



SCIENCE MARCHES ON

This article introduces new inventions for Space:1889.

Some are suitable for PC inventors to create, while others will probably be the products of evil mad scientist NPCs.

Referees may find some of these inventions to be useful points of departure for adventures.

By James L. Cambias

Devices are grouped by Research Area. The required minimum knowledge level and experimental success numbers are listed in parentheses after the name of each device.

TRANSPORTATION

Horseless Carriage: (2,1). Some of these can already be seen on the streets of London and Paris. A horseless carriage is simply an internal-combustion engine mounted on a chassis, with a transmission. Its speed in miles per hour is equal to twice its Reliability. Horseless carriages burn about one pound of petroleum for every mile travelled, and they have a 20-pound fuel supply. They have room for three passengers or 500 pounds of cargo, and require a crew of one. *Weight:* 2 tons. *Price:* £400.

Bathysphere: (15,2). A very sturdy steel sphere equipped with air tanks and thick windows, which is lowered into the deep ocean by cable. It can reach a depth in miles equal to its Reliability and can stay down for six hours. A bathysphere has room for four passengers. *Weight:* 10 tons. *Price:* £1000.

Motor-Bicycle: (18,2). A two-wheeled motorized vehicle, powered by a small internal-combustion engine. It requires a successful Routine: Agility task to learn how to ride one without falling over. They have a speed in miles per hour equal to twice their Reliability, and they consume a gallon of petroleum every 10 miles travelled. Motor-bicycles require one driver, and they can accommodate one passenger or 100 pounds of cargo. *Weight:* 200 pounds. *Price:* £250.

ELECTRICITY

Magnetic Levitation: (23,3). A method of suspending objects above a special magnetic track. This can be used to create wheel-less railways and similar fantastic vehicles. A magnetic levitation device can support a ton of cargo times its Reliability and can propel vehicles at a speed of 60 mph. *Weight:* 1 ton (in addition to the track, which weighs 10 tons per mile of length). *Price:* £500 per power level, plus £100 per mile of track. *Power:* 1 per ton of cargo.

BIOCHEMISTRY

Animal Repellent: (18,3). A strong-smelling liquid which, when applied to the skin, repels a given type of animal. In general, each sort of animal repellent affects a single class of living creatures (i.e., fish, reptiles, mammals, etc.). The duration of a dose in hours is equal to the Reliability. *Weight:* A dose sufficient to coat a person weighs four ounces. *Price:* £1 per dose.

Regeneration Drug: (23,3). This amazing substance quickly repairs damage to the body. Each dose restores a number of wounds equal to the Reliability number. The drug takes 15 minutes to take effect, during which time the patient must be resting qui-

etly. The healing of the serum or expire horribly. Creatures will retain some of their original features as they are transformed; a turtle raised to human level would still have a shell and recognizable turtle features. It is possible to raise a being beyond level 7, but the results are left to the referee to determine. The serum must be injected directly. *Weight:* 10 doses per ounce. *Price:* £5 per dose.

Growth Serum: (34,3). This strange chemical produces amazing temporary growth in organisms. A dose makes the user double in height and gain eight times the initial weight. It requires two days to take effect, during which time the subject has an amazing appetite. The effect lasts a number of days equal to the Reliability, at which point the subject returns to normal over a period of two days. At full size, the individual's Strength and Endurance are doubled, while Agility is halved. The effect of two doses doubles the being's size yet again, but further doses merely prolong the effect. If the serum is given to a growing infant, the growth will be permanent. Users must make a successful Reliability roll to avoid suffering 1D6 damage. *Weight:* 1 dose per ounce. *Price:* £10 per dose.

Pseudo-Death Drug: (36,4). This mysterious substance causes living things to sink into a deathlike state. There is no heartbeat, no respiration, and the victim's body temperature drops. The patient needs no food and is unconscious. Physicians may notice that there is no rigor mortis or other sign of decay. The trance lasts for a number of days equal to Reliability and takes effect instantly upon injection. Persons using the drug must roll equal to or below Reliability to revive successfully—otherwise, the pseudo-death becomes the genuine article. *Weight:* 8 doses per ounce. *Price:* £6 per dose.

De-Evolution Drug: (36,4). This fiendish compound can actually regress a living organism back along the path of its evolutionary development—each dose taken will lower an individual one level on following scale:

Level	Evolutionary Development
1	Protoplasm, one-celled creatures
2	Plants
3	Invertebrates (insects, mollusks, worms, etc.)
4	Reptiles and amphibians
5	Avians or mammals
6	Intelligent beings
7	Superhuman intelligences

The subject must roll less than the Reliability of the drug to avoid an unpleasant death. The drug may be injected or taken orally—it has a strong and unpleasant taste which is difficult to disguise. *Weight:* 10 doses per ounce. *Price:* £4 per dose.

Evolution Serum: (37,5). This fantastic potion has the amazing effect of *advancing* the user along the evolutionary scale. Each dose moves the creature one level higher on the scale shown above. For each dose taken, the subject must roll under the Reli-

ability of the serum or expire horribly. Creatures will retain some of their original features as they are transformed; a turtle raised to human level would still have a shell and recognizable turtle features. It is possible to raise a being beyond level 7, but the results are left to the referee to determine. The serum must be injected directly. *Weight:* 10 doses per ounce. *Price:* £5 per dose.

Universal Solvent: (39,5). The universal solvent is very dangerous, for it can dissolve through any substance, given enough time. This makes it extremely difficult to keep for extended periods, as it must be continually transferred to new containers. A pint of universal solvent applied to a surface will dissolve matter as if it were an explosive with a power equal to the Reliability of the solvent. *Weight:* 1 pint weighs a pound. *Price:* £5 per pint.

Lift Hormone: (40,5). This synthetic drug duplicates the effects of a complex hormone present in High Martians, which stimulates the action of the lifting gland. One dose given to a Canal or Hill Martian will allow them to fly as easily as a High Martian. There are potential side effects—if a Martian using the drug fails the Reliability roll, he suffers one wound, and his lifting gland is permanently destroyed. The drug has no effect on Terrans or Lizard-men. *Weight:* 5 doses per ounce. *Price:* £20 per dose.

THE ETHER

Miniaturizer: (37,5). The miniaturizer can reduce the size of any object by a factor of two for each level of Reliability. Thus, a miniaturizer of Reliability 3 would reduce objects to one-eighth of their original size. The effect lasts 12 hours. While miniaturized, an individual's Strength, Endurance and Hit Points are reduced by the level of the miniaturization (keeping all fractions). *Weight:* 1 ton. *Price:* £20,000.

Teleportation Device: (43,5). The teleportation machine consists of two booths. Objects placed in one booth can be instantaneously transported to the other, no matter what distance separates them. The device's range is based on the Reliability, as given in the following table:

Reliability	Range
1	150 yards
2	1 mile
3	100 miles
4	10,000 miles
5	1 million miles
6	100 million miles

To operate, the transmitting booth must be supplied with one power factor for each level of distance to the receiver. It can send 500 pounds of material. *Weight:* Each booth weighs 1000 pounds. *Price:* £10,000 per booth.

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Superluminal Propeller: (44,5). The superluminal propeller is a type of ether propeller capable of driving an ether flyer at speeds above that of light, making it possible to reach other stars. A superluminal propeller is similar in most respects to an ordinary ether propeller, with a power level equal to Reliability, and an efficiency equal to $20+(3 \times \text{Reliability})$. The only difference is that the speed value ($[\text{power level} \times \text{efficiency}] + \text{lifted mass}$) squared gives the speed in multiples of the speed of light. So if the vessel's speed value is 2, it can achieve four times the speed of light. Superluminal propellers cannot work within 10 million miles of a planet. This means that a vessel must still have an ordinary ether propeller in addition to the superluminal drive. *Weight:* 4 tons per power level. *Price:* £10,000 per speed value.

OPTICS

Night Photographic Plates: (27,3). Night photographic plates are sensitive to infrared light, rather than visible light, allowing the operator to take photographs in darkness. Of course, the plates must be developed in a darkroom before the images can be seen. *Weight:* 8 plates weigh 1 pound. *Price:* Each plate costs £1.

Optic Fibers: (30,2). Optic fibers are curious filaments which transmit light, thus allowing individuals to see around corners or down long shafts. Other useful applications are left to the players and referee.

Weight: 3 feet of quarter-inch optic fiber weighs 1 pound. *Price:* £1 per pound.

GEOLOGY AND METALLURGY

Nonadhesive Surface: (24,1). An amazing substance with the extremely useful property that nothing can stick to it. Possible applications include cookware, and vehicles for use in the muddy regions of Venus. *Weight:* Negligible. *Price:* Covering an object with nonadhesive surface adds 10% to the price of the item.

Monofilament: (30,2). Monofilament is an extremely thin cable with a variety of uses and some associated dangers. A single

strand of monofilament has a tensile strength of 100 pounds; additional fibers add their capacity. Because of its thinness, monofilament can seriously injure persons handling it. A strand of monofilament is a perfect blade, capable of cutting through almost any substance like a wire through cheese. *Weight:* 100 feet of monofilament weighs half a pound. *Price:* £1 per foot.

FLIGHT

Ornithopter: (27,5). An ornithopter is a flying machine that mimics the flight of birds. An ornithopter is thus capable of vertical takeoff and landing, and can fly at a speed of 40 mph plus 10 times the Reliability of the device. Ornithopters can carry a pilot and either one passenger or 200 pounds of cargo. *Weight:* 1000 pounds. *Price:* £100. *Fuel:* 20 pounds of gasoline per hour; normal fuel capacity is 100 pounds.

PRECISION MACHINERY

Kinetographic Camera: (17,2). A fascinating device which records movement on long reels of celluloid film. When the films are developed and run at the proper speed, moving images can be seen. The device must be cranked by hand. *Weight:* 25 pounds. A reel of film weighs 2 pounds per 15 minutes of running time. *Price:* A camera costs £20, and film costs 5d per minute of running time.

Air Gun: (23,3). A firearm similar to an ordinary rifle, which uses compressed air rather than powder to propel the bullets. This makes the air gun utterly silent and smokeless. The disadvantage is that the weapon's air tank must be filled using a large compressor, making it unsuitable for field use. An air gun has the firing characteristics of a lever-action carbine in all respects. It can hold enough compressed air to fire a complete magazine of six shots. *Weight:* 10 pounds. *Price:* £150.

COMBUSTION

Rocket Rifle: (27,2). This weapon is particularly useful for low-gravity environments, where the recoil from an ordinary weapon would be troublesome. A rocket rifle fires small solid-fuel rockets, thus eliminating recoil and the need for a heavy barrel. Its rate of fire is 1, and it must be reloaded after every shot. It inflicts a wound of 1 and has no required Strength. The range is 100 yards. *Weight:* 5 pounds. *Price:* £3. The ammunition costs 10/- for each shot.

Incendiary Bullets: (17,2). These bullets, impregnated with phosphorus or some similar chemical, are especially effective against highly flammable targets (such as zeppelins). Objects hit by incendiary bullets have a chance of catching fire equal to the Reliability of the bullets. The effect on living targets is normal. *Price:* £1 per 50 rounds. £