with a remarkable burst of speed. They soon tire, however, and distance runners such as the roogies pose a more serious threat to the eegaars than the impressive sprinter, the steppe tiger. When run down by roogies, the herd will disperse and reunite later, usually minus several members.

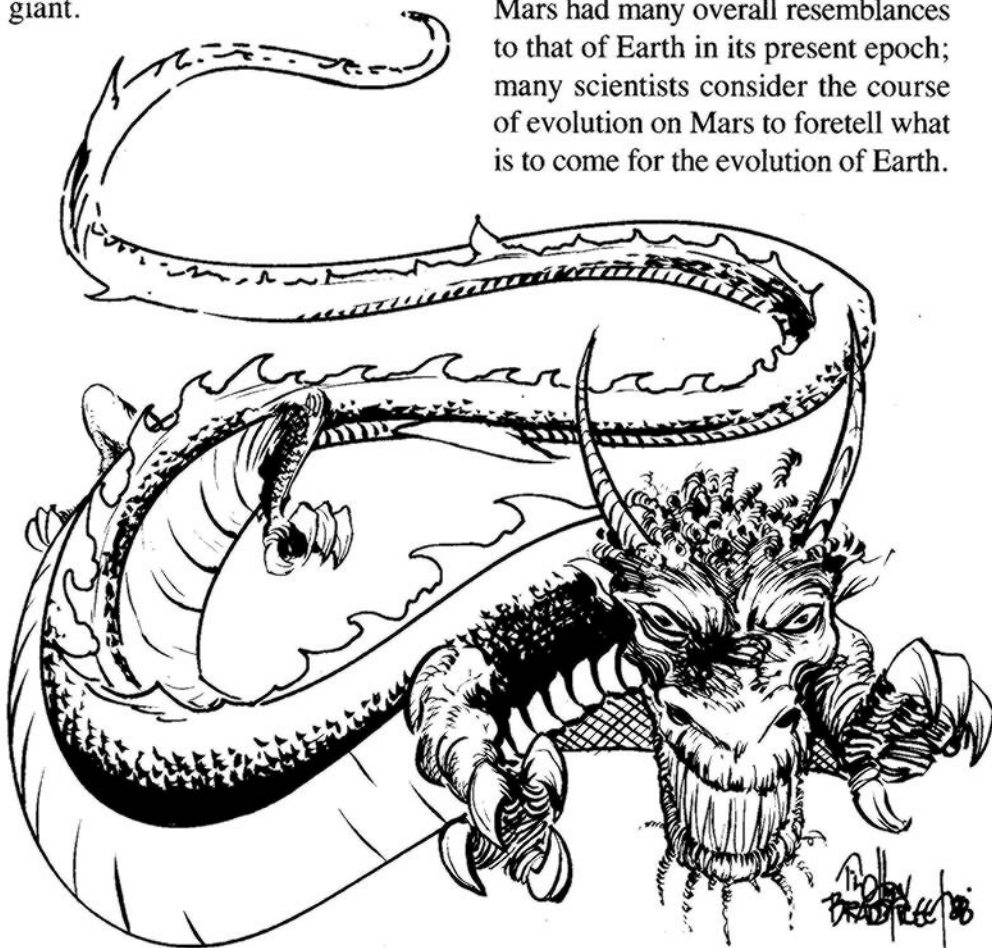


LEGENDARY FAUNA

LEGENDARY animals include:

Sandwing: The High Martians tell stories of an incredibly large flyer, resembling the dragon of Earthly mythology in size and overall appearance. It is said to be a large and ferocious predator, capable of carrying off a ruumet breehr to feed its young as a kestrel would carry off a mouse. The people of the Astusapes Highlands claim to have hunted the beast to extinction after the invention of cannon and the sky galleon put Martians on more equal terms with the beasts, but other High Martians still speak of them as if they were still alive. No trace of one has ever been uncovered.

Ohnam Reekh: Among the Hill Martians south and west of Syrtis Major there are legends of a giant subsurface burrower whose collapsed tunnels are now used as canals. The beast, as described by most storytellers, resembles a giant, hairless mole, but without hind legs and with a number of thick, bony plates over the forward third of its body. Legends of this creature are used to frighten Martian children into obedience, and it is obvious that the creature is either totally mythical or an exaggeration and distortion of some naturally occurring (but smaller) creature. The tale could have originated as an explanation of the canals by a primitive and ignorant people, much as savages on Earth will attribute the formation of lakes to the footsteps of some mythical giant.



ADVENTURES

● THE CHARACTERS are hired to act as guides or bodyguards for a zoological expedition, seeking either to capture known animals for study or to locate traces of legendary or extinct creatures.

PREHISTORIC FAUNA

THE PREHISTORIC fauna of Mars was once as extensive and varied as that on Earth, before the planet's water disappeared eons ago. Remains are fragmentary, but correlating Martian legends with the few actual fossil discoveries paints a tantalizing and hauntingly familiar picture. The animal life of prehistoric Mars had many overall resemblances to that of Earth in its present epoch; many scientists consider the course of evolution on Mars to foretell what is to come for the evolution of Earth.

SPECIAL CONSIDERATIONS

THE MAIN PROBLEM faced by the visitor to Mars will be the extreme dryness of the climate, and the almost total lack of water in most areas. Expeditions must carry their own water (a heavy and bulky commodity) or stay near the canals or old canal beds.

Language will present difficulties. Canal Martians have over 200 separate dialects, the Hill Martians almost as many (little information is available on the High Martian languages). Although some languages are more common than others, travellers will still find communication a problem unless they stay inside certain restricted areas of the British colony. Learning one or more of the local languages is the best solution to this problem, although many people will not have the ability to do this (some are more capable in this field than others). Hiring a reliable guide is the second best solution. Finding a reliable guide is a major problem of its own.

There is a growing hatred of humans among many Martian communities, and this feeling has erupted into active violence on several occasions. While most Canal Martians dislike humans, only a few are willing to risk the wrath of Her Majesty's gunboats (among these are the more radical antihuman organizations, such as the Ground Cleansers). Notwithstanding, incautious travellers may find themselves attacked by a mob for violating some incomprehensible local taboo or for accidentally defiling a temple or holy place. A special area of concern is the region near the Belgian Coprates, where the locals have been so mis-

treated that they have been driven to desperate actions, and many bands of rebels wander the frontiers. The situation has been worsened by the sale of modern firearms to the renegades, an action for which certain unscrupulous American merchants must take responsibility.

Of course, among the barbaric Hill Martians and the bestial High Martians, humans must be constantly on their guard, as these groups have not the wit to be frightened by threats of retaliation.

THE CULT OF THE WORM

THIS BIZARRE, violent little cult draws most of its followers from among the bestial High Martians. An equally good translation of the name might be "Followers of Decay" or "Worshippers of Rot and Corruption." The Cult of the Worm is, as one might expect, a rather nihilistic religion, much given to living sacrifices, murder, terrorism, and debauchery. The Worm Priests tell their followers that the only reason to remain alive is that it is not yet time to die.

The deities who receive the sacrifices and adulation of the Followers of the Worm are the "Living Old Ones," immortal beings whose great age and experiences have shown them the futility and wickedness of life. Although the gods of this cult prefer Martian flesh, human captives are rumored to have been killed on the bloodstained altars of the Worm Priests.

THE GROUND CLEANSERS

THE SOCIETY of the Purifiers of the Soil (more commonly called the Ground Cleansers) is a fanatical, antihuman movement, popular mostly

with the Canal Martians. Its members are a basically reactionary force that wants to purge Martian society of the corruption the humans have introduced. More extreme elements want to purge Mars of the humans themselves.

The more radical elements of the Oenotrian ruling oligarchy are believed to be members of the Ground Cleansers, and the cult has its strongest centers in the city-states of the Oenotrian Empire.

ANARCHISTS

THE ANARCHISTS were a group of European intellectuals who believed that government and society were unalterably corrupt, and that the only way one could achieve real freedom was to do away with it all. To achieve this end, violence was the only answer. Government officials must be killed—but more than that, the organs of government, the buildings, the records, the clerks, the bureaucrats must be destroyed. To awaken a sleeping humanity, and infuse in it sufficient anger to make it rise up and destroy government and society, random terror and destruction were needed. It was regrettable that some would have to die, but humanity would be the better for it. The more militant anarchists, such as Mikail Bakunin, were opposed to any organization whatsoever, even anarchist organizations (Bakunin once bombed an anarchist meeting for this reason).

Anarchist activity on Mars consists mostly of leaflets, random bombings of public places and government offices, and assassinations of governmental officials (the higher the better) and the wealthy and titled (again, the higher the better).

THE FENIANS

WHEREVER THERE are English, there are Irish also. Ireland was subject to varying English control from the 12th century onwards and was formally bound to London by the Act of Union of 1800. Ireland remained separate in religion, culture, and attitude, however—an angry, ill-used land of Protestant immigrants who owned the land and Catholic natives who worked. The injustices that brought about the rebellions of 1798 and 1803 had not been lifted, and the terrible famine of 1845-48 was grossly and callously mishandled by the government. The survivors of the catastrophe, especially those who emigrated to America in search of better conditions, were often filled with a virulent hatred for all things British.

In 1858, a revolutionary movement known as the Irish Revolutionary Brotherhood was founded simultaneously in Dublin and New York. The members of the group were known as Fenians, after the legendary hero Finn MacCumhaill, and swore “a secret, conspiratorial oath” to uphold the independence and integrity of an as-yet-fictional Irish Republic. Although most members were intellectuals, a number wanted immediate, violent actions to bring about independence. In 1866, an attempt to invade Canada by a scratch “army” of 600 Irish veterans of the American Civil War ended with a hasty and undignified retreat to the United States, and other attempts in 1870-71 were no more successful. Fenian actions closer to home were much more threatening. In 1867, a ship full of arms, manned by American Fenians, sailed from

Boston in an effort to raise insurrection in Ireland. At the same time, there was an attempt to seize the arsenal at Chester Castle; the plotters were arrested, and a rescue bid was made while the men were being taken through Manchester in a prison van. Sympathizers blew open the doors of the van, and a policeman was killed, apparently by accident. The public was shocked, and three Fenians were hanged, on doubtful evidence, for the murder of the constable.

Notwithstanding, the vast majority of Irish are loyal subjects of the Queen (albeit probably supporters of reform) and opposed to the radical ambitions of the revolutionaries. This population of loyalists, however, makes it possible for the Fenians and their friends to place themselves at suitable points to carry out their acts of mayhem. The first appearance of a Fenian presence on Mars came in 1879 with disturbances in the British quarter of Parhoon following public meetings on the Irish question at the Imperial Institute Hall. An informal group of agitators was identified by British agents. At first, Fenian activity was restricted to subversive pamphlets and vandalism of public property, but with the arrival of Liam O'Connor in 1880 or 1881, events took a more militant turn. O'Connor organized a series of robberies to finance Fenian operations. Liam was a man of imagination as well as a persuasive tongue, and by 1882 he had arranged for the construction of the *Fenian Ram*, a 600-ton screw galley. Funding of the project lagged behind building costs, but O'Connor was undeterred—he stole the vessel in 1884 and took off for a life of piracy and anti-English mayhem in

ADVENTURES

- ON A JOURNEY through the British colony, one or more members of the group is kidnapped by a secret cell of the Ground Cleansers and requires rescue.

- The characters are attacked by Fenians or anarchists wanting their weapons or their vessel for some nefarious purpose.

the Meroe Highlands. O'Connor's panache exceeded his real success in taking on the might of the Empire, but it gained him many admirers, especially in the United States, where he became the subject of one of Ned Buntline's lesser literary gems. With the destruction of the *Fenian Ram* in 1887, O'Connor was wounded but managed to escape, and his whereabouts are presently unknown. He is doubtless somewhere in the colony, raising money and plotting some new outrage.





VENUS

FOR YEARS, Venus presented a mystery to human astronomers. When the earliest telescopes were trained on the world, they showed a blank, featureless surface. Several reasons were advanced for this, but when the ether flyer made possible expeditions to the world, it was discovered that the blank surface was due to the incredibly dense cloud cover. Venus, it turned out, was a hothouse world of shallow seas, steaming tropical jungles, bogs, swamps, marshes, perpetual overcast, and heavy rainfall.

The dense jungles of the Venusian lowlands produce numerous plants for which there is great demand on Earth by chemists, dyemakers, pharmaceutical companies, and florists (the Cytherian Orchid is especially valued for its beauty and its hauntingly subtle fragrance). The lowlands are also home to hundreds of varieties of giant reptilian creatures, called dinosaurs, and to the savage Lizard-men. Humans find the lowlands almost unbearable and tend to stick to the few highland plateaus, where life is more tolerable and the sun can occasionally be glimpsed through the overcast. In recent times, large plantations have been created using Lizard-men to cultivate and harvest several of the most valuable plants. For the most part, however, tribes of friendly Lizard-men roam the

jungles harvesting the various plants and bringing them to the various lowland trading outposts and the settlements that have sprung up around them. Dinosaurs and hostile Lizard-men pose a constant threat to these human enclaves, and they are one reason that a permanent military presence is maintained by each major colonial power.

Although expeditions were sent to Venus as early as 1873 (using British-made Armstrong Flyers), the first one to return was the German-backed Heidelberg expedition of 1879-80. It was discovered that the peculiar nature of the Venusian magnetic field interacts with the ether in an unknown fashion which causes radically accelerated liftwood decay on that world. Within days of landing, the first three expeditions (of 1873, 1875, and 1877) soon found their flyers would not leave the ground, and they were unable to activate their ether engines because of atmospheric drag. Germany, unable to obtain large quantities of liftwood because of its lack of a viable Martian colony (at least initially), was forced to make use of dirigibles as the lifting means for their ether flyers. When a German ether dirigible carrying the Heidelberg expedition landed at what came to be called the Kaiser Wilhelm Plateau, they found the last few survivors of the earlier expeditions, se-

verely reduced in number due to the attacks of multiple dinosaurs and groups of hostile Lizard-men.

Germany has dominated the exploration and exploitation of Venus since that time, although Russian, Italian, British, and American settlements or trade enclaves are also present. Although not as heavily colonized as Mars, Venus presents almost equal economic potential.

A NOTE ON PLACE NAMES

GERMAN COLONISTS have retained many of the British place names (although usually translating them into German), as a means of honoring those first gallant explorers of Venus. (For instance, Mount Maxwell is called Maxwellberg by the Germans.) Since the opening of the world, several nations besides Germany have sent exploratory expeditions to Venus (most notably the Russian and Italian expeditions of 1881 and 1883, respectively) leading to more diverse place names than on Mars, including German, English, Russian, Latin, and Greek (these last two because the commander of the Italian expedition was of a classical inclination).

VENUSIAN GEOGRAPHY

STRICTLY SPEAKING, the suffix "geo-" properly refers to Earth and Earth alone. Nevertheless, the phrase "Venusian geography" is much more convenient (and more easily pronounced) than such words as Cytherography, Aphroditography, or Venography, and the latter terms are used only by the most primly fastidious of orthographers.

Major Landforms

VENUS IS a younger world than the Earth and is still in an early, chaotic stage of its development. Its landforms, like its life forms, are therefore not as varied as those of Earth and can be broken down into the following broad categories:

Mountains: The mountains of Venus are believed to be of relatively recent origin geologically. This surmise is necessary in order to account for the fact that the mountains have not yet eroded away under the almost perpetual rainfall.

Some of the mountains on Venus are volcanic in origin, including the Kaiser Wilhelm range. Mount Maxwell is thought to have been active as recently as 5000 years ago, but there do not seem to have been any eruptions since then. The Aphrodite Mountains, on the other hand, seem to have resulted from some form of geological uplift similar to that which produced most mountains on the Earth.

In the mountains, it is not uncommon to find outcroppings of the native bedrock, especially in areas where the slope is extreme and the native plants can find no purchase. Humans often exploit these outcroppings for building material.



The Highlands: The upper altitudes of Venus receive more light from the sun, and the plant life of the highland jungles tends to resemble that of Earth in similar locations. Tree-like plants are encountered more frequently than in the lower altitudes (although most of the ferns and cycads of the lower forests can be found higher up as well), and the layer of "soil" is thinner (less than seven feet over most of the Victoria Plateau, for instance).



The Lowlands: The lower altitudes of Venus receive less light and tend to produce plants with less energetic requirements than those of the higher altitudes. There are very few flowering plants; cycads and ferns tend to be the most common. The "soil" of the bogs consists of a thick paste of organic material through which the plants of the bog send shoots and tendrils seeking nutrients. The bogs of Venus are very much like the peat bogs found

in northern Europe, consisting of a thick sponge of organic matter (mostly decaying bogweed) and water. In some cases the upper layer of plant material is solid enough to walk on; in others a person will sink out of sight in seconds (bogs 60 feet or more in depth are not uncommon in the lowlands). Humans on Venus took a leaf from the Lizard-men's book and devised a type of footgear called the bogshoe. Bogshoes are



broad, flat, circular contraptions (similar to snowshoes), usually made of an open mesh to permit water to drain off. They spread the wearer's weight over a wider area and make it possible to walk atop the bogs with little danger of sinking. Bogshoes require a little practice before the wearer can do things like run, but are not difficult to master within a day or two.

So-called quaking bogs are commonly encountered, and they present a considerable hazard to the unwary traveller. Quaking bogs are areas where a dense layer of bogweed lies atop a pool of less dense muck. When walked upon, the ground begins to resonate with each step, like a trampoline. If the person walking on the surface tries to go too fast, the resonations are amplified until the surface of the bogweed splits open, swallows the unfortunate victim, and closes over again, leaving an almost



imperceptible seam. Quick action is necessary lest the unfortunate victim perish. Within hours, the rupture will repair itself and will be as strong as before. Experienced travellers on Venus soon learn to recognize these quaking bogs. Boots with pointed toes or thin heels are not recommended.

The bogs of Venus hold water like a sponge and release it gradually to trickle downhill to the oceans. For this reason, there are no small streams and few rivers on Venus, and those that do exist tend to shift position at irregular intervals, appearing and vanishing within a few weeks.



The Marshes and Shallow Seas: The plant material of the bogs thins gradually, until the bog turns into a marsh. The main difference between a Venusian marsh and a Venusian bog is that the bog contains a majority of solid matter, whereas a marsh contains mostly water.

The marshes of Venus resemble the Everglades of the American state of Florida, consisting of large expanses of slow-moving shallow water interspersed with temporary islands where eddies and currents deposit mounds of muck. Some of these islands grow their own colonies of ferns and cycads and become permanent fixtures of the marsh; others are washed away again within a few months of their creation.



The marshes of Venus fade gradually into shallow seas less than a few hundred yards in depth but still permeated with growths of plant material resembling terrestrial seaweed, which extends from the bottom to the surface in some areas. The growth of this weed is rumored to be thick enough to interfere with the passage of seagoing craft in some places (although no such patch of weed has ever been discovered). These areas are sometimes nicknamed "Sargassos," after the Sargasso Sea on Earth.

The Oceans: At the centers of the larger Venusian maritime regions, called the Nordmeer (North Sea) and the Südmeer (South Sea), are deep oceans. Except for the cloud cover, these are quite like the oceans of Earth and would seem familiar to almost any mariner. Surface travel is quite rare, however, because of the difficulties of navigation and the hazards presented by the monstrous creatures which inhabit these depths.

The Weather

THE CLIMATE and weather on Venus can be summed up very easily: hot and wet. On Venus, it is always either raining or about to rain, regardless of location (and a good thing it is, because it helps to keep the temperature down). Lightning often accompanies the heavier storms, but high winds are rare. Temperatures are lowest in the high mountain plateaus (where they range from the middle to upper 90s) and highest in the lowland areas and the surface of the seas (where the temperature averages over 110 degrees). Humidity is always between 95 to 100 percent, regardless of altitude.



In the lowlands and on the seas, visibility ranges from less than 10 feet up to a few hundred yards, depending on local weather conditions. Higher up the fog is often thinner, but intervening terrain features usually limit visibility to about the same distance. On the upper slopes of Mount Maxwell, however, visibility is often in excess of a mile (that is, airships can be spotted at this distance—there are no other mountains near Mount Maxwell to be seen).

THE EXPLORATION OF VENUS

MOUNT MAXWELL figures prominently in the early explorations of Venus because it is the most prominent surface feature of the world that can be glimpsed through the cloud cover (on days when that cloud cover is particularly thin). On rare days other high peaks can be dimly seen, but Mount Maxwell is visible about half the time. About three times a year, Mount Maxwell actually protrudes from the clouds.

Armstrong Expedition of 1873

LED BY Captain Robert Armstrong (no relation to the founder of the Armstrong Ether Flyer Company), the expedition departed Earth on January 14th, 1873 and never returned. The fate of the expedition was not known until 1884 when James MacKenzie, the last survivor of that party, was discovered living among a tribe of Lizard-men about 800 miles southeast of the Victoria Plateau. The poor soul had "gone native" and was initially unwilling to leave, but once in human company again, he soon recovered much of his sanity. After a brief period of convalescence, he dictated a brief account of the ill-fated first expedition to Venus and embarked upon a series of lecture tours. MacKenzie died in 1888 of what doctors believe was a lung infection acquired during his years in the Venusian jungle.

MacKenzie reported that the expedition circled the world twice and made first landfall on Mount Maxwell (which Armstrong named in honor of Thomas Maxwell, the lookout who spotted it). After planting a flag and an inscribed brass plate

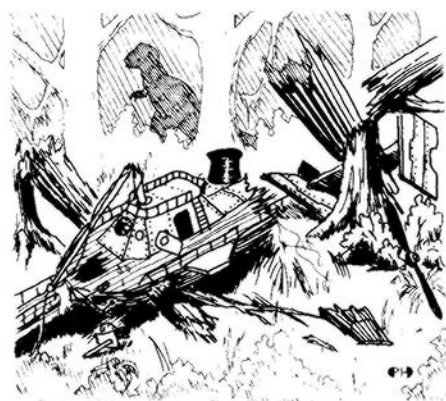
(which have never been found), Armstrong dispatched the three smaller liftwood conveyors he had brought, one west (of which more below), one east, and one south. Armstrong was to take the ether flyer to the north. The conveyors were to return to Mount Maxwell in four days. Mackenzie and a companion were assigned to the southern route, and soon discovered two things: A vast ocean lay to the south, and their liftwood was rapidly losing its lifting ability. Fortunately, MacKenzie's conveyor was capable of floating (converted as it was from a ship's whaleboat), and they made a safe landing on the surface of the ocean. Within days they had made landfall and begun to trek northward in an attempt to locate the main expedition. They rapidly became lost (normal compasses do not work on Venus, it was later discovered), and dinosaurs, hostile Lizard-men, and the climate soon took their toll. After a year, MacKenzie was the only one left alive. He found a tribe of friendly Lizard-men and was eventually adopted by them.

The westbound conveyor was found by the Collingswood expedition. No trace has ever been found of Armstrong's ether flyer or the other conveyor.

Collingswood Expedition of 1874

THE SECOND exploratory expedition to Venus was financed by subscription from the members of the Royal Society, and Sir Edward Barton Collingswood was placed in command. The expedition departed Earth on July 3, 1874. Collingswood also made his landfall at Mount Maxwell, where he established a base camp and sent out exploratory par-

ties on foot. Two days after landing, one of these parties found the remains of one of the conveyors of the Armstrong expedition, crushed as if trampled by some gigantic beast.



Near the wreck of the conveyor, at the top of a nearby hill, the party discovered a small redoubt of stones and boulders, piled in a circle. Inside they found the remains of three members of the conveyor's crew, buried in shallow graves under piles of stones. They also found the sodden remnants of a journal, so completely ruined by the damp as to be unreadable, and a message scratched onto a flat stone: "Tarry not! This world decays liftwood, & you will be stranded. Beware the Monster lizards and the savages—B. F. Hollyday." The fate of Benjamin Hollyday, third officer of the Armstrong expedition, can only be guessed at, but as his remains were never found, it can be assumed that the Lizard-men overran the stone fortlet and carried him off.

The exploratory party carried the stone bearing Hollyday's message back to Collingswood, who immediately attempted to lift into orbit, but the vessel was unable to attain sufficient height to enable the ether engines to be activated. Collingswood elected to use the flyer to lift the

expedition high up the slopes of Mount Maxwell and to search out a position which could be readily defended. After several miles of steep slope, they finally came to the large plateau which Collingswood named Victoria Plateau. Upon locating a suitable position, Collingswood ordered the ether flyer dismantled and used its materials to construct shelters and to fortify the position.

The position was such that the monstrous lizards (later called dinosaurs, after similar creatures from Earth's past) could not easily get to it. Within weeks, the expedition managed to make contact with several groups of Lizard-men, some friendly, but most hostile.

Times Rescue Expedition of 1876

IN JUNE of 1876, the London *Times* financed an expedition to Venus for the purpose of locating the two previous expeditions. Expecting some form of hostile native life was the reason for the disappearance of the first two expeditions, the expedition took along two Gatling guns of the most recent design, a screw gun of the type used by the British Army in the mountains of India, two dozen Martini-Henry breech-loading rifles, and ample supplies of ammunition. Colonel Aloysius Ditherby-Stoat, late of the 2nd Bengal Lancers, was chosen to lead the expedition. It departed Earth on June 20, 1876.

Unlike the previous expeditions, the *Times* expedition arrived at one of those times when Mount Maxwell was not readily visible. The expedition landed in several spots, discovering no trace of humanity in any of them. Finally, after three days of these fruitless explorations, they took

to the air again and spotted Mount Maxwell (atmospheric conditions had cleared). The expedition decided that this might be where Collingswood would have chosen to put down (correct, as it turned out) and immediately set a course for the mountain. About eight hours before their arrival, the expedition's chief trimdsman noticed that the ship was unable to gain altitude and was, in fact, slowly losing it.

By the time the flyer had made landfall at the mountain, it was too late. It too was unable to take off again. The expedition soon ran afoul of the dinosaurs, and, although the Gatlings made quick work of them, Colonel Ditherby-Stoat decided that they would have to find a more defensible position. The Gatlings soon bogged down in the soft, spongy soil, and the expedition had to abandon first one, then the other. The screw gun was designed to be broken down into loads suitable for portage by one man, however, and the expedition managed to get it completely up the mountain. After trekking several days up the increasingly steep slope of Mount Maxwell, the expedition finally came to the Victoria Plateau and was amazed to find a Lizard-man that greeted them in English.

This, it transpired, was Samock (his real name was unpronounceable), a friendly Lizard-man who helped the Collingswood party survive. Samock led Ditherby-Stoat to Collingswood, where the two parties joined forces. The screw gun was especially welcomed, for despite the presence of Samock and others of his ilk, the humans were still subject to periodic attacks by bands of hostile Lizard-men. A few weeks after their arrival, the humans sent out a party

to recover the Gatlings, but they succeeded in bringing only one back, by dismantling it and carrying the individual pieces on their backs.

Heidelberg Expedition of 1878

BY CONTRAST to the earlier expeditions, the Heidelberg party was almost anticlimactic. Unable to secure liftwood because of their lack of a viable Martian colony (later partially remedied by a trading enclave in Western Dioscuria), the Germans were forced to make use of lighter-than-air gases for their ether flyers, much as Edison's original flyer used a hydrogen balloon for lift. In the case of the German machines, an army officer named Frederick von Zeppelin, inspired by Edison's achievement, invented a cigar-shaped rigid airship which was originally called the Aerobot by British writers but soon came to be known as the Zeppelin airship, or Zeppelin for short.

The Heidelberg expedition left Earth on March 17, 1878, led by Colonel Doctor Ruprecht Heidelberg of the Imperial German Army. The expedition arrived on Venus and, like the *Times* expedition two years earlier, did not at first spot Mount Maxwell. When at last they landed on the Victoria Plateau, they soon located the bedraggled survivors of the previous expeditions.

Much to the chagrin of the British, Doctor Heidelberg insisted on remaining on Venus for several months, where he carried out a thorough survey of the mountain range he was to name after Kaiser Wilhelm. He did take the British aboard his airship immediately, but Collingswood is said to have harbored a mild dislike for his rescuer since that time.

A DESCRIPTION OF THE COLONIES OF VENUS

THE COLONIZATION of Venus has lagged behind that of Mars because of the delay in its exploration. There are, however, several thriving colonial establishments on the world.

The Russian Enclave

CZAR ALEXANDER III has never been overly enamored of colonial ventures, but the expedition sponsored by his father in 1880 laid claim to territories on Venus and discovered a number of plants of economic significance (including the cotton tree and the aephodilia). The Russian settlements are primarily small, heavily fortified trading posts in the Aphrodite Mountain region.



The British Enclave

BECAUSE OF their early exploration efforts, the British have a claim to a portion of Venus and maintain a small settlement on the Victoria Plateau, incorporating several small plantations and a number of small trading stations. The British settlements are each self-governing, but the magistrate of Fort Collingswood is considered to be in overall charge. A military bureaucracy is also present, separate from and nominally independent of the civilian one. But in practice, the magistrate and the ranking British officer cooperate in all important matters. The slopes lead-

ing up to the Victoria Plateau are steep enough to keep out the largest and most dangerous dinosaurs, but British soldiers are nevertheless stationed on Venus for the protection of the more remote British trading stations.

The American Presence

ON VENUS, the Americans have concentrated their efforts on developing mercantile posts rather than territorial claims, campaigning for what they call an "open door" policy of trade. American merchants have a near-monopoly on the import of one luxury item: ice. Shipped in insulated holds and stored in sealed warehouses under several feet of insulating sawdust, ice commands a high price on Venus for obvious reasons (American merchants say it is easier to transport ice to Venus than to Calcutta). In addition, interplanetary ether flyers of American registry carry the larger part of civilian cargo to and from Venus, especially for the Italian and Russian settlements.

The Americans maintain no troops on Venus, but their mercantile parties customarily travel about heavily armed.

The Italian Enclave

THE ITALIAN expedition of 1880-81 made no important botanical or zoological discoveries, but it did manage to map an unexplored portion of the equatorial region of Venus. The Kingdom of Italy maintains no major military presence on Venus but has laid claim to several territories on the Sappho Plateau, where it maintains a few trading posts and plantations and keeps a few hundred troops for their defense.

THE VENUSIAN TELEGRAPH

THE CITIES, trading posts, and the larger outlying plantations of the Kaiser Wilhelm Mountains (including the British settlements on Mount Maxwell) have recently been interconnected by telegraph. The system was constructed by a civilian company and financed initially by contributions from the plantation owners. The British and German colonial governments have also agreed to partially subsidize the operation of the system as a matter of military necessity.

In the higher areas, the wires could be strung from poles in a conventional manner, but in the lowlands, ground solid enough to anchor the poles permanently was scarce. The solution lay in the use of a heavily insulated cable, similar to that used in submarine telegraphic systems on Earth. The cable could simply be laid upon the ground, where it soon sank out of sight in most places.

The telegraphic system has already saved several lives, as it has permitted at least two outlying communities to call for help when attacked by savages rather than send runners (the previous practice). The savages do not seem to comprehend the significance of the telegraphic cables, for they make no effort to sever them (except by accident) even if they manage to stumble across them. They evidently believe them to be some peculiar sort of human vine and usually pay no attention to them after determining that they are not edible.

The German Colony

THE GERMAN colony on Venus occupies the western slopes of the Kaiser Wilhelm Mountains and has a population of about 8000 humans and an estimated 200,000 Lizard-men. The area claimed by the colony amounts to just under 140,000 square miles, but only a minute percentage of this area has been settled by humans. Most of the population is contained in the four major cities, and in a dozen or so small trading posts and the villages that have grown up about them.



The capital and seat of government of the German *Venus Kolonie* is the city of Venusstadt. The governor and his staff are civil servants and are part of the normal German colonial administration. A military contingent is present, consisting of two regiments of *Schutztruppen*. There are a few units of Lizard-men, commanded by human officers and NCOs, but

the governor does not completely trust them and insists that none of them be allowed inside the capital.

Venusstadt and the other cities are protected from marauding dinosaurs by natural terrain features (steep slopes and cliffs). Most of the plantations and outlying trading posts must rely on man-made fortifications and weapons for defense against the monstrous dinosaurs. Outlying settlements must also defend themselves against the occasional bands of marauding Lizard-men who manage to evade the overworked *Schutztruppen* patrols.

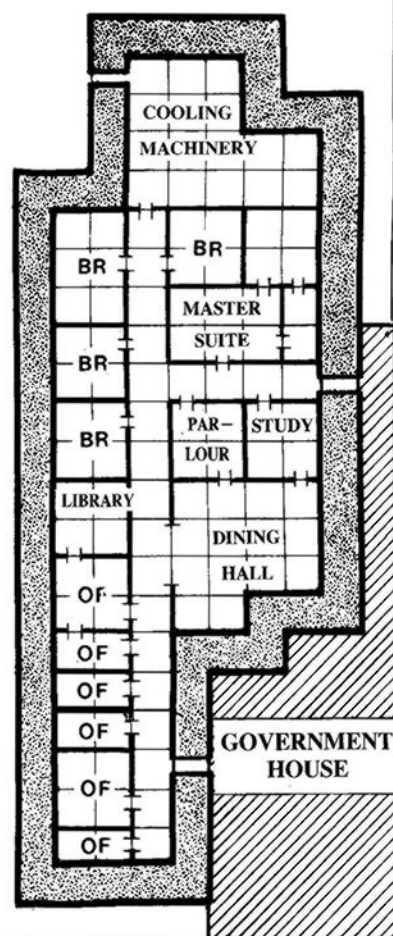
THE ICE PALACE

ONE SMALL wing of the Governor's Palace in Venusstadt is called *Der Eispalast* (the Ice Palace) because of a most interesting mechanical air-cooling system. The wing (which contains the quarters for the governor and his family, a library, a sitting room, a parlor, and a small private dining room) is completely sealed off from the outside. Air is forced into the wing by means of huge blowers (similar to those used in forced draught boilers, but much larger) but is first chilled by being passed over the coils of a gigantic Linde ammonia refrigeration apparatus. The reduction in temperature causes moisture to condense on the coils, from which it is collected and pumped away. Because of this apparatus, despite the nearly unbearable temperature and humidity of the outside atmosphere, the governor and his family are kept cool and dry (and are the only ones on Venus of whom this can be said).

The machinery was installed last year, by Josephus Martin, an American inventor and engineer who had previously made use of such machinery for the construction of a number of artificial ice factories in America. Mr. Martin is said to have been inspired by a similar arrangement used to ease the suffering of the American President Garfield after an assassin's bullet struck him down some years ago. He is currently constructing an artificial ice factory in Venusstadt, from which he and his investors expect to turn a tremendous profit by providing locally-produced ice at a cost significantly lower than that currently charged by importers.

The Ice Palace is kept in constant communication with all parts of the German capital by means of the recently installed telephone system, which relieves the governor of the necessity to leave the comfort of his quarters except for important occasions.

BR—BEDROOM
OF—OFFICE



LIZARD-MEN

THE NAME "Lizard-men" (German: *Eidechsemenschen*) was applied to the aboriginal inhabitants of Venus by the first humans to arrive on that world because of the creatures' reptilian appearance. Although the first groups encountered were uniformly hostile, it was soon discovered that there were many tribes of Lizard-men who could be friendly to humans. Indeed, in 1887 James MacKenzie, the lone survivor of the 1873 expedition, was discovered living with a friendly remote tribe, having gone completely native (it was he who revealed the translation of the Lizard-men's name for humans, *Bolu Popimayama*: "pale as a dead fish").

Physical Description

THE LIZARD-MEN of Venus are upright bipeds, although when speed is desired, they will often slither along on their bellies in a manner

similar to a terrestrial otter sliding down a riverbank. Their feet are broad, flat, three-toed appendages, with a thick webbing between the toes which serves as a secondary means of propulsion in the water and prevents them from sinking into the muck when they walk on the land. Their tail is their primary propulsive organ when swimming and also serves as a portable support when they stand upright (much like the Australian kangaroo). Their broad bellies and narrow chests accentuate the resemblance to a kangaroo, especially when they stand upright.

Their arms are thin and spindly, but surprisingly strong, and end in hands which are quite human-like but for missing a digit (what a human would call the little finger). When sliding or swimming, these arms are held flat against the sides and are used in steering or braking.

The head of a Lizard-man is his most reptilian characteristic, somewhat resembling that of a terrestrial



monitor lizard, but with large, batrachian eyes (presumably because of the world's dim light). Male Lizard-men have a small horn-like projection on the nose, which they do not seem to use as a weapon except in their ritual mate selection duels. The eyes seem to protrude slightly from the face, but this is an illusion created by the thick brow ridges. There are two sets of eyelids, a transparent inner lid (which is closed to protect the eyes when swimming in relatively clear water), and a thicker outer lid, which is closed when burrowing through the mires and bogs of the Venusian lowlands. The nostrils are relatively large but can be closed by means of a sphincter muscle when burrowing through the muck. They use their nostrils underwater to "smell" prey and to locate others of their species.

Lizard-men were at first thought to possess gills, but dissections have proven this erroneous. Lizard-men breathe using lungs, as terrestrial reptiles do, but recent investigations have revealed a hitherto unsuspected ability: Lizard-men can supplement their lungs underwater by absorbing oxygen and respiring carbon dioxide through their belly skin (their back skin is too thick for this process). This process is not enough to keep them alive, but it can extend their time underwater by a sizable margin and makes possible immersions of up to an hour. Subsurface navigation is accomplished by smell and by means of echo location.

SKIN

LIZARD-MEN SHED their skin as they grow, with the interval increasing as they age. (Evidently Lizard-men never really stop growing, but their rate of growth slows as they get older.) The skin of a Lizard-man is thick and warty on the creature's back and the upper surfaces, and thickens with age. Their belly skin is softer and thinner, although still very tough and leathery. Their back skin is usually a dark green or gray-brown in color, often so dark as to be almost black, although lighter shades are not unknown. The belly is usually a paler version of the back color and almost always oddly patterned in a light yellow or yellow-green. These patterns are unique to each individual and are considered to contain auguries of an individual's future life in their intricate patterns. In the more developed tribes of Lizard-men there are shamans who "read" each individual's future at the time of hatching. Warriors mount their most recently shed skin on their shield as a semi-heraldic escutcheon, especially if they wear body armor (which covers the belly skin, obscuring the pattern).

Cultures and Societies

MOST LIZARD-MEN live in an appallingly primitive state, wandering the lowlands (or swimming in the shallow seas) in nomadic, small family and clan groups, carrying their meager possessions in net bags woven of vines and creepers. Some Lizard-men, however, have begun to ascend the path to civilization, although they are still savage primitives in most respects.

Even before the coming of humanity, there were a few tribes of Lizard-men which had developed a primitive

agriculture (or aquaculture, since they are equally at home on land and in water), and were beginning to lead a more sedentary lifestyle than their nomadic neighbors. Family and clan groups coalesced under a chief or council of elders into a village, and soon villages began to combine into tribes. Agricultural surpluses accumulated and permitted specialized occupations such as warrior, shaman, priest, and so on.

With the arrival of humans, some of these tribes were absorbed into the colonies. Here, they work on the giant plantations of the jungle-

covered plateaus, tending plants and protecting them from the local animal life in return for food and protection (from the elements, from dinosaurs, and from the deprivations of their marauding brethren). Other tribes near the settled plateaus have prospered greatly from trade. The Lizard-men, who are acclimatized to the hot, wet lowlands, gather the plants and other materials which humans find valuable. These they trade for various human goods at hundreds of small human trade stations located throughout the lowlands.

TOOLS, TRADE GOODS, AND WEAPONS

THE LIZARD-MEN, not having the use of fire, remain in a stone age, making their tools from rock, bone, and plant materials. Iron and steel soon become worthless piles of rust in the hands of the Lizard-men, but corrosion-resistant tools are much in demand among them. The most common trade goods are knives, axe heads, spearheads, and other items of brass (which corrodes more slowly than most other metals). Pots, jars, and other containers of ceramic or glass are highly prized. Other items which are traded are rubberized canvas bags and strips of rubberized cloth (for belts and the like), cut-glass prisms and pendants of all colors, gold-covered medallions (which do not rust or corrode, even on Venus). Generally, anything which shines or sparkles and does not corrode can be traded for several pounds of valuable material.

The weapons of the Lizard-men are constructed from the *Oma Jolima* (Mother of Weapons), a reed-like plant of the Venusian lowlands. Although relatively supple when alive, the stem hardens after harvesting, becoming an extremely tough but slightly springy substance, approximating ebony in hardness, but without the excessive weight of that hardwood, and with the flexibility of horn. By shaping the plant immediately after harvesting and allowing it to harden, the Lizard-men make most of their weapons. Young shoots are used for arrows; slightly older shoots are used for javelins, harpoons, and spears. War clubs, axes, and maces can be made by braiding together lengths of the supple shoots and allowing them to harden. Sharp bits of bone or chipped stone (or, more recently, broken glass obtained from human merchants) are often woven into the ends of these weapons, making them quite deadly. Helmets, shields, breastplates, and other armor can also be constructed from the plant by weaving the thin shoots into the shape desired, like wicker. Since the plant hardens within an hour of harvest, great speed and dexterity are needed in order to complete the more complicated items. The action of the Venusian elements and putrefactive bacteria will eventually cause the material to deteriorate, but it can last for years under normal use. Before the arrival of humans, these missiles were quite light and had little penetrative power, and were therefore usually tipped with deadly poison from one of the numerous toxins available to the Lizard-men. (Fortunately, these poisons have proven somewhat less lethal to humans than to Lizard-men, and generally cause severe fever but seldom death.) Metal points obtained from human traders give their missiles more weight and sufficient penetration to be deadly without this barbaric and cruel accessory. The warriors of the tribes close to human settlement have given up the practice, but the more remote savages retain it.

THE BIOLOGY OF LIFE ON VENUS

IN GENERAL, life on Venus is simpler, more primitive, and less well-developed than on Earth. There are no higher forms such as mammals or birds, and there are few flowering plants.

Land Life

THE DOMINANT fauna on Venus are collectively referred to as dinosaurs, because of their close resemblance to the extinct terrestrial life form of the same name. Since the dinosaurs of Earth are extinct, it is impossible to determine the exact relationship (if any) between the dinosaurs of Venus and those of Earth. Many of the larger dinosaurs

are very difficult to kill with weapons smaller than light artillery, and these present a danger to all travellers. Hundreds of varieties have been cataloged, and we herewith present a summary of a few of the more common types.



Brontosaurus: The many varieties of large, quadrupedal plant-eating dinosaur are popularly known as brontosaurus. These large, semiaquatic creatures inhabit the marshes and bogs near the shores of the Venusian seas, although some inhabit the highland jungles as well. They are characterized by thick bodies, long tails, and long necks. Although normally herbivorous, these creatures will attack when they believe their young are threatened. They travel in family groups, and some are believed to be migratory.



RUMORS

A NUMBER of giant creatures are rumored to exist, but there are no reliable accounts of them, and no specimen (living or dead) has ever been recovered. Some of these beasts have allegedly been encountered by humans; others are based on legends and stories of the various tribes of Lizard-men. Here is a summary of the various alleged monsters:

- James MacKenzie, the only survivor of the 1873 expedition, told of seeing a giant carnivorous sea turtle and a sea serpent over five rods in length. He also reported a giant tentacled creature similar to a squid or octopus, but with arms several rods in length, which he claimed snatched two members of his party from their drifting conveyor. Since MacKenzie was lost at the time of these sightings, he was unable to provide any details about the location of these encounters. No trace of them has been recovered by any other survey party.

- A giant crocodilian beast is rumored to dwell along the equatorial shores of the Südmeer (the Southern Sea). It is said to be too large to walk on land, but can swallow swimming Lizard-men whole.

- Lizard-men report the existence of giant carnivorous plants capable of trapping a human being. Meat-eating plants of smaller size are known to exist, and there is no theoretical reason that a species of similar flora could not exist somewhere on the planet. Until a specimen can be acquired for study, however, these and other legends must remain the subject of speculation.

Tyrannosaurus: The large, carnivorous, bipedal dinosaurs of Earth are properly called carnosaurs, but those of Venus are commonly known by the name of the most famous genus of their terrestrial analogues, *Tyrannosaurus Rex*. Often weighing more than 40 tons and possessing razor-sharp teeth up to six inches long, these creatures are the most dangerous of the many hazards to be found on Venus. Smaller carnivores of this type are usually collectively called carnosaurs.



Ceratopsians: These dinosaurs are a group of horned, quadrupedal herbivores, smaller than the bron-

tosaurus mentioned earlier. These horned dinosaurs frequent the highland jungles and often find themselves in conflict with various plantation owners and small settlements in these regions. The horned dinosaurs all possess an armored "collar" at the back of the skull and one or more horns, the number and location of which vary with the numerous varieties. The triceratops is most commonly encountered and possesses three horns (a small one on the nose and two larger ones, one over each eye). Ceratopsians range in size from eight to 24 tons and usually travel in herds. They will attack in response to the slightest perceived threat by lowering their massive heads and charging like enraged bulls.



Stegosaurus: A smaller (10-ton), herbivorous dinosaur distinguished by the row of upright plates or spikes down its spine and the cluster of spikes on the tip of its tail. There are several minor varieties, which differ both from each other and from Earth stegosaurs in small details. Stegosaurs are solitary creatures and respond to threats by facing away from their enemy and thrashing with their deadly tail.



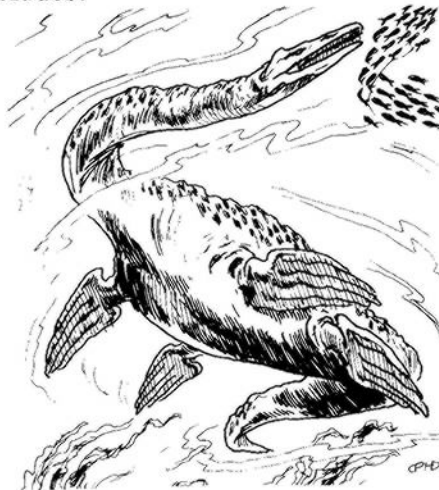
Hadrosaurs: This is a general name applied to a large number of

bipedal herbivores which are very popular with trophy hunters because of their unusual heads. Each species has a unique combination of wattles, crests, horns, and jawbones, and many have several color variations as well. Their small size (six to 10 tons) makes them easier to kill than most other dinosaurs, and the number of hunting expeditions seeking these creatures is increasing every year.

Small Lizards: The highland jungles are home to numerous small (less than one ton) lizards of every sort. There are too many of these to be described here, and they represent a nuisance rather than an active danger to travellers on Venus. One variety, the pacyosaurus, has been domesticated by several of the more advanced tribes of Lizard-men as a draft animal and mount.

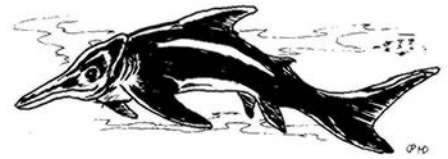
Sea Life

KNOWN VENUSIAN sea life includes:



Plesiosaurs: These are large marine creatures found throughout the oceans and seas of Venus. They have a thick, slightly flattened body, four flippers, a long neck, and no tail. The largest encountered was over 42 feet in length, but larger

animals are believed to exist.

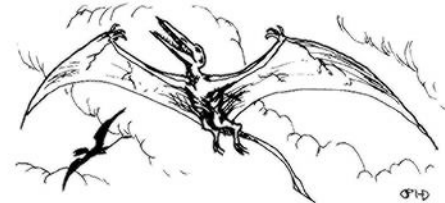


Ichthyosaurs: Large marine creatures which inhabit the deep oceans of Venus, ichthyosaurs can sometimes be found in the shallower seas. They are ichthyoid in form, somewhat resembling the dolphin of Earth, although much larger, up to 36 feet in length (for the largest specimen yet acquired).

Primitive Fish: A variety of fish inhabit the seas and oceans of Venus, but most are primitive, resembling those of Earth's bygone epochs. These range in size from an inch or two to three or more feet.

Aerial Life

SMALL FLYING creatures such as insects are common on Venus, as they are on Earth. Birds and bats are completely absent (avian and mammalian life have not yet arisen). The largest insect is the giant dragonfly (wingspan 18 inches), which is almost completely harmless despite its menacing appearance.



Aside from the insect-like creatures mentioned above, flight on Venus is the sole province of a few reptilian creatures similar to the pterodactyls of Earth's bygone ages. The largest of these has a wingspan of three yards and weighs just under 35 pounds. The smallest is the size of an Earth pigeon.



GENERAL DATA

VENUS IS the second world outward from the Sun and occupies a nearly circular orbit at a mean distance of 67 million miles. Its year is 225 Earth days in length, and its day is just under 22 Earth hours. The world is completely covered by dense white clouds, and this, combined with its proximity, makes it the third brightest object (after the Sun and the Moon) in the terrestrial heavens.

Venus represents the opposite extreme from Mars, and its nature emphasizes the sequence of development observed elsewhere. Venus is primitive, Earth advanced, Mars decadent. On Venus it is always raining, on Mars it never rains, and on Earth is the perfect mean.

A little-understood peculiarity of the Venusian magnetic field radically accelerates liftwood decay on that world, a fact that stranded the first three expeditions there. It wasn't until a German expedition (equipped with an ether dirigible) landed on the world that humanity learned the truth. Venus, it turned out, was a dank, hothouse world of dense clouds and heavy rainfall. Only from the highest mountains and plateaus can the Sun be occasionally glimpsed through the dense clouds. However, to the growing chemical industries of Germany, hungry for the raw materials needed to produce drugs, dyes, and other chemical products, Venus is not only a hothouse, but also a treasure trove of botanical products.

The main areas of settlement are the German and British settlements

in the Kaiser Wilhelm Mountains. The Russians and the Italians also have small enclaves.

GEOGRAPHY

VENUS PRESENTS certain unique problems to explorers. It cannot be mapped from orbit because of the perpetual cloud cover. The only way to take a navigational fix is to lift high enough above the clouds to be able to see the Sun or the stars (depending on the time of day). Therefore, only a fraction of the planet has been properly mapped, and the accuracy of this mapping leaves much to be desired (especially for the less well visited areas). A few locations in the highlands are known with accuracy (such as Mount Maxwell) because the Sun can be seen well enough to shoot a fix directly from the ground.

About a quarter of the planet is believed to be covered by oceans or shallow seas. There are two main oceans, the Nordmeer, or North Sea, and the Südmeer, or South Sea. Both are relatively shallow for the most part, especially by comparison with the oceans of Earth. The higher altitudes of Venus are covered with dense jungles; the lower altitudes are mostly marsh or bog. There are a few mountain ranges and upland plateaus where most of the human settlement has occurred.

FLORA AND FAUNA

THE PLANT LIFE of Venus has its counterparts on Earth, and humans will find most of it tantalizingly familiar, albeit somewhat primitive. There are few flowering plants, and a greater variety of the more primitive plants such as ferns and cycads than are present on Earth.

The animal life of Venus is equally primitive. Huge lizards called dinosaurs roam the lowlands, the fishes of the ocean are simple and undeveloped, and the most intelligent creature on the world is the barbarous Lizard-man.

LIFE ON VENUS

VISITORS TO Venus will find a number of interesting and amusing aspects to the world.

Their clothing (leather goods in particular) will grow a thin coating of green slime unless sprayed with carbolic acid every day or so. Though rubberized clothing is resistant to the climate, it is also quite heavy and hot, while most conventional clothing soon becomes rotten and reduced to rags. Iron and steel which are not properly cared for will soon turn to useless lumps of rust. Wood must be treated with creosote, carbolic acid, or some other chemical preservative or it will rot away within weeks. The humidity will turn the stiffest of starched collars to a sodden rag within minutes (the new celluloid collars are a must for any gentleman on Venus).

Anyone who ventures outside must decide whether it is worse to be drenched in the open air or remain drier but hotter inside a rubberized canvas sou'wester. Travel is mostly by airship, and long-distance journeys are usually made above the cloud layer to lessen navigational difficulties. Travellers on foot will need special footgear in the bogs.

Weapons are essential. Travellers in the lowlands must be prepared to defend themselves from the attacks of giant dinosaurs, and travellers outside settlements must be prepared for the attacks of hostile Lizard-men.

WEAPON CHARACTERISTICS:

Martian Cannon

Weapon	Pen	DV	ROF	Rng.
Sweeper	—	P	2	0/1
Light	0	1	1	1/2
Rod Gun	3	1	(1)	2/4
Heavy	1	2	1	1/3
Rogue	2	3	(1)	2/4
Lob Gun	2	4	(1)	—/3

WEAPON CHARACTERISTICS:

Royal Navy Guns

Weapon	Pen	DV	ROF	Rng.
Maxim	—	P	6	1/ 2
Gardner	—	P	2/3	1/ 2
Nordenfelt	—	P	5	1/ 2
1-pdr	0	1	3	2/ 4
3-pdr	1	1	3	2/ 4
6-pdr	1	1	3	3/ 6
4" short	2	2	1	3/ 6
4" long	3	2	1	4/ 8
5"	4	4	1	4/ 8
6"	5	6	1	5/10
8"	9	8	(1)	6/12
10"	10	10	(1)	7/14
12"	12	12	(1)	8/16
14"	14	14	(1)	9/18
16"	16	16	(1)	10/20

TO HIT

Die
Range Roll
Close: 3-6
Long: 5-6

TO HIT MODIFIERS

Condition	Modifier
Different Altitude:	—1
Green Crew:	—1
Burning:	—1
Crack Crew:	+1
Shrapnel or Grape:	+1

HIT

LOCATION

Die	Location
Roll	Location
1	Hull
2	Hull
3	Crew
4	Crew
5	Gun
6	Critical*

*Roll on table below and see the Critical Hits Chart.

Weapon Characteristics Notes (Both Charts)

Pen: If target's armor value exceeds penetration, halve gun's damage value (DV). If armor value is more than twice penetration, gun has no effect.

DV: A damage value of "P" means that only personnel are affected by the weapon; all hits become crew hits, and the weapon's fire is treated as small arms fire.

ROF: Rates of fire in parentheses indicate that the weapon fires once and then takes the number of rounds in parentheses to reload.

Rng.: Short range/long range.

CRITICAL HIT TABLE

Die	Result
Roll	Result
2	Magazine
3	Bridge
4	Fire/Boiler
5	Trim Damage
6	Rudder Jammed
7	Fire
8	Lifters Jammed
9	Screw/Mast
10	Magazine
11	Bridge
12	Fire/Boiler

COLLISIONS

Conditions	Roll	Effects
Enter from Bow or Stern: —1	5, 6	Hull hit if roll less than other ship's hull size.
Turn In Hex: +2		Smaller ship suffers loss of trim if rolls less than half the difference in hull sizes (round down).

RAMMING

Conditions	Roll	Effects
Avoid: —1/2 movement (round up)	3-6	Ram Mounted: Rammed ship suffers hull hits equal to half the hull size of the ramming ship (round fractions up). Rammed ship suffers loss of trim if rolls less than half the hull size of the ramming ship (round fractions up). Rammed ship is grappled unless it plummets due to a loss of trim.
		No Ram Mounted: Same as for a collision, but if the ramming ship is smaller there is no chance of a loss of trim. Rammed ship is grappled unless it plummets due to a loss of trim.

CRITICAL HITS

THE FOLLOWING are possible critical hits in aerial combat.

Magazine: Each large gun is assumed to have its own magazine or shell locker, so detonation of a magazine will not necessarily destroy a ship. It will do considerable damage, however. The ship automatically loses one gun (determined randomly) with a damage value of 1 or greater. The gun is destroyed, and its crew is dead. The ship also takes hull hits equal to the damage value of the gun that was destroyed (*not* the gun that fired) and rolls for one additional critical hit. The additional critical hit is resolved as if caused by a gun with a damage value equal to that of the destroyed gun.

If no gun with a damage value greater than 1 is mounted on the ship, treat this critical hit as a fire result.

Bridge: Bridge crewmen are killed equal to half the damage value of the round that hit (round fractions up). In addition, the ship may not voluntarily change altitude or course in the next turn.

Fire: A fire is started on board the ship. The initial fire level is equal to the damage value of the firing gun. Once a fire has started it will eventually spread and consume the ship unless put out by the crew. At the beginning of each turn all fires presently burning are increased by one level except on kites. Fires burning on kites are increased by two levels. Any ship on fire receives an adverse die roll modification of -1 on all rolls to hit from firing (including small arms fire) due to smoke interfering with the aim of the gunners. At the start of the movement phase in which the level of the fire is greater than the vessel's hull size, the vessel takes one magazine critical hit. If the vessel has no magazines, left it instead loses 1 die roll worth of hull hits.

Fires may be fought at the end of the player's movement phase. Roll 1 die for each deckhand and each extra petty officer and 1 die for every two marines

detailed to fight the fire. For each die roll result of 6, the fire is reduced one level. On steel ships, the fire is reduced one level for every 5 or 6 rolled. Treat all British ships as being steel and all Martian ships as being wood.

Fire/Boiler: Ships which are not powered by steam treat this as a fire result. Steamships treat this as a boiler hit. Roll a die. If the result is less than the damage value of the firing gun, the boiler blows up. If the boiler blows, the entire engine crew is killed, the ship's speed is permanently reduced to 0, and the ship suffers additional critical hits equal to the size of the boiler. All additional critical hits are resolved with a damage value of 1.

If the boiler does not blow, the ship's speed is reduced by the damage value of the firing gun. However, this speed reduction is not permanent, and the amount of the reduction is reduced by one each subsequent turn (as the engine gang patches the boiler, wraps rags around split steam lines, etc.)

Screw/Mast: The air screw (propeller) or its driving chains are hit on a screw galley or steamship, or the masts and rigging are damaged on a kite. A steamship or screw galley has its speed permanently reduced by 1. A kite permanently subtracts 1 from its movement die roll. If a vessel has its movement allowance reduced to zero due to screw or mast hits, it may jury-rig a mast or temporary propeller. To jury-rig a mast or propeller, roll a 6 at the end of the movement phase. A jury rig allows the vessel to move with a movement factor of 1. A vessel may not have more than one jury rig at a time.

Loss of Trim: The ship's trim controls are damaged and the ship suffers a sudden loss of trim. The owning player immediately attempts to recover trim by rolling greater than the damage value of the firing gun on a die. (If the loss of trim was caused by a collision, the player recovers by rolling greater than half the difference in hull sizes, rounding fractions down.) If the trimmer is dead, the captain makes the attempt, but with a die roll modifier of -1. If the

captain is dead, any surviving officer or petty officer may make the attempt but with a die roll modifier of -2. If all officers and petty officers are dead, any crewman may make the attempt but with a die roll modifier of -3. Ships with hull sizes of 5 or larger have a +1 modification to the die roll. Ships with hull sizes of 10 or larger have a +2 modification, etc.

A roll of 6 will always recover trim, regardless of the damage value of the firing gun or the die roll modifier in use.

If the ship recovers trim, it remains at its current altitude but may not voluntarily change altitude during its next movement phase. If the ship does not recover trim, it immediately drops one altitude level, and the attempt to recover is repeated. This procedure is repeated until either the ship recovers trim or it crashes. If the ship drops one or more altitude levels, then the ship may not move, fire, fight fires, or change any crew assignments until the end of the next movement phase. (The crew is still stunned.) If boarded, the crew may defend itself.

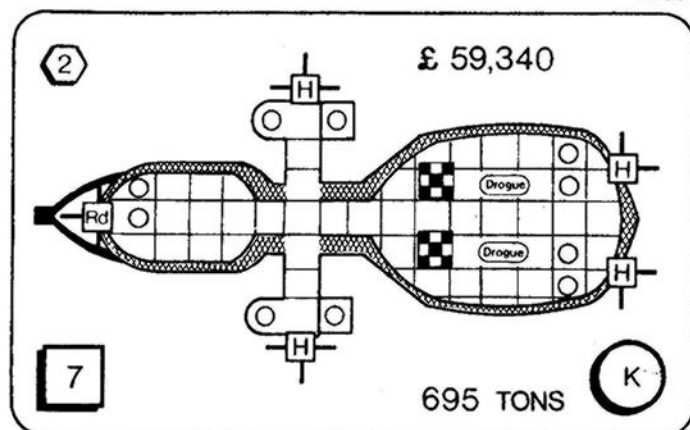
Rudder Jammed: The ship may not change course until the rudder is freed. To free the rudder, roll a die for a number greater than the damage value of the firing gun.

If a ship with a rudder already jammed suffers another jammed rudder result, add the damage value of the new result to that already suffered to determine the number needed to free the jam. For example, if a ship already has a rudder jammed by a damage value of 2 and suffers one with a damage value of 1, the player must now roll greater than a 3 to free the rudder. However, a roll of 6 will always free the rudder, regardless of the damage value of the round. Attempts to free the rudder are made at the end of the movement phase, at the same time as all other repair attempts.

Lifters Jammed: The ship's large lifting panels are temporarily jammed in place, and the ship may not change altitude until they are freed. Freeing jammed lifters is done the same way as freeing a jammed rudder.

WHISPERDEATH

Kite



Bridge

C	H	T	S	O
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[illegible][illegible]

Hull Hits

Passengers

H						
M						
L						
VL						

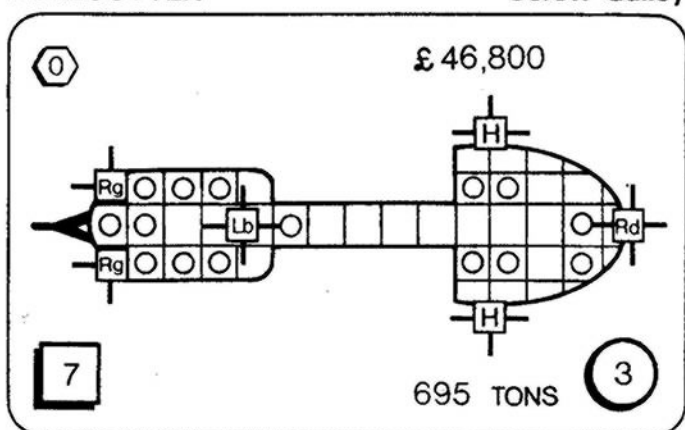
0				

Masts

-1
-2
-3
-4
-5
-6

HULLCUTTER

Screw Galley



Bridge C H T S O O O

Deck

[illegible]

Hull Hits

Passengers

H									
M									
L									
VL									

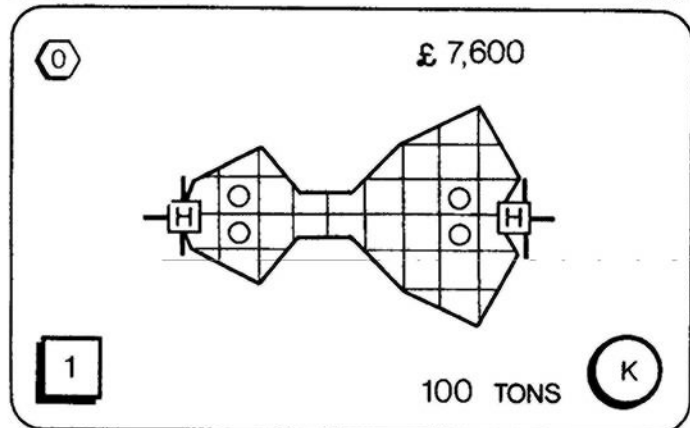
0				

Screw

321

BLOODRUNNER

Kite



Bridge **CHTS**

Deck ☐

Maneuver	
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Hull Hits

Passengers

H	
M	
L	
VL	

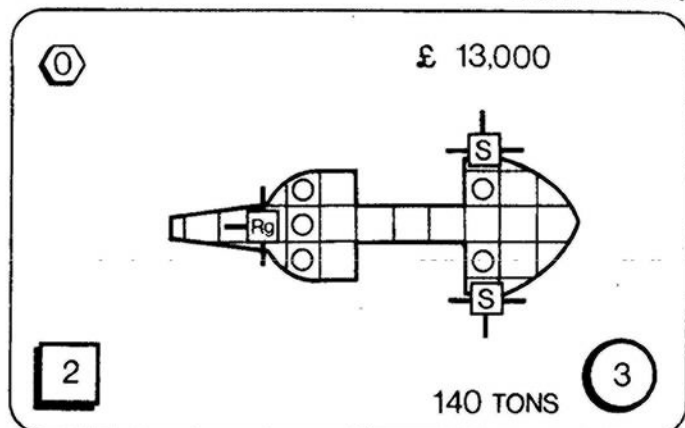


Masts

-1
-2
-3
-4
-5
-6

SMALL BIRD

Screw Galley



Bridge

C	H	T	S
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Deck [REDACTED]

[illegible]

Hull Hits

Passengers

VH	
H	
M	
L	
VL	

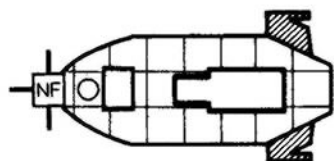
Screw

3
2
1

Aerial Steam Launch

0

£ 4,840



1

50 TONS

5

Bridge CHT

Deck

Maneuver

Screw

5
4
3
2
1

Hull Hits

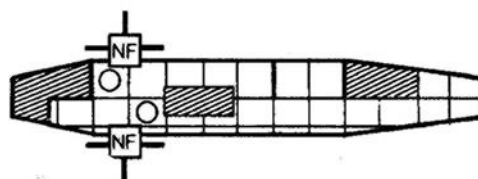
VH
H
M
L
VL

Passengers

Zeppelin

0

£ 20,000



2

200 TONS

6

Bridge CHTS

Deck

Maneuver

Screw

6
5
4
3
2
1

Hull Hits

VH
H
M
L
VL

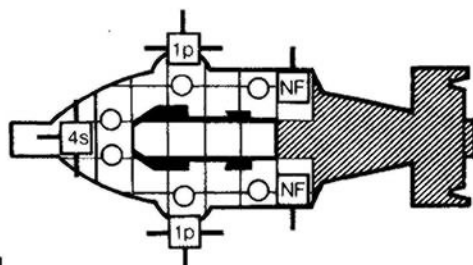
Passengers

APHID-Class

Aerial Gunboat

2

£ 23,220



2

160 TONS

6

Bridge CHTS

Deck

Maneuver

Screw

6
5
4
3
2
1

Hull Hits

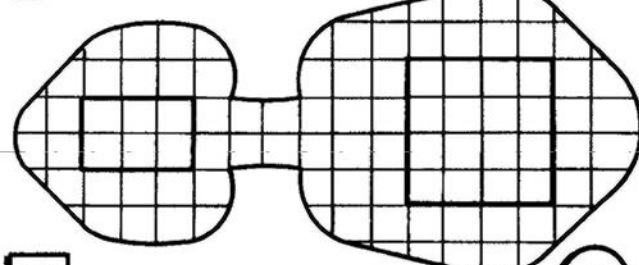
VH
H
M
L
VL

WARM WINDS

Merchant Kite

0

£ 112,600



20

1,950 TONS

K

Bridge CHTSOO

Deck

Maneuver

Masts

-1
-2
-3
-4
-5
-6

Hull Hits

(Each box counts as two)

M
L
VL

Passengers

SMALL ARMS FIRING TABLE

Weapon	Shots	Mag	Reload	Wnd	Required Strength	Save	Range
Pistols							
Single-Barrel Pistol	1	—	1	2	2	1	15
Light Revolver	3	6	(3)	1-2†	1	2	10
Heavy Revolver	3	6	(3)	1-2†	2	2	15
Light Multibarrel	2	2	(2)	1-2†	1	2	5
Heavy Multibarrel	2	4	(2)	2	2	1	15
Rifles							
Bolt Action Rifle (LM)	1	8	(4)	2	3	1	120
Bolt Action Carbine (LM)	1	8	(4)	2	2	1	90
Bolt Action Rifle	1	5	(5)	2	3	1	120
Bolt Action Carbine	1	5	(5)	2	2	1	90
Lever Action Rifle	2	12	(3)	1-2†	2	1	75
Lever Action Carbine	2	6	(3)	1-2†	1	1	45
Breech-loading Rifle	1	—	1	2	3	1	90
Breech-loading Carbine	1	—	1	2	2	1	60
Muzzle-loading Rifle	1	—	3	2	3	1	75
Muzzle-loading Carbine	1	—	2	2	2	1	45
Smoothbore Musket	1	—	2	2	3	1	45
Smoothbore Carbine	1	—	2	2	2	1	30
Long Hunting Rifle	1	—	1	3	3	1	200
Heavy Double Rifle	2	2	1	4	4	1	150
Shotguns							
20-gauge Double	2	2	1	1D/2	2	0	30*
12-gauge Double	2	2	1	1D	3	0	30*
12-gauge Scattergun	2	2	1	1D	3	0	15**
12-gauge Lever Action	2	5	(2)	1D	3	0	30*
Nonfirearms							
Bow	1	—	1	1	2	2	30
Spear	1	—	—	2	3	2	10
Throwing Knife	1	—	—	1	2	3	5
Stone	1	—	—	1	1	4	5††

Notes: (LM): Lee-Metford. *Shotguns halve their chances of hitting (round fractions up) at double range and may not fire beyond double range. **Scatterguns follow the same rule on range as shotguns, as noted above. In addition, however, they add two to their hit number at close range. †These weapons inflict one wound unless within 10 yards of the target, in which case they inflict two wounds. ††Triple range when used with sling. (#): Number of rounds which can be reloaded per combat action.

MACHINEGUN FIRING TABLES

Weapon	Shots	Mag	Reload	Wnd	Save	Range
Gatling 0.50	2/6	36	3	3	1	300
Gatling 1-inch	2/6	18	4	4	1	300
Mitrailleuse	8	8	3	3	1	300
Gardner	2/4	20	2	3	1	300
Nordenfelt 1-B	3	15	2	3	1	150
Nordenfelt 3-B	5	48	2	3	1	300
Nordenfelt 5-B	8	48	2	3	1	300
Maxim	10	50	2	3	1	300

SMALL ARMS SAVING THROW MODIFIERS

Target	Modifier
Mass Formation:	-1
Charging:	-1
Close Range:	-1
Airborne:	+1
Mounted:	+1
Light Cover:	+1
Medium Cover:	+2
Hard Cover:	+3
Concealed:	+Fieldcraft/2 (round up)

BRITISH FIELD GUN FIRING TABLE

Weapon	ROF	Range	Burst
1-pr HRC	2	400	2
6-pr RBL	(1)	600	4
7-pr MH	(1)	600	4
9-pr RBL	(3)	600	6
12-pr RBL	(3)	600	8
15-pr RBL	(3)	600	10
20-pr RBL	(3)	600	12
40-pr RBL	(3)	800	14
5'' Hwtzr.	(3)	800	14
Hale Rocket	1	600	16

HRC: Hotchkiss Rotating Cannon
RBL: Rifled Breech Loader
MH: Mountain Howitzer
ROF: Weapons which list a number in parentheses have a rate of fire of 1. It then takes the number in parentheses in combat actions to reload the weapon.

MARTIAN CANNON FIRING TABLE

Weapon	ROF	Range	Burst
Sweeper	(1)	100	2
Light Gun	(3)	200	4
Heavy Gun	(4)	300	6
Rod Gun	(5)	400	4
Rogue	(6)	400	8

ROF: Weapons which list a number in parentheses have a rate of fire of 1. It then takes the number in parentheses in combat actions to reload the weapon.

ARTILLERY AMMUNITION EFFECTIVENESS

Ammunition	Hit	Save
Shot	3	0
Shell	2	1
Grapeshot	3	2
Shrapnel	4	2

MELEE WEAPONS

Weapon	Hit Required		Strength	Wnd	Block
	Reach	Dice			

Pole Arms

Pike	3	2	3	2	-2
Spear	2	3	3	2	-1
Rifle/bayonet	2	3	3	2	-

Edged Weapons

Great Sword	2	4	3	1+S	-
Cutlass	2	4	3	1	-
Saber	2	5	2	1	-
Knife	1	5	1	1	-1
Machete	2	4	3	1	-1

Bashing Weapons

Club	1	2	3	1	-2
Axe	2	2	4	1+S	-1
Hatchet	1	3	2	2	-2

NPC MORALE AND CLOSE COMBAT

Experience	Morale Level	Close Combat
Green	8	1
Trained	9	2
Experienced	10	3
Veteran	11	4
Elite	12	5

BARRIER TOUGHNESS

Material	Multiplier
Wood	×5
Dirt	×3
Earthworks	×2
Brick, Stone	×1
Iron	×1/3
Steel	×1/4
Superhard Steel	×1/8

MORALE LEVEL MODIFIERS

Condition	Modifier
Casualties:	-1 level each
Outnumbered 2-1:	-2 levels
Superior Enemy Morale:	-difference

ALLOWED ACTIONS

Remain Stationary	Reload a Weapon
Move	Change Weapons
Charge	Dodge
Attack	Block
Prepare a Weapon	Special Action

1 turn = 30 seconds. Four actions allowed per turn unless within 10 yds. Within 10 yds., actions allowed equal to Close Combat skill or Agility attribute, whichever is greater.

ARMOR VALUES TABLE

Armor	Value
Doublet	1*
Shoulder Scales	1*
Mail	2*
Breastplate	3*
Helmet	1
Shield	1**

*Only one type of torso protection (doublet, shoulder scales, mail or breastplate) may be used. All other armor effects are cumulative.

**A shield allows a player to block with two dice in addition to the blocking dice of any weapon used, or six dice if used by itself. If used by itself, the character uses his primary combat skill as a block number but may not riposte with any extra successful blocking dice.

EXPLOSIVE BURST SIZE

Power	Burst
1	2
2	4
3-4	6
5-8	8
9-12	10
13-18	12
19-24	14
25-32	16
33-40	18
41-50	20

TASK DIFFICULTY LEVELS

Difficulty	Target Level
Easy	Target 4
Moderate	Target 8
Difficult	Target 12
Formidable	Target 16
Impossible	Target 20

MOVEMENT

Factor	Crawl	Walk	Run†
Dry Land	2 yds	8 yds	20 yds + Agil. Dice
Shallow Water	2 yds	4 yds	10 yds + Agil. Dice
Combined w/Attack*	NA	4 yds	10 yds + Agil. Dice
Swimming**	Swimming Skill Dice in yds		

*Movement combined with attacks reduces the hit number by 1 when walking and by 2 when running. **Swimming speed is reduced by 1 per 10 lbs. carried and by 1 for adverse water or weather conditions. †Charging is a running action. See page 96 for its uses/effects.

ANIMAL TRANSPORTATION

Type	Miles/ Day	Price/ Day
Riding Animal	20	3s
Howdah	10	2s
Wagon	10	2s
Coach	30	3s

WATER TRANSPORTATION TABLE

Inland Waterway

Vessel	Miles/ Day	Price/ Day
Man-Powered	20-30	2d
Wind-Powered	1D×10	3d
Steamer	50	5d

Open Sea

Vessel	Miles/ Day	Price/ Day
Wind-Powered	100	3s
Steamship	200	5s

Note: First-class passage costs five times the listed rate.

FOOT TRAVEL

Characters may walk either 10 or 20 miles per day, at their option (if 20 is chosen, below modifier applies.) Players may not march 20 miles through mountain or swamp.

Fatigue: Roll Endurance attribute dice for an Easy task to avoid fatigue when marching by foot. Difficulty level is modified as follows:

Marched additional 10 miles: +1 level

Encumbered: +1 level for every 20 percent of body weight carried

Human on Mars: +1 level

Human on Venus: +2 levels

Mountains: +1 level

CLIMBING ACCIDENT

Roll	Result
1	Climb delayed. Subtract 1 from faces climbed in day.
2	Climb delayed. Subtract 2 from faces climbed in day.
3	Climb delayed. Subtract 3 from faces climbed in day.
4	Climb delayed. No faces climbed in day.
5	Injury. Treat as level 1 fatigue. Lasts for one week. No rock faces climbed in day.
6	Injury. Broken leg. Climber cannot walk or climb and must be carried up mountain. Cut number of faces per day in half (round fractions up) and add one to difficulty to avoid accident. Leg mends in one month.

NAVIGATION HAZARDS

Roll	Result
1	Boat aground. 10 miles travel lost pulling it off.
2	Boat aground. One full day lost pulling it off.
3	Screw or rudder damaged. Speed halved until boat reaches port.
4	Hull damaged. Two full days lost making repairs.
5	Hull damaged. One die roll of days lost making repairs.
6	Hull crushed. Vessel grounded to avoid sinking. Cannot be refloated unless a large work crew and a large vessel are brought to the site.

MARS WEATHER TABLE

Die	Result
Roll	Result
1-4	Clouds
5-6	Windstorm

WEATHER EFFECTS TABLE

Weather	Visibility	Travel	Storm
Clear	Unlimited	No Effect	None
Overcast	1 mile	No Effect	None
Mist	800 yards	No Effect	None
Drizzle	400 yards	No Effect	Storm
Rain	200 yards	Halved	Storm
Torrent	50 yards	Prohibited	Severe
Windstorm	50 yards	Prohibited	Severe

AERIAL TRANSPORTATION TABLE

Vessel	Miles/ Day	Price/ Day
Zeppelin	300	10s
Steam Flyer	300	10s
Kite	200-400	6s
Screw Galley	200-300	4s
Long Boat	100-200	—
Conveyor	100-200	—
Glider	400	—
Aeroplane	100/hr	—

THE INNER WORLDS (CISASTEROIDAL)

Name	Orbit	Day	Year	Diameter	Circum.	Gravity
Mercury	36	—	88	3030	4760	40%
Venus	67	23	248	7526	11,821	100%
Earth	93	24	365	7927	12,457	100%
Luna	0.3*	28**	365	2160	3392	16%
Mars	141	24	687	4200	6597	90%

THE OUTER WORLDS (TRANSASTEROIDAL)

Name	Orbit
Jupiter	480
Saturn	900
Uranus	1800
Neptune	2800

Notes: Orbit is in millions of miles from the Sun, except that Luna's orbit (*) is measured from the Earth. Lengths of days are given in hours except that Luna's day (**) is 28 Earth days long. Mercury, since it is gravitationally locked facing the Sun, has no days. Years are given in Earth days. Diameter and circumference are given in miles. Gravity is the gravity at the surface as a percentage of that found on the Earth.

TURBULENCE/METEOR DAMAGE

Die	Damage
1-2	Injury
3-5	Minor
6-7	Major

COMMERCIAL SPACE TRAVEL

Vessel	Speed	Price
Liner	2.5	£60
Cargo	2.0	£40

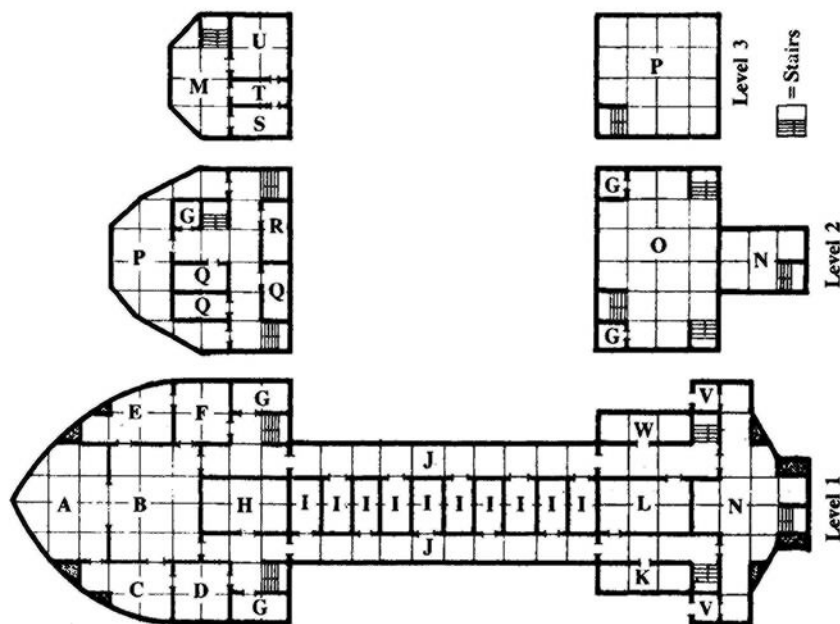
NAVIGATION AIDS

Device	Die Mod
Orrery	—1
Analytical Engine	—1
Astrogation Computer*	—4
Telescope	—1
Improved Telescope**	—2

Notes: The astrogation computer (*) is used instead of the orrery and the analytical engine, not in addition to them. The improved telescope (**) is used in place of the regular telescope. All other devices may be used together and their modifiers added.

HERTZIAN COMMUNICATORS

Reliability	Range (Miles)
1	10
2	100
3	1000
4	100,000
5	1,000,000
6	10,000,000



A TYPICAL COMMERCIAL ETHER FLYER

A. Gallery	M. Bridge
B. Dining Room	N. Engine Room
C. Bar	O. Steerage
D. Library	P. Greenhouse
E. Kitchen	Q. Officer's Stateroom
F. Private Dining Room	R. Captain's Quarters
G. Head	S. Captain's Day Cabin
H. Billiards Room	T. Chart Room
I. Stateroom	U. Ward Room
J. Promenade	V. Air Lock
K. Crew's Mess	W. Petty Officer's Quarters
L. Crew's Quarters	

MARS WILDERNESS ENCOUNTERS

Terrain	Dry Canal Bed	Steppe	Hills	Swamp	Mountain	Desert
Encounter #	4	3	2	2	1	1
Die Roll	Encounter Type					
1	Caravan	Nomad Village	Nomad Hunters	Swamp Pirates	High Martian Hunters	Oasis
2	Caravan	Nomad Hunters	Nomad Hunters	Swamp Pirate Camp	High Martian Hunters	Lone Traveller
3	Bandits	Nomad Hunters	Bandits	Ruumet Breehr Herd	Flying Skrill	Lone Nomad
4	Ruumet Breehr Herd	Gashant Herd	Gashant Herd	Cissawaan	Eelowaan	Roogie Pack
5	Gashant Herd	Eegaar Herd	Eegaar Herd	Green Koko	Great Kommota	Lone Eegaar
6	Nomad Hunters	Steppe Tiger	Roogie Pack	Knoe Shoshu	High Martian Galley	Lone Gashant

MARTIAN AERIAL ENCOUNTERS

Terrain	Mountain	Nonmountain
Encounter #	2	1
Die Roll	Encounter Type	
1	High Martian Galley	Merchant Kite
2	High Martian Galley	Merchant Kite
3	Flying Skrill	Armed Merchant Kite
4	Eelowaan	Small Warship
5	Great Kommota	Large Warship
6	High Martian Hunters	Pirate

MARTIAN STOCK NPCs

NPC Type	Experience	Marksman	Att.	Arms
Bandit	Trn/Exp	2	Phys	Musket
Pirate	Exp/Vet	3	Phys	Musket
Swamp Pirate	Trn/Exp	2	Phys	Musket
Merchant	Grn	1	Ment	Knife
Thief	Grn/Trn	1	Phys	Knife
Hill Warrior	Exp/Vet	4	Phys	Musket, Great Sword
Hill Brave	Grn/Trn	2	Phys	Bow, Sabre
High Martian	Exp/Vet	3	Phys	Bow or Pike
Caravan Guard	Trn/Exp	4	Phys	Rifle, Sabre
Soldier	Trn/Exp	3	Phys	Rifle, Bayonet
Marine	Exp/Vet	4	Phys	Rifle, Sabre
Traveller	Grn/Trn	1	Ment	Variable

ENCOUNTER DESCRIPTIONS

FOR STATISTICS of animals see the Animal Charts on the back; for animal descriptions, see the section on animals for the relevant world. If an encounter is listed under more than one terrain type, look for its description with its first terrain type.

MARTIAN WILDERNESS ENCOUNTERS

Bandits: A band of 30 bandits preparing an ambush for a caravan. They will immediately attack the characters and attempt to kill or capture them to prevent them from warning any nearby caravans.

Caravan: A large caravan of perhaps 20 ruumet breehrs carrying howdahs and protected by 20 guards mounted on gashants. Its members will be suspicious of the characters at first but will treat them with hospitality if the characters do not offend or threaten them.

High Martian Hunters: A party of 20 High Martians on a hunt. They will attack the characters and attempt to kill or capture them.

High Martian Galley: On a roll of 1-3 it is a small galley, on a roll of 4-6 it is a large one. It is either returning from or preparing to leave for trading or raiding. It will attack the characters and attempt to capture them.

Lone Nomad: A nomad brave on his man-

hood quest, this lone nomad may attempt to steal from the party at night, but he will not be otherwise hostile. He may consent to travel with the characters for awhile and will help avoid them a fight if they encounter other nomads.

Lone Traveller: The lone survivor of a bandit attack, this wealthy merchant is suffering from exposure and starvation and will reward the characters for helping him get home. Alternatively, the traveller is an enemy dispatch rider, an eccentric European hunter, a lost explorer, a fugitive from justice, a holy man on a cleansing sojourn, or any number of other possibilities.

Nomad Village: A village of perhaps a dozen families, either camped or on the move with their possessions carried on gashants. There will be 12 warriors and as many braves with the village. They will react with suspicion toward the characters but will probably not attack unless the characters provoke them or have something of obvious value the nomads want.

Nomad Hunters: A party of six nomad braves led by two warriors. They will react to the characters with more curiosity and less restraint, as there is no village present which would be endangered by a fight. If the characters are helpless, they may offer assistance; if they are well off, they may ask for gifts or attack the characters.

Oasis: At this oasis, the characters can find life-giving water. The oasis may be relatively large or may be only a small pool, well, or

spring. A caravan, nomads, or even bandits could be camped around it (or lurking nearby).

Swamp Pirates: Four small boats, each with six pirates. They will attack and attempt to capture the characters.

MARTIAN AERIAL ENCOUNTERS

Armed Merchant Kite: One large merchant kite as above, but armed with two heavy guns and a dozen marines. It will exercise caution but will defend itself vigorously if attacked.

High Martian Galley: On a roll of 1-3 it is a small galley, on a roll of 4-6 it is a large one. It will attack the characters and attempt to capture their vessel.

Large Warship: One warship of the nearest state. On a roll of 1-3 it is a galley, on a 4-6 it is a kite. It will attempt to board and inspect the characters' vessel and will attack if resistance is shown.

Merchant Kite: One unarmed large merchant kite which will try to flee if shown any sign of hostility and will be cautious anyway.

Pirate: On a roll of 1-4 it is a small ship, on a 5-6 it is a large one. On a second roll of 1-4 it is a galley, on a 5-6 a kite. It will attack and attempt to capture the characters' vessel.

Small Warship: One warship of the nearest state. On a roll of 1-3 it is a galley, on a 4-6, a kite. It attempts to board and inspect the characters' vessel and attacks if resistance is shown.

ANIMAL CHART: Mars

Type	#App	Size	Move	Wnds	Save	Weight (lbs.)	Weapons
Predators							
Steppe Tiger	1	1×2	L50 ¹	10	1	1500	Teeth (2, 4, 0, 2), Claws (3, 3, 1, 1)
Cissawaan	1D×10	1×1	W20 ²	1	—	100	Teeth (3, 2, 0, 1)
Green Koko	1	1×3	W20	3	1	200	Fangs (2, 3, 0, 1), Coils (2, 3, 0, 4)
Eelowaan	1	1×3	F40	3	—	200	Fangs (1, 3, 0, 1), Coils (2, 3, 0, 4)
Scavengers							
Great Kommota	1	3×3	F40	10	1	1 ton	Talons (2, 3, 3, 1), Drop (1, 1, —, 1D)
Roogies	1D×3	1×1	L40	1	—1	100	Teeth (2, 2, 0, 1)
Knoe Shoshu	1	2×2	W10	6	—	600	Tentacles (4, 4, 3, 3), Sting (1, 2, 0, 1)
Plant Eaters							
Flying Skrill	1D	2×2	F50 ³	4	—	500	Horns (1, 2, 2, 2), Talons (2, 2, 1, 1), Drop (1, 1, —, 1D)
Gashant	1D×10	1×2	L50 ⁴	6	—	1000	Teeth (1, 2, 0, 1), Tail (1, 2, 2, 1)
Ruumet Breehr	1D×2	2×3	L20	20	1	5 tons	Crush (1, 1, 3, 5)
Eegaar	1D×10	1×1	L60 ⁵	2	—1	200	Horns (1, 2, 2, 1)

Notes: 1: The steppe tiger will only maintain this pace for two actions, after which he will become cautious and either retreat or circle for a better chance at an attack. He will always attempt to attack from less than 50 yards so as to immediately close the distance to his prey. 2: The cissawaan will only move half as fast on land. 3: Subtract 1 from the skrill's speed for every 10 pounds of weight carried. 4: Subtract 1 from the gashant's speed for every 20 pounds of weight carried. 5: The eegaar will tire after one complete game turn of running, and will slow to half its normal speed. Weapons: Characteristics are listed in the following order: number of hit dice, required hit number, reach, wound value.

HUMAN STOCK NPCS

NPC Type	Experience	Marksman	Att.	Arms
Soldier	Trn/Exp	4	Phys	Bolt Action Rifle
Officer	Exp/Vet	3	Phys	Revolver, Sabre
Merchant	Grn	1	Ment	Revolver
Explorer	Trn/Exp	3	Ment	Revolver
Hunter	Grn/Trn	5	Ment	Hunting Rifle
Scientist	Grn	2	Ment	Light Revolver
Administrator	Grn/Trn	2	Ment	Light Revolver
Anarchist	Grn/Trn	3	Ment	Light Revolver, Bomb
Fenian	Trn/Exp	4	Phys	Shotgun
Sailor	Grn/Trn	2	Phys	Cutlass
Adventuress	Exp	3	Ment	Light Multibarrel Pistol

ANIMAL CHART: Earth

Type	Size	Move	Wnd	Save	Weight (lbs.)	Weapons
Horse	1×2	L60	6	—	1000	Hooves* (2, 2, 1, 1)
Mule	1×2	L40	4	—	800	Hooves* (2, 2, 1, 1)
Camel	1×2	L40	5	—	1200	—
Ox	1×2	L20	8	—	1500	Horns (1, 2, 2, 1)
Elephant	2×3	L20	20	1	3 tons	Horns (1, 2, 2, 1), Crush (1, 1, 3, 5)

*Attack as a claw attack.

VENUSIAN WILDERNESS ENCOUNTERS

Terrain	Marsh	Bog	Highlands	Mountain
Encounter #	1	3	2	1
Die Roll	Encounter Type			
1	Native Fishing Boats	(Roll 2D.)	Native Hunting Party	Lost European
2	Native Trading Barge	Giant Carnivorous Plant	Native Raiding Party	Native Trading Party
3	Native Pirate Canoes	Brontosaurus	Native Trading Party	Native Trading Party
4	Brontosaurus	Carnosaurus	Native Trading Party	Native Raiding Party
5	Tyrannosaurus	Stegosaurus	Pacyosaurus	Native Raiding Party
6	Pterodactyl	Ceratopsian	Pterodactyl	Pterodactyl
7		Hadrosaurus		
8		Pterodactyl		
9		Native Hunting Party		
10		Native Trading Party		
11		Native Raiding Party		
12		Tyrannosaurus		

VENUSIAN WATER ENCOUNTERS

Terrain	Ocean	Shallow Sea	Hunter	Grn	5	Phys	Bow, Club
Encounter #	1	2	Porter	Grn	2	Phys	Club
Die Roll	Encounter Type		Headman	Trn	2	Ment	Hatchet
1	Plesiosaurus	Plesiosaurus	Merchant	Trn	2	Ment	Knife
2	Ichthyosaurus	Ichthyosaurus	Guard	Trn	4	Phys	Bow, Spear
3	Giant Turtle	Native Fishing Boats	Raider	Trn/Exp	4	Phys	Bow, Club
4	Giant Octopus	Native Fishing Boats	Fisherman	Grn	2	Phys	Knife
5	Giant Crocodile	Native Trading Barge	Pirate	Trn/Exp	4	Phys	Bow, Club
6	"Sea Serpent"	Native Pirate Canoes	Barge Crewman	Grn	2	Phys	Knife

ENCOUNTER DESCRIPTIONS

FOR ANIMAL statistics see the Animal Charts on the back; for animal descriptions, see the section on animals for the relevant world. If an encounter is listed under more than one terrain type, look for its description with its first terrain type.

VENUSIAN WILDERNESS ENCOUNTERS

Lost European: Haggard and worn, this lost European has barely survived after his expedition became lost weeks ago. He will be grateful for help and may reward the characters for taking him to a civilized outpost. Alternatively, his outpost could have just been overrun by hostile Lizard-men, and it may be imperative that he reach a telegraph or main outpost quickly to warn the military and other European inhabitants nearby. He could

also be a survivor of a Zeppelin ether flyer crash or a shipwrecked trader.

Native Hunting Party: A dozen Lizard-men out hunting from small game to feed their village. They will react with suspicion but will not attack unless they are provoked or clearly have the upper hand. If approached with gifts, they may provide information in return.

Native Raiding Party: Twenty armed Lizard-man warriors are intent upon raiding a human settlement. They will immediately attack the characters and attempt to kill or capture them.

Native Trading Party: One or two village headmen, about 20 porters, and a dozen guards comprise this party of Lizard-men. They are bound for the human enclaves to barter rare plants for trade goods. They will not attack, and they offer to take the party to the enclave in return for an introduction and recommendation.

VENUSIAN WATER ENCOUNTERS

Native Fishing Boats: These native boats are two to 12 (roll two dice) small fishing boats, each with two or three Lizard-men fishing from them. The Lizard-men will not attack and will scatter and flee in the face of hostile action. They will be reluctant to help characters in distress but will react with friendship to offers of gifts.

Native Pirate Canoes: One to six (roll one die) pirate canoes approach, each containing four Lizard-men. They will immediately attack and attempt to kill or capture the characters.

Native Trading Barge: This barge is a large (by Venusian standards) merchant barge with 12 crewmen, a merchant, and six guards. They will react with caution but are willing to listen to any reasonable proposition.

ANIMAL CHART: Venus

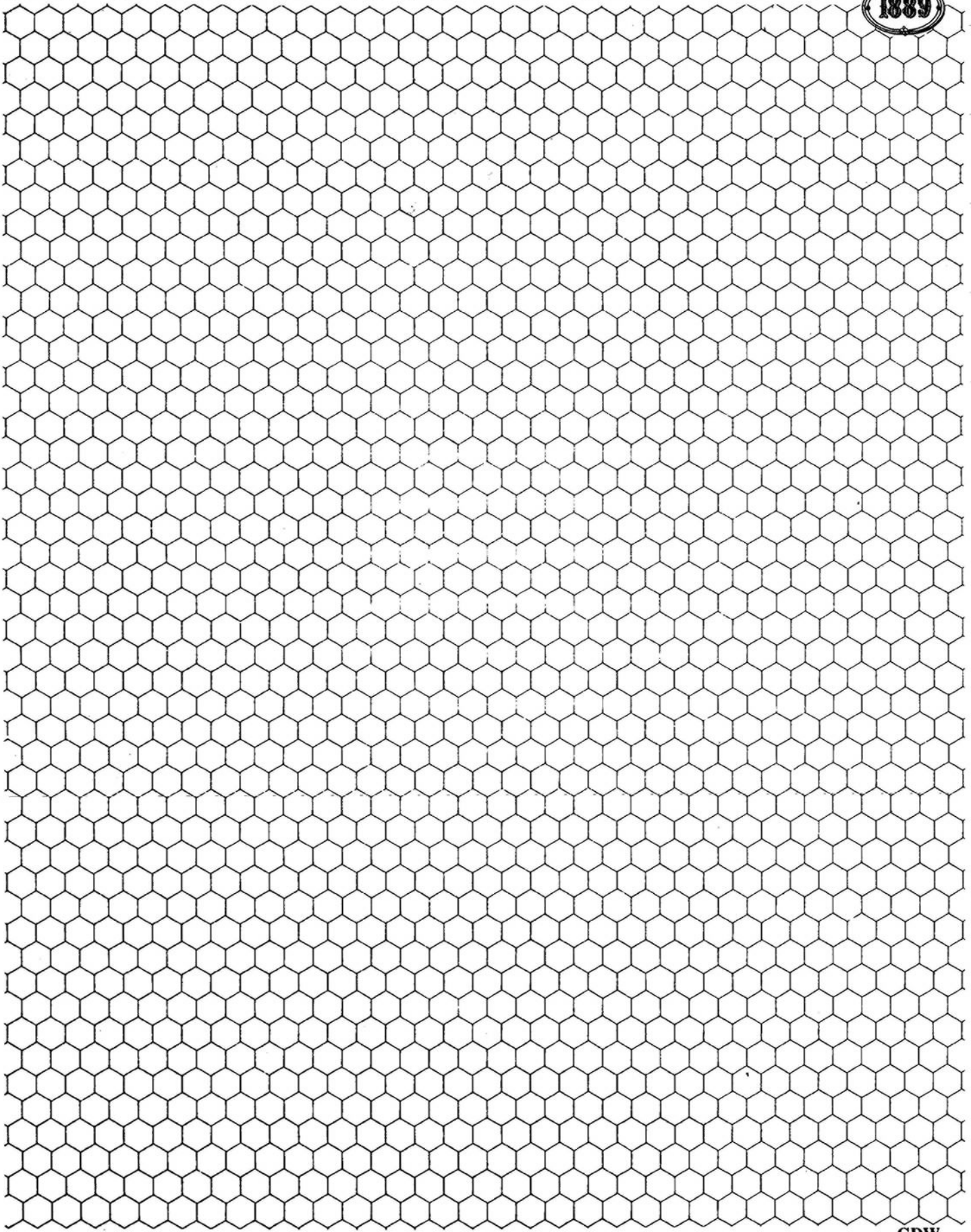
Type	#App	Size	Move	Wnds	Save	Weight (lbs.)	Weapons
Marine Life							
Plesiosaurus	1D×1	2×6	W20	30	1	20 tons	Teeth (1, 2, 1, 3), Tail (1, 1, 3, 3)
Ichthyosaurus	1	1×6	W30	25	—	10 tons	Teeth (2, 2, 0, 3)
Giant Turtle	1	3×6	W10	30	2	40 tons	Teeth (1, 2, 1, 6)
Sea Serpent	1	1×10	W20	25	1	20 tons	Teeth (1, 2, 1, 4)
Giant Octopus	1	3×3	W10	15	—	5 tons	Tentacles (8, 2, 3, 6), Stinger (1, 2, 0, 1)
Giant Crocodile	1	2×6	W10	25	1	10 tons	Teeth (1, 2, 1, 3), Tail (1, 1, 3, 2)
Predators							
Pterodactyl	1D×1	2×2	F30	1	—	35	Talons (2, 3, 1, 1)
Tyrannosaurus	1	2×4	L16	40	1	40 tons	Teeth (2, 2, 2, 6), Tail (1, 2, 3, 3), Crush (1, 1, 3, 6)
Carnosaurus	1D×1	1×3	L24	20	—	5 tons	Teeth (3, 2, 0, 3), Tail (1, 2, 3, 1), Crush (1, 1, 1, 4)
Plant Eaters							
Brontosaurus	1D×1	2×6	L10	40	1	40 tons	Teeth (1, 2, 2, 3), Tail (1, 2, 3, 3), Crush (1, 1, 1, 6)
Ceratopsian	1D×3	2×4	L10	30	2	20 tons	Horns (1, 2, 3, 3), Crush (1, 1, 1, 6)
Stegosaurus	1	2×3	L10	25	1	10 tons	Tail (2, 2, 3, 3), Crush (1, 1, 1, 6)
Hadrosaurus	1D×2	1×3	L16	15	—	8 tons	Horns (1, 2, 2, 2)
Pachyosaurus	1D×1	1×2	L30	10	—	1500	Horns (1, 2, 2, 1)
Carnivorous Plants							
Giant Carnivore	1	3×3	—	10	—	1000	Tentacles (10, 2, 3, 1), Stinger (1, 1, 0, 1)

LUNAR STOCK NPCS

NPC Type	Experience	Marksman	Arms	Str	Agl	End	Int
Drone	Grn	0	—	1	2	3	1
Custodian	Exp	3	Spear	1	3	2	2
Specialist	Vet	3	Spear	1	3	3	4

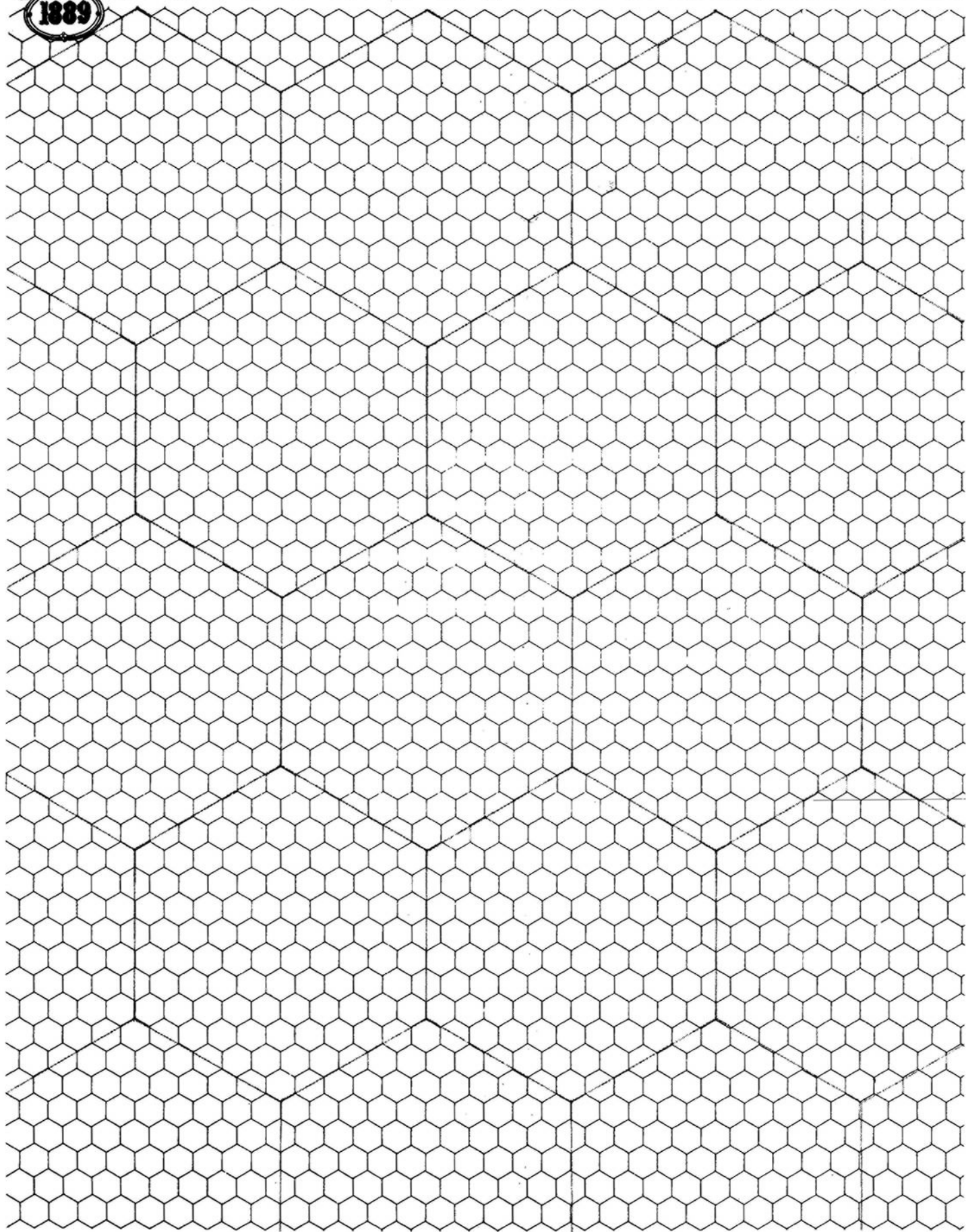
ANIMAL CHART: Luna

Type	#App	Size	Move	Wnd	Save	Weight (lbs.)	Weapons
Lunar Rat	1D×1	Tiny	L10	1	—	2	Teeth (1, 1, 0, 1)
Lunar Bat	Swarms	1×1	F40	1	—	2	Swarm (8, 1, 0, 1)
Caterpillar	1	1×3	L10	10	1	1000	Fangs (2, 2, 0, 1), Coils (—, —, —, 4)



SPACE SMALL-SCALE MAP

1889



**CHARACTER**

Player _____
Ht. _____ Wt. _____
Income _____ Nationality _____
1st Career _____ 2nd Career _____

ATTRIBUTES AND SKILLS

Strength _____	Intellect _____
Fisticuffs _____	Observation _____
Throwing _____	Engineering* _____
Close Combat* _____	Science* _____
Trimsman* _____	Gunnery* _____
Agility _____	Charisma _____
Stealth _____	Eloquence _____
Crime* _____	Theatrics _____
Marksmanship* _____	Bargaining _____
Mechanics* _____	Linguistics† _____
	(†List languages below.)
Endurance _____	Social Level _____
Wilderness Travel* _____	Riding* _____
Fieldcraft _____	Piloting* _____
Tracking _____	Leadership _____
Swimming _____	Medicine _____

WOUNDS

Unconsciousness _____
Str + End/2 _____
Potential Wounds _____
Str + End _____
Current Wounds _____

POSSESSIONS**WEAPONS****†LANGUAGES**

Native _____ Primary _____
Others _____

INVENTIONS**RESEARCH AREAS**

The Ether _____	Combustion _____
Electricity _____	Precision Machin. _____
Biochemistry _____	Power Production _____
Transportation _____	Optics _____

RENOWN

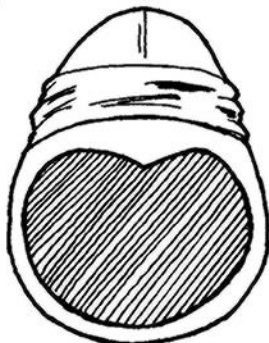
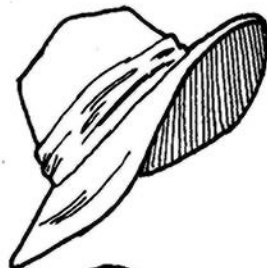
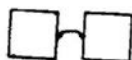
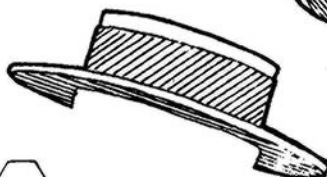
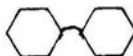
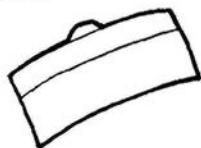
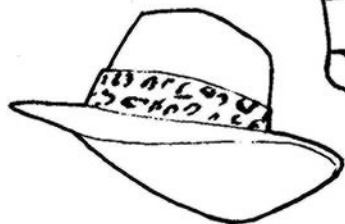
Heroism _____
Science _____
Exploration _____
Military _____
Patriotic Service _____

MEDALS AND KNIGHTLY ORDERS***CASCADE SKILLS**

<i>Trimsman</i> Aerial flyer Cloudship <i>Marksmanship</i> Pistol Rifle (includes carbines and shotguns) Bow <i>Mechanics</i> Steam Electricity Machinist <i>Wilderness Travel</i> Mountaineering Foraging Mapping <i>Close Combat</i> Edged Weapon Pole Arm Bashing Weapon <i>Riding</i> Horse Camel Elephant Gashant Rumet Breehr Flying Skrill Pacyosaurus	<i>Crime</i> Lockpick Pickpocket Forger <i>Engineering</i> Structural Engineering Naval Architecture Explosives Earthworks <i>Science</i> Physics Chemistry Biology Geology Archaeology <i>Gunnery</i> Muzzle-Loading Cannon Breech-Loading Cannon Machinegun/Rotary Cannon Exotic Weaponry <i>Piloting</i> Aerial Flyer Cloudship Zeppelin Interplanetary Ether Flyer Sailing Vessel Steam Vessel Submarine
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SPACE CHARACTER FACES

1889



ADDITIONAL DEFAULT SKILL

SWIMMING IS an additional default skill for the Endurance attribute in much the same way that Throwing is for Strength. Each player starts with a Swimming skill equal to half his Endurance attribute (rounding fractions down).

HEALING WOUNDS

TWO SPECIAL aspects of recovering from wounds are encountered in an adventurer's career: recovering consciousness and recovering from unarmed, hand-to-hand combat damage. The standard healing rule is also reprinted here, for your convenience.

Recovering Consciousness

AFTER A character takes wounds equal to the average of his Strength and Endurance (rounding up), he loses consciousness. If the character has taken just enough wounds to make him lose consciousness, then he will recover consciousness in 20 turns divided by his Endurance, rounded to the nearest whole number:

RECOVERING CONSCIOUSNESS

Endurance	Turns	Minutes
1	20	10
2	10	5
3	7	3.5
4	5	2.5
5	4	2
6	3	1.5

For every wound a character has taken beyond the average of his Strength and Endurance, add 10 turns (five minutes) to the time which

he spends unconscious above the base time given in the table.

For example, Carstairs has an Endurance of 5 and a Strength of 3. He will lose consciousness if he takes four wounds. Unfortunately, Carstairs has a nasty encounter with a tyrannosaurus and in one attack is bitten for six wounds. If he had taken four wounds, he would recover consciousness in four turns (two minutes). Because he has taken six wounds, it will take him 20 extra turns to recover consciousness, for a total of 24 turns (12 minutes) before he is conscious again.

After a character recovers consciousness, he maintains the same wound level at which he lost consciousness (subject to normal healing). If he engages in combat or any other activity which wounds him again, he immediately loses consciousness once more, and the new wound total is used to calculate when he will once again regain consciousness.

Normal Healing

WOUNDS WILL heal normally at the rate of one wound every two days spent resting and under medical care. If a character is travelling or suffering from fever, wounds heal at the rate of one per week.

Temporary Damage

ALL SUCCESSFUL unarmed melee attacks from kicks, punches, or even head butts inflict one wound. However, this damage is actually, for the most part, temporary damage due to stunning, bruising, and pain. Half of all wounds caused by unarmed melee attacks (round fractions up) are actually temporary damage. Temporary damage "heals" at a rate

of one wound every two hours (longer, at the referee's discretion, if constant strenuous activity is being undertaken, but never longer than one wound every five hours).

If a character receives enough wounds so that he would die while he is still recovering from temporary damage, he does not die. Instead, he is unconscious until enough of the temporary damage has healed to bring his wound total down under the point at which he would die.

For example, Eileen, whose Strength is 3 and whose Endurance is 4, was roughed up by some dastardly Fenians an hour ago and took three unarmed combat wounds, two of which are temporary damage. Now she is bitten by a giant turtle and takes six wounds. Nine wounds would normally kill Eileen, but since she is still recovering from temporary damage, she is instead unconscious for three hours. When she awakens, she will have seven wounds and will undoubtedly seek immediate medical attention.

TASK ATTEMPTS AT ZERO SKILL LEVEL

IF A CHARACTER wishes to do something which is resolved by the use of a skill in which the character has no skill (zero skill level), consider the overall situation. If the character can present a good reason for making the attempt, such as just having seen someone else perform the task, and if the situation is an emergency, the referee may institute this procedure: The player makes a quick roll against the attribute under which the skill falls. If the roll is successful, the referee awards the character with a skill level of 1 in that skill and allows the character to at-

tempt the requisite task with this skill level. When the current adventure or episode is finished, the experience point which this skill would have cost to purchase is deducted from the number of experience points which the character receives.

THROWING

EXPLOSIVE WEAPONS

EXPLOSIVES WHICH can be thrown include dynamite, the infamous anarchist's "black bomb," and (for the daring or foolish) nitroglycerin. Grenade-like thrown weapons include bottles of alcohol or oil rigged to ignite on impact (firebombs), and bottles of strong acid.

To attack with an explosive or grenade-like weapon:

(1) Determine the range, in yards, to the object. The referee's decision is final.

(2) Roll the task to throw an object for accuracy.

(3) Determine the explosive power of the object by consulting the Thrown Explosive Weapons Table, or the "Combat" and "Equipment" chapters of **Space: 1889**.

(4) Determine the burst size by consulting the Explosive Burst Size Table.

(5) If the task roll is successful, the weapon hits exactly where desired. All people in the burst area are knocked down. Roll a die for each character or NPC in the burst area. A result of 2 or under is a hit. If a character is hit, he takes a number of wounds equal to one die roll for each level of power of the explosion and is knocked out by the blast. Characters may make a save to avoid being hit. The save number is 1, modified by any cover modifiers which may apply (see the Small

Arms Saving Throw Modifiers Table). If the die roll indicates a hit by an explosive weapon, but a save is made, the character must make a second, identical save. If this save is failed, the character takes 1D6 wounds from the fragments kicked out by the explosion. If the save is made, no wounds are taken. Certain grenade-like weapons have special attack and damage effects.

(6) If the task roll is unsuccessful, the weapon deviates by a die roll in yards. Roll a die, rerolling a 5 or 6. If the result is a 1, the weapon went long. On a 2, it landed to the right of the target. On a 3, it was short, and on a 4, it landed to the left.

Throw An Object For Accuracy: The range of the target, in yards, is the target number. Roll Throwing dice. If a character has a Throwing skill of 0, he has a skill level of 1/2 for the purposes of rolling this task (he rolls a die and divides the result by two). The distance the object is thrown is three times the dice roll divided by the weight of the object in pounds. (This formula has been condensed on the Thrown Explosive Weapons Table.) If the target number or greater is rolled, the task succeeds.

Dynamite: If multiple sticks are thrown together, they must be fastened together and fused to ignite simultaneously. Roll a die when dynamite is thrown by characters with no Explosives skill: On a 2-5, nothing unusual occurs. On a 1, the fuse is short, and the dynamite goes off midway to the target. On a 6, the fuse is long, and characters in the burst area may take two allowed actions before the dynamite goes off. (They may run or even try to throw the dynamite back.)

Black Bomb: Black bombs are composed of a one-pound casing and three pounds of gunpowder. If someone with no Explosives skill fuses one, follow the procedure under "dynamite."

Nitroglycerine: To move nitroglycerin hastily is extremely dangerous. If it is thrown, roll a die: On a 1-2, it reaches the target before exploding. On a 3-5, it explodes midway to the target. On a 6, it blows up in the throwing character's hand.

Firebomb: Firebombs are glass or ceramic bottles filled with flammable liquids which have been prepared with a lighted wick to ignite on impact. When a firebomb breaks, it ignites flammable substances like paper, cloth, or wood, which may burn on after the firebomb has burnt out. Characters in the burst radius of a firebomb are not knocked down. Characters hit by a firebomb take one wound the first turn they are alight, two wounds the second turn, and one wound the third turn. The firebomb then burns out. Characters may move out of the fire, roll on the ground, or take other actions to extinguish themselves before the full course of the damage has been run. However, if a character misses his save, at least one wound will be taken.

Strong Acid: Strong acid will dissolve substances it reacts with, but it takes awhile to work. Characters in the burst radius of strong acid are not knocked down. A character hit by strong acid takes no damage the first turn, one wound the second, and two wounds the third. The fourth turn he is totally incapacitated by pain for 2D6 turns (he can take no actions). This sequence may be broken by prompt medical attention, flushing out the wound, or neutralizing the acid.

The Three Faces Of VENUS

0 1000 2000 3000
Miles



SPACETM

1889

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