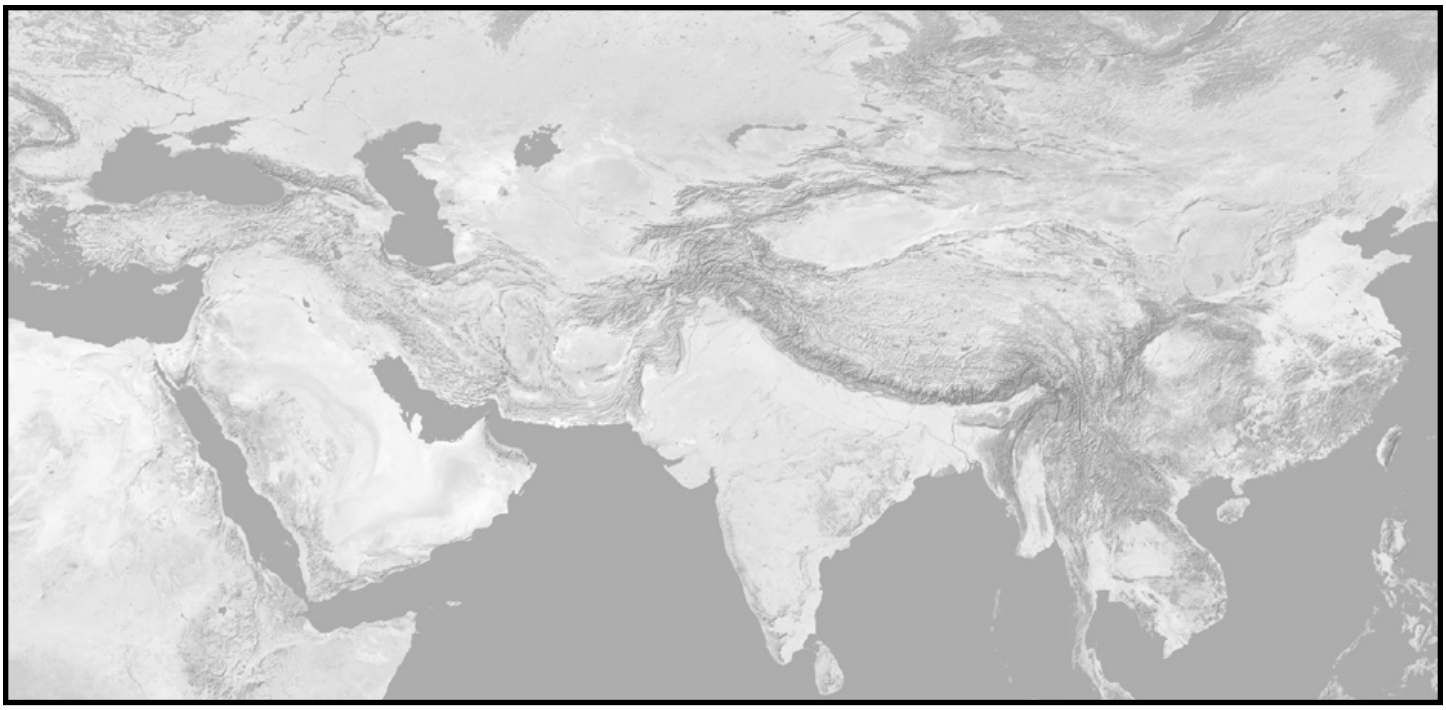
A MAGICAL SOCIETY:
SILK ROAD



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Introduction

Silk Road. The name itself invokes adventure, danger, and a hint of the exotic. The historic Silk Road resides in Central Asia, surrounded by numerous mountain ranges and unforgiving deserts, but in a fantasy world, it can reside wherever you wish.

A Magical Society: Silk Road explores networks of land-based trade routes that span continents. Like its predecessors (*A Magical Society: Western Europe* and *A Magical Society: Ecology and Culture*), *A Magical Society: Silk Road* synthesizes information from the historic silk road and presents trends and information for role-playing and world-building. Unlike its predecessors, we provide information on the historic silk road due to the general unfamiliarity of Central Asia.

Although the Silk Road covers a vast area (Arabia, India, China, and the nomadic people of the Steppes and the Tibetan Plateau), this supplement only covers aspects of these cultures as they are applicable to the workings of the Silk Road. *A Magical Society: Silk Road* discusses the crossroads where all these cultures and their political structures interact while offering tools to simulate a great overland trade route in your own campaign. Our mechanical representation of the historic Silk Road is not rooted in a specific time, rather it is a representation of the Silk Road, its tumultuous history, and its flare for the exotic.

In *Chapter 1: Components of Silk Roads*, we address what is the Silk Road, what conditions produce silk roads and common features found in conjunction with silk roads. *Chapter 2: Traveling on Silk Roads* gives guidelines for plotting a silk road, keys points in navigating through the silk road, and who travels along great overland trade routes. *Chapter 3: Types of Caravans* explores the traditional desert caravan as well as alternative types of caravans. In *Chapter 4: Money Matters*, we talk about how goods move along silk roads as well as an economic trade simulator. *Chapter 5: Trade Goods* contains over 1000 commodities. In *Chapter 6: The Historic Silk Road*, we apply all the design principles of the preceding chapters to give you a holistic picture of the historic Silk Road.

What is the Silk Road?

Strictly speaking, the term "Silk Road" is a 19th century European invention describing the overland trade routes that connect China to the West (i.e. Europe). The Silk Road derived its name from the demand for Chinese silk by China's western neighbors, to which people attribute the existence of such overland trade routes.

The Silk Road encompasses a large geographical area. The most conservative boundaries attributed to the Silk Road are from Xi'an (Chang'an) to Kashgar (between which lies the edge of the Gobi Desert and the Taklamakan Desert), with a northern border of the Tien Shan Mountains and a southern border of the Kunlun Mountains. The most liberal boundaries expand north of the Tien Shan Mountains, northwest to transoxiana, west into west Asia (aka the Middle East), and south through the Pamirs and the Hindu Kush into the Indian Subcontinent. Despite efforts to focus the Silk Road on China or "The West" (whether that be Greeks, Persians, Parthians, Romans, or medieval Italian merchants), the real story lies in Central Asia, a unique landscape with its own tumultuous past. The people and places of Central Asia are the heart of the Silk Road, although its arteries and veins carry Chinese silks, Roman glass, Khotanese jade, Mongolian horses, Indian incense, and steppe raiders.

There are many popular misconceptions concerning the Silk Road. First, the Silk Road was not a single trade route from one end of the compass to another. In reality the Silk Road was a network of smaller trade routes that facilitated localized networks of trading as well as vast overland endeavors. There were many beginnings and ends along the breadth of the Silk Road. Second, the silk trade was not the only mercantile value of these overland trade routes. Many other luxury goods and more mundane commodities changed hands along the Silk Road, and traders were not the only people moving along this artery of the desert. Diplomats, pilgrims, refugees, scouts, and normal everyday travelers found their way through the treacherous terrain. And lastly, goods were not the only things exchanged along the Silk Road. In many ways, Central Asia was a marketplace of ideas, religions, and technology as they and their neighbors to the east and west explored, experimented, created, conquered, lost, and rediscovered a number of technological advances, cosmologies, religions, and philosophies.

What do you mean by Silk Roads?

Throughout the supplement, we use the term "silk roads" analogous to vast overland trade routes in the vein of the historic Silk Road. To avoid confusion, we use the plural silk roads to denote general observations on overland trade routes. When we are discussing the historic Silk Road, we make a point to capitalize and mention "historic" or "real life."

Chapter 1: Components of Silk Roads

Laying the Foundation

Constructing a silk road in your world can be a daunting task, but the trick is creating all the foundational components before figuring out how many camels you need to carry a thousand bolts of silk. The basic considerations when creating great overland trade routes in your world are geography, cultural groups, and trade goods from afar.

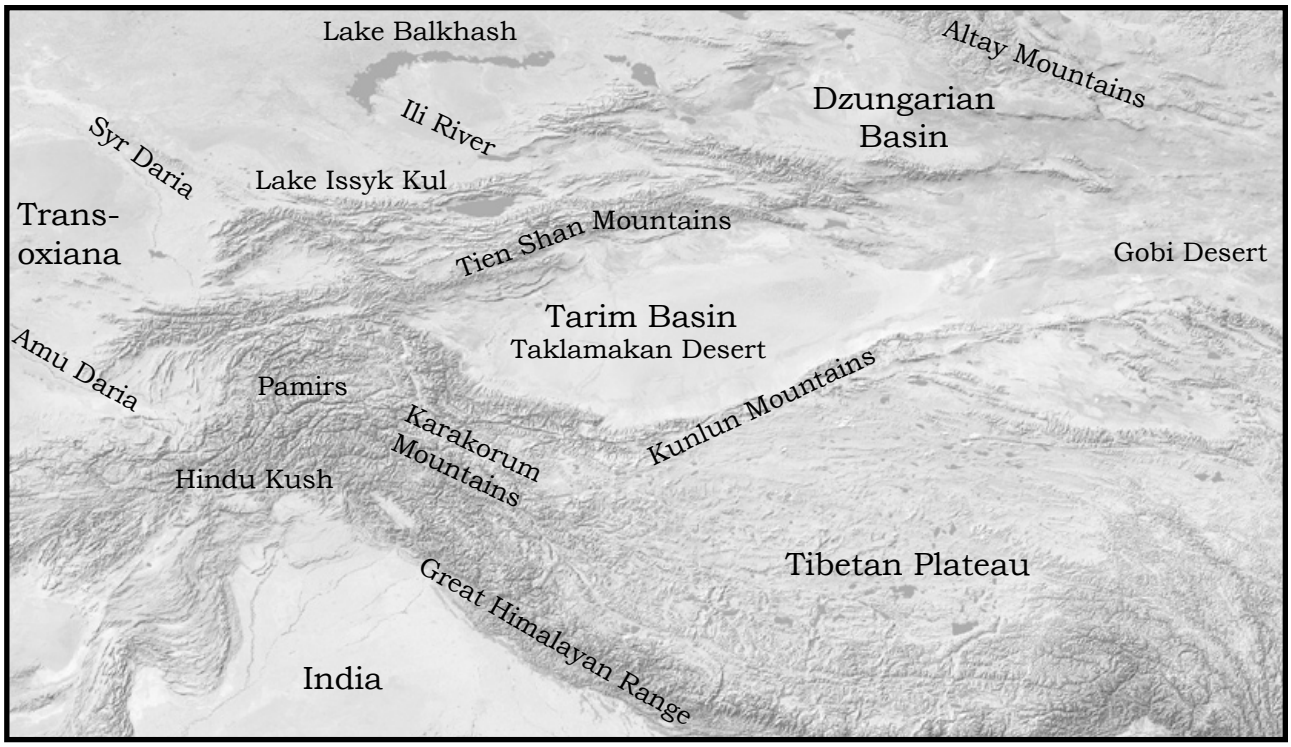
Geography

As with any business venture, the key is location, location, location. Geography is one of the most important considerations in placing silk roads. The development of a great overland trade route begins with isolation due to physical barriers that make migration more difficult.

Although it seems counter intuitive (how can isolation promote the establishment of a great overland trade route?), physical barriers are a vital part of the process. As populations of intelligent species expand (be it humans, elves, gnomes, etc.), they migrate into new areas, often displacing earlier migrants. Daunting physical barriers (such as deserts, mountains, dense jungles, or expansive swamps) are effective boundaries to the expanding population. Such places are less desirable to new or displaced emigrants because other locales have less-difficult geography. This relative isolation gives populations a chance to develop unique cultures, technologies, religions, and ways of life.

To borrow an example from Earth, consider the historic Silk Road. The Taklamakan Desert is 600 miles east-west and 250 miles north-south. Along the northern edge of the Taklamakan Desert is the Tien Shan Mountains stretching 800 miles alongside the desert from Turfan to Kashgar. Along the southern edge of the desert is the Kunlun mountain range. To the east are the Gobi Desert and some smaller mountain chains. To the southwest are the Pamirs and Hindu Kush, and to the northwest is transoxiana followed by more deserts.

The area that is to become the infamous Silk Road looks barren and foreboding indeed, but such deterring geography increased the isolation of developing societies in the region. Chinese society develops east of the Silk Road. Tibetan society develops south of the Kunlun Mountains. The Persians (with their Hellenistic influences) and other Iranian groups develop west of the Silk Road, while the Mongols and numerous steppe nomads and pastoralists develop north of the Tien Shan Mountains.



Concurrent to this relative isolation, there are bound to be the curious, the desperate, the adventurous, and the greedy—those people who wander out into the wilderness and see what is on the other side. These people are the second component to geography: stark geographical features that drastically deter migration but do not make migration altogether impossible. Although relative isolation is an important key in creating unique cultures with unique goods, remember that true isolation is nigh impossible.

The historic Silk Road admirably demonstrates how much cultures interacted despite the Taklamakan Desert. The famed Tang Opera style and many of the instruments now used in Chinese music are actually imports from Central Asia, notably from Kucha, renown for its musicians. The Chinese also imported horsemanship from Iranian cultures found west of the Taklamakan Desert, and the Chinese names for equestrian accoutrements still bear Iranian roots. Sogdian fashion was once all the rage in China, while dancing girls from Central Asia were highly prized commodities throughout the area. Central Asian architecture bear Hellanistic elements imported through the Persians. Religions have mixed, mingled, and clashed all along the Tarim Basin from Persian Zoroastrianism, to Indian Buddhism, to a thriving tradition of Judaism, Christianity, and Islam.

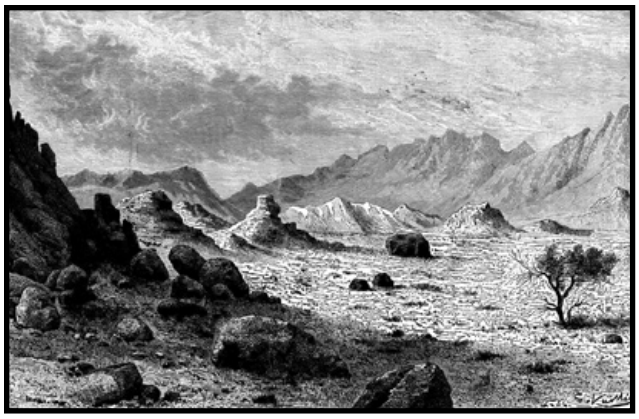
Essentially, silk roads are conglomerations of concurrent isolation and interaction. The isolation allows the development of unique goods, technology, crafts, and ideas, while the interaction (in part driven by the desire to trade these unique goods, technology, crafts, and ideas) interlinks these seemingly isolated cultures.

Design Notes

Geography is a big topic in and of itself. For guidelines on realistic geography, climate, and biomes, consider *A Magical Society: Ecology and Culture*. That being said, here are some design notes on determining geography on silk roads.

First, determine the combination of physical barriers to employ. In this case, size does matter. In general, the larger the physical barrier, the more distinct the cultures become on opposite sides of the physical barrier. Don't feel limited to a single geological feature. For example, the historic Silk Road is a desert circled by mountains with treacherous high-altitude passes. Travelers entering the Silk Road often have to ascend in order to enter the Tarim Basin. In the case of the historic Silk Road, there is an entire chunk of land (albeit predominantly desert) made inaccessible by stark geography, forming an entire physical barrier zone.

Also consider the shape of the physical barrier zone and the lay of the land radiating out from the physical barrier zone. Scope, shape and terrain



play a large part in determining how many unique cultures you have and how they are situated around the physical barrier zone. In the historic Silk Road, the steppes provide wave after wave of invaders and raiders, some of which take over oases and become settled people in time. The Tibetan Plateau surrounded by vast, steep mountains separated China and Tibet, creating two distinct cultural groups. To the west and northwest of the Tarim Basin are smaller deserts (notably Kara Kum, Kyzyl Kum, and Ust-Urt, which are among the bleakest and emptiest deserts on earth) that shape where major cultural groups flourish with relative isolation from their neighbors.

Second, not every square inch of the physical barrier zone is unfriendly to life, just the vast majority. Use the environment to support and explain these harbors. Taking from the historic Silk Road, there are lush, verdant valleys stashed between mountain ranges. There are traversable mountain passes and frozen lakes which offer winter travelers lower-altitude options. There are snowmelt rivers that feed oases in the desert. But pound for pound, you are more likely to find more sand and rock than anything else.

Third, if you are using conventional geography (i.e. little to no magical voodoo that changes the laws of physics), physical barrier zones are often found deep within the interior of a large continent. The deeper you venture into the interior of a large landmass, variations are more dramatic in both daily temperatures and seasonal climate. Along the coast, oceans stabilize coastal climates (in relation to inland areas) because they moderate temperature variation; land absorbs and releases heat much faster than the ocean.

This geographical truism plays its role in population density. Up to 70% of a world's population is found within 50 miles of the coast, and the majority of the population that does not live within 50 miles of the coast typically live within 50 miles of a lake or river (although lakes and river do not regulate temperature variations like oceans). The more-stabile climate coupled with the food and materials from the sea are a beacon for all life. In general, population density drops as you move inland because greater variation in daily temperatures and seasonal climate produces

harsher living conditions for plant life as well as intelligent species. Barring other considerations, coastal (or riverine) areas are where you find agricultural societies that have the natural resources (surplus food) to develop more complex societies and civilization. By definition, physical barrier zones are generally isolated by deterring geographical features and have marginal land in comparison to the cultural groups outside of the physical barrier zone (who are more than likely living 50 miles from the coast and blooming toward civilization). Remember, silk roads are valuable because they move goods over and through harsh inhabitable lands, not for the nice weather and good soil.

To tie it all together, the geography creates the set of perimeters prerequisite to silk roads. You have physically deterring geography that creates a physical barrier zone. You have areas around the physical barrier zone where (generally) agricultural societies develop in relative isolation due to the physical barrier zone. And then you have the people who move across the physical barrier zone, gestating the seeds of a silk road.

Barrier Cultures

The second foundation stone to silk roads are people, more specifically barrier cultures. Barrier cultures are the people that live in the inhospitable conditions of the physical barrier zone. The existence of barrier cultures presupposes that your world (at least that part of it) has filled up, and people have migrated into more difficult geographical areas. In fantasy worlds, barrier cultures are often the barbaric races or wild variants.

Although each barrier culture varies with the geography and the interaction between neighboring cultures, barrier cultures share four traits. First, barrier cultures are more sensitive to changes in environment because their survival margin is slimmer. In general, the consequences of environmental variation are more devastating for barrier cultures because they live in the marginal lands of the physical barrier zone. For example, consider the oasis dwellers that rely on a renewable source of water, whether from artesian wells or from rivers fed by annual snowmelt from the mountains. A river shifting its course or a water table drying up has more serious consequences in comparison to a group living in more hospitable terrain.

Second, as a result of their slim survival margin, barrier cultures are generally more mobile, both on a micro level and a macro level. On a micro level, many of the barrier cultures are nomadic or pastoralists; terrain in physical barrier zones are typically not suitable for agriculture. There may be pockets of terrain suitable for agriculture (akin to the historic Silk Road oases of the northern route fed by annual snowmelt from the mountains), and such a setup breeds potential for trade and conflict between settled people and semi-nomadic people. On a macro level, barrier cultures within the physical barrier zone are aerated at a higher frequency. In other words, people of the physical barrier zone move around a lot more.

The most common reason for movement in the physical barrier zone is displacement. The cause of the displacement varies. Internecine fighting can splinter one people into multiple groups while warfare forces the losers to move camp. In the case of many oases, the settlement may survive, but the inhabitants change depending on the victor of the last battle. When one group vanquishes another, the losing faction may be dispersed and taken to foreign lands as slaves. Sometimes the religious climate or prejudices encourage movement of groups that find themselves out of favor.

Climatic changes are also common causes for movement. For example, climatic and geologic changes within the Tarim Basin caused Lake Lop Nor to dry up, turning fishing villages into desert salt basins. Sometimes groups within the physical barrier zone are displaced by invaders. The Silk Road's history is littered with nomadic horse people of the steppes who conquered oases of the Tarim Basin and abandoned their nomadic lifestyle. Steppe societies are not solely bent on expending their borders; sometimes the environment makes their movement essential. When chronic draught threatens their survival, riders from the steppe either raid or take over oases along the northern edge of the Taklamakan Desert. Something as simple as warfare between two groups outside of the physical barrier zone can introduce new barrier cultures into the physical barrier zone, either as refuges or as unintentional conquerors.

Even changes in density can have devastating effects. For a historic example, some cities relied heavily upon a large population to maintain irrigation systems, which the desert often tried to reclaim. When the population is high, the city is a thriving trade town. But when the population drops and the city no longer has the population to maintain the irrigation system, the desert encroaches and the settlement is threatened with not having enough land to grow food to feed its insufficient population. In such a situation, it is not long before the inhabitants clear out. Regardless the cause of displacement, movement of barrier cultures often begins a domino effect with far-reaching consequences, where an initial barrier culture displaces one group, who in turn displace another group.

Third, barrier cultures are often the initial contacts for cultural groups outside the physical barrier zone. There are many implications from that relationship. Barrier cultures that interact with a

culture outside of the physical barrier zone exchange cultural mores and goods, shaping the development of both cultures. For a historical example, the people of Kashgar shared many cultural similarities with neighboring Iranian groups (Achaemenid, Parthian, Sasanian, and Arabian) while eastern cities like Dunhuang shared cultural similarities with the Chinese. There are also many tangible examples of barrier cultures shaping cultural groups outside of the physical barrier zone. Central Asian peoples greatly impacted Chinese culture, which imported Central Asian clothing, music, technologies, and most notably, horsemanship.

Fourth, as the number of barrier cultures increases, trade and interaction between barrier cultures also increase, and things move further away from their place of manufacture. In essence, barrier cultures become the first ambassadors and disseminators of "exotic" goods, foods, and technologies, both within and outside of the physical barrier zone. The increase in trade within the physical barrier zone creates a trading network across an otherwise-impassable, unfriendly terrain. As barrier cultures move products from one side of the physical barrier zone to another, they create a demand for "exotic" goods on all sides of the physical barrier zone. Eventually Chinese silks end up in Roman hands, and the Roman glass finds favor in China.

To borrow an example from history, the Chinese bribed steppe raiders with silk to cease raiding Chinese farms. Through trade among barrier cultures in the Tarim Basin, Chinese silk eventually made its way to the west, when a different barrier culture traded with the Parthians who then traded with the Romans.

Design Notes

Populating your silk road is a daunting task, especially considering the scope and interconnectivity between barrier cultures and with barrier cultures and civilizations outside of the physical barrier zone. First, take your map and freeze time, creating a cross section of people inhabiting your silk road in that time and that place. As the pieces come together in your here and now, you can create each culture's past and extrapolate their future.

Next, consider the major civilizations surrounding the physical barrier zone, taking geography into account. More than likely, offshoots of these civilizations are going to seed your barrier zone with barrier cultures. Do not discount non-agricultural societies; the nomadic people of the steppes have supplied the Tarim Basin with plenty of barrier cultures in its history. Remember, physical barrier zones fill up when all the "good" land is taken, and displacement is the prime factor in movement of people into and within the barrier zone.

When you fill your physical barrier zone with cultures, there are three main concerns: how densely populated is the physical barrier zone, where did a barrier culture come from, and who do they interact with. In this case, density refers to the occurrence or frequency of groups, not only a straight percentage of people per area. Density determines how much overall movement of people and goods occur within and across the physical barrier zone: the more densely populated, the more movement of people and goods. The domino effect mentioned above is more drastic when the physical barrier zone has more barrier cultures, and the political structures within the physical barrier zone are more fragile.

When designing a particular barrier culture, their origin and movement in the physical barrier zone gives the people an appearance, history, and cultural framework. Once you know where people come from (i.e. their physical features, coloration, crafts, dress, religion, rites, etc.), you have a palette from which to paint changing cultures and landscapes. Establishing cultural traits based on environmental stimulus is outside the scope of this work; for guidelines in that area, pick up our supplement *A Magical Society: Ecology and Culture*. Tracing the movement of barrier cultures is another source of fleshing out your silk road. When people move around, they carry and disseminate (whether ambiently or deliberately) their crafts, arts, technology, ideas, and physical features (through intermarrying).

The last consideration is determining with whom that barrier culture interacts. With whom do they micro trade? What goods do they offer and require? Do they have connections with a larger entity, be that a civilization/empire outside of the physical barrier zone, a religious organization, or other city-states within the physical barrier zone? Are they a conglomerate of peoples, like the historic Uighurs? What and from whom have they borrowed from other cultures: their language, written alphabet, coinage/money, or other social structures? Answering these types of questions for your major barrier cultures creates a web of relations, further defining the shape and possibilities in your silk road.

Making Culture Count

What makes the Silk Road so inviting to adventurous souls? Difference and curiosity. How do people dress over there? How do they cook? What do they eat? What's that dance they do right before they sacrifice goats? Creating an environment with rich detail and verisimilitude can impart this same sense of adventure into the unknown, but also consider how to mechanically integrate this difference into your game. You can create cultural templates that give players beneficial (as well as detrimental) traits

according to cultural mores. Localizing particular spells or types of magic gives adventurers all the more reason to traverse daunting geography. Making certain feats or weapons limited to a particular cultural group makes the acquisition of martial knowledge a physical and social journey. Prohibiting certain types of items or magic creates an ever-changing landscape for inventive problem solving.

The Finer Things in Life

Once you have the geography and the population in place, the final foundation is a luxury good worthy of crossing deserts, climbing mountains, and risking raiders. With the presence of barrier cultures, there is most likely trade already occurring, as well as diplomatic gifts, religious pilgrims, raiding parties, and refugees from the latest battle. But nothing kick-starts silk roads like a luxury good with ample demand and promising profits.

Basically, said luxury is something that is unique to a specific locale and cannot be produced elsewhere, whether through limitations in geography, climate, technology, or a unique resource. The two most notable historic examples are silk and spices. The more unique luxury goods introduced into silk roads, the more money to be made by moving trade goods. For example, Chinese silk, Indian incense and spices, Roman glass, Astrakhan (Karakol) wool, Ferghana Valley horses, and Khotan jade all had high demand both within and outside of the Tarim Basin, making the historic Silk Road a thriving, wealthy artery of goods. It is important to note that luxury goods may originate inside or outside of the barrier zone, but at least one luxury good must originate from one side of the barrier zone and be highly sought after by a culture from a different side of the barrier zone.

The production of luxury goods may not remain specific to a locale indefinitely. With the movement of people along silk roads, it is entirely possible that technology, specimens, specialized knowledge, and production tools are smuggled out of one area and transplanted into another appropriate area. This knowledge leads to self production of luxury goods and multiple centers of production for trading purposes. It is important to note that such absconded knowledge does not necessarily decrease the demand or the price of the original luxury good.

Two notable historic examples are glass and silk. Roman glass was very popular in China, as were diamonds, pearls from the Red Sea, and coral. Roman glass was transported as solid opaque bulbs in 10 varieties according to color: pink, white, black, green, yellow, blue, brown, azure, red, or violet. Although the Chinese learned the art of glass manufacturing from the Sogdians in the 5th C.-7th C. CE and produced glass locally, the Chinese preferred Roman glass and continued to import the luxury item with zeal.

Another example is sericulture, the process of making silk. China prevented the dissemination of sericulture, securing their monopoly through several different methods. The royal silk makers compartmentalized labor, preventing anyone from having intimate knowledge of the entire process. For example, one group of laborers worked on the mulberry trees, grafting sections and preparing the leaves for the worms. Another group worked with the bombyx moth, bringing it from pupa stage to cocoon and reserving eggs for next years harvest. Yet another purified the cocoons and unwound the silk through steaming or plunging in boiling water. Restricting mercantile access to China also protected the secrets of sericulture; only bearers of approved diplomatic gifts and traders with the right papers were allowed to enter China. As legend has it, sericulture made its way into Central Asia when a Chinese bride (married to Khotan for diplomatic reasons) smuggled a silk worm and mulberry seed out of China, so that she would not have to go without silk in her new barbarian home. Sericulture takes root in Central Asia (and eventually as far west as Constantinople by the 6th century CE), and Turkistan silk becomes a commodity on the Silk Road.

Although one would assume increase in production would reduce the value of Chinese silk, this is historically not the case. Turkistan silk becomes the more affordable silk in the west because the production center is closer than China. Essentially, Turkistan silk becomes an imitation knock-off of the more luxurious Chinese silk, making silk available to more people, thus increasing the overall demand of any silk. Even though China did not maintain its monopoly on sericulture, the price and demand for Chinese silk in the west did not wane. Because the demand for silk was high, the introduction of the second manufacturing center did not decrease the demand or price of the original manufacturing center since the second manufacturing center helped the overall market to grow.

Designer Notes

Strapped for ideas? See *Chapter 5: Trade Goods* for a sampling of over 1000 trade goods that may fit the bill in your overland trade route.

Features of Silk Roads

Once you have the lay of the land and fill it with people and goods (including a luxury good or two), you have the beginnings of a silk road. Be forewarned: great overland trade routes are more than a sum of their parts. Below is a list of features common to silk roads to give your great overland trade route some verisimilitude. For more detail on specific design notes on planning and plotting stops on silk roads, see *Chapter 2: Traveling the Silk Road*.

A rose by any other name…

With the confluence of multiple people and cultures on silk roads, it is no surprise that many things have multiple names. Bane to historians and researchers, there are numerous situations where people attribute multiple names for the same place, people, or object. The most common are names in different languages. Pick the name of an oasis along the Silk Road and you will have no less than 4 different names: a Chinese name, a Mongol name, an Iranian root name, and a Roman or western European name. There is also the oldest form of naming: mispronouncing a preexisting native name and codifying your mistake.

Even within a single language, there may be multiple names for a single place or people. There are variations depending on age (ancient, middle, or modern versions of the same language over time). There may be systematic changes in the custom of naming things. New settlements with new names may be built on old, abandoned settlements. And many times people have additional, colloquial names as well as the "official" name.

Even though places and people have multiple names, there is often a reason behind the madness. In the case of multiple names in different languages, the names may be translations of the same theme; asking for directions then becomes of matter of speaking multiple languages. The theme may be appearance-based or a descriptor which gives a physical, political, or cultural point of reference. My favorite translation of a name by far is the Chinese name for the Pamirs, *Congling* which translates to "onion mountains."

For the linguists as heart, the names of silk roads are a history in and of themselves. I think of language as the passive historian and storyteller. Tracing language families and finding out (sometimes to much surprise) which languages are related also traces the movement of people and culture over time. Hunting down roots and derivatives may be a clue from where a culture adopted certain practices. Even naming blunders can attest to what contemporary people thought. For example, the Roman name for China was Seres, because that is where they thought China was located. Rome never directly traded with China but obtained silk through the Parthians by land or Indians by sea. The Romans could not establish an overland trade route directly with China due to the Parthians who controlled the area south of the Caspian Sea to the Persian Gulf. As a result, the Romans never knew exactly where China was, and the Parthians maintained their lucrative role as middlemen. Incidentally, the Roman's misnomer is where we derived the name for silk making, sericulture.

The Middleman

In any great overland trade route, there is a special place reserved for the middleman. What exactly is a middleman? A middleman is one who makes his or her money by moving goods from one place to another, not from manufacturing goods.

Middlemen have different levels of engagement on silk roads depending on the breadth of their wares and scope of their travel. In general, the farther a middleman travels, the more money he can make; the more communities he services, the more money he can make; and the more luxury items or specialized goods he trades, the more money he can make.

There are different ways of integrating the middleman into silk roads. Most common and numerous are traders of small scope. They move goods between two communities, one of which they belong to, and service the living groups between those two communities. Their wares are limited, typically locally produced food stuffs, clothing, crafts, and tools. Their travel time is short (within a week) except in the case of remote communities trading for necessities. The next step up is a trader of a crossroads city. Trading towns situated where two trade routes meet will have more goods from a greater variety of

At their height, Tibetans linked the Southern Tarim Basin, Northern India, and Western China.

manufacturing sites. Traders of these towns may still only engage in small scope trade, but their breath of wares increases their potential profits as they serve smaller communities around the crossroads city.

The next stage is traders who travel from one crossroads city to another crossroads city, increasing their wares, number of communities served, and distanced traveled. From this point on, middlemen can add additional stops to major trade intersections, although the details and complexities of moving goods at this scope increases exponentially. A middleman embarking on such a journey has to consider the season, different climates and terrain, which animals they will need, which places they will stop, which goods to buy and sell at which points, how to time their stops to take advantage of different harvests, and how to finance an endeavor of such a large scope. With these considerations in mind, it is little mystery why proportionally few traders attempted traveling the historic Silk Road from China all the way to Constantinople. For more guidelines on plotting trade routes, see Chapter 2: Traveling the Silk Road.

Although cultures generally have a codified role for middlemen within their society, some cultures are based on being middlemen, specializing in mercantile endeavors and social skills. A historic example from the Silk Road is the Sogdians, who taught their children the art of trade and numerous languages. Located in transoxiana (south of the Aral Sea between Amu Dar'ya and Syr Dar'ya), Sogdiana had two major trade cities: Samarkand and Bukhara. Sogdiana was a trading and cultural crossroads. Traders from the west (both north and south of the Caspian Sea) went through Samarkand and/or Bukhara in their journey east. Travelers from the east through Kashgar, the biggest trading city in the Tarim Basin, traveled through Samarkand and/or Bukhara to go to Balkh (Bactria) and Persia. Chinese and nomadic traders also traveled north of the Tien Shan Mountains through Tashkent into Samarkand and Bukhara.

At their height, Sogdians were commonly used by the Chinese as messengers, emissaries, and translators. They were found throughout all the oases of the Tarim Basin and the Chinese outpost of Dunhuang. At the Silk Road's height, Sogdians opened caravanserai (part hotel, part restaurant, part storehouse/corral) that catered to Sogdian merchants and travelers, featuring Sogdian dancing girls and Sogdian ale served in Sogdian mugs. They also made a cultural impact on their neighbors. The Mongols and Uighurs used the Sogdian alphabet until they evolved their own script. Incidentally, the Uighur language was the lingua franca of the Tarim Basin, and many of the names we use today are Uighur names, including the Taklamakan Desert, translated as "the desert of irrevocable death."

Through waves of political protectorates, Sogdiana eventually fell to the expanding Arabs, and the displaced Sogdians were eventually absorbed into the conglomerate Uighur people.

"Who picked this one camel town anyway?"

Wherever there are reliable or consistent streams of travelers, there are accommodations for the night. The quality, scope, price, and organization of said accommodations vary greatly. The most modest accommodations are those that caravans make themselves, relying on resources they brought or scavenge from the surrounding landscape. One step up from that is small homesteads or villages, whose greatest value to offer is knowledge. Where is the nearest source of potable water? Small villages offer caravans a chance to disseminate goods on the smallest scale of trading, although stocking up on food and supplies in such places is very limited.

Small trading cities are one step above small villages. This is the first place travelers get a glimpse of big city living, complete with inns, restaurants, entertainment, staging posts where traders restock their supplies, and other specialized places for travelers. Small trading cities often have a local specialty or primary access to the supply of a specialty good. They may be destination points in and of themselves depending on the scope of the trader.

Crossroads cities are the grandest stops along silk roads, short of the metropolises found in the culture groups surrounding the physical barrier zone. The more roads the city connects, the greater the diversity of people, goods, and cultural influences in the city. Crossroads cities offer a traveler a variety of religious spaces, eateries, specialized inns and entertainment, and trade goods. For people living and trading in

the barrier zone, crossroad cities are also the first locations that have access to foreign goods, making them popular places to shop and trade.

For guidelines on how and where to place stops for the night, including staging posts, trade cities, and overnight stops, see *Chapter 2: Traveling the Silk Roads*

The current political climate may greatly affect the frequency and organization of stops along silk roads. In the presence of stable kingdoms within the physical barrier zones (often city-states and the surrounding landscape), travelers find more stops along the route to serve the greater traffic, albeit if only homesteads and small villages. In the presence of a protectorate empire from outside of the physical barrier zone, you will find a greater level of organization and tailoring of stops for traders and travelers. You will also find more defensible places to stop for the night. To borrow an example from the historic Silk Road, during the Tang Dynasty, China extended its reach across the Tarim Basin to Kashgar. An increased military presence kept the raiders at bay and encouraged greater movement along the Silk Road due to increased safety. Besides adopting pre-existing oases (and their accompanying city-state kingdoms), China also created new stops along the popular northern Tarim Basin route. Some stops began as forts, which turned into thriving cities with China's support and enough people to maintain a sustainable living environment. Some stops were little more than homesteads and small villages, except that they catered to traders and travelers by having supplies, inns, eateries, stables, corrals, or some combination of these. This increased traveler infrastructure may persist despite the waning of their protectorate's presence in the physical barrier zone, reverting to self rule and continuing to grow wealthy from the movement of goods and people.

Riders on the Storm

Where there is wealth, there are raiders. Bane to merchants and trading centers, raiders are an integral component to silk roads. They are the bandits to waylay caravans. They are the menace that loot trading posts of their goods. They are the usurpers who take over kingdoms in physical barrier zones. Raiders shake things up when settled people get a little too settled.

Although geography, density, dispersion, and history determine your specific batch of bandits and raiders, there are a few overarching principles in designing raiders. First, raiders are mobile. What they value is not tied to a specific location, unlike the easy prey of oases and trading centers. This does not exclude raiders from forming culturally rich populations with political structures, just that they are mobile culturally rich populations with political structures. It is important to note that the political structure of raiders is generally tribal; they are rarely centralized, although tribal groups can cooperate for a larger purpose. Being a mobile (or nomadic) society has many implications. It means the society is primarily hunter-gatherer or pastoralist rather than primarily agriculturists, yielding smaller living groups than farmers. If a society is nomadic, it means that the land they inhabit is marginal; otherwise they would be farming. That leads us to the second design principle of raiders. Raiders are scrappers. They have smaller societies with less complex political structures living in comparatively marginal lands. This fosters a mentality and personality that differs from agricultural people. Raiders are hard people surviving in hard conditions compared to agriculturalists. And it also makes them feisty, which is the third design principle of raiders. Raiders have martial skills and prowess, with an emphasis on speed and precision. Their living conditions and scrapper mentality result in a martial lifestyle that is not emphasized in agricultural communities. Hunting, riding, and skills with weaponry determine whether raider societies survive. In agricultural communities, those skills are second to agricultural concerns and are often limited to an elite group within the society. While agriculture produces surplus resources to support specialized martial occupations, all raiders have to have military skills for survival.

Frequency and level of threat are another consideration of raiders. Generally, more raiders are present when there is a greater amount of wealth in an area, both in raw numbers and in the number of communities. Depending on a community's size, raiders have limits to the prey they attempt. The smallest of groups limit themselves to stray merchants who wandered from their caravan, while the largest groups are capable of upsetting or conquering trade centers as well as threaten the security of rich cultural groups outside of the physical barrier zone.

In the historic Silk Road, the unique geography facilitated a multitude of fierce riders from the steppes, which stretched across the Eurasian continent from shore to shore. The steppes gave potential raiders ideal launching points for plucking the bounty of the

oases of the northern Tarim Basin route. Often attacks were hit and run affairs, but some raiders decided to stay and become rulers, the Uighur being the most notable example.

Under Pressure

Perhaps it is becoming clear why roleplaying in merchant caravans traveling along great overland trade routes is a common trope: it is prime potential for conflict. You have limiting geography, harsh landscapes, flourishing cultural centers surrounding the physical barrier zone, havens of agriculture and trade within the physical barrier zone, and fierce raiders who would gladly sweep in and claim it all.

This pressure often sends silk roads into cycles throughout their history: growth, fighting, and decline. Keep in mind that people and goods are moving the entire time, but events often increase or decrease the quantity, quality, and variety of people and goods. Silk roads in periods of growth experience many positive traits: increased movement of people, goods, and ideas; increased exchange of cultures and religions; and an increase of wealth within the physical barrier zone. Unfortunately, growth has some negative side effects. As the wealth increases in the physical barrier zone, there is a concurrent rise in the number of groups that fight over the increased wealth. To borrow a prime example from the historic Silk Road, when China sent its first emissary/explorer into the Tarim Basin, they passed through the territory known as the 36 kingdoms, which promptly multiplied after China became a major trade player in the Silk Road.

Another source of pressure comes from outside of the physical barrier zone in the form of the cultural centers surrounding the physical barrier zone. Once the wealth inside the physical barrier zone passes a certain threshold, it is bound to attract the attention of its neighbors on all sides. This attention can be disruptive when outside empires fight each other for control and the chosen battleground is the silk road itself, but imperial attention can also be beneficial. In the presence of a strong empire or protectorate (i.e. one that has the military might and wealth to squash rebellions, raiders, and other would-be protector entities), silk roads can flourish with increased safety, stability, and infrastructure. Inevitably, the protectorate's power over the silk road will wane, making room for challengers and combatants. This cyclical build up and release of pressure plays itself out in the silk road, from the merchant choosing a different route with less banditry to the refugees fleeing from the last battlefield.

Dead Cities

What cannot be sustained is often left behind, reclaimed by the unforgiving landscape of the physical barrier zone. As your silk road matures, and kingdoms rise and fall, there will inevitably be dead cites. In a roleplaying environment, dead cities are a playground full of potential.

Dead cities are the vestiges of past power, and they take on many forms. Abandoned forts and outposts tell of extended imperial power or the presence of an ambitious protectorate that has since waned. Large timber posts piercing the desert attest to a shift in climate, changing a wet fishing village into a parched salt basin. Empty city streets and half burned buildings are witness to the downfall of a city-state. Carved cave systems with long-neglected iconography are signs of an ideology whose influence has passed.

While some dead cities pass quietly into non-existence, there are dead cities that continue to have importance after their decline. Sometimes their location is too crucial in navigating across a harsh landscape, and future rulers build nearby (or even on the ruins of) a dead city. Dead cities may be revered (or have an object or location that is revered) and attracts pilgrims. In the case of warring factions or protectorates, dead cities may find new life with a change in management. There is always room for scavengers, those who loot dead cities for gain. Dead cities also elicit the curious: who was here and what happened to them? What did they leave behind and where did they go?

Roadside Attractions

In an area as cultural diverse as silk roads, there are bound to be points of interest along the journey. Some are geographical features, some religious sites, while some are simply roadside attractions skimming a little wealth off travelers. Even traders may be tempted to leave a few days early so they can take the scenic route. After all, when's the next time you're going to be in Bactria?

Chapter 2: Traveling on Silk Roads

Now that the foundation for a silk road exists, it's time to break down the nuts and bolts of traveling on your silk road. Where does it go and whom does it connect? What sort of considerations, both mundane and magical, are would-be travelers facing? Who travels along your silk road and what implications evolve from such travel?

Plotting Your Silk Road

These germane questions all begin with the map. Mapping can be a daunting task (which side of the mountain is the wet side?), and mapping realistic maps is outside the scope of this work. For more help on making realistic maps, look for *A Magical Society: Ecology and Culture*.

If you've considered your foundation points, you know what geological formations comprise your physical barrier zone, what civilizations abut it, its general shape and orientation, and what luxury goods are sought after on opposite sides of the physical barrier zone. For our purposes, the only mapping necessary is actually fleshing out the trade routes that cross the foreboding landscape and identify neighboring cities outside the barrier zone that are trade destination points.

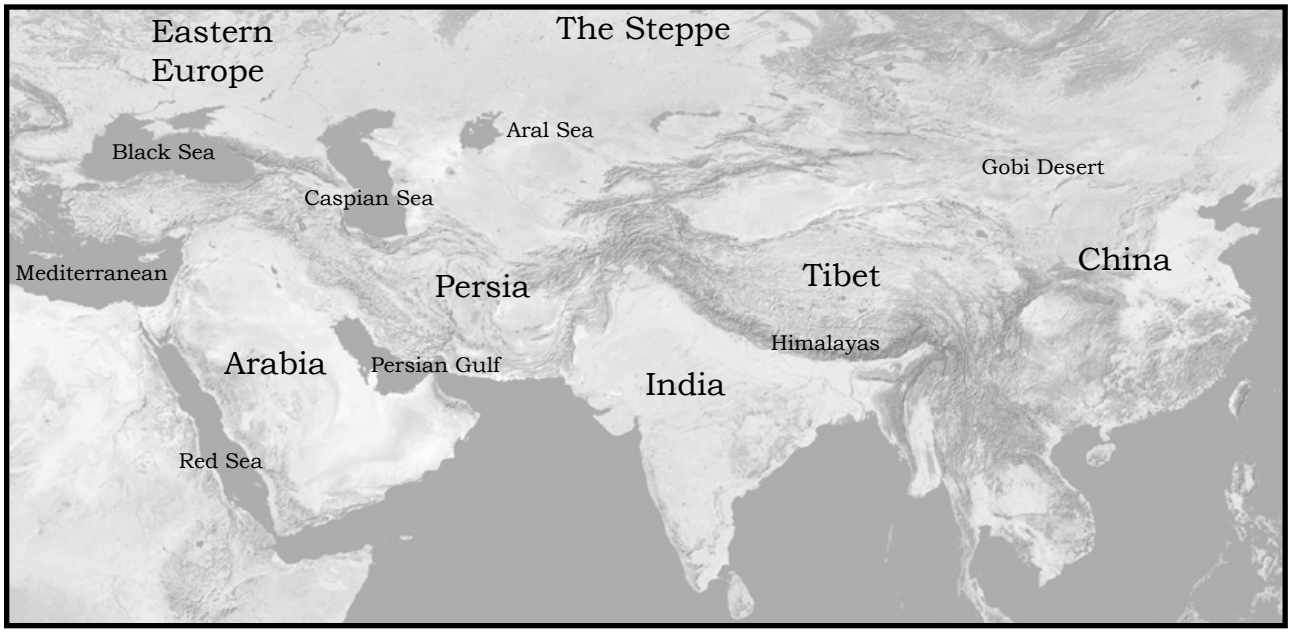
Warning: the following steps discuss mapping your physical barrier zone from the top down, starting with the big picture and zooming in. You can stop at any time and walk away from the drawing board. A world builder can do as little as necessary for the next gaming session or get as detailed as possible down to the last micro trading villages. While these tools are meant for the whole spectrum, it begs the question, which came first, the story or the map? Well, only people this side of the screen need to know.

Step 1: Civilization Centers

Define the civilization centers that consume desired luxury goods. Sometimes they are the capital of empires, like Rome. Other times they are large cities closest to the barrier zone, like Chang'an in China, although Chang'an does serve as China's capital city amid its history of numerous civil conflicts and invasions.

Civilization centers cover a broad scope of locations. Generally, they are the jewel of a kingdom's realm, where goods, wealth, ideas, religions, and people congregate and intermingle. Civilization centers do not have to be on an imperial scale, but there are a few criteria they should possess. First, they are usually large cities or metropolises large enough

Map of Silk Road Civilizations



Major geological formations provided for reference.

to produce a sizable middle to upper class that has money to spend on luxury items. Second, they should produce luxury goods desired by another cultural center, either within or across the barrier zone. Third, each civilization adjacent to the barrier zone should have at least one civilization center. Fourth, if a neighboring civilization has more than one qualifying city, consider creating a hierarchy among the cities or specializing their production/consumption of goods.

There are a couple of different ways to think about civilization centers. Again, the prerequisites are lots of people, lots of wealth, and production of a sought after commodity. If the civilization center does not produce the commodity itself, then they need to have monopolistic control over its dissemination to the consumers, either across or radiating from the physical barrier zone.

The name "civilization center" may be a bit of a misnomer depending on the scope of political organization. To broaden the definition, if there is a distinct cultural group that seeks to trade across a barrier zone, they have to go somewhere to conduct that trade. If they are politically influential enough, the biggest, most important, wealthiest city that people gather to conduct such trade is their civilization center. If they do not have a city of their own for such trade, they must travel and conduct trade in another culture's civilization center.

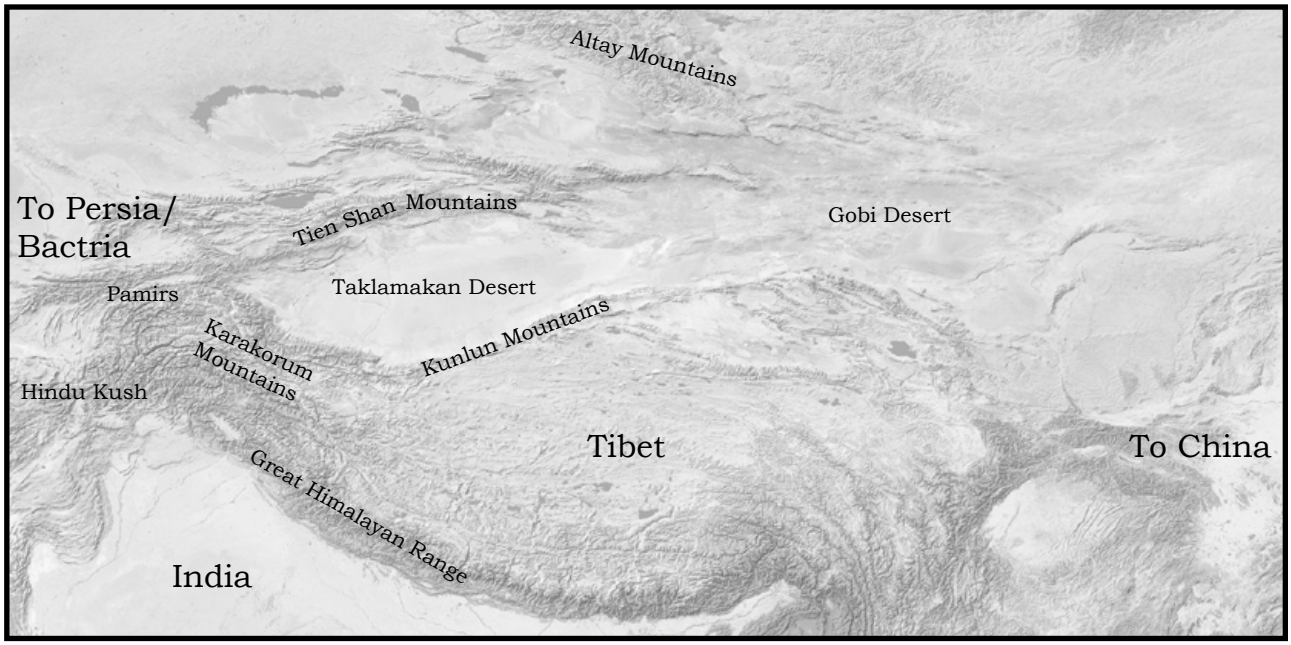
In the case of larger imperial entities, there are probably numerous cities that offer their citizens exotic luxuries from afar. There are many ways to differentiate these cities from each other, and they are as varied as humanity itself. Perhaps the imperial city has better selection, and the city further south is for the nouveau riche. Perhaps there isn't much of a market for that particular style of embroidery this far west. Perhaps religiously or ideologically-minded cities may prefer to trade with like-minded cities. Perhaps one city is physically closer to the production source, getting the jump on traders from other cities come harvest time. People will go to extraordinary lengths to differentiate themselves from one another, and they build their cities in much the same manner.

Step 2: Identify crossroads and major trade cities within barrier zone

Once you've created the major destinations outside the barrier zone, it's time to link major destination points on your map. Start with rough sketches connecting one major civilization center to another, going through all the different permutations. When you've interconnected all the civilization centers, see where the routes intersect. Those are prime candidates for crossroads in the barrier zone, and those locations are prime candidates for crossroad cities. Also make geography a consideration of where these crossroad cities occur. In arid lands, perhaps the crossroad cities have renewable sources of water. In a swamp, perhaps crossroad cities are large plots of solid ground. In mountainous terrain, perhaps crossroad cities are in part determined by lower altitude passes.

If there are multiple intersection points that are relatively close to each other, consider combining them into one mega crossroad city. Once a crossroad

Map of Silk Road Terrain



This landscape of deserts and mountains is the heart of the Eurasian continent. Any travel or trade between east and west, and to some extent north and south, must find a path through such foreboding terrain.

city reaches a certain girth, it creates its own gravity, drawing people to its gates. For this reason, crossroad cities are often far apart from each other, and within the near proximity of a crossroad city, you are more likely to see a string of smaller trading cities than another crossroad city. The characteristics of the surrounding landscape also shape the distribution of people in the area. For example, consider the historic Silk Road. The major crossroad cities are Kashgar, Khotan, and Kucha, all of which are relatively large oases with renewable sources of water and irrigation.

For those of you who took higher math and experimental science, consider this exercise akin to fitting the curve. Identify the major crossroad cities in your barrier zone using geographical factors and location of civilization centers. More than likely, these crossroad cities are the largest cities in your physical barrier zone with a wide diversity of people, goods, and ideologies. Crossroad cities that connect more than two civilization centers are larger, wealthier, and contain more diversity.

It is important to remember how crossroads cities develop when committing them to a map. In the barrier zone, these trade destinations are products of people moving around with goods. It is the roads that feed the cities and make them great, and not the other way around; the roads were not founded in order to make those cities great. When people are trying to cross the barrier zone, their goal is to get from here to there by the quickest, safest, most convenient path, and the roads bearing travelers are what make crossroad cities and lesser trading cities great. It is a self-feeding cycle (the greater the city, the more likely it becomes a destination or staging post itself) that relies on people traveling silk roads. Then the important question becomes how people travel and what factors play a role in their route-making process.

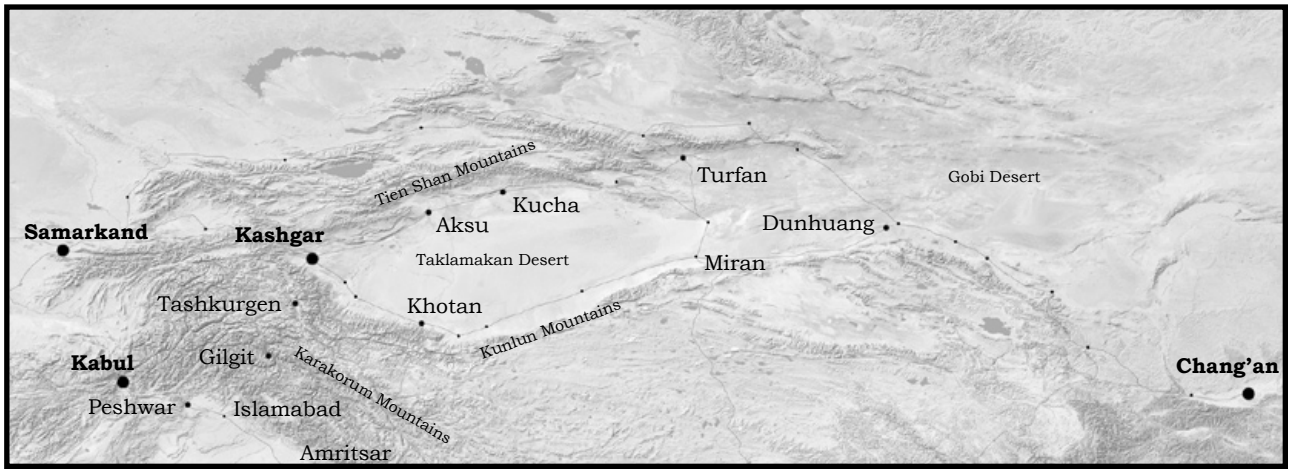
Step 3: Connect the Dots

The civilization centers and crossroad cities you've just plotted have now become trade destination points. Now it's just a matter of connecting the dots. Although the shortest distance between to points is a straight line, there are many mitigating factors that shape a route between two points on a map. The most pressing is geography, typically to avoid hazardous geography, take advantage of favorable geography, or obtain required resources from the land. Bottlenecking often occurs due to natural geography, such as canyons, mountain passes, fords, and vegetation. Routes may wind to avoid hazardous terrain, like deserts, mudflats, and seasonal flooding. Travelers may choose routes with easier mountain passes or low points for easier river fording. Caravans may travel a longer route in order to find regular waterholes for their animals. Civilizations can take steps to minimize the hazards of geography by creating regular stops and road markers. For example, in northern Africa lies the Chott Djerid, a large mudflat southeast of the Nefta Oasis. Chott Djerid doubles as a seasonal lake and floodplain for the 150+ artesian wells and springs feeding the oasis, and the land becomes a swamp of salty mud whose surface hardens as it's baked by the intense sun. At one time, safe passage across the Chott Djerid was lined with trunks of palm for merchants and travelers entering and leaving the Nefta Oasis. For an example from the historic Silk Road, the Chinese created forts along the northern and southern routes in the Tarim Basin. These stops were especially helpful along the southern route, where water sources are scarcer and areas between the oases are barren. With irrigation, the Chinese were able to create a series of forts and cities along the southern route, and in periods of Chinese decline, these forts and cities often reverted to self rule (if the landscape was forgiving) or were reclaimed by the desert because of insufficient labor to maintain the irrigation works. These forts were also subject to Tibetan assault as the neighbors to the south fought China for control over the lucrative trade routes across the Tarim Basin.

Natural geography is not the only factor to consider in mapping your routes. Political tensions and open warfare may persuade travelers to take a physically more difficult path with fewer cities and less-friendly geography along the way. Political projections of neighboring civilizations may make travel safer or easier with more frequent stops, such as cavanserais and forts created in the Tarim Basin by various political powers. For example, under the Han Dynasty in the beginning of the 1st C. CE, China created four commanderies or forts through the Gansu Corridor which led to both the Tarim Basin and to the route north of the Tien Shan Mountains. Each fort built up ramparts with gates to control traffic in an effort to defend merchants through the narrow gorge that was a favored bottleneck for raiders.

Remember that plotting trade routes can also be a world building opportunity. Place stops along the route from civilization center to crossroad cities. These cities may produce specialty goods for sale, export their music and dress, ally themselves through marriages, and build a culture all their own. When mapping these smaller trading cities in the barrier zone, keep in mind geography: these cities should occur where there is some respite from the unfriendly living conditions characteristic of the barrier zone. Also consider the surrounding landscape. For example, there are oases along the northern and southern Tarim Basin routes that grew into trading cities, albeit smaller than the three main crossroad cities. The northern Tarim Basin route (following the southern ridge of the Tien Shan Mountains) has more water in general than the southern route (following

Map of Crossroad Cities, Trade Cities, and Staging Posts



By skirting the most desolate parts of deserts and traveling through less treacherous mountain passes, people found paths that pierce through the heart of the Eurasian continent, connecting east and west through major trade centers that are a creation of the difficult geography. Also note the north and south travel through the mountains. Paths through the Kunlun Mountains, Karakorum Mountains, Pamirs, and Hindu Kush also connect the Tarim Basin to Indian and Persian trade centers (and by extension all their trade partners).

the northern ridge of the Kunlun Mountains). However, there are fewer trading cities (Aksu and Kucha) along the northern route than along the southern route (Yarkend, Karghalik, Khotan, Minfeng, Endere, Cherchen, and Miran). The scarcity of water in the area through which the southern route passes encourages grouping centered on water sources, forming higher-density locales which become trading cities as travelers search for water along the arid southern route. Although there are more trading cities that make the map on the southern route, the area between trade cities is sparsely populated. In the relatively wetter area through which the northern route passes, there are fewer trade cities that are map-worthy, but the area has more settlements, albeit smaller settlements, along the route due to the greater availability of water.

Typically there are demographic guidelines for how different types of cities interrelate, but due to the hostile environment of the barrier zone, such rules are not easily gleaned. For example, the northern route of the Tarim Basin is littered with more watering holes at fairly regular intervals while the southern route is fairly barren except for the trading cities centered on water, yet both routes were wildly used depending on destination and political deposition. The rule of thumb is safety in numbers. That means traveling with other people and traveling on routes used by other people. People generally travel the most popular route until they need to branch off for their desired destination. In addition, there are typically multiple ways to get from point A to point B, largely defined by the stops in between. You are creating a web of roads which travelers of all types use. You can also create points of interest that are destination in and of themselves, such as religious sites (like monasteries and religious cave systems) and routes that lead to unique communities featured in your campaign.

Step 4: Barrier Zone Correlates

Now that you've grasped the larger destination points, consider their correlates within the barrier zone. The smaller trade cities you've plotted as mere stopovers on the path to civilization centers may be important locales for those living in the barrier zone. Perhaps they are their cultural centers, and villages in the barrier zone establish routes to trade in those smaller trading cities. This micro level of trade potentially creates crossroad cities of a lesser scale, where local trading routes intercept places that facilitate trade between major civilization centers outside the barrier zone.

World builders may repeat this process until they reach the desired level of detail in their silk road (or even a portion of their silk road). At the end of day, your map should look like a web, ultimately connecting civilization centers to each other through crossroad cities, but also connecting crossroad cities to lesser trading cities in the barrier zone and featured communities to lesser trading cities.

Navigating Travel

You've set the geography, filled it with people and cultures, committed your cities and plotted your course. Now you're ready to talk about camels and bolts of silk, or more generally, the actual nuts and bolts of traveling on a silk road. For considerations unique to caravans traveling through certain terrains, see *Chapter 3: Types of Caravans*. For mechanics on loading caravans and calculating cost and income, see *Chapter 4: Money Matters*.

Organizing the Trip

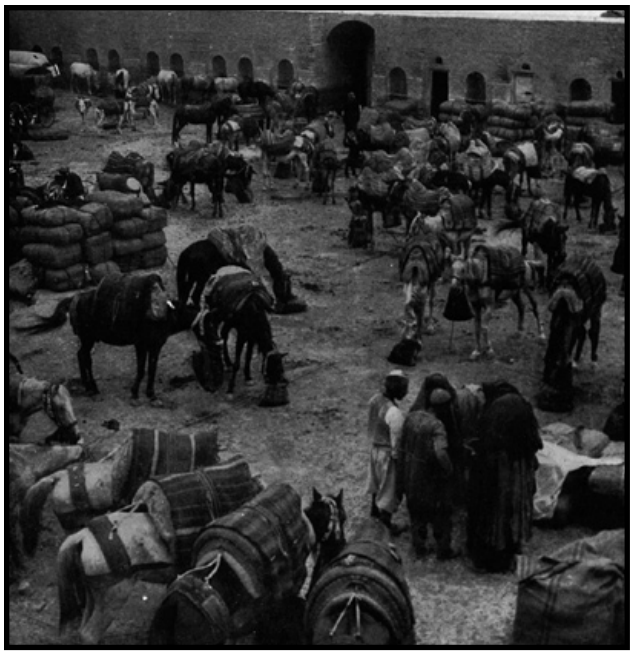
There are many considerations before actually embarking on the silk road: the embarkation and destination points, the time frame of travel, pack animals, supplying such an excursion, and what goods to trade along the way. When creating a caravan for your world building endeavor, consider first the scope of trade. Are your PC's hitching a ride with small trader going from small village to small village? Are they hired as guides from a community traveling to a smaller trade city with which the PC's are familiar? Are they guarding a caravan making a circuit around the smaller trade cities in the barrier zone? Perhaps they are protecting valuable cargo traveling from a civilization center to a crossroad city?

Once you've ascertained the scope of the trip, think about the time frame of travel. Are you talking days, weeks, or months? The time frame depends upon the length of the journey, the type of pack animals used, the number of stops, and the size of the caravan (how many people are traveling together). A good rule of thumb for estimation is 10 to 25 miles a day. Obviously, terrain, weather, vegetation, and travel conditions affect how far a caravan can travel per day. Uneven or sandy terrain, storms or strong winds, and overabundance or complete lack of vegetation (no shade or grazing) can slow down progress. Caravans travel faster with unburdened animals and fewer people to organize. Carts drawn by animals also slow progress in comparison to loading wares on the animals directly. Seasonal considerations may affect how long and what times of day travel is possible.

When you organize a trade route, consider their stops and motivations. Are they leaving in mid-spring to take advantage of the grape harvest at one stop, and then the first sheering of fine black wool further down the route? Are they leaving after the first pressing of oil to meet high demand in the nearest city for an upcoming festival? Are they traveling during winter to use low altitude frozen lakes rather than traverse high mountain passes? Are they bypassing a certain stop because of high tariffs? Perhaps they are going the long way to avoid fighting from the latest outbreak of war between two imperial powers. There is more to plotting a trade expedition than just dots on the map.

Staging Posts

Staging posts are where expeditions begin. They are places where merchants can buy or rent pack animals, supply their caravans, and meet other people who are traveling similar routes. Civilization centers, crossroad cities, and smaller trade cities in the barrier zone act as staging posts for would-be travelers; the scope and quantity of provisions and animals increase with the size of the city.



The largest staging posts are civilization centers outside the barrier zone, like the historic Constantinople, Palmyra, Samarkand, and Chang'an. Crossroad cities that link civilization centers are the next largest staging posts, such as Kashgar through which merchants of many destinations met. The northern and southern Tarim Basin route rejoined in Kashgar. The northern passage toward the Altai Mountains passed through Kashgar. Traders heading from the Tarim Basin to Samarkand and other trade destinations in Transoxiana traveled through Kashgar. Merchants traveling to India or Arabia via the Pamirs also found themselves traveling through Kashgar. Needless to say, cities like Kashgar are used to travelers, and in the interest of profit, they are well equipped to supply caravans.

Any of the smaller trade cities also serve as staging posts, although they may not consistently have the variety and quantity of animals and supplies for travel. If they have a seasonal product, they may beef up on supplies in anticipation of harvest traders. Some staging posts are not associated with cities. Along the historic Silk Road, towns, villages, individuals, or a collection of investors build caravanserais for travelers, typically offering rooms for rent, food for sale, corral space for animals, and storage space for unloaded wares. The most basic caravanserais along the historic Silk Road are walled mud-brick construction with buildings for travelers to eat and sleep, a courtyard for animals, and buildings for additional storage. More elaborate caravanserais have entertainment (dancing girls and gambling rooms) and tea and smoke rooms (for story telling and exchanging news). There were also themed-caravanserais, catering to the regional or religious preferences of the merchants themselves.

Imperial protectorates may create staging posts to facilitate trade across the barrier zone. In the historic Silk Road, China created multiple staging posts in the Gansu Corridor, Dunhuang being the last Chinese staging post before entering the Tarim Basin. Such a power may create a staging post by infusing wealth, military support, suppliers and goods to a pre-existing settlement, or they may create a new settlement. These new settlements often begin as defensible, military outposts and grow into thriving cities in their own right.

Staging posts offer ideal resources for travelers. They can find out upcoming hazards, catch up on news of the day, and pry from passing merchants the going price for their trade goods in the stops ahead. Staging posts are where caravans form when merchants heading the same direction band together for safety. A composite caravan of hundreds to thousands of animals fairs much better than the lone trader with his dozen animals. Besides the threat of raiders, bandits, and thieves, weather and terrain can throw wrenches in the best-made plans. Besides other merchants, a caravan also picks up passengers seeking protection in numbers and guidance by experienced travelers. Pilgrims, diplomats, and visitors gravitate toward staging posts so they can travel with caravans.

Animals

Animals are the backbone of any caravan. They bear the brunt of trade goods, their dung fuels fires and auxiliary sales on the road, and they are a heck of a lot cheaper (and often less ornery) than lots magic-users with *floating disks*. There are a few considerations when picking animals: how much can they carry, how fast they move, their native terrain, temperament, and the level of care required. Merchants can either pack wares directly on animals or use carts that are pulled by animals. Although they carry more weight, carts move much slower but they also accommodate oddly sized goods that do not easily strap to the side of animals.

Some merchants owned their animals while others rented animals, depending largely on the scope and origin of trader. Traders living in the barrier zone trading on small scale (less than a dozen animals) often owned their animals and used their resources all year round (meat, milk, hair, dung). Traders from herding communities within or nearby the barrier zone also owned their pack animals. Merchants living in barrier zone cities may own their animals and provide boarding for them when they are not on the road, or they rent animals before each excursion. Preserved documents from the historic Silk Road are often mercantile in nature, some of which stipulate animal rental agreements in fine detail, including compensation for animals that die natural deaths, accidental death, and in natural disasters. Merchants from out of town often purchased or rented animals on site, especially if they have to travel any portion by sea.

For merchants trading a long route, it is wise to learn from the Buddhist sentiment: once you cross the river, you need not continue to carry the canoe. Only rent or purchase animals when needed for carrying your trade wares. Merchants travel faster and cheaper without additional animals. When traveling on long trips with terrain or climate changes, merchants often have to change their pack animals to suite different environmental challenges. Such transactions take place at staging posts, although the serendipitous traders may be able to make such arrangements with local herders to carry their wares. Another axiom of caravan animals: don't leave empty handed. An unburdened camel is a burden, losing hundreds of pounds of potential profit. If a merchant has animals, they better be the trade good or carry them.

Mixing animals in caravans is also common, especially for merchants trading in livestock directly. For example, the bulk of a caravan may be camels, but the camel handlers are riding horses in order to travel up and down the caravan quickly or steer an errant camel. For information on pack animals in different types of caravans, see *Chapter 3: Types of Caravans*.

Translators and Currency

For out of town merchants, language is a serious consideration. Such traders often rely on translators to socially (and sometimes physically) navigate their excursion in the barrier zone. Speaking the lingua franca of the barrier zone as well as the languages of neighboring civilizations guarantees an inhabitant of the barrier zone perpetual employment. There maybe an entire culture dedicated to such skills, such as the Sogdians in the historic Silk Road. Sogdian was the lingua franca of the Silk Road, and the Sogdians trained their children to speak many languages on top of pertinent trade skills. As Sogdiana fell to waves of Islamic Arab invasion, the natural-born traders and translators dispersed throughout the Tarim Basin and the majority joined the conglomerate Uighurs, whose language then assumed lingua franca status.

Another consideration is exchanging currency. The first and most persistent currency was in kind, especially between established trading connections, like two villages that trade annually or merchants trading in yaks for camels at the slopes of the mountain. Trading in kind was a matter of bartering the right goods at an agreed rate. Taxes and tariffs may also be paid in kind at various cities and stops along the road. While some level of trade remained at the barter scale, the development of currency and promissory notes delineate a more fiscally sophisticated silk road.

Exchanging currency was especially important for merchants from outside the barrier zone who wished to trade inside the barrier zone. If there is a strong political presence exerting control over the barrier zone, merchants stand a better chance of using the same currency throughout through journey over the barrier zone, exchanging currency only when they enter and leave the barrier zone. This strong political power may be from a civilization outside the barrier zone, akin to Chinese power in the Han or early Teng Dynasty, or from kingdoms inside the barrier zone, akin to the Uighurs in the face of China's slip into civil war in the 8th C.

On the Road Again

Depending on conditions, a caravan travels 10-25 miles a day. Most of their stops will be self-made, relying on the provisions they bring with them or forage along the way while stocking up on at staging posts/trade cities. Foraging possibilities (for animals and traders alike) and sources of fresh water are other considerations in planning daily caravan stops, sometimes making travel routes look more like connect-the-dots than a smooth line from point A to point B. A large portion of time is spent making and breaking down camp and tending to animals. A caravan's food provisions are probably less than ideal, chosen for shelf life rather than taste. This lifestyle makes heading into trading cities even more appealing. Routes with more staging posts/trading cities along the way are preferable to merchants, unfortunately making such routes prime targets for raiders. In time of uncertainty (warfare, loss of protectors, contesters to pre-existing power centers), merchants may choose more remote routes to avoid taxation, raiding, and fighting.

Travelers of Silk Roads

Silk roads are a creation of people in motion trying to find the quickest, safest, and easiest path from here to there. Needless to say, certain paths became instant favorites while changes in environment or political stability shift favor between the various routes. A fair amount of the movement are local people traveling at set times, often for pilgrimages, weddings, funerals, festivals, religious holy days, and seasonal trading between establish partners, typically dictated by natural rhythms like harvest or animal grazing. Other common travelers are simply visiting family and friends.

Certain travelers are driven by religious purposes: conducting a pilgrimage, proselytizing, visiting a distant temple of their faith, carrying translations of religious text in the barrier zone vernacular, visiting renowned sites of the saints, or searching for the true roots of an adopted faith. At the height of the historic Silk Road, it was not uncommon to see Buddhist monks, Zoroastrian priests, Manichean magi, Nestorian Christians, and Jewish merchants using the same stretch of road and finding places of worship for all religions in the major crossroads cities.

Another source of travelers is politics. A fair amount of the trade passed through the historic Silk Road as "diplomatic gifts" from one political structure to another. The Chinese under the weakening Tang Dynasty sent gifts of silk to the Uighurs, while the Uighurs sent horses as gifts to the Chinese, although the horses declined in quality as the Chinese grip loosened over the Tarim Basin. Diplomatic gifts are not limited to goods and chattel; more than one Chinese princess (and her assigned entourage) traveled through the Jade Gate, destined for one of the barbaric tribes of Central Asia. Besides bearers of diplomatic gifts, ambassadors and messengers constantly travel within the barrier zone, especially if the city-states in the barrier zone are aligned with an outside empire or religious order, or allied with other city-states. Military troops also use these established routes. Troops may be from empires outside the barrier zone that act as a protectorate, or they may be the imperial agents, like the Mongols who policed the historic Silk Road, implementing the Pax Mongolia with swift, decisive action against troublemakers. Officials also travel along silk roads, such as tax collectors, assessors, judges, and governors.

Some travelers are strictly business—acquiring goods in fits and starts, and finding the best prices along the way. Some people seek or disseminate knowledge, both mundane and magical. There are also displaced people looking for a new home where they can find work and settle down. Conversely, there are people who live on the road from one job to another, such as mercenaries and traveling entertainers.

Imagine all these people with different reasons for traveling all sharing the same road. To use a modern analogy, think of it like riding the greyhound. It takes much longer to travel to your destination because of all the stops along the way. You make many stops where some people get on and others get off. Embarking from larger cities means more people and more stuff (animals and goods). There is a seasonal nature to the travel, so there are peak times where multiple caravans, all packed with people, are clogging up the roads, kind of like coming home on Christmas Eve. Everyone is responsible for his or her stuff, and if you are late getting on the caravan, this bus does not wait for you either.

Trading More Than Rugs

Silk roads are a vast network of routes accommodating movement of wealth and people, but there are more than just rugs being traded. Wherever people travel, they bear their clothing, style of speech, language, technology (what kinds of travel gadgets

are you carrying?), religion, and philosophies. This transmission and co-mingling can be both deliberate or merely a side effect of different people being curious and culturally rubbing off on one another.

Cultures of the barrier zone are often intermediaries between vastly different civilizations. The more traveling that takes place along silk roads, the more cultural transmission occurs. For an example, consider the role of religions along the historic Silk Road. Buddhism began in northern India and spread into Central Asia through trade routes leading into the Tarim Basin. There was a time when Buddhism was the dominant religion in the Silk Road (the first known proselytizing religion). It took root in some places outside of Tarim Basin, like China. In others, it spread, lost ground, and was retransmitted at a latter time, such as Buddhism in Transoxiana. Other times religious traditions grew not due to converts but because of diasporas and the movement of people, such as Iranian and Jewish religions. Sometimes religion spread through military might, such as the Islamic domination throughout western and central Asia.

Despite how these religions were seeded throughout the historic Silk Road, it is important to note that they were practiced with a vernacular flare, such as Mongolian Christians drinking mare's milk wine as a religious ceremony and Iranian Buddhists' reverence for fire despite their ideological break with Iranian religions.

Integrating Cultural Differences

The main factor in creating the atmosphere of silk roads is difference: people look and behave differently, their beer is a little off, and the foreign monsters are nastier. The disparity between cultures and their wares drives micro and macro trade alike, and the role-playing possibilities increase exponentially when player characters enter situations with limited or no knowledge of another culture's social cues.

The least mechanically disruptive method is to keep all mechanics the same and use the social fabric of the area to bring these differences to the foreground and create challenges for player characters. For example, spellcasters requiring "common" spell components find that they are rare or taboo in the barrier zone, or religiously unified societies may frown upon divine casters using a different divine focuses. Perhaps punishment for thievery is cutting off the thief's hand, making life more difficult for sticky-fingered player characters. Maybe fighters have a difficult time finding replacement weapons on the road because longswords are considered exotic in those parts.

Gamemasters may choose to reinforce this feeling of difference and traveling into exotic lands with minor mechanical changes. For example, clerics bound

to certain ethics and causes may find themselves in an environment where they feel distant from their god, like a cleric of the sun traveling with an underground caravan for months or a cleric of water traveling through the desert. Rather than simply leaving it as a role-playing device, gamemasters may choose to weaken the effect of domain spells or require a morale check when the cleric prays for spells each day. Perhaps fire spells cast while traveling in the desert are considered empowered or maximized, while water spells must be cast a spell slot higher in order to work.

Some gamemasters may not feel that minor changes truly capture the ambience of silk roads and opt for more severe changes. Gamemasters may choose to restrict certain spells based on geography or cultural mores. Perhaps a wizard wishing to learn *fireball* has to venture to another culture because his does not know of such magic. Perhaps certain domains are not accessible for learning or casting depending on the disposition of the culture. Maybe casting works differently in different places, and arcane spellcasters have to "relearn" how to cast certain spells, using different material components, making different somatic gestures, or saying different completion phrases. Regardless how gamemasters choose to mechanically implement cultural differences in their game, remember to make both beneficial and problematic scenarios that are consistent with the cultural or social mores of the places players travel. As a general rule, the further away from home, the stranger it gets.

Going to exotic lands is also a perfect opportunity to introduce variants to preexisting monsters. Nothing beats the look on players' faces when silver doesn't work on *these* lycanthropes. When making variant monsters, consider changing their physical appearance, habits, special abilities or qualities, and/or vulnerabilities in a manner consistent with the geography, climate, and cultural concepts of the neighboring people. For example, desert variants may take more damage from cold spells and be somewhat resistant to fire, or desert trolls consider fire damage non-lethal.

Chapter 3: Types of Caravans

When we think caravan, images of camels ("ships of the desert") crossing dunes of sandy landscape on a starry night are the most familiar, but do not feel limited to this type of caravan and silk road terrain. In the realm of fantasy and imagination, there are different types of great overland trade routes. This chapter focuses on historic caravans of the desert and mountains as well as fantasy caravans underground and through swamps. When you are tailoring your caravans, consider mixing the types of terrain and their correlating hazards, like swamps amid mountains, mountains that abut the desert, or desert caravans that choose to go under the mountains instead of over the mountains.

Desert Caravans

The most traditional type of caravan is the desert caravan. Deserts are defined by rainfall: extreme deserts have less than 2.75 inches of rain a year, true deserts have less than 4.75 inches of rain a year, and semideserts have less than 16 inches of rain per year. Deserts generally form in three ways: through high-pressure zones (based on planetary wind currents), mountain ranges (causing rain shadows), and continental depth. Where more than one of these comes into play, a major desert occurs, like the Sahara with its high-pressure zones and continental depth.

Landscape

Some deserts are sandy while others are composed of small, gravel-like pieces of rock, like the Gobi Desert. The color of the sand also varies with the mineral composition of the area. The most common color is the yellow desert, sometimes nearing an orange tint. Less common are red deserts, white deserts (from white rock and mineral deposits such as gypsum) and black deserts (from the degradation of volcanic rock). Sometimes these uniquely colored deserts are merely pockets within a larger desert, or they may be consistently colored throughout.

Deserts have a wide range of temperatures, both annually and daily. Since there is little moisture or vegetation to absorb solar energy, almost all (90%) of the sun's energy penetrates and heats the ground. This makes the temperature differences from day to night great. Deserts have stark topologies, ironically often partially shaped by water. Without vegetation, the unprotected soil erodes away under the strength of strong windstorms. When rare rain occurs, it is often very violent and forms flash floods. Eventually the water finds a low spot, and for the briefest time, lakes stand in the desert. But they quickly evaporate under the unforgiving sky, leaving only dry lakebeds, glistening with the salt particles left behind from the leached soil.

Plants and animals have many challenges in the desert, and you don't see very many of either crossing those sandy dunes. Native flora and fauna have two adaptations to desert conditions: drought evaders and drought resisters. Most desert flora and fauna have adaptations to resist the arid heat, such as the camel and cacti. Drought evaders are active when conditions are more agreeable, like the spade-foot toad who remains underground in a gelatinous-lined, watery cell until the "rainy season" or plants that only live during the brief periods of rain and die after making seeds for the next time moisture is available. Depending on rainfall, some deserts may be on a verge of scrublands or grasslands while extreme deserts have very little plant life and only in certain locations. Short grasses and cacti are among the plants that can survive the desert, and given enough water, some rugged trees (like the poplar of the historic Silk Road) can survive as well. Reptiles are common in deserts along with birds. Reptiles need significantly less food than mammals, and birds have a big advantage with flight. Since resources are often scattered over large distances, flight makes survival easier than terrestrial movement. Few large animals call the desert home, but camels, onyx, wild horses, pumas, and coyotes successfully survive the desert's challenges. A few rare herds of elephants survive in the true desert by constantly moving from oasis to oasis and mixing their environment with forays into the savanna. Like camels, these elephants of the desert remember the location of each oasis, even though some are days apart through sandy country.

Game Mechanics

Traversing the desert by foot is no easy task. The conditions of the desert soil make road building a difficult endeavor. Consequently, people and animals traveling the desert move at half speed, except for those native to the desert and have adaptations for desert travel.

Gravel-like deserts make nimble movement more difficult. The DC of Balance and Tumble checks increase by 2. Sandy deserts have sand dunes that function as hills that move; if the wind is strong and consistent, a sand dune can move several hundred feet in a week's time. Sand dunes cover hundreds of feet, with a gentle slope pointing the direction of the prevailing winds and a steep slope on the leeward side. Gradual slopes aren't steep enough to affect movement, but characters gain a +1 bonus on melee

attacks against foes downhill from them. Steep slopes are a different matter. Characters moving uphill (to an adjacent square of higher elevation) must spend 2 squares of movement to enter each square of steep slope. Characters running or charging downhill (moving to an adjacent square of lower elevation) must succeed on a DC 10 Balance check upon entering the first steep slope square. Mounted characters make a DC 10 Ride check instead. Characters who fail this check stumble and must end their movement 1d2×5 feet later. Characters who fail by 5 or more fall prone in the square where they end their movement. A steep slope increases the DC of Tumble checks by 2.

In general, the maximum distance in desert terrain at which a Spot check for detecting the nearby presence of others can succeed is 6d6×20 feet; beyond this distance, elevation changes and heat distortion in warm deserts makes spotting impossible. The presence of dunes in sandy deserts limits spotting distance to 6d6×10 feet. The desert imposes neither bonuses nor penalties on Listen or Spot checks. The scarcity of undergrowth or other elements that offer concealment or cover makes hiding more difficult. However, the presence of sand dunes provides enough cover to hide from anyone below the top of the dune.

Hazards

Crossing the desert bears numerous hazards. While immense heat and lack of water for traveler and animal alike are the most immediate threats to survival, they are not the only threats.

Heat

The desert has many hazards, the most common being extreme heat and sun exposure. Although people native to desert terrain may develop physiological adaptations to cope with the desert, that is little help to the traveler just passing through. The heat of the desert can get quite immense, reaching upwards of 125°F at the peak of the day. Loss of water and salt from excessive sweating can be extremely dangerous if the water and salt are not replenished. Loss of salt causes giddiness and mental confusion as well as cramps. Heat cramps start as mild muscular discomfort in the legs, arms, or abdomen and advance to severe muscle cramps if the victim does not cease all activity, get in the shade, and drink some water. Excessive loss of water and salt can also lead to heat exhaustion, whose common symptoms are headache, mental confusion, irritability, excessive sweating, weakness, dizziness, cramps, and pale, moist, clammy skin. The best treatment for heat exhaustion is to move victims into the shade, preferably off the ground (which is very hot itself). Loosen their clothing, sprinkle water on their skin, have them drink small amounts of water every few minutes, and keep them calm and restful.

The most serious condition caused by severe loss of water and salt is heat stroke, where the body looses the ability to cool itself. Symptoms include lack of sweat, hot dry skin, headache, dizziness, fast pulse, nausea, vomiting, mental confusion, and loss of consciousness. Like treating victims of other heat conditions, the key is to get them into the shade and cool them down by laying them above the ground, pouring water on them, and if they are conscious, drinking small amounts of water every few minutes. In addition, massage their arms, legs, and body to work out the fatigue. If laying them on the ground is unavoidable, try to cover the ground with as many layers as possible to buffer the victim from the heat of the ground.

Besides the extreme heat, the sun also causes sunburn and damages unprotected eyes. Covering up is the best method of preventing sunburn, while protective eye wear (like goggles) will not only cut glare and UV rays, but also keep sand out. See "Clothing and Gear" below for more on desert-appropriate apparel.

Game Mechanics

The easiest way to avoid heat exposure is to rest during the heat of the day and work/travel during the cooler part of the day and into the evening. However, there are times when such modus operandi cannot be executed, and moderate to heavy work must be conducted in the heat. Wearing appropriate clothing, keeping your body hydrated, and practicing desert survival habits (see Navigating Hazards below) ward off many heat-related conditions.

The heat of the day is three hours after dawn until an hour before dusk. Physically doing anything beyond resting in the heat is considered moderate work while any movement faster than a walk, forced marches, melee combat and hard manual labor are considered heavy work. The level of work determines how often you have to make saves and the base DC of those saves. Characters wearing heavy clothing or any armor heavier than light armor take

a -4 penalty on their saves. Characters wearing metal armor have an additional -2 circumstantial modifier to their Fortitude Saves. Treatment (reaching shade, surviving until nightfall, getting doused in water, being targeted by *endure elements*, and so forth) prevents the escalation of heat condition, but does not reset the level of heat condition until the character or animal has fully rested (8 hours). Certain conditions may merit racial or circumstantial bonuses to the Fortitude save at the GM's discretion, such as being a native of desert terrain, having specialized training for desert survival, or being a seasoned traveler in desert terrain, although the wisest survive the desert by avoiding the heat.

Table 3.1 Desert Heat Table

Work	Frequency of Checks	Fortitude Save DC
Moderate	Every 2 hours	10 +1 per previous check
Heavy	every hour	15 +1 per previous check

Failed saves results in the following progression.

Fatigue: A fatigued character can't run or charge and takes a penalty of -2 to Strength and Dexterity. Doing anything that would normally cause fatigue causes the fatigued character to become exhausted.

Exhausted: An exhausted character moves at half speed and takes a -6 penalty to Strength and Dexterity. After 1 hour of complete rest in the shade, an exhausted character becomes fatigued. A fatigued character becomes exhausted by doing something else that would normally cause fatigue.

Heat Exhaustion: A failed save results in 1d4 nonlethal damage per hour until treated. Once rendered unconscious through the accumulation of nonlethal damage, the character begins to take lethal damage at the same rate.

Heat Stroke: A failed save results in 1d4 lethal damage per hour until treated.

Vermin

Life persists, and in the desert, much of it is unpleasant in its own special way. Insects of all types live in the desert, and from their perspective, travelers are heaping sacs full of water. Insects will try to exact water from eyes, mouths, and piercing the skin. While some insects are simply annoying, others carry diseases and are even poisonous. Common insects are lice, mites, flies, and wasps; common poisonous creatures are spiders, scorpions, centipedes and snakes.

Minimize your exposure to these vermin by covering your body and extremities, even wearing gloves. Old buildings, ruins, caves, and other places that offer protection from the elements are teeming with life, so be careful what you touch, where you sit, and where you lay down. Pack animals may also harbor lice, mites, and maggots, so be careful about handling equipment, saddles, and the animals themselves. Also shake out bedding, shoes, and clothing for hidden vermin before putting them on or away.

In a magical world, there are more vicious things in the desert than scorpions and lice. Pick up *Monster Geographica: Plain & Desert* for 200 monsters from the prairie to the desert, from CR less than 1 to 20+.

Getting Lost

Getting lost is fairly easy in the desert. There are few distinguishing physical features as well as fewer people and settlements along the way. Sand dunes shift, making a new landscape each time you travel the desert. Heat distorts long vision, and heat exhaustion brings confusion. Many a traveler is lost to the desert by simply wandering away from their caravan.

Road building is quite difficult in sandy conditions, but roads are easier to build in rocky, gravel-like deserts. Unpaved roads do not affect movement speed in the desert (remains half speed), but it does lessen the likelihood of getting lost. Some historic roads in the desert line the sides of roads with trees or stones, marking the trail without actually building a road.

The preferred method of navigating the desert is by the stars, especially for caravans that travel at night to avoid the heat. They are one thing that does not shift, and only on cloudy nights and with approaching sand storms do they disappear. Unfortunately, they are little help to someone unfamiliar with the constellations in that part of the sky, and there is still a chance of misjudging distance and bearing.

Game Mechanics

As a general rule of thumb, if your party goes into the desert without a road, trail, or guide, they will probably get lost. Every time you change bearing, make a Survival check DC 15. Having a guide or a seasoned traveler familiar with the terrain greatly reduces the chance you will get lost in the desert. Having such a person [effectively a person with 5 ranks in Knowledge (local) or Knowledge (Geography)] adds a +2 circumstantial bonus to Survival checks when a party changes bearing, recognizes that they are lost, and sets a new course. Unlike traveling at night in other terrains, night travel in the desert does not count as poor visibility.

If a party becomes lost, it is no longer certain of moving in the direction it intended to travel. Randomly determine the direction in which the party actually travels during each hour of local or overland movement. The characters' movement continues to be random until they blunder into a landmark they can't miss, or until they recognize that they are lost and make an effort to regain their bearings. In the desert, it will more likely be the latter.

Recognizing that You're Lost: Once per hour of random travel, each character in the party may attempt a Survival check (DC 20, -1 per hour of random travel) to recognize that they are no longer certain of their direction of travel. Some circumstances may make it obvious that the characters are lost.

Setting a New Course: A lost party is also uncertain of determining in which direction it should travel in order to reach a desired objective. Determining the correct direction of travel once a party has become lost requires a Survival check (DC 15, +2 per hour of random travel). If a character fails this check, he chooses a random direction as the "correct" direction for resuming travel. Once the characters are traveling along their new course, correct or incorrect, they may get lost again.

Conflicting Directions: It's possible that several characters may attempt to determine the right direction to proceed after becoming lost. Make a Survival check for each character in secret, then tell the players whose characters succeeded the correct direction in which to travel, and tell the players whose characters failed a random direction they think is right.

Regaining Your Bearings: There are several ways to become un-lost. First, if the characters successfully set a new course and follow it to the destination they're trying to reach, they're not lost anymore. Second, the characters through random movement might run into an unmistakable landmark. Third, if conditions suddenly improve—the clouds pass showing the stars—lost characters may attempt to set a new course, as described above, with a +4 bonus on the Survival check. Finally, magic may make their course clear.

Sandstorm

Sandstorms, also known as duststorms, are winds laden with sand or dust at densities so great they obscure the sun and greatly reduce visibility. Sandstorms typically come suddenly and can last days on end. Sandstorms are a common occurrence in deserts, where intense heating of the ground encourages the strong dry winds that comprise sandstorms. Global air currents also affect their occurrence, making areas prone to frequent sandstorms (as often as once a week). Most sandstorm-prone areas have consistent gentle winds that climb to 90 mph (144kph) in the fiercest of storms. While the wind typically whips the sand 2 meters from the ground, dust (which is smaller and lighter) can be whipping up to 16,000 feet (5,000 meters) in the air. The leading edge of the storm looks like a solid wall of dust and sand. Covering your mouth and nose with cloth and wearing protective eye gear (like goggles) will protect you from the whipping sand. If there is no natural shelter, simply lie down, sit out the storm, and prepare to dig your friends out of the sand.

Game Mechanics

A sandstorm reduces visibility to 1d10×5 feet and provides a -4 penalty on Listen, Search, and Spot checks. Sandstorms make ranged weapon attacks impossible, except for those using siege weapons, which have a –4 penalty on attack rolls. They automatically extinguish candles, torches, and similar unprotected flames. They cause protected flames, such as those of lanterns, to dance wildly and have a 50% chance to extinguish these lights. Those

that cannot take shelter from the sandstorm take 1d3 points of nonlethal damage per hour and is at risk of choking (see Drowning—except that a character with a scarf or similar protection across her mouth and nose does not begin to choke until after a number of rounds equal to 10 × her Constitution score).

Most sandstorms are accompanied by severe winds and leave behind a deposit of 1d6 inches of sand. However, there is a 10% chance for a greater sandstorm to be accompanied by windstorm-magnitude winds. Greater sandstorms leave 2d3–1 feet of fine sand in their wake. Driving sand creeps in through all but the most secure seals and seams, to chafe skin and contaminate carried gear. Resuming travel after a sandstorm constitutes a Survival check DC 15 as if you were changing bearing.

Mirage

Mirages are optical phenomena that make it difficult to identify objects and gauge distances. They are caused by super heated air rising from the hot desert ground, refracting the light in such a manner that blurs distant contours, giving the illusion of sheets of water. The wavy vision also makes far away objects appear to move. Mirages obscure the few natural features one can use for navigation and can be very dangerous in conjunction with mental confusion caused by heat exhaustion. Surveying the landscape at dawn, dusk, or by moonlight give travelers more reliable visual information on the terrain. If you are survey terrain during the day, finding higher ground will get you above the layer of heated air that causes mirages.

Game Mechanics

Characters traveling on the desert floor during the heat of the day suffer a -2 circumstance modifier to Spot checks and Survival checks related to changing bearing and getting lost. Finding higher ground 3 meters or more above the desert floor negates the -2 circumstance modifier listed above.

Rain

Although water is generally a blessing in the desert, there are times when introducing too much water at one time creates hazardous conditions. Heavy rains in the otherwise-parch landscape can lead to flash flooding, especially in flat areas with the loose desert soil. After the rain, collections of water may look appealing, but beware of areas with high mineral content, such as borax, salt, alkali, and lime. Such minerals make the water undrinkable, and physical contact with such water (such as soaking clothing in water to cool off) can cause skin irritation.

Another water-related hazard are mudflats, which appear solid but the ground underneath is soft. Akin to quicksand, mudflats occur in the desert after seasonal rains saturate the ground, but the heat dries the surface, giving it a solid appearance.

Game Mechanics

A character approaching a mudflat at a normal pace is entitled to a DC 8 Survival check to spot the danger before stepping in, but charging or running characters don't have a chance to detect before blundering in. The momentum of a charging or running character carries him or her 1d2×5 feet into the mudflat.

Once in the mudflat, creatures begin sinking into the mud. Unlike quicksand and bogs, people don't immediate sink into mudflats. Unfortunately, the longer a person is trapped in a mudflat, the harder it is the pull them out. Characters must make a Swim check (DC 15 + 1 per round in the mudflat) to move 5 feet in whatever direction is desired. If a trapped character fails this check, he fails to move and sinks a foot into the mud. If he falls below the surface, he begins to drown whenever he can no longer hold his breath. An animal that walks into a mudflat becomes panicked. Animal handlers must make a Handle Animal check DC 15 to steer the animal out of the mudflat.

Pulling out a character trapped in a mudflat can be difficult. A rescuer needs a branch, spear haft, rope, or similar tool that enables him to reach the victim with one end of it. Then he must make a Strength check (DC 15 + 1 per round the target is in the mudflat) to successfully pull the victim, and the victim must make a DC 10 Strength check to hold onto

the branch, pole, or rope. If the victim fails to hold on, he must make a DC 15 Swim check immediately to avoid sinking deeper into the mudflat. If both checks succeed, the victim is pulled 5 feet closer to safety.

Navigating Hazards

Despite the perils that lie in wait among with dunes and sun, travelers can successfully navigate across great deserts with proper supplies and forethought.

Water

A good rule of thumb for travelers not native to desert terrains is half a liter (approximately 1 3/4 cups) of water every hour for temperatures below 100°F (38°C). For temperatures above 100°F (38°C), drink 1 liter (approximately 3 1/2 cups) of water every hour. If you keep your body hydrated through drinking water at regular intervals, it helps your body remain cool and decrease sweating. Rationing water is not the best method for coping with water scarcity. Instead, travel at night and reduce food intake to reduce the amount of water required. A person can go days without food, but only a day or two without water. Other good habits for reducing water requirements during the heat of the day are finding shade to rest quietly (open mouths release moisture from your body and talking does take energy), keeping all your clothing on to absorb sweat, and never lay directly on the ground. Propping yourself 2 to 3 feet above the ground is preferable, but laying something between your body and the hot ground is better than nothing.

Game Mechanics

In general, a character needs 2-3 gallons of water a day in the desert. A character can go without water for 1 day plus a number of hours equal to his Constitution score. After this time, the character must make a Constitution check each hour (DC 10, +1 for each previous check) or take 1d6 points of nonlethal damage. Characters who have taken nonlethal damage from lack of water are fatigued. Nonlethal damage from thirst cannot be recovered until the character gets water, as needed—not even magic that restores hit points heals this damage.

Clothing and Gear

The oppressive sun and the whipping winds laden with sand are hazards easily mitigated with appropriate clothing and gear. Multiple layers of thin cloth that cover all your appendages are best for the desert. It protects the skin from sunburn, absorbs sweat, which keeps the body cooler throughout the day, insulates the body's heat in the cold desert

nights, and protects from the wind and sand. Keeping your head and neck covered is also important, as well as protective eyewear (like goggles) and coverings for the nose and mouth during sandstorms.

Game Mechanics

Needless to say, armor is a liability in the desert, especially when staving off the heat. Wearing armor heavier than light armor in desert during the heat of the day (3 hours after dawn until an hour before dusk) grants a -4 circumstantial modifier to Fortitude saves. Wearing metal armor in the desert during the heat of the day adds an additional -2 circumstantial modifier to Fortitude saves. Movement in the desert is typically slower than base movement, so encumbrances due to weight may make travel even slower.

Stop Overs

Water is the limiting resource in desert travel; in the desert, he who rules the water, rules the world. Oases are the prime locations for caravanserais, staging posts, crossroad cities, and smaller trading cities. Oases are areas in the desert that have natural supplies of fresh water. This water cones from far away sources, carried into the desert through a layer of permeable (porous) rock in between two layers of impermeable rock. Oases form in places where the top layer of impermeable rock has eroded, exposing sand to the permeable rock. The water then seeps up through capillary movement, watering the soil and bringing life to the desert. Oases can also be formed at sites of artesian wells. Like the traditional oases formation, water comes from far away sources, carried through a layer of permeable rock in between two layers of impermeable rock. When a fault line occurs in the top layer of impermeable rock, the weight of the accumulated water forces the water up through the fault line, reaching the surface. The third method of oases formation is a reliable source of snowmelt in places bordering mountains. With proper irrigation, oases can extend their natural boundaries and become jewels of the desert.

Animals

The preferred animal for desert travel is the camel, commonly referred to as "ships of the desert;" however, information on horses and mules in desert conditional are also provided, as well as some fantastic animals suitable for desert travel.

Camels

Camels are the preferred animal for desert travel, whether for riding or as a pack animal. Camels have an average lifespan of 30 years, although some have reached the ripe age of 50. A healthy camel can begin heavy labor at age 3, while some start work after 6 years. A camel can carry a significant load of 600 lbs and still travel around 25 miles (40 km) a day. Some breeds of camel carry up to 900 pounds, although such weight slows their speed. They are hardy animals, albeit stubborn and willful. Beware of their strong teeth and tendency to spit.

Food and Water

Unlike many other animals, camels can graze and gain nourishment on desert scrub plants and thorny trees. They can also graze on grass, hay, grains, straw and other animal fodder, making them adaptive eaters. If a camel is kept in its native region, they recognize poisonous plants growing in the area and will not eat them. A camel grazes for 8 hours each day with another 6 to 8 hours to chew the cud. When grazing is not an option, either due to lack of resources or lack of time, caravans can bring fodder for animals, approximately 22 lb of grass (or hay and straw), 9 lb. of grains, 2 pounds of seedcakes per camel per day. Remember that camels can go without food for a long time, living off the fat stored in their hump and losing up to 1/3 of their weight (up to 200 kg.) before it becomes harmful. Camels require a lot of salt, needing eight times as much salt as cattle and sheep. In the wild, camels obtain salt from brackish water and plants that grow in high saline conditions (halo-phytes). A camel needs 2-4 ounces (60-120g) of salt daily or roughly 2 pounds (slightly less than 1 kg) of salt a week.

Camels are renown for their ability to go long periods without water. Camels can change their body temperature between 34 °C-41 °C and reduce their loss of water though excreting concentrated urine and nearly dry feces. In general, a camel can go up to 20 days without water before it is harmful; however, if a camel is kept near a water source, it may drink small amounts of water daily. Environment and workload also determine how long a camel can go without water. In cold weather with green feed, a camel can go months without water because it gets enough water through its food. During dry periods, a camel drinks up to 60 liters of water every 10 days, while a thirsty camel in hot dry conditions may drink up to 200 liters at once. Ideally, camels under heavy labor should be offered 20-40 liters water at one sitting every 1-2 days. If they go longer than 10 days without water, they should be allowed to drink up to 8 hours and replenish their bodies. It is important to note that camels will drink brackish water, tolerating water 4 times as salty as water for horses and mules.

Other Adaptations

Besides food and water considerations, camels are adapted to desert environments in other ways. Course hair protects them from solar radiation and whipping sands. Long bushy eyelashes and thick lids protect their eyes from sand, while closing their nostrils at will prevents them from breathing in sand. Their feet are designed for sandy soil with a ball of fat that cushions their flat, soft feet. It is said that older camels remember watering holes, and camels give warning to impending sandstorms by burying their nose in the sand.

Maintenance

If you keep camels in their native environmental conditions (dry, sandy soil), they are durable, tough animals. Some camel caravans are as large as thousands of animals, and for proper camel care, count on 1 camel handler for every 3 camels. Animal handlers are responsible for daily maintenance, tending to sick camels, steering the camels, and coercing/coaxing the camel to behave where others have failed (usually with bites or kicks to boot).

There are a few signs that let you know if your camel is amiss. If a camel is eating earth or chewing bones, it probably has a worm infection in its stomach. Gut parasites cause weight loss, weakness

and may cause diarrhea and death, especially in the young camels. Lungworms will cause breathing problems, marked with the development of short, sharp coughs.

Camels are also prone to skin infections caused by mites, ticks, and maggots (feeding on open wounds). Mites cause mange among camels. Camels can catch mange by contact with infected animals, from mites on saddles and other equipment, and rolling in dust where infected animals have been. Mange mites burrow in the skin and cause loss of hair. The skin becomes thick and white, and an infected camel will scratch incessantly against any solid object and do not eat well. Untreated camels experience weight loss, milk production drops, and camels can die. Thorough washing of equipment, saddles, grooming brushes, and handlers (mange mites can also infect humans) are good preventive measures.

Ticks feed off the blood of the camel, causing weakness in the animal. Ticks also transmit a number of diseases, the more serious ones causing paralysis in a camel. Removal of the offending tick is the best way to treat paralysis in camels. Daily grooming reduces the number of ticks, typically found on a camel's legs, head, and underbelly. Animal handlers can remove ticks by hand or apply a burning brand or a specially prepared unguent to the back of the tick.

Tending open wounds is especially important on the road. If ropes and bindings abrade the camel's skin, it is important to burn the flesh and cauterize the wound. This not only disinfects the wound but also helps the open wound heal faster. If open wounds are left unattended, they will become infected with maggots. There is even a maggot that invades a camel's nostrils and feed on the inside of the camel's nose.

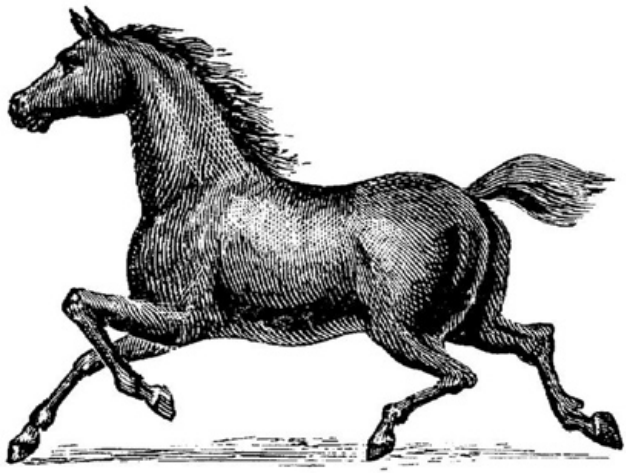
Sometimes small, sharp objects get caught in a camel's foot, causing discomfort and swelling. Handlers can remove the offending piece from the foot and wrap the foot with thick cloth or leather to stop the swelling from becoming worse. In cold weather, handlers often wrap each toe in wool and massage the camel's feet to increase circulation. In cold terrains, they also end a day's travel by tying camels (two at a time) together side by side with the head of one camel next to the tail of the second camel. This allows the camels to cool off for 2 hours without collapsing on the cold ground, preventing illness.

Horses and Mules

Some desert caravans may employ horses, and mules, either in place of or in addition to camels. Horses have an average lifespan of 20-35 years with some venerable horses reaching 50 years old, although they start to show signs of aging in their mid-teens. Mules are hardier animals, with an average lifespan of 30-50 years. In general, mules can carry more weight (30% of their weight compared to horse's 20%), work longer hours, and need less feed than horses. Horses and mules are easier to train than camels because there are herd animals by nature, and they have a less ornery disposition than camels. Unfortunately, they carry less weight than camels, they require feed (they cannot live off desert foraging), and they have greater water requirements. On average, horses and mules carry 400 pounds. Depending on the size and strength of the animals, they may carry up to 600-700 pounds, although such weight reduces their speed. Mules maneuver narrow rocky areas better than horses, while horses are better through mud and swamps due to their broader feet. Although they have a reputation of being stubborn, mules are not as particular as horses, which have higher required maintenance and spook easier than mules.

Food and Water

Horses and mules cannot graze on the thorny plants of the desert, so caravans employing these animals must bring or acquire feed along the way. Feed comes in two varieties: grass/hay and concentrates, such as millet, corn, barley, rice, maize, or crushed oats. Generally per day, a working mule needs 2.2 pounds (1 kg) of concentrate feed in addition to 10 pounds (4.5 kg) hay. A working horse needs 4.4 pounds (2 kg) of concentrate feed in addition to 10 pounds (4.5 kg)



hay, with heavily worked horses requiring 8.8 pounds (4 kg) of concentrate feed. Vegetables can also be integrated into feed, such as carrots, turnips, and skins of potatoes, apples, and cabbages.

With the hot, arid conditions of the desert, horses and mules need more water at more regular intervals than camels. Horses require 15 gallons of water per day in the desert, while mules require 10 gallons per day. Horses and especially mules are particular about having clear, clean drinking water. Mules have some tolerance for dehydration; they can go up to 3 days without water and can lose up to 25% of their weight due to dehydration. Some desert-native breeds of horses can go up to 3 days without water and can lose up to 10% of their body weight due to dehydration. Tired or sweating horses should be walked around and cooled down before giving them water, else they get colic. Horses and mules also need salt, commonly added to their concentrate feed. Salt requirement in equines largely depends on their workload and the amount they sweat, but a good rule of thumb is 0.5-1% of their concentrate feed, or 2-4 ounces of salt a day. Unlike camels, horses and mules will not drink brackish water (camels will drink water 4 times as salty as horses), and they do not graze on the high-saline desert plants, so equines' salt requirement will have to be brought. Horses deficient in salt will lick or chew on dirt, rocks, and other objects, and if the deficiency is severe, horses become fatigues and exhausted.

Adaptations

There are some breeds of horses and mules native to desert terrains, coping with hot, arid life through physiological and behavior adaptations. Desert breeds are often proportionally larger-bodied with longer, thinner appendages, lowering their metabolic rate (over smaller animals) and minimizing their radiant heat gain while maximizing their heat loss (profile versus surface area of appendages). Their coats are typically light colored, reducing the amount of solar radiation they absorb, and desert-adapted equines' coats get thinner as their body size increases, facilitating heat loss. Desert-adapted animals are often active during the cooler hours of the day and graze at night, when temperatures drop and the plants absorb the ambient moisture in the air. They often seek shade during the heat of the day, creating a microclimate that is significantly (up to 20°F) cooler. When they have to be active during the hottest hours of the day, they align their body with the sun with their rear toward the sun or lay down in this orientation with their heads down. This orientation uses their own body to shade them from the sun and the slim profile reduces the amount of solar radiation and heat they absorb. Desert equines also have drier feces and more concentrated urine in comparison to horses from wetter terrains.

Maintenance

Equine maintenance revolves around 3 factors: daily grooming, foot care, and proper tackle. Daily grooming consists of brushing the horse with a strong hand-held brush that removes loose hair and dirt from its coat. When going through wet areas, it is also advisable to remove mud and dirt from the legs and feet. Horses should also be groomed before fitting them with a harness or saddle, lest trapped dirt rub the skin and cause irritation. When an equine is wet, either from sweat or precipitation, it must be dried before stabling/resting lest it get sick. Handlers can remove moisture with a metal scraper drawn over the coat, twisted curved handfuls of straw stroked downward over the body, or rubbing the body with straw, cloth, or blankets.

Horses and mules are single hoofed animals whose feet comprise three bones. The visible part is the wall of the hoof, while the under part is the sole. Cleaning the sole of mud, dung, and debris on a regular basis prevents infection, while oiling/greasing the hoof wall prevents the hoof from cracking. Shoeing an equine protects the hoof, especially when the animal is walking on hard surfaces, like mountain roads or treated roads (tar/concrete). Taking these precautions

should keep a horse or mule healthy and at work, although animal handlers are always on the lookout for lameness. Lameness is an abnormal walk, checked by watching a horse trot toward you and away from you; its head nods when the lame foot hits the ground. The three causes for lameness are infection of the sole (pus secreting from the sole treated with cleaning and rest), a crack in the wall of the hoof (treated by oiling the hoof or shoeing), or the bottom of the foot is infected and turns black, wet and smelly (only seen in wet conditions). A horse is only as good as its feet, so proper foot care goes a long way.

Proper tackle includes harness or collar for pulling carts, a saddle for riding or carrying loads, hobbling equipment, and bridles for steering. First, keep the tacking clean and be sure it fits properly. Ill-fitting tackle rubs the animal and leaves sores, rubbing off the hair and developing a wound that will become infected. Second, make sure tacking does not rub the animal, either from an ill fit or rough, stiff edges. Third, when using a saddle (for riding and carrying loads), place a cotton cloth underneath the saddle to absorb sweat and avoid chaffing. Fourth, check the girth (on the underside of the animal) for trapped folds of skin. And lastly, loosen the girth when the caravan stops moving for rest, but do not remove harnesses or saddles until the animal starts to cool down (several minutes).

Mules are obstinate, and horses spook easily. Consequently, there are times with animal handlers take extra measures before working on horses and mules. Covering a horse's eyes, either from hooding or covering with a blanket, helps calm the animal. Sometimes they muzzle the animal with a twitch, a thick stick with a circle of rope (circumference of 1 foot) passing through one end of the stick. Handlers also hobble horses and mules, basically tying their legs together to decrease their mobility. Caravans use hobbling to prevent animals from running away when the camp is resting and they also hobble to examine and treat animals.

Besides these measures of basic maintenance, equines are also susceptible to a number of conditions. Colic is an abdominal pain common in horses and mules. Common indicators of colic are as follows: kicking at its belly, repeatedly lying down and then getting up, rolling about, or sitting up on its back legs like a dog. Another indicator is sweating when it isn't working nor is it hot outside. The common causes of colic are: parasitic worms in the gut, rasp sharp teeth that make the animal unable to chew its food properly, grazing on sandy ground, eating too much grain, and drinking water when the animal is hot and tired after working. If an equine has colic, the best treatment is walking the animal, not giving it any feed, and giving it a drench (large dose of liquid medication) of medication or (in a pinch) vegetable oil and water. Incidentally, feeding the horse barley is one method of checking for rasp teeth by seeing the consistency of barley the animal's dung, and keeping animal areas clean of dung is a good preventive measure since parasites are often spread through dung.

Besides gut parasites, equines are also susceptible to a whole array of parasites. Lungworms are common in mules and passed to horses through coughing up eggs or through dung. Lungworm infections causes respiratory problems with serious infections causing death in horses, and symptoms include coughing and discharge from nostrils. Whipworms cause irritation in the anal region, and infected animals do not feed properly. Horses with whipworm infections are restless and rub their tail against a wall or post. Red worms and other types of round worms can cause colic as well as general weakness and damage to various internal organs.

Horses and mules are also subject to epidermal complications. Equines are subject to mange, infected by numerous different mites. Body mange starts on the head or neck and spreads over the body, while foot mange and ear mange are limited in scope. Mange causes scabs and lesions on the skin, which can be infected by maggots if not properly treated. Mange also irritates the animal and makes it difficult to place tackle and work the animal. Serious bouts of mange can cause weight loss and reduced constitution, leading to death. Thoroughly cleaning grooming equipment and tackle, as well as handlers (humans can also be infected and transmit mange mites) are good preventive practices to combat mange. Ringworm produces round whitish scabs and hair loss. Any part of the equine is susceptible to ringworm, and lesions can become large and join together if left untreated. Ringworm irritates the animal, and one treatment is washing the scabs with an iodine solution (an element common in sea salts). Lice, commonly found on the base of the tail or mane, suck the blood and chew on the skin. They irritate the animal and cause hair loss. Ticks are found on the legs, belly, and ears of horses and mules. As ticks feed on blood, they can pass infections from one animal to another as well as subject animals to altogether new diseases. Animal handlers can remove ticks by hand or apply kerosene, a lighted cigarette, or a specially prepared unguent to the back of the tick. Open wounds caused by ill-fitting tacking and epidermal conditions are subject to infection and maggots, which hatch and feed on the blood and meat of the equine. To prevent such infection, clean and cover (or cauterize) wounds, and most importantly, let the area completely heal.

Fantastic Animals

Just because real life has provided the ideal desert pack animal, do not feel limited to camels in desert terrains. Here are two examples of fantastic pack and riding animals from *Monster Geographica: Plain & Desert*.

Aecanopyornis

Medium Magical Beast
Hit Dice: 4d10+8 (30 hp)
Initiative: +3
Speed: 50 ft. (10 squares)
Armor Class: 15 (+3 Dex, +2 natural), touch 13, flat-footed 12
Base Attack/Grapple: +4/+7
Attack: Talon +7 melee (2d4+3)
Full Attack: 2 talons +7 melee (2d4+3) and bite+2 melee (1d6+1)
Special Attacks: —
Special Qualities: Darkvision 60 ft., low-light vision, sheltering wings, subsonic call
Saves: Fort +6, Ref +7, Will +2
Abilities: Str 16, Dex 17, Con 15, Int 3, Wis 12, Cha 8
Skills: Jump +11, Listen +6, Spot +7
Feats: Alertness, Endurance
Environment: Warm deserts
Organization: Solitary, pair, camp (3-6), or flock (7-12)
Challenge Rating: 2
Treasure: None
Alignment: Always neutral
Advancement: 5-12 HD (Large)
Level Adjustment: —

Aecanopyornises are large flightless birds about the size of an ostrich. Unlike most flightless avians, the aecanopyornis possesses large wings with pure white feathers. It uses these great wings to shelter itself from sandstorms, forming a canopy of sorts. This behavior, combined with its relatively calm demeanor, makes it a popular choice as a mount for desert-dwelling peoples. Aecanopyornises are sometimes referred to as "canopy steeds".

Aecanopyornises are omnivorous, feeding on small desert reptiles and desert plants. A typical aecanopyornis stands 8 feet tall and weighs nearly 350 pounds. Its wingspan is almost 20 feet.

Combat

If trained to fight, the aecanopyornis's serrated beak (normally reserved for splitting open cacti and other tough desert plants) can be used to deadly effect; its natural response is to kick and claw at predators.

Sheltering Wings (Ex): As a standard action, an aecanopyornis can lift and spread its wings, creating a tent-like dome around itself large enough for itself and 1 Medium, 4 Small, 16 Tiny, 32 Diminutive, or 128 Fine creatures. The bird's remarkable physiology

maintains the temperature within its wings at a level comfortable for beasts and humans, as well as allowing it to support an incredible weight of sand covering. Further, a unique oil secreted into the bird's wing feathers provides any creatures within the tent (including the aecanopyornis itself) the benefit of resistance to fire 5.

Though the aecanopyornis is vulnerable to attack while it remains in this posture, anyone within its wings has improved cover. In the wild, the aecanopyornis uses this ability to protect its chicks from sandstorms or the vicious desert heat.

Subsonic Call (Ex): If trapped beneath the desert sands, an aecanopyornis gives out a throaty subsonic call. All aecanopyornises or other creatures with extremely acute hearing can make a Listen check (DC 10 + 1 per 500 feet beyond a quarter-mile) to hear the trapped aecanopyornis. Even wild aecanopyornises always come to the aid of such a bird unless large predators are known to be in the area, and help to dig the trapped bird out with their powerful legs and splayed talons. The wise rider, trapped under the sand with his aecanopyornis, rations his food and water carefully while waiting for aid and shares it with his faithful mount.

Green-Beaked Aecanopyornis

The green-beak is a variety of aecanopyornis that dines almost solely on the noptri cactus. The noptri is poisonous, but the green-beak is immune to this toxin. Its beak, dyed green by the cactus pulp, is saturated with the poison, and thus its bite is very dangerous.

Poison (Ex): Bite, Fortitude DC 14; initial damage 1d4 Dex and nauseated, secondary damage 1d6 Constitution. The save DC is Constitution-based.

Droth'yar

Large Animal
Hit Dice: 3d8+9 (22 hp)
Initiative: +3
Speed: 50 ft. (10 squares)
Armor Class: 15 (-1 size, +3 Dex, +3 natural), touch 12, flat-footed 12
Base Attack/Grapple: +2/+10
Attack: Butt +5 melee (1d8+4)
Full Attack: Butt +5 melee (1d8+4) and kick +0 melee (1d4+2)
Space/Reach: 10 ft./5 ft.
Special Attacks: —
Special Qualities: Low-light vision, scent
Saves: Fort +6 (+14 against poison), Ref +6, Will +1
Abilities: Str 18, Dex 16, Con 16, Int 2, Wis 10, Cha 6
Skills: Jump +13, Listen +4, Spot +4, Survival +9
Feats: Alertness, Run
Environment: Any plains
Organization: Solitary, pair, or herd (4-20)
Challenge Rating: 2
Treasure: None
Alignment: Always neutral
Advancement: 4-5 HD (Large)
Level Adjustment: +0* (mount)

Droth'yar are swift, two-legged herbivores, used as mounts and beasts of burden. A droth'yar's body resembles that of an oversized lizard, bearing two thick legs but lacking forelimbs. Its head is vaguely draconic, and sports a large horn which curves back toward its tail. Though a droth'yar walks upright, it keeps its neck lowered to help maintain its balance. Its tail drags behind it, nearly the same length as its body. An adult droth'yar stands about 6 feet high, and is 12 feet long from its head to the base of its tail. Droth'yar have tough, mottled hides, colored in earth tones.

Droth'yar are highly adaptable, and several different breeds have evolved in different regions. Those found in arid lands are leaner and have longer legs than most, while droth'yar in areas with particularly harsh winters have been known to grow sleek coats of fur. All droth'yar are strict herbivores, and regularly eat plants poisonous to most species.

Droth'yar herds are usually led by a single dominant male. During mating season (the timing of which varies according to breed), droth'yar establish dominance by butting heads. Two competing droth'yar will fight until one dies or flees from the battle.

In domestication, droth'yar are used to help plow fields, pull chariots, and transport goods between cities. They are occasionally used as mounts for soldiers, when more powerful exotic beasts are unavailable or too expensive. Droth'yar have a life expectancy of about fifteen years.

Combat

Wild droth'yar only fight when cornered or defending their young. Droth'yar trained and bred for war are somewhat more vicious, but even they often require urging from their riders to fight.

Training a Droth'yar

A droth'yar requires training before it can bear a rider in combat.

Training a droth'yar requires six weeks of work and a DC 20 Handle Animal check. Riding a droth'yar requires a saddle. A droth'yar can fight while carrying a rider, but the rider cannot also attack unless he or she succeeds on a Ride check.

Droth'yar trained for combat are worth 200 gp apiece on the open market, while domesticated droth'yar are worth 75 gp each. Professional trainers charge 150 gp to rear or train a droth'yar.

*A paladin or druid of sufficiently high level can take a droth'yar as a mount or animal companion.

Carrying Capacity: A light load for a droth'yar is up to 200 pounds; a medium load, 201-400 pounds; and a heavy load, 401-600 pounds. A droth'yar can drag 3,000 pounds.

Procedure

The generic rules for adventuring and travel assume that adventures can only travel 8 hours in a day, the rest being spent setting up camp, breaking down camp, and other sundry events. But those sundry events and routines vary from environment to environment. Travel was often conducted at night to avoid the heat and to use the stars to navigate in the barren, featureless terrain. Visibility at night is unhindered by mirages (caused by superheated air radiating off the hot desert floor and refracting light in an unusual manner), and the ships of the desert move across the sand by clear moonlight. Caravans stop just before or at dawn, giving travelers a chance to set up camp before the oppressive heat of the day. Animal handlers unpack the animals and tend to their grooming and care, while others make their portable shelter and prepare food. The camp stirs at dusk as people break down camp, animals are packed with wares, and another day's travel begins.

A safe estimate for a day's travel is 25 miles, although some experienced caravans (traveling the same route year after year) have been known to travel 30-40 miles in a day. A fair amount of planning is required to space stops according to water (and sometimes food) requirements of people and animals alike. Often times caravanserais, villages, or outposts spring up at these routine stops, taking advantage of their location. Large caravan endeavors often send scouts to report on conditions ahead, as well as herald a caravan's impending arrival into town. Caravans receive a great greeting because they carry goods for locals to purchase, carry news from the outside world, and are quite exotic all the way around. They also have coin to spend on food, lodging, drink, and entertainment. These stops are a respite to camping in the open desert, offering comforts in accordance to their size and wealth.

Large caravans are often a conglomerate of smaller merchants and travelers, some numbering in thousands of camels and hundreds of armed guards. The other end of the spectrum is the individual trader with his humble retinue and 5-12 camels tied together with a bell attached to the rearmost camel's neck. Some establish trade companies that organize large caravans, where wealthy families sponsor larger caravans of smaller merchants, insuring their safety and goods for a fee while also sending their merchants out as well. Although some merchants are constantly on the move, many merchants only take long (more than a few days travel) caravan trips 1 or 2 times a year.

Desert Travel Checklist

This is the ideal list. Animals and travelers can stretch on food and water to different degrees, and animal handlers can be assigned to more animals, although that is not the optimal situation.

- Stop every 25 miles (40 km) with water for horses and mules.
- 3 gallons of water per person per day
- Normal food requirements for characters (depending on size)
- Camels–Food: graze 8 hours a day with 6-8 hours to chew cud or 22 lb of grass (or hay and straw), 9 lb. of grains, 2 pounds of seedcakes per camel per day. Water: see description. Salt: 2 pounds a week-can be attained through proper grazing
- Horses–Food: 4.4 pounds (2 kg) of concentrate feed in addition to 10 pounds (4.5 kg) hay, with heavily worked horses requiring 8.8 pounds (4 kg) of concentrate feed. Water: 15 gallons of clean water per day. Salt: 2-4 ounces a day, not from brackish water or saline plants.
- Mules– Food: 2.2 pounds (1 kg) of concentrate feed in addition to 10 pounds (4.5 kg) hay. Water: 10 gallons of clear, clean water per day; see entry for dehydration toleration. Salt: 2-4 ounces a day, not from brackish water or saline plants.
- Animal handlers: 1 per every 3 animals

High Altitude Caravans

The mountains are the most variable landscape because mountains are defined by altitude, not by temperature and precipitation; within them you may find forests, grasslands, wetlands, and scrublands.

Landscape

There are a few key indicators on the character of your particular mountain. First, where is the mountain located in your world? Mountains are most influenced by latitude; if two mountains are of the same height, the mountain in the higher latitudes has fewer climate zones than the mountain found closer to the equator. On mountains, ecological zones

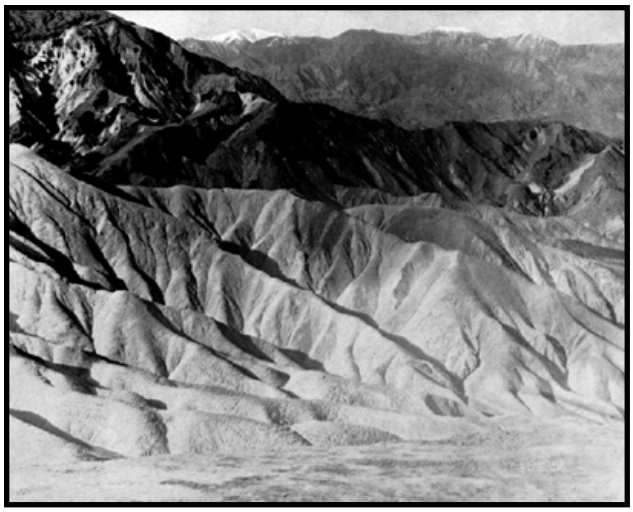
are vertical and defined by altitude; therefore tall mountains by the equator have the greatest potential for ecological diversity.

The second consideration is mountain height. For every 200 ft. in height, the average temperature drops 0.7ºF. Generally, increases in height also come with greater wind speeds and higher incidence of fog and storms. The third consideration is rain. Mountains generally have a wet side and a dry side. The difference may be slight, but rainfall differentials increase with taller mountains and wind that consistently flows from one direction. The fourth factor is sunlight. Many mountains have a sunny side and a shady side, greatly influencing what kind of plants flourish.

The last factor is ruggedness, largely a consequence of age and how the mountain formed. Speaking in geologic terms, older mountains tend have gentler slopes and lower peaks than newer mountains, largely due to erosion. Generally, the most rugged mountains are formed when a continental plate collides with another continental plate because both plates resist subduction. Although volcanic eruptions can be spectacular, they are not good mountain builders. Mountains chains built predominately by volcanic activity are usually shorter (in length and height) than mountains built in plate collision (continental with continental or continental with oceanic). When we talk about mountains in relation to silk roads, we are talking chains or layers of mountains that would create (either alone or in conjunction with other formations) a physical barrier zone as described in Chapter 1. So as far as age and formation goes, think the Andes or the Himalayas rather than the Appalachians.

Plants and animals in mountains vary with the altitude, temperature, and precipitation. Mountains act as islands on an earthly sea. Their creatures develop in sheltered environments that tend to favor specialization and speciation. This is not to say that mountains only have unique species; many mountain species live both on the slopes and the flatlands. However, mountains facilitate small and specialized ecosystems when compared with the surrounding terrain. Some mountain ranges are home to dozens of different species of the same creature, and some creatures are only found on particular mountains. This effect is most noticeable on tropical mountains, as the cool temperatures found on their slopes are to be found nowhere else for hundreds, perhaps thousands, of miles.

With these considerations in mind, remember that mountains have clear vertical zones. After a certain height (10,000 ft temperate zones and 15,000 ft equatorial zones), mountains are cold, barren deserts of ice, snow, and rock. Just below are alpine



conditions and the first traces of forests when coming down the mountain. In equatorial zones, grains can be grown under 10,000 ft, but the agricultural zone does not typically start until less than 5,000 ft. in temperate zones. This ecological reality has certain importance to travelers of silk roads that cut through mountains. First, you will often have to go up to come down. Second, cultural groups in the higher altitudes are most likely herders, whereas people of the low highlands are farmers, each producing and purchasing different kinds of goods for their livelihood. Third, cold and the paucity of ambient fuel (no plants or trees) are unavoidable challenges to traveling through silk road mountains. And fourth, there are wolves, leopards, and other predators that prey on travelers and livestock.

Game Mechanics

Traveling in the mountains is slow going, traveling ¾ speed on trails, roads, or highways while traveling ½ speed in trackless areas. The approach to the mountains may be gradual, traveling through hilly terrain that rolls into progressively steeper, higher peaks that turn into mountains. On the other hand, there may be virtually no transition, where flat lands quickly turn into rocky slopes and crags. When cutting through chains or waves of mountains, travelers often travel great distances (both horizontally and vertically) for traversable mountain passes. Crawling up and down the sides of mountains have mechanical side effects depending on the type of terrain.

The three mountain terrain categories are alpine meadows, rugged mountains, and forbidding mountains. As travelers ascend a mountain, they're likely to face each terrain category in turn, beginning with alpine meadows, extending through rugged mountains, and reaching forbidding mountains near the summit.

Gradual Slope: This incline isn't steep enough to affect movement, but characters gain a +1 bonus on melee attacks against foes downhill from them.

Steep Slope: Characters moving uphill (to an adjacent square of higher elevation) must spend 2 squares of movement to enter each square of steep slope. Characters running or charging downhill (moving to an adjacent square of lower elevation) must succeed on a DC 10 Balance check upon entering the first steep slope square. Mounted characters make a DC 10 Ride check instead. Characters who fail this check stumble and must end their movement 1d2×5 feet later. Characters who fail by 5 or more fall prone in the square where they end their movement. A steep slope increases the DC of Tumble checks by 2.

Cliff: A cliff typically requires a DC 15 Climb check to scale and is 2d6×10 feet tall, although the needs of your map may mandate a taller cliff. A cliff isn't perfectly vertical, taking up 5-foot squares if it's less than 30 feet tall and 10-foot squares if it's 30 feet or taller. Cliffs taller than 80 feet take up 20 feet of horizontal space.

Chasm: Usually formed by natural geological processes, chasms function like pits in a dungeon setting. Chasms aren't hidden, so characters won't fall into them by accident (although bull rushes are another story). A typical chasm is 2d4×10 feet deep, at least 20 feet long, and anywhere from 5 feet to 20 feet wide. It takes a DC 15 Climb check to climb out of a chasm. In forbidding mountain terrain, chasms are typically 2d8×10 feet deep.

Light Undergrowth: A space covered with light undergrowth costs 2 squares of movement to move into, and it provides concealment. Undergrowth increases the DC of Tumble and Move Silently checks by 2 because the leaves and branches get in the way.

Scree: A field of shifting gravel, scree doesn't affect speed, but it can be treacherous on a slope. The DC of Balance and Tumble checks increases by 2 if there's scree on a gradual slope and by 5 if there's scree on a steep slope. The DC of Move Silently checks increases by 2 if the scree is on a slope of any kind.

Dense Rubble: The ground is covered with rocks of all sizes. It costs 2 squares of movement to enter a square with dense rubble. The DC of Balance and Tumble checks on dense rubble increases by 5, and the DC of Move Silently checks increases by +2.

Rock Wall: A vertical plane of stone, rock walls require DC 25 Climb checks to ascend. A typical rock wall is 2d4×10 feet tall in rugged mountains and 2d8×10 feet tall in forbidding mountains. Rock walls are drawn on the edges of squares, not in the squares themselves.

Cave Entrance: Found in cliff and steep slope squares and next to rock walls, cave entrances are typically between 5 and 20 feet wide and 5 feet deep. Beyond the entrance, a cave could be anything from a simple chamber to the entrance to an elaborate dungeon. Caves used as monster lairs typically have 1d3 rooms that are 1d4×10 feet across.

Table 3.2 Mountain Terrain Features

Feature	Alpine Meadow	Rugged	Forbidding
Gradual slope	50%	25%	15%
Steep slope	40%	55%	55%
Cliff	10%	15%	20%
Chasm	—	5%	10%
Light undergrowth	20%	10%	—
Scree	—	20%	30%
Dense rubble	—	20%	30%

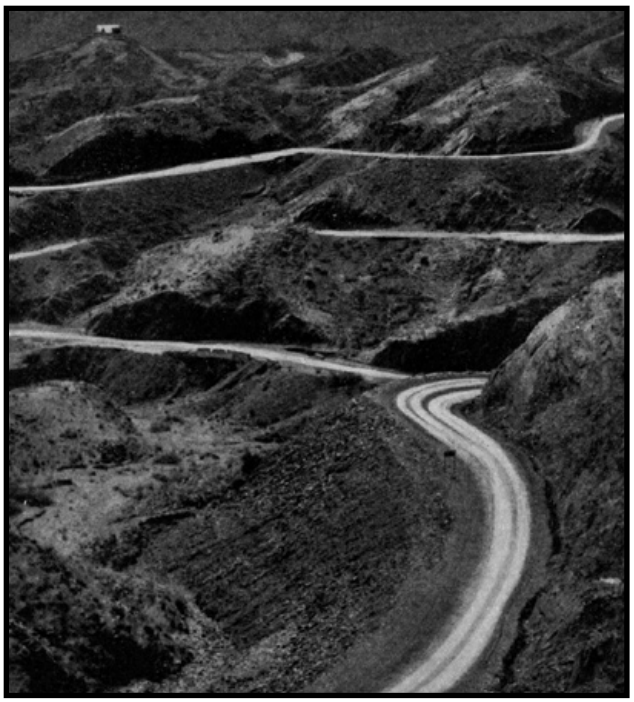
Stealth and Detection in Mountains: As a guideline, the maximum distance in mountain terrain at which a Spot check for detecting the nearby presence of others can succeed is 4d10×10 feet. Certain peaks and ridgelines afford much better vantage points, of course, and twisting valleys and canyons have much shorter spotting distances. Because there's little vegetation to obstruct line of sight, the specifics on your map are your best guide for the range at which an encounter could begin. A ridge or peak provides enough cover to hide from anyone below the high point. It's easier to hear faraway sounds in the mountains. The DC of Listen checks increases by 1 per 20 feet between listener and source, not per 10 feet.

Hazards

Mountain travel is filled with peril, from falling debris to falling travelers. Once a certain altitude is breached, the threat to altitude sickness and cold conditions compound the danger of the peaks.

Trail Blazing and Getting Lost

In the mountains, getting from here to there is no easy matter because mountain travel is just as concerned with vertical travel as with horizontal travel. The vertical element in mountain travel also makes mapping is no easy endeavor. Mountains have more discernible features and landscapes, as well as having limited options for travel opposed to the vast, blank desert landscape. In general, there are more trails and roads in mountains than deserts. Mountain traveling often takes the form of switchbacks following the curves and angles of the mountain. Travelers also have the advantage of height when surveying their course, although curved narrow roads and passes do not always give travelers forewarning of immediate dangers or impediments ahead.



Game Mechanics

If travelers have a map and/or experienced guide [5 ranks in Knowledge (local) or Knowledge (geography)] and are traveling on a road or trail, there is a small chance they will get lost (DC 8 Survival check). However, circumstantial conditions like difficult terrain and poor visibility increase the Survival check to DC 12. Any time characters cannot see at least 60 feet in the prevailing conditions of visibility, they may become lost. Characters traveling through fog, snow, or a downpour might easily lose the ability to see any landmarks not in their immediate vicinity. Similarly, characters traveling at night may be at risk, too, depending on the quality of their light sources, the amount of moonlight, and whether they have darkvision or lowlight vision. Any character in forest, moor, hill, or mountain terrain may become lost if he or she moves away from a trail, road, stream, or other obvious path or track. Forests are especially dangerous because they obscure far-off landmarks and make it hard to see the sun or stars.

If a party becomes lost, it is no longer certain of moving in the direction it intended to travel. Randomly determine the direction in which the party actually travels during each hour of local or overland movement. The characters' movement continues to be random until they blunder into a landmark they can't miss, or until they recognize that they are lost and make an effort to regain their bearings.

Recognizing that You're Lost: Once per hour of random travel, each character in the party may attempt a Survival check (DC 20, -1 per hour of random travel) to recognize that they are no longer certain of their direction of travel. Some circumstances may make it obvious that the characters are lost.

Setting a New Course: A lost party is also uncertain of determining in which direction it should travel in order to reach a desired objective. Determining the correct direction of travel once a party has become lost requires a Survival check (DC 15, +2 per hour of random travel). If a character fails this check, he chooses a random direction as the "correct" direction for resuming travel. Once the characters are traveling along their new course, correct or incorrect, they may get lost again.

Conflicting Directions: It's possible that several characters may attempt to determine the right direction to proceed after becoming lost. Make a Survival check for each character in secret, then tell the players whose characters succeeded the correct direction in which to travel, and tell the players whose characters failed a random direction they think is right.

Regaining Your Bearings: There are several ways to become un-lost. First, if the characters successfully set a new course and follow it to the destination they're trying to reach, they're not lost anymore. Second, the characters through random movement might run into an unmistakable landmark. Third, if conditions suddenly improve—the fog lifts or they find a different section of the stream they were traveling along—lost characters may attempt to set a new course, as described above, with a +4 bonus on the Survival check. Finally, magic may make their course clear.

Over the Edge

The higher they climb, the harder they fall. The basic rule is simple: 1d6 points of damage per 10 feet fallen, to a maximum of 20d6.

If a character deliberately jumps instead of merely slipping or falling, the damage is the same but the first 1d6 is nonlethal damage. A DC 15 Jump check or DC 15 Tumble check allows the character to avoid any damage from the first 10 feet fallen and converts any damage from the second 10 feet to nonlethal damage. Thus, a character who slips from a ledge 30 feet up takes 3d6 damage. If the same character deliberately jumped, he takes 1d6 points of nonlethal damage and 2d6 points of lethal damage. And if the character leaps down with a successful Jump or Tumble check, he takes only 1d6 points of nonlethal damage and 1d6 points of lethal damage from the plunge.

Falls onto yielding surfaces (soft ground, mud) also convert the first 1d6 of damage to nonlethal damage. This reduction is cumulative with reduced damage due to deliberate jumps and the Jump skill.

Falling Rocks

Just as characters take damage when they fall more than 10 feet, so too do they take damage when they are hit by falling objects.

Objects that fall upon characters deal damage based on their weight and the distance they have fallen. For each 200 pounds of an object's weight, the object deals 1d6 points of damage, provided it falls at least 10 feet. Distance also comes into play, adding an additional 1d6 points of damage for every 10-foot increment it falls beyond the first (to a maximum of 20d6 points of damage).

Objects smaller than 200 pounds also deal damage when dropped, but they must fall farther to deal the same damage. Use Table: Damage from Falling Objects to see how far an object of a given weight must drop to deal 1d6 points of damage.

Table 3.3 Damage from Falling Objects

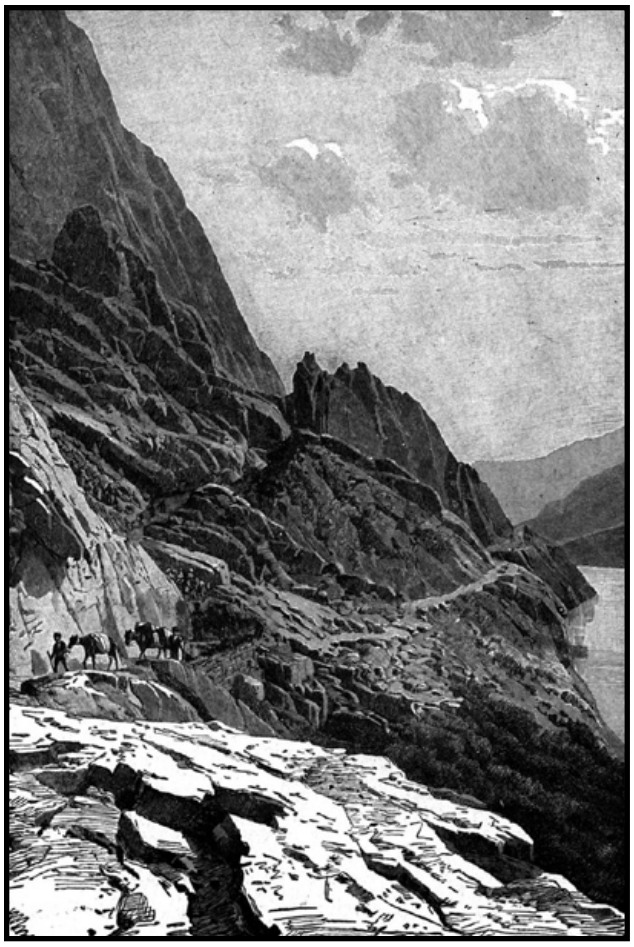
Object Weight	Falling Distance
200–101 lb.	20 ft.
100–51 lb.	30 ft.
50–31 lb.	40 ft.
30–11 lb.	50 ft.
10–6 lb.	60 ft.
5–1 lb.	70 ft.

For each additional increment an object falls, it deals an additional 1d6 points of damage.

Objects weighing less than 1 pound do not deal damage to those they land upon, no matter how far they have fallen.

Water Crossings

Travelers may have to cross streams and rivers in their course. During the winter, the beds are relatively dry or frozen over while rising spring an summer temperatures fill the streams and rivers with snowmelt. Characters walking on ice must spend 2 squares of movement to enter a square covered by ice, and the DC for Balance and Tumble checks increases by +5. Characters in prolonged contact with ice may run the risk of taking damage from severe cold (below). A traveler can wade through the water at half speed so long as the water is not too high (above their heads). To wade through mild waters (late summer and autumn), travelers must make a DC 10 Str check, while spring and early summer rapids raise the Str check to DC 15. A person can be carried over the water by a wading person, which raises the wading DC by 5, presuming the porter is able to carry the person in the first place. Pack animals are also subject to Str checks for wading through the water. For those that fail their saves, they then have to make Swim checks (DC 10 for calm waters, DC 15 rough waters), either to swim across or to regain their footing and continue wading. Travelers crossing frigid waters (higher than 10,000 ft or winter waters) are subject to



a Fortitude save DC 15 or take 1d6 points of nonlethal damage due to exposure, although native animals do not have to make such saves.

Altitude Sickness

As travelers and animals venture higher in altitude, the air has less oxygen, causing some to become very ill. In general, traveling in altitudes under 8000 ft. (2500m) does not warrant worry. However, after 8000 ft. certain physiological changes take place. Hyperventilation (fast breathing) and shortness of breath during exertion is common, as well as increased urination, frequently waking up at night, and having weird dreams. Perhaps the most disconcerting reaction (especially to those unfortunate to discover it) is having different breathing patterns during sleep. At higher altitudes, persistence hyperventilation reduces the level of carbon dioxide in your blood, which is a key indicator for when it is time to take a breath. While you are awake, remembering to breathe is not so difficult, but during sleep people will cycle through normal breathing, breath-holding, and accelerated breathing as the body adjusts to low-oxygen environments. While this is all normal for traveling at heights, it is disturbing to wake up and realize you have stopped breathing, or to find your neighbor has stopped breathing.

Acclimation to low-oxygen environments is the best insurance against altitude sickness, which means giving the body time to adjust. As a general guideline, at altitudes above 10,000 ft (3000m), sleeping elevation should not increase more than 1000 ft (300 meters) per night, and spend a second night at the same elevation every 3000 ft (1000 m).

Despite these checks on the speed of ascent, travelers are still subject to altitude sickness, even acclimated travelers. Headache in conjunction with any of the following are signs of altitude sickness: loss of appetite, nausea, vomiting, fatigue, weakness, dizziness, light-headedness, confusion, staggering gait, and difficulty sleeping. The best cure is to stop ascending and descend to the last sleep altitude where these symptoms did not occur. Some people become severely ill at high altitudes, where their brain swells and ceases to function properly or their lungs fill with fluid, also best cured by immediately descending to the last sleep altitude before symptoms occurred.

Game Mechanics

High altitude can be extremely fatiguing—or sometimes deadly—to creatures that aren't used to it. Cold becomes extreme, and the lack of oxygen in the air can wear down even the hardiest of warriors.

Acclimated Characters: Creatures accustomed to high altitude generally fare better than lowlanders. Any creature with an Environment entry that includes mountains is considered native to the area, and acclimated to the high altitude. Characters can also acclimate themselves by living at high altitude for a month. Characters who spend more than two months away from the mountains must reacclimate themselves when they return. Undead, constructs, and other creatures that do not breathe are immune to altitude effects.

Altitude Zones: In general, mountains present three possible altitude bands: low pass, low peak/ high pass, and high peak.

Low Pass (lower than 8,000 feet): Most travel in low mountains takes place in low passes, a zone consisting largely of alpine meadows and forests. Travelers may find the going difficult (which is reflected in the movement modifiers for traveling through mountains), but the altitude itself has no game effect.

Low Peak or High Pass (8,000 to 15,000 feet): Ascending to the highest slopes of low mountains, or most normal travel through high mountains, falls into this category. All nonacclimated creatures labor to breathe in the thin air at this altitude. Characters must succeed on a Fortitude save each hour (DC 15, +1 per previous check) or be fatigued. A fatigued character can't run or charge and takes a penalty of -2 to Strength and Dexterity. Doing anything that would normally cause fatigue causes the fatigued character to become exhausted. The fatigue ends when the character descends to an altitude with more air. Acclimated characters do not have to attempt the Fortitude save.

High Peak (more than 15,000 feet): The highest mountains exceed 20,000 feet in height. At these elevations, creatures are subject to both high altitude fatigue (as described above) and altitude sickness, whether or not they're acclimated to high altitudes. Altitude sickness represents long-term oxygen deprivation, and it affects mental and physical ability scores. After each 6-hour period a character spends at an altitude of over 15,000 feet, he must succeed on a Fortitude save (DC 15, +1 per previous check) or take 1 point of damage to all ability scores. Creatures acclimated to high altitude receive a +4 competence bonus on their saving throws to resist high altitude effects and altitude sickness, but eventually even seasoned mountaineers must abandon these dangerous elevations.

The use of transportation magic at altitudes higher than 8,000 ft. is even more dangerous. Acclimation is based on the speed of ascent, and a quick or instantaneous change in altitude greater than 1000 ft. per day due to magic (such as *fly*, *teleport*, and *wind walk*) gives a -4 circumstantial modifier to Fortitude checks on high altitude fatigue and altitude sickness.

Cold and Snow

If travelers go high enough, they will find snow. After a certain height (10,000 ft temperate zones and 15,000 ft equatorial zones), mountains are cold, barren deserts of ice, snow, and rock. The most immediate hazard is the cold itself: frostbite, hypothermia, blizzards, and avalanches. While finding water is not so much a problem, foraging for fuel and food and finding shelter is. Traveling the mountains have to be carefully timed. Traveling the mountains too late after harvest increases the change of poor weather and getting caught in a storm, while traveling in spring and early summer means rapids for water crossings flowing with snow melt. Some caravans have been known to travel during the dead of winter and travel across frozen lakes in order to avoid mountain passes at higher altitudes.

The icy wind seeps through layers of clothing, making is impossible to be completely warm or entirely dry while marching through the snow. The temperature is always below freezing, although sunlight does make the cold more bearable. The snow piles high, forcing travelers (the their animals) to sink into the snow with each step, wetting their clothing which quickly refreezes in the artic conditions. The extreme cold is very arid, and your body spends much of its energy staying warm that dehydration is something to watch out in cold conditions.

People of the high mountains watch for signs of impending storms and use these signs when deciding when and where to stop. A local guide well versed with the landscape and weather is invaluable, if only for their troubleshooting abilities. To be caught in at a remote pass in a blizzard is a nigh death sentence. The animals often sense a storm through changes in barometric pressure, while cloud color and formation also indicate a storm. One herd community uses salt to tell if it will storm tomorrow by throwing the salt into the fire. If it pops and explodes, the salt is dry, and they are safe to travel another day. If the salt does not explode, it has absorbed moisture and indicates an impending storm.

Game Mechanics

The following are mechanics related to cold climates in high altitudes.

Cold and Exposure

Cold and exposure deal nonlethal damage to the victim. This nonlethal damage cannot be recovered until the character gets out of the cold and warms up again. Once a character is rendered unconscious through the accumulation of nonlethal damage, the cold and exposure begins to deal lethal damage at the same rate.

An unprotected character in cold weather (below 40° F) must make a Fortitude save each hour (DC 15, + 1 per previous check) or take 1d6 points of nonlethal damage. A character who has the Survival skill may receive a bonus on this saving throw and may be able to apply this bonus to other characters as well.

In conditions of severe cold or exposure (below 0° F), an unprotected character must make a Fortitude save once every 10 minutes (DC 15, +1 per previous check), taking 1d6 points of nonlethal damage on each failed save. A character who has the Survival skill may receive a bonus on this saving throw and may be able to apply this bonus to other characters as well. Characters wearing winter clothing only need check once per hour for cold and exposure damage.
A character who takes any nonlethal damage from cold or exposure is beset by frostbite or hypothermia (treat her as fatigued). These penalties end when the character recovers the nonlethal damage she took from the cold and exposure.

Extreme cold (below –20° F) deals 1d6 points of lethal damage per minute (no save). In addition, a character must make a Fortitude save (DC 15, +1 per previous check) or take 1d4 points of nonlethal damage. Those wearing metal armor or coming into contact with very cold metal are affected as if by a *chill metal* spell.

Characters walking on ice must spend 2 squares of movement to enter a square covered by ice, and the DC for Balance and Tumble checks increases by +5. Characters in prolonged contact with ice may run the risk of taking damage from severe cold (see above).
Inclement Weather

Bad weather frequently slows or halts travel and makes it virtually impossible to navigate from one spot to another. Precipitation in cold conditions can manifest as snow, sleet, or hail.

Snow: Falling snow has the same effects on visibility, ranged weapon attacks, and skill checks as rain, and it costs 2 squares of movement to enter a snow-covered square. A day of snowfall leaves 1d6 inches of snow on the ground.

Heavy Snow: Heavy snow has the same effects as normal snowfall, but also restricts visibility as fog, obscuring all sight, including darkvision, beyond 5 feet. Creatures 5 feet away have concealment (attacks by or against then have a 20% miss chance). A day of heavy snow leaves 1d4 feet of snow on the ground, and it costs 4 squares of movement to enter a square covered with heavy snow. Heavy snow accompanied by strong or severe winds may result in snowdrifts 1d4×5 feet deep, especially in and around objects big enough to deflect the wind—a cabin or a large tent, for instance. There is a 10% chance that a heavy snowfall is accompanied by lightning. Wind speeds are severe (30 to 50 mph), and visibility is cut by three-quarters. Such storms last for 2d4-1 hours.

Snow has the same effect on flames as moderate wind, with a 50% chance of extinguishing small, unprotected flames, such as candles.

Sleet: Essentially frozen rain, sleet has the same effect as rain while falling (except that its chance to extinguish protected flames is 75%) and the same effect as snow once on the ground.

Hail: Hail does not reduce visibility, but the sound of falling hail makes Listen checks more difficult (-4 penalty). Sometimes (5% chance) hail can become large enough to deal 1 point of lethal damage (per storm) to anything in the open. Once on the ground, hail has the same effect on movement as snow.

Blizzard: Blizzards are a combination of high winds and heavy snow (typically 1d3), and the bitter cold make blizzards deadly for all who are unprepared for them. In blizzards, wind speeds are over 50 mph. Very high winds and torrential precipitation reduce visibility to zero, making Spot, Search, and Listen checks and all ranged weapon attacks impossible. Unprotected flames are automatically extinguished, and protected flames have a 75% chance of being doused. Creatures caught in the area must make a DC 20 Fortitude save or face the effects based on the size of the creature. Blizzards obscure vision as effectively as a dense fog.

Avalanches (CR 7)

The combination of high peaks and heavy snowfalls means that avalanches are a deadly peril in many mountainous areas. While avalanches of snow and ice are common, it's also possible to have an avalanche of rock and soil.

An avalanche can be spotted from as far away as 1d10×500 feet downslope by a character who makes a DC 20 Spot check, treating the avalanche as a Colossal creature. If all characters fail their Spot checks to determine the encounter distance, the avalanche moves closer to them, and they automatically become aware of it when it closes to half the original distance. It's possible to hear an avalanche coming even if you can't see it. Under optimum conditions (no other loud noises occurring), a character who makes a DC 15 Listen check can hear the avalanche or landslide when it is 1d6×500 feet away. This check might have a DC of 20, 25, or higher in conditions where hearing is difficult (such as in the middle of a thunderstorm). A landslide or avalanche consists of two distinct areas: the bury zone (in the direct path of the falling debris) and the slide zone (the area the debris spreads out to encompass). Characters in the bury zone always take damage from the avalanche; characters in the slide zone may be able to get out of the way. Characters in the bury zone take 8d6 points of damage, or half that amount if they make a DC 15 Reflex save. They are subsequently buried (see below). Characters in the slide zone take 3d6 points of damage, or no damage if they make a DC 15 Reflex save. Those who fail their saves are buried.

Buried characters take 1d6 points of nonlethal damage per minute. If a buried character falls unconscious, he or she must make a DC 15 Constitution check or take 1d6 points of lethal damage each minute thereafter until freed or dead.

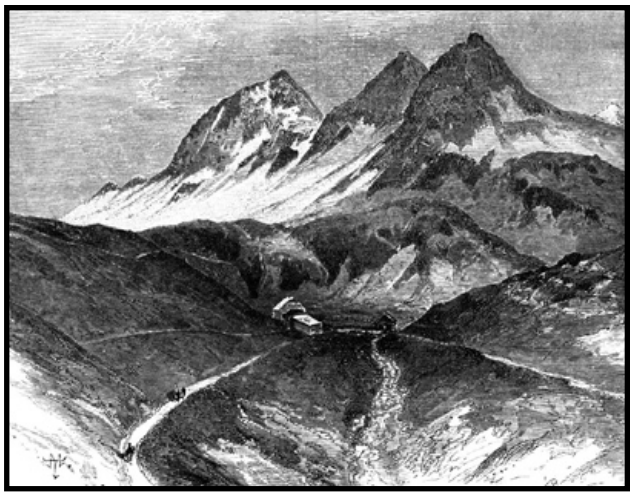
The typical avalanche has a width of 1d6×100 feet, from one edge of the slide zone to the opposite edge. The bury zone in the center of the avalanche is half as wide as the avalanche's full width.

To determine the precise location of characters in the path of an avalanche, roll 1d6×20; the result is the number of feet from the center of the path taken by the bury zone to the center of the party's location. Avalanches of snow and ice advance at a speed of 500 feet per round, and rock avalanches travel at a speed of 250 feet per round.

Table 3.4 Wind Effects in Blizzards

Wind Speed	Ranged Attacks Normal/ Siege Weapons[1]	Creature Size[2]	Wind Effect on Creatures	Fort Save DC
75–174 mph	Impossible/–8	Medium or smaller	Blown away	20
		Large	Knocked down	
		Huge	Checked	
		Gargantuan or Colossal	None	

1 The siege weapon category includes ballista and catapult attacks as well as boulders tossed by giants.
2 Flying or airborne creatures are treated as one size category smaller than their actual size, so an airborne Gargantuan dragon is treated as Huge for purposes of wind effects.
Checked: Creatures are unable to move forward against the force of the wind. Flying creatures are blown back 1d6×5 feet.
Knocked Down: Creatures are knocked prone by the force of the wind. Flying creatures are instead blown back 1d6×10 feet.
Blown Away: Creatures on the ground are knocked prone and rolled 1d4×10 feet, taking 1d4 points of nonlethal damage per 10 feet. Flying creatures are blown back 2d6×10 feet and take 2d6 points of nonlethal damage due to battering and buffeting.



Predators

Besides your garden variety of wolves, leopards, and predatory creatures of the mountains, magical worlds have a plethora of things that attack stray pack animals and lone travelers. For 200 monsters of the heights, pick up *Monster Geographica: Hill & Mountains* with custom counters found in *Counter Collection: Perilous Heights* from Fiery Dragon Productions.

Stop Overs

Where does one find respite in the mountains? For high altitude travelers, the greatest concern is the extreme cold, being caught in a storm or blizzard, and the lack of fuel. Native guides and seasoned local travelers memorize an array of caves and natural shelters along their path for overnight stops and hasty retreats for shelter. High altitude lakes, streams, and rivers are all sources of potable water, although some high altitude lakes are briny. Sources of water have a higher propensity for encountering settlements and villages, which can be a good source of information, directions, shelter, and limited food and supplies.

Low altitude passes and valleys are natural places for settlements and trading villages for both herders and farmers. Sometimes there are plateaus in high altitudes (altiplano), which are favored for their flat terrain amid the peaks. Do not underestimate the presence of mountain kingdoms or city states; the mountains are an ideal place for cities because of their defensible nature. Mountains may also call to religious people and institutions, where ascetics seek solitude in remote places, except that their followers come with them, creating hidden temples and settlements in remote parts of the mountains.

Animals

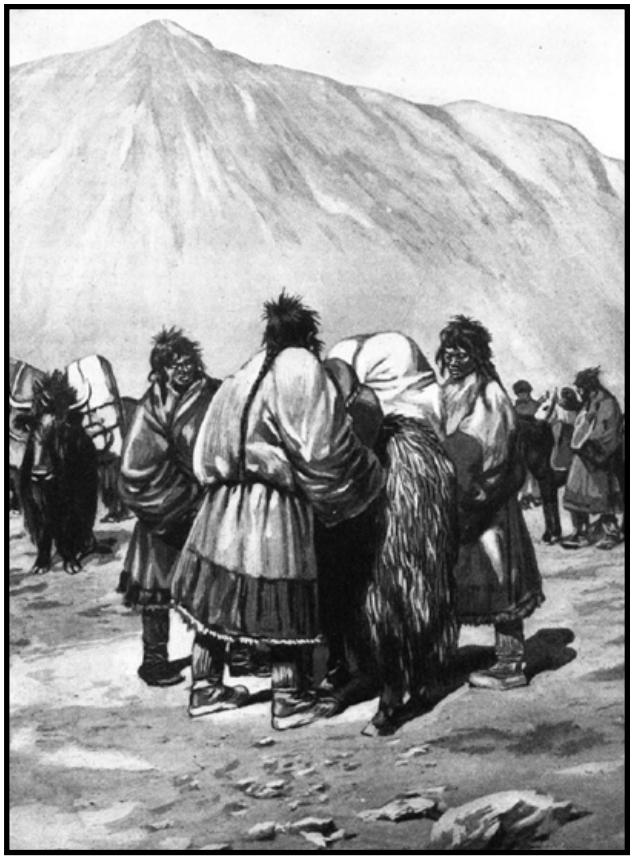
Caravans traveling through mountainous terrains have their own preferential animals. For travel above 10,000 ft, the yak is no doubt the preferred beast of burden. Caravans traveling in the mountains also use camels, horses, mules, llamas, sheep and goats.

Yaks

Yaks are the preferred pack animal in high altitudes. Domesticated yaks grow to 1,200 pounds (bulls) with a shoulder height of 3-4 feet, while wild yaks can grow up to 2200 pounds with a 6 foot shoulder height. Yaks have an average lifespan of 20-25 years. They only weigh 25-35 pounds at birth, but gain a considerable amount of weight (up to 500 pounds) in their first six months. Yaks are used for labor after 2-3 years. Generally, a fully loaded yak carries 300 pounds and travel 12-18 miles (20-30 km) a day on high, cold, steep mountainous paths. Yaks are generally low maintenance creatures and are easier to lead and steer than other animals. Yaks are sure-footed despite their massive size, and they spook less easily than horses.

Water and Food

Yaks are not picky eaters and require much less feed than their bovine cousins. If given enough time and space for grazing, yaks find all the nourishment they need from the wilderness. Yaks require much less feed than cattle, grazing on grasses, herbs, lichens, coarse grass, withered leaves and twigs. Yaks gain nourishment from marginally grazing that other animals cannot. They even forage through the snow to find nourishment; one traveler reports yaks rolling down slopes to pack the snow and eating their way up the slope. Yaks require a fair amount of water, but



they are willing to eat snow and ice for their needs. Yaks also require roughly 2 ounces of salt a week, not nearly as much as camels and horses.

Adaptation

Even though yaks carry less weight and move slower in comparison to other large pack animals, they are still the preferred beast of burden in the mountains. They are native to cold temperatures and high altitudes, anywhere from 10,000 ft (3200m) to 20,000 ft (5,500+m). Their massive girth and downy coats protect them from the extreme cold; a yak's wet hide constitutes 8% of the live weight. They can survive temperatures as low as -40°F/C. Yaks have fierce horns and protect themselves for predators, allowing them to graze in the wild during travel while travelers camp for the evening. Yaks are renown for trail blazing; their natural intuition spots hazards otherwise covered by snow. At the head of a caravan, yaks beat down the snow and make a trail for other pack animals, such as horses, mules, sheep, goats, and camels. Most importantly, yaks provide fuel in the barren coldlands via their dung. Yaks have a strange beauty, making a grunting noise (much like a pig) and throwing their tails over their backs, waving in the wind like flags when they run.

There is one drawback to yaks: they do not fair well in altitudes lower than 10,000 ft. Herders crossbreed yaks and cows, which does produce fertile females. Crosses between yak and cows (called dzo) also give more milk and better meat and are excellent work animals for carrying loads at moderate altitudes.

Maintenance

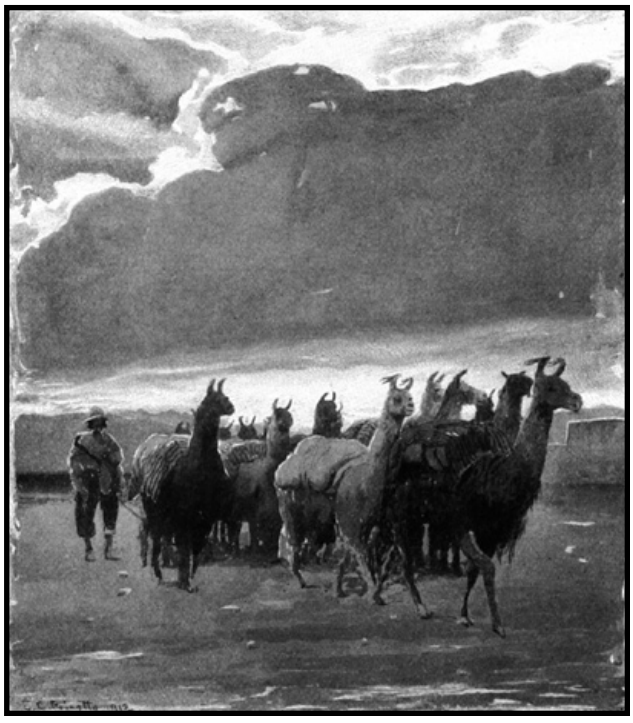
Yaks are a mixed bag as far as mood goes. At times they are temperamental and wild, other times they are timid and easy to steer. Yaks have a strong herding instinct, and the key to using yaks in caravans is to have a strong, experienced lead yak which others will follow. Yaks do no require nearly as many animal handlers in comparison to camels, horses, and their ilk. A single person can control and manage a large herd with both special calls and small stones delivered with a sling. The sound of the whizzing stone alerts the yak, while the direction of the stone's movement lets the animal know where it should be going. Stones are especially useful when controlling the lead yak, which the other animals will follow, but sometimes the lead yak needs a little encouragement. Bulls are used as pack animals, and they are typically allowed to graze freely at night since their horns are ample protection from wolves and great cats. Once the animals arrive at camp, their packs are removed, and the yaks start to graze. In the morning, the animal handlers must round up the yaks and load them with wares once again. Handlers bind the animal's two rear legs (or feet) together to saddle and load the yaks with gear, untying the bindings when they are ready to move out. Every two or three days, the caravan should stop to let the yaks fully graze and rest.

Llama

Llamas are close relatives to camels that are native to arid, high-altitude environments. Their average lifespan is 20-25 years, and they are smaller pack animals, with a maximum weight of 300-450 pounds. Their long necks extend their head up to two feet from their shoulder, with height at 5.5-6 feet. They come into physical maturity after 2-3 years, after which time they can begin physical labor, such as being a pack animal. Due to their smaller size and weight, they cannot carry heavy loads, typically carrying 50-80 pounds (roughly 20% of body weight) for 12 miles of travel a day. They wear pack saddles with wares loaded on either side of their flank. Although a well-trained llama can carry a small person (up to 40 pounds), they are generally not accustomed to being ridden. Llamas are sure-footed and agile in mountainous environments, making them ideal pack animals at high altitudes.

Water and Food

Llamas are ruminants that graze and browse from trees, shrubs, and weeds. In a pinch, they can be given feed or hay, typically 2% of their body weight daily (6-9 pounds). They require a small amount of salt every day, but do not like salt licks and must be given loose or crumbly salt. Llamas also need water every day and can be picky about their water, preferring clean water.



Adaptation

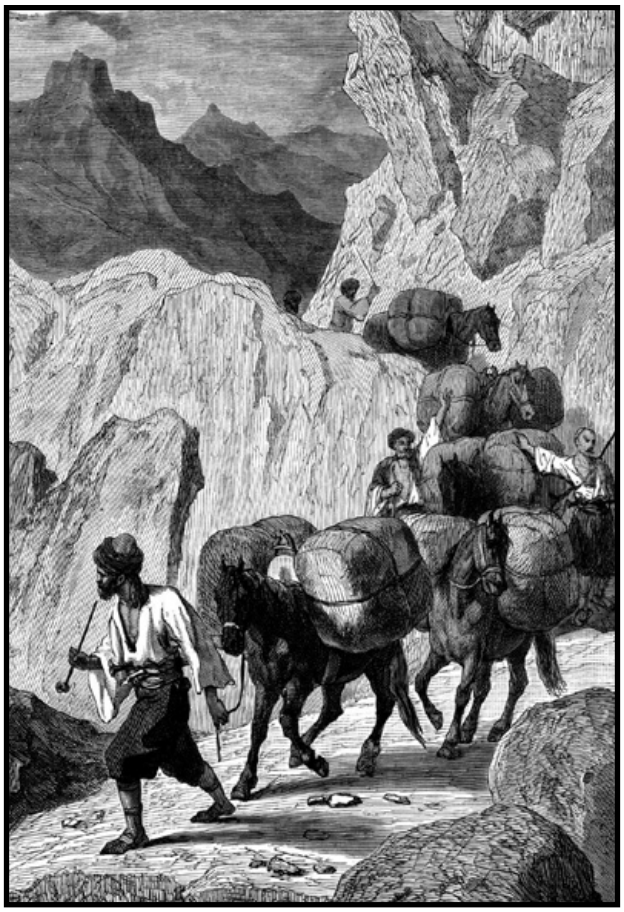
Llamas work well as pack animals in mountainous terrain. They are adapted for low-oxygen air found at high-altitudes, and their wooly coats protect them from the wind and cold. Unlike their desert cousin the camel, llamas are sure-footed climbers on the steep slopes of mountainous terrain. Their two-toed foot has a leathery pad for absorbing the impact of walking on hard surfaces, while each toe produces a hoof-like toenail to protect their feet. Like yaks, llamas produce fuel for mountain caravan travelers in the form of their dung, which is dried and used in fires.

Maintenance

Llamas are fairly easy to steer and control and do not require as many animal handlers as their cousin the camel. They are subject to many of the same problems found in camels, such as mange, ticks, parasites, and ringworm, as well as some infections and illnesses common in cattle and sheep. In general, checking the mouth and feet of llamas covers most external problems areas. Checking for healthy teeth and gums is good preventive medicine, while problems in the mouth are signs of illness. Excessive salivation accompanied by mouth lesions (swollen tongue, red spots and blisters, or worn spots where skin comes off and exposes red tissue) and rancid breath are signs of illness. Gritting or grinding of teeth, excessive getting up and lying down, and laying with the back feet to the side are signs of discomfort or pain in llamas. More serious conditions produce other odd behavior in llamas, such as groaning, kicking at their stomach, not chewing cud, not eating, and sluggish reaction to commands. Foot care is also important when handling llamas. Their two toes grow hoof-like nails that require regular trimming, while lameness in llamas is probably due to sprains, strains, or footpad injuries.

Other Mountain Pack Animals

Sheep and goats are used as pack animals for the middle altitudes (below 10,000 ft.), often by pastoral communities that use their herds to transport other trade goods to lower altitudes. Sheep and goats are girded with pack saddles and carry even less weight than llamas. Larger scope trading outfits are more likely to use horses, mules, and pack animals that can carry more weight than sheep and goats. Caravans have traversed high altitudes with camels, although they are not as sure-footed as their cousin the llama. Animal handlers have to work with camels in the cold, such as wrapping their toes in cloth, messaging their feet to encourage circulation, tying pairs of camels head to tail and fully cooling the animals before placing their bellies on the frigid earth, and placing sand on icy slopes for traction. Camel's feet are not



use to wet conditions, so watch carefully for foot rot, especially in warmer (non-freezing), wet conditions. Horses are also native to mountainous terrain, although they are usually found at lower altitudes than the forbidding yak. Horses and mules are not as susceptible to altitude sickness than people, but drop in energy level, delay in reaction time, and loss of coordination are possible signs of altitude sickness in animals not native to mountainous regions.

Procedure

Traveling in the mountains is no piece of cake. Although the distance may be short as the crow flies, travelers and their pack animals have to move up and down mountains in search of traversable passes. Timing is very important to mountain caravans. Some leave well into winter to cross frozen lakes, well accustomed to interpreting the sounds safe and unsafe ice. Some leave late fall, after harvest but before winter storms threaten to waylay travelers. Some leave in late winter, trading the wares from higher altitudes to lowlanders in their own caravan scheme. When using weather or seasonal conditions as travel guidelines, always remember that altitude plays a large role in when things occur. For example, snow melts from passes at lower altitudes sooner than higher altitudes, and planting is later in agricultural communities at 10,000 ft. than at lower altitudes.

Trading through the mountains is largely local and vertically stratified. For example, high altitude herders trade with high-altitude farmers (10,000 ft) to get their requirements; in turn, those high-altitude farmers trade with flatlanders, bearing some of the wares from the high-altitude herders as well. Often times, individual villagers travel together for safety and company, adding their 2 dozen yaks into the herd of all their neighbors, creating giant herds of animals. There are defiantly peak times of travel in mountains, where one caravan is riding on the tails of another, and the camp fire is still smoldering while another caravan comes to take its place. Travel in late fall after harvest but before winter storms is a popular time to travel down the mountains, while travel up the mountain starts in late spring, after passes are thawing out and just in time for planting. With this great movement of people, incidental travelers can hitch a ride with a caravan heading their direction.

Travel times are greatly slowed by the terrain, and possibly limited to pack animals, especially for grazing animals that need time to eat and chew cud. Don't count on more than 20 miles a day in mountain travel and that is an expeditious mountain caravan with few delays. Unlike the desert with its oases and caravanserais, the mountains offer little comfort in that capacity. Previous travelers may leave a little dung before for the next caravan, or local people may leave a little fuel in caves. If you are traveling through a more populated area, you may time stops at mountain kingdoms or religious hermitages along the weeks of cold and snow. Travelers often have to bring all the food and supplies they will need until they reach the other side of the mountains.

Caves offer shelter from the wind and snow, although they are not always available on the road. Mountain travelers typically have to make camp in the wilderness, using their wares to buffer themselves from the elements. Sacks and bags can be stacked in a horseshoe around the camp, deflecting some of the bitter wind. Blankets and carpets that cushioned the animal's backs from the saddle make mattresses and sleeping bags. The chipped block of ice will become water with a little help from the dung-fed fires.

Mountain Travel Checklist

This is the ideal list. Animals and travelers can stretch on food and water to different degrees, and animal handlers can be assigned to more animals, although that is not the optimal situation.

- Stop every 12-18 miles (7-11 km) with water for animals.
- 2 gallons of water per person per day
- Normal food requirements for characters (depending on size)
- Yaks, llama, sheep, goats: daily grazing, clean water, and salt.
- Camels–Food: 22 lb of grass (or hay and straw), 9 lb. of grains, 2 pounds of seedcakes per camel per day. Water: see description. Salt: 2 pounds a week-can be attained briny lakes are loose salt.
- Horses–Food: 4.4 pounds (2 kg) of concentrate feed in addition to 10 pounds (4.5 kg) hay, with heavily worked horses requiring 8.8 pounds (4 kg) of concentrate feed. Water: 8 gallons of clean water per day. Salt: 2-4 ounces a day, not from brackish water or saline plants.
- Mules– Food: 2.2 pounds (1 kg) of concentrate feed in addition to 10 pounds (4.5 kg) hay. Water: 6 gallons of clear, clean water per day; see entry for dehydration toleration. Salt: 2-4 ounces a day, not from brackish water or saline plants.
- Animal handlers: 1 per every 3 camels, horses, and mules. 2-3 herders for yaks, llamas, sheep, and goats.

Swamp Caravans

Historically, caravans would avoid swamps and travel around them; however, this need not be the case in a fantasy world with magic. I've seen more than my fair share of maps with large dark green sections labeled "Great Swamp," and the existence of different humanoids and pack animals creates alternatives for piercing the heart of the swamp while creating a marshy silk road.

Landscape

Swamps and marshes are wetlands where the rivers and lakes mesh with the soil, lands in which the water is just as important as the soil in life's movement. Wetlands come in three basic varieties with significant differences. Basin wetlands are created by depressions in the land and by water flowing vertically. Riverine wetlands are created by rivers and streams with water flowing in one direction. Fringe wetlands are created along the coast of large lakes, seas, or oceans and by water flowing in two directions. Wetlands dominated by herbaceous vegetation are called marshes while wetlands dominated by trees are called swamps.

Marshes and swamps can occur in numerous types of climate zones, from sweltering jungles to tundra bogs. The key to creating wetlands is drainage; where there is a continual or consistent source of water without adequate drainage, wetlands will form. Wetland plants and animals often have adaptations for this unique environment of water and soil, including aerial roots (to compensate for the oxygen-poor soil under water), emergent plants that grow in shallows where water and soil meet, animals with both lungs and gills, and aquatic creatures that attain oxygen in both fresh and salt water. The abundant amount of vegetation (both above and below the water) in conjunction with the mingling of water and soil make crossing swamps such a daunting task. Unsurprisingly, animal life also flourishes in wetlands due to the continual amount of vegetation and detrital material. Besides herbivores and smaller predators, large predators like crocodiles, alligators, and anacondas also stalk the wetlands looking for a tasty treat among such verdant, lush conditions. But do not underestimate the humble herbivore; consider the misanthropic hippo.

There are many names for wetlands. Wetlands in which a significant amount of water is retained in decaying vegetation are called peatlands or mires. Peatlands dominated by sedges and in which water flows up are called fens. Peatlands in which the majority of the water arrives in the form of precipitation and are dominated by sphagnum moss are called bogs. Moors develop where the compressed peat of mires acts as a barrier between the water and the soil. The water collects on top of the moor and forms a perched water table above the true soil. Some of the most dangerous bogs are termed quaking bogs. These bogs form when a lake basin slowly fills in from above as layer after layer of sphagnum moss falls to the lake floor. Eventually large floating mats of moss completely cover large pools of water, creating a death trap for any unlucky or foolish creature. The search for solid ground is the greatest challenge for swamp caravans, followed closely by navigating through overgrown vegetation, large predators, hostile wetland inhabitants, and disease.

Movement and Bogs

Movement through the swamp is slow, ¾ movement on roads and trials, ½ speed if traveling trackless. Highways are unlikely in an environment where finding solid ground is a challenge. Established roads or trails may be marked through hedgerows, stone markers, or other visible markers that outline safe passage. Some creatures have the ability to move through swamps (and/or jungles) with not movement penalties; let's hope they're with you and not hostile natives.

Mechanically, there are two types of wetlands: moors, which are relatively dry, and swamps, both of which border bodies of water (qualifying as aquatic terrain). Within moors and swamps, there are shallow bogs (20% and 40 % respectively) and deep bogs (5% and 20% respectively). Deep bog squares are usually clustered together and surrounded by an irregular ring of shallow bog squares. Both shallow and deep bogs increase the DC of Move Silently checks by 2.

Shallow bogs are deep mud or standing water about 1 foot deep, costing 2 squares of movement to move 1 square within a shallow bog and increasing Tumble check DCs by 2. Deep bogs has roughly 4 feet of standing water, and it costs Medium or larger creatures 4 squares of movement to move into a square of deep bog, although characters can swim if they wish. Small or smaller creatures must swim to move through a deep bog, and tumbling is impossible in deep bogs.

The water in a deep bog provides cover for Medium or larger creatures. Smaller creatures gain improved cover (+8 bonus to AC, +4 bonus on Reflex saves). Medium or larger creatures can crouch as a move action to gain this improved cover. Creatures with this improved cover take a –10 penalty on attacks against creatures that aren't underwater.

Undergrowth

If bogs don't get you, the vegetation will. Bushes, rushes, aerial roots, and tall grasses blanket the soggy ground. Light undergrowth (30% and 20% for moors and swamps respectively) cost 2 squares of movement to move into light undergrowth, and it provides concealment. Undergrowth increases the DC of Tumble and Move Silently checks by 2. Areas of heavy undergrowth (10% and 20% in moors and swamps respectively) cost 4 squares of movement to move into and provides concealment with a 30% miss chance (instead of the usually 20%). Heavy undergrowth increases the DC of Tumble and Move Silently checks by 5. Heavy undergrowth is easy to hide in, granting a +5 circumstance bonus on Hide checks, although running and charging are impossible. Squares with undergrowth are often clustered together, but an area cannot mechanically have both bog and undergrowth modifiers.

Skill Modifiers

The vegetation in moors and swamps affects certain skill checks. In a moor, the maximum distance at which a Spot check for detecting the nearby presence of others can succeed is 6d6×10 feet. In a swamp, this distance is 2d8×10 feet. Undergrowth and deep bogs provide plentiful concealment, so it's relatively easy to hide in a marsh. A marsh imposes no penalties on Listen checks, but using the Move Silently skill is more difficult in both undergrowth and bogs.

Aquatic Terrain

Land often borders the aquatic terrain in the swamp. There are mechanically two categories of aquatic terrain: flowing water and non-flowing water. Unless it is a flood situation, travelers in the swamps are more likely to encounter non-flowing water. Characters in non-flowing water, simply require a swim speed or successful Swim checks to move through water (calm water DC10, rough water DC15, stormy water DC 20). Characters need a way to breathe if they are underwater or risk drowning. When underwater, character can move in any direction as if they were flying with perfect maneuverability. Sight underwater largely depends on water's clarity (4d8x10 feet if clear water, 1d8x10 feet if murky), and moving water is always murky unless it is in a particularly large, slow-moving river.

And because it always seems to come up…

Underwater Combat

Land-based creatures can have considerable difficulty when fighting in water. Water affects a creature's Armor Class, attack rolls, damage, and movement. In some cases a creature's opponents may get a bonus on attacks. The effects are summarized in the accompanying table. They apply whenever a character is swimming, walking in chestdeep water, or walking along the bottom.

Ranged Attacks Underwater: Thrown weapons are ineffective underwater, even when launched from land. Attacks with other ranged weapons take a –2 penalty on attack rolls for every 5 feet of water they pass through, in addition to the normal penalties for range.

Attacks from Land: Characters swimming, floating, or treading water on the surface, or wading in water at least chest deep, have improved cover (+8 bonus to AC, +4 bonus on Reflex saves) from opponents on land. Landbound opponents who have *freedom of movement* effects ignore this cover when making melee attacks against targets in the water. A completely submerged creature has total cover against opponents on land unless those opponents have *freedom of movement* effects. Magical effects are unaffected except for those that require attack rolls (which are treated like any other effects) and fire effects.

Table 3.5 Combat Adjustments Underwater

Condition	Attack/Damage		Movement	Off Balance?[4]
	Slashing or Bludgeoning	Tail		
Freedom of movement	normal/normal	normal/normal	normal	No
Has a swim speed	–2/half	normal	normal	No
Successful Swim check	–2/half[1]	–2/half	quarter or half[2]	No
Firm footing[3]	–2/half	–2/half	half	No
None of the above	–2/half	–2/half	normal	Yes

1 A creature without a *freedom of movement* effects or a swim speed makes grapple checks underwater at a –2 penalty, but deals damage normally when grappling.

2 A successful Swim check lets a creature move one-quarter its speed as a move action or one-half its speed as a full-round action.

3 Creatures have firm footing when walking along the bottom, braced against a ship's hull, or the like. A creature can only walk along the bottom if it wears or carries enough gear to weigh itself down—at least 16 pounds for Medium creatures, twice that for each size category larger than Medium, and half that for each size category smaller than Medium.

4 Creatures flailing about in the water (usually because they failed their Swim checks) have a hard time fighting effectively. An off-balance creature loses its Dexterity bonus to Armor Class, and opponents gain a +2 bonus on attacks against it.

Fire: Nonmagical fire (including alchemist's fire) does not burn underwater. Spells or spell-like effects with the fire descriptor are ineffective underwater unless the caster makes a Spellcraft check (DC 20 + spell level). If the check succeeds, the spell creates a bubble of steam instead of its usual fiery effect, but otherwise the spell works as described. A supernatural fire effect is ineffective underwater unless its description states otherwise. The surface of a body of water blocks line of effect for any fire spell. If the caster has made a Spellcraft check to make the fire spell usable underwater, the surface still blocks the spell's line of effect.

Hazards

There are a host of dangers that plague swamp travelers, both in real life and in fantastic worlds.

Getting Lost

Unlike the desert, swamps have ample vegetation and wildlife; however, like in deserts, getting lost in swamps is quite common, especially without the benefit of a guide, trail, or map. There are a few conditions that warrant a Survival check to see if one is lost. In the absence of a trail, road, or other obvious travel indicator, the character leading the way must succeed on a Survival check (moor with map DC 6, moor with no map DC10, swamp DC 15) or become lost. Traveling at night (depending on the quality of light source and vision) as well as traveling in conditions in which a character cannot see at least 60 feet.). Having a guide or a seasoned traveler familiar with the terrain greatly reduces the chance you will get lost in the desert. Having such a person [effectively a person with 5 ranks in Knowledge (local) or Knowledge (Geography)] adds a +2 circumstantial bonus to Survival checks.

If a party becomes lost, it is no longer certain of moving in the direction it intended to travel. Randomly determine the direction in which the party actually travels during each hour of local or overland movement. The characters' movement continues to be random until they blunder into a landmark they can't miss, or until they recognize that they are lost and make an effort to regain their bearings.

Recognizing that You're Lost: Once per hour of random travel, each character in the party may attempt a Survival check (DC 20, -1 per hour of random travel) to recognize that they are no longer certain of their direction of travel. Some circumstances may make it obvious that the characters are lost.

Setting a New Course: A lost party is also uncertain of determining in which direction it should travel in order to reach a desired objective. Determining the correct direction of travel once a party has become lost requires a Survival check (DC 15, +2 per hour of random travel). If a character fails this check, he chooses a random direction as the "correct" direction for resuming travel. Once the characters are traveling along their new course, correct or incorrect, they may get lost again.

Conflicting Directions: It's possible that several characters may attempt to determine the right direction to proceed after becoming lost. Make a Survival check for each character in secret, then tell the players whose characters succeeded the correct direction in which to travel, and tell the players whose characters failed a random direction they think is right.

Regaining Your Bearings: There are several ways to become un-lost. First, if the characters successfully set a new course and follow it to the destination they're trying to reach, they're not lost anymore. Second, the characters through random movement might run into an unmistakable landmark. Third, if conditions suddenly improve—the torrential rains cease—lost characters may attempt to set a new course, as described above, with a +4 bonus on the Survival check. Finally, magic may make their course clear.

Quaking Bogs

Bogs are standing bodies of water without underground sources of fresh water. The water is stagnate, acidic and low in oxygen. Mosses grow and form thick mats of floating vegetation over the water, and over time these plants can fill in the body of water and be firm enough to support trees. Quaking bogs are a developmental stage in bogs, where the vegetative mats cover the water, but shift and quiver when weight is applied to them. However, if too much weight is applied, the subject falls through the mat of plants into acidic water and is forced to swim through a net of moss to get to the surface. Because of the acidity and low-oxygen water, some plants near these bogs adapted and became carnivorous, like Venus flytraps, pitcher plants, and their monstrous cousins.

Game Mechanics

Deceptively solid in appearance, a character approaching a patch of quaking bog at a normal pace is entitled to a DC 8 Survival check to spot the danger before stepping in. Charging or running characters do not have a chance to detect the quaking bog before blundering in. Due to the nature of bog development, the outer ring of the body of water is relatively stable (where there are trees), and stability lessens as you approach the center. Quaking bogs are typically 20 feet in diameter, and the momentum of a charging or running character carries him or her 1d2x5 feet into the bog. Remember that quaking bogs may hold the weight of one person, while a second person exceeds its weight toleration, sending both into the bog (at the GM's discretion, of course). Characters below the surface of a bog may swim back to the surface with a successful Swim check (DC 15, +1 per consecutive round of being under the surface). The acidic water is not enough to give chemical burn to exposed skin, although anyone drinking that water must make a Fortitude Save DC 10 or be sickened for the rest of the day.

Flooding

Although flooding is not common in swamps, when they happen, they are catastrophic. Any condition that introduces a large amount of water into the swamp that turns non-flowing water into flowing water (giving it a current) is considered flooding in the semi-aquatic conditions of marshes and swamps. Here are a few circumstances that might warrant flooding in marshes: flooding of a large nearby river, a river shifting its course, torrential rainfall, or a dam breaking.

Game Mechanics

During a flood, assume a rise in water level across the board. Marshes and swamps are a product of poor drainage, right? Water level rises 1d4x5 feet, and Swim checks become one category harder (calm water becomes rough). Depending on the conditions, the speed of the water may be 10-40 feet per round with rapid-like conditions are as fast as 60-90 feet per round. If the water is moving 60 feet per round or faster, a character must make a DC 20 Swim check every round to avoid going under or being swept away.

Drowning

In the presence of so much water, drowning is always a concern. Any character can hold her breath for a number of rounds equal to twice her Constitution score. After this period of time, the character must make a DC 10 Constitution check every round in order to continue holding her breath. Each round, the DC increases by 1. When the character finally fails her Constitution check, she begins to drown. In the first round, she falls unconscious (0 hp). In the following round, she drops to –1 hit points and is dying. In the third round, she drowns.

Vermin and Disease

Vast bodies of non-flowing water are an invitation for vermin and insects. In cold climate marshes, vermin and insects are seasonal annoyance to animals and people alike, often larger than breeds found in temperate or tropical areas. In warmer regions, these pests are often carriers for diseases that effect people and pack animals. A few notable diseases passed on through insects are malaria, dengue fever, rift valley fever, west nile encephalitis, and yellow fever. And those are just the mosquito carriers. In a magical world, don't discount the presence of more menacing challenges that also carry disease, especially vermin and undead that wander the wetlands.

Game Mechanics

Traveling through marshes for weeks on end exposes travelers and animals to many possible diseases.

Malaria—injury, Fortitude DC 18, incubation period 2d6 days, damage 1d4 Con. Travelers in warm marshes are at risk of catching malaria (6% chance per day in marshes or swamps). Transmitted to people through mosquitoes, malaria is a parasite that enters the bloodstream when an infected mosquito takes a blood meal. The parasite travels through the blood stream and takes refuge in various organs, multiplying and attacking red blood cells which release toxins in the blood. Characters affected by malaria have severe chills, bouts of intense fevers, moments of delusion or paranoia, and utter exhaustion. Characters with malaria are considered exhausted until they are cured.

Yellow Fever—injury, Fortitude DC 16, incubation period 1d4 day, damage 1d4 Con. Carried by mosquitoes, every day spent in warm wetlands provides a 2% chance of being exposed to yellow fever. Although yellow fever shares many early symptoms with malaria (such as severe chills followed by high fevers and exhaustion), yellow fever also causes multiple muscle and joint aches and

persistent nausea. Sometimes the fever subsides for a few days only to return with a vengeance. During the second stage of yellow fever, those infected experience uncontrolled hemorrhaging and vomiting of dark blood. They also acquire sever jaundice, giving yellow fever its name. Death frequently occurs within a week after exposure to the virus. Yellow fever only affects humanoids, and characters stricken with yellow fever are nauseated and fatigued until cured or dead. Anyone surviving yellow fever is immune to it.

Trypanosomiasis—injury, Fortitude DC 15, incubation period 1d4 days, damage 1d4 Con. Carried by biting fleas, every day in warm wetlands provides a 1% chance of exposure to trypanosomiasis, aka the sleeping sickness. Although chronic fatigue is the most common symptom, the parasite in question attacks the central nervous system. An afflicted person may experience violent mood swings, loss of appetite, and sleepiness, with the persistent infection causing the victim to fall in a coma and die. Trypanosomiasis affect humanoids and animals, and characters with the disease are fatigued until cured or dead.

Do not limit yourself to insects as disease vectors. This is a magical world, open to all sorts of possibilities. Below are a few examples from *Monster Geographica: Marsh & Aquatic*.

Barrow Roach

Large Undead
Hit Dice: 3d12 (19 hp)
Initiative: +3
Speed: 40 ft. (8 squares), climb 30 ft. (6 squares), swim 20 ft. (4 squares)
Armor Class: 18 (-1 size, +3 Dex, +6 natural), touch 12, flat-footed 15
Base Attack/Grapple: +1/+10
Attack: Claw +5 melee (1d4+5 plus disease)
Full Attack: 2 claws +5 melee (1d4+5 plus disease) and bite +0 melee (1d6+2 plus disease)
Space/Reach: 10 ft./5 ft.
Special Attacks: Disease, frightful presence
Special Qualities: Blindsense 30 ft., collective mind, undead traits
Saves: Fort +1, Ref +4, Will +5
Abilities: Str 20, Dex 17, Con —, Int —, Wis 15, Cha 6
Skills: Climb +13, Hide +7, Jump +9, Move Silently +5, Swim +13
Feats: Run [B]
Environment: Warm forest or marsh
Organization: Cluster (2-4), colony (5-40), or hive (50-100)
Challenge Rating: 2
Treasure: 50% coins; 50% goods; 50%items
Alignment: Always neutral evil
Advancement: 4-9 HD (Large)
Level Adjustment: —

The creature appears to be a massive roach, one roughly the size of a horse.

Combat

Barrow roaches are fearless to the point of recklessness, and they grow more effective when more of their numbers congregate.

Disease (Ex): Festering ague—claw or bite, Fortitude DC 11, incubation period 1d4 days, damage 1d3 Str and 1d3 Con. Any day in which a victim takes 3 points of Constitution damage, the afflicted creature must immediately succeed on an another DC 13 Fortitude save or 1 point of Constitution damage becomes Constitution drain instead. The save DC is Constitution-based.

Frightful Presence (Ex): A barrow roach can unsettle its foes with its mere presence. This ability takes effect automatically whenever the barrow roach performs some sort of dramatic action (such as charging or attacking). Creatures within 30 feet and with less than 3 HD must succeed on a DC 9 Will save or become shaken for 2d6 rounds and those with 3 or more HD become shaken for 1d4 rounds. Creatures that successfully save are immune to the frightful presence of the same barrow roach for 24 hours. The save DC is Charisma-based.

For each additional barrow roach that the victim can see beyond the first, the save DC increases by +2. If any creature fails the Will save by 5 or more, it is frightened rather than shaken.

Collective Mind (Su): For every 3 barrow roaches congregated within 100 feet of each other (even if separated by stone, earth, water, or other nonmagical barriers), each gains an effective Intelligence bonus of +2 for the purpose of its relative capacity to make tactical decisions (to a maximum effective Intelligence of 10). Thus, if 15 or more barrow roaches are present, they can react as logically and effectively to changes in local conditions, environment, and other stimuli as an average human might. Further, if 5 or more Barrow roaches are within 100 feet of each other, each gains the benefit of the Combat Expertise feat; if 10 or more are present, they also gain the benefit of the Improved Trip feat.

This ability does not allow the barrow roaches to actually communicate information in any way.

Skills: A barrow roach has a + 2 racial bonus on Move Silently checks and a +8 racial bonus on Climb and Hide checks. A barrow roach can always choose to take 10 on Climb checks, even if rushed or threatened.

A barrow roach has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

Bog Beast

Large Monstrous Humanoid
Hit Dice: 5d8+20 (42 hp)
Initiative: +0
Speed: 30 ft. (6 squares)
Armor Class: 14 (-1 size, +5 natural), touch 9, flat-footed 14
Base Attack/Grapple: +5/+14
Attack: Claw +9 melee (1d6+5)
Full Attack: 2 claws +9 melee (1d6+5)
Space/Reach: 10 ft./10 ft.
Special Attacks: Disease, improved grab, rend 2d6+7
Special Qualities: Darkvision 60 ft., lowlight vision
Saves: Fort +5, Ref +4, Will +5
Abilities: Str 20, Dex 11, Con 18, Int 5, Wis 12, Cha 9
Skills: Listen +7, Spot +7
Feats: Alertness, Power Attack
Environment: Temperate and warm marsh
Organization: Solitary or pack (2-5)
Challenge Rating: 5
Treasure: None
Alignment: Always neutral
Advancement: 6-10 HD (Large); 11-15 HD (Huge)
Level Adjustment: —

The bog beast is a large, shaggy, fur-covered, vaguely humanoid creature that makes its home in bogs and swamps. It has two large upright tusks of pale white protruding from its mouth. Its hands sport sharp claws with filthy nails. Its eyes are dull brown in color and its fur is brownish-yellow. The bog beast stands over 9 feet tall and weighs around 1,100 pounds. It makes its lair amid overgrown swamplands and attacks just about any creature that travels too close to its lair.

Combat

Bog beasts attack with their claws, fighting to the death. A creature killed by a bog beast is dragged back to the beast's lair, where it is devoured.

Disease (Ex): Filth fever—claw, Fortitude DC 16, incubation period 1d3 days; damage 1d3 Dex and 1d3 Con. The save DC is Constitution-based.

Improved Grab (Ex): To use this ability, a bog beast must hit an opponent of up to Large size with both claw attacks. It can then attempt to start a grapple as a free action without provoking an attack of opportunity. If it wins the grapple check, it establishes a hold and rends.

Rend (Ex): A bog beast grappling an opponent latches onto the opponent's body and tears the flesh. This attack automatically deals an additional 2d6+7 points of damage each round.

Bayowulf

Large Magical Beast
Hit Dice: 7d10+28 (66 hp)
Initiative: +2
Speed: 50 ft. (10 squares), swim 40 ft (8 squares)
Armor Class: 18 (-1 size, +2 Dex, +7 natural), touch 11, flat-footed 16
Base Attack/Grapple: +7/+15
Attack: Bite +11 melee (1d8+6 plus disease)
Full Attack: Bite +11 melee (1d8+6 plus disease)
Space/Reach: 10 ft./5 ft
Special Attacks: Breath of the moor, disease, howl
Special Qualities: Darkvision 60 ft., low-light vision, scent
Saves: Fort +9, Ref +7, Will +3
Abilities: Str 18, Dex 15, Con 18, Int 9, Wis 13, Cha 10
Skills: Climb +5, Hide +5, Jump +12, Listen +5, Move Silently +8, Spot +3, Swim +12, Survival +1*
Feats: Blind Fight, Stealthy, Weapon Focus (bite)
Environment: Warm forest and marsh
Organization: Solitary or pack (4-10)
Challenge Rating: 6
Treasure: 10% coins; 25% goods; 50% items
Alignment: Always neutral evil
Advancement: 8-14 HD (Large); 15-21 HD (Huge)
Level Adjustment: —

A billowing cloud of rolling, gray fog moves unnaturally swift over the moors.

Bayowulfs stand approximately six feet high at the shoulder and measure roughly nine feet in length from snout to hindquarters, with a thin, wiry tail extending another three feet behind them. They possess short, stubby ears, protruding jaws bearing rows of narrow, pointed teeth, thin, brown whiskers, and luminescent, yellow eyes emitting an

unnerving, malevolent glow. Their four legs end in oddly shaped, polydactyl, webbed paws tipped with jagged, calcified claws. Their short, brown fur glistens with an oily sheen, presumably waterproofing and cooling their bodies as they wade in the warm, murky waters of their habitat. Unfortunately for the bayowulf, trappers and poachers value them as a source of leather. Although unproved, some sages speculate that bayowulfs hunt humanoids in preference to other species as a deliberate response to the commercial harvesting of their skin.

These savage predators, equally adept at hunting on land or in shallow water, nomadically wander an expansive area in search of humanoid prey. Bayowulfs speak Common and Aquan.

Combat

Bayowulfs rely upon their ability to generate fog as their first line of defense. In addition to providing concealment, the billowing mists also enable the creatures to utilize their Scent ability and Blind-Fight feat to effectively surround and flank their adversaries. Although ferocious, bayowulfs flee underwater when seriously threatened, regrouping and attacking again at a more advantageous time.

Breath of the Moor (Su): At will, a bayowulf can exhale a thick, billowing cloud from its lungs that fills a stationary, 30-foot cube centered on the bayowulf. The fog obscures all sight, including darkvision, beyond 5 feet. A creature within 5 feet has concealment (attacks have a 20% miss chance). Creatures farther away have total concealment (50% miss chance, and the attacker can't use sight to locate the target).

A moderate wind (11+ mph) disperses the fog in 4 rounds; a strong wind (21+ mph) disperses the fog in 1 round. Otherwise, the fog disperses in 2d4 rounds. Magical and nonmagical fire immediately evaporates the mists within the inflammatory source's area of effect.

Disease (Ex): Bayou rot—bite, Fortitude DC 17, incubation period 1 day, damage 1d4 Str. Creatures failing the save must succeed on another DC 17 Fortitude save on each subsequent day or suffer 1 point of Strength drain. The save DC is Constitution-based.

Howl (Su): As a standard action, a bayowulf can let out a terrifying howl that affects all living creatures within 20 feet. Affected creatures must succeed on a DC 13 Will save or be shaken for the remainder of the encounter. If the save is successful, that creature cannot be affected again by the same bayowulf's howl for 24 hours. This is a sonic, mindaffecting fear effect. The save DC is Charisma-based.

Skills: A bayowulf has a +2 racial bonus on Hide, Listen, and Move Silently checks.

A bayowulf has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

*A bayowulf has a +4 racial bonus on Survival checks when tracking by scent.

Large Predators and Hostile Natives

No matter how unfriendly conditions in the physical barrier zone are, there is always someone living there. Sometimes these inhabitants are partners in trade, sometimes they are plunderers, and sometimes they are simply hungry. While deserts and mountains have they own limiting natural resources that make life in those areas more difficult to achieve, marshes and swamps have ample water, vegetation, and critters to feed larger predators and populations of intelligent humanoids. Caravan travel through swamps is one instance where safety in numbers is amplified. Most animals and magical beasts are hesitant to attack when greatly outnumbered, but travelers and pack animals that stray from the group best be on guard.

Wetland humanoids can be a boon or a bane, depending on the relationship of the passing caravan. Well adapted to the environment and familiar with native pack animals and the terrain, cooperative wetland natives make excellent guides, translators, animal handlers, and trade partners. However, these same traits make wetland humanoids dangerous enemies for unwanted guests passing through their territory. Below is a sampling of large predators and humanoids of the wetlands. For more creatures of the wetlands, look for *Monster Geographica: Marsh & Aquatic*.

Retch Hound

Medium Magical Beast
Hit Dice: 3d10+6 (22 hp)
Initiative: +2
Speed: 40 ft. (8 squares)
Armor Class: 17 (+2 Dex, +5 natural), touch 12, flat-footed 15
Base Attack/Grapple: +3/+5
Attack: Bite +5 melee (1d6+3)
Full Attack: Bite +5 melee (1d6+3)
Space/Reach: 5 ft./5 ft.
Special Attacks: Breath weapon, stench, trip
Special Qualities: Darkvision 60 ft., scent
Saves: Fort+5, Ref+5, Will+2
Abilities: Str 15, Dex 15, Con 15, Int 5, Wis 12, Cha 6
Skills: Listen +4, Search +3, Spot +8, Survival +3 (+7 when tracking by scent)
Feats: Alertness, Track
Environment: Temperate forests and marshes
Organization: Solitary, pair, or pack (3-6)
Challenge Rating: 3
Treasure: None

Alignment: Usually neutral (evil tendencies)
Advancement: 4-7 HD (Medium); 8-9 HD (Large)
Level Adjustment: —

This beast looks like a large wolf with sickly brownish-yellow fur, matted and torn in places. Small sores cover its body, each oozing a thick, yellowish-green liquid, and the creature's mouth is filled with pointed yellow teeth. Four large yellow eyes are aligned evenly across its head.

Retch hounds are highly aggressive and powerfully built carnivores that love the taste of human flesh and bones. Their appearance lends to the facade of a sickly, unhealthy dog which sometimes works to the retch hound's advantage when hunting its prey.

Retch hounds are often found in the service of powerful fighters and warriors, who use the dogs to guard prisoners, lead hunting expeditions, and perform other such services. A retch hound is only as loyal to its master as it has to be to insure its own survival. While the dog won't necessarily seek escape at the earliest possible time, it often turns on its master at some point. Retch hounds raised in captivity are often more loyal to their masters, than those captured in the wild. Retch hounds stand 4 to 4 ½ feet tall at the shoulder and weigh about 200 pounds.

Combat

Retch hounds hunt their prey in packs. Using an eerie howl, they seem to coordinate and communicate with one another during these hunts. A favored tactic of a retch hound pack is to encircle a foe and then hit it from all sides at once. Usually the largest hound in the pack is the leader. When slain, a retch hound melts into a pile of stinking and bubbling slime.

Breath Weapon (Su): Once per minute, a retch hound can belch forth digestive juices in a 10-foot cone. Affected creatures take 2d6 points of acid damage and are nauseated for 1d3 rounds. A successful DC 13 Reflex save halves the acid damage and prevents the nausea. The save DC is Constitution-based.

Stench (Ex): All living creatures (except other retch hounds) within 30 feet of a retch hound must succeed on a DC 13 Fortitude save or be sickened for 10 rounds. The save DC is Constitution-based. Creatures that successfully save cannot be affected by the same retch hound's stench for 24 hours. A delay poison or neutralize poison spell removes the effect from the sickened creature. Creatures with immunity to poison are unaffected, and creatures resistant to poison receive their normal bonus on their saving throws.

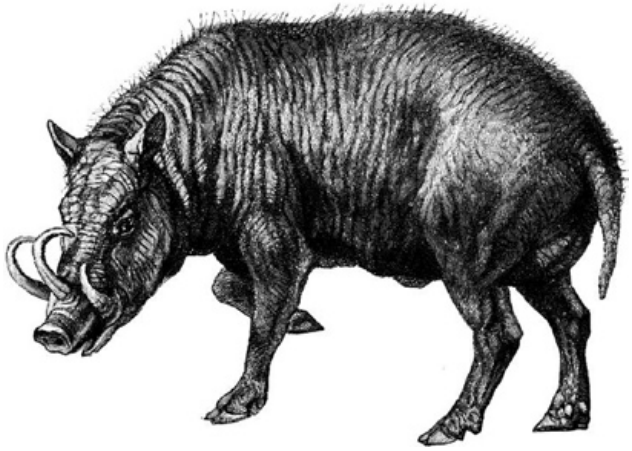
Trip (Ex): A retch hound that hits with a bite attack can attempt to trip the opponent (+ 2 check modifier) as a free action without making a touch attack or provoking an attack of opportunity. If the attempt fails, the opponent cannot react to trip the retch hound.

Skills: Because of its multiple eyes, a retch hound has a +4 racial bonus on Spot and Search checks. Retch hounds have a +4 racial bonus on Survival checks when tracking by scent.

Diseased Boar

Large Animal
Hit Dice: 9d8+ 63 (103 hp)
Initiative: -1
Speed: 40 ft. (8 squares), swim 30 ft. (6 squares)
Armor Class: 15 (-1 size, -1 Dex, +7 natural), touch 8, flat-footed 15
Base Attack/Grapple: +6/+18
Attack: Gore +13 melee (2d8+12)
Full Attack: Gore +13 melee (2d8+12)
Space/Reach: 10 ft./5 ft.
Special Attacks: Ferocity, stench, tidal surge
Special Qualities: Low-light vision, scent
Saves: Fort +13, Ref +5, Will +4
Abilities: Str 26, Dex 9, Con 24, Int 2, Wis 13, Cha 6
Skills: Jump +12, Listen +10, Spot +8, Swim +16
Feats: Alertness, Improved Bull Rush, Improved Overrun, Power Attack
Environment: Any marsh
Organization: Solitary
Challenge Rating: 5
Treasure: None
Alignment: Always neutral
Advancement: 10-18 HD (Large), 18-27 (Huge)
Level Adjustment: —

Some boars are too mean to die. They just live on, growing bigger and nastier. When their bulk becomes almost too great for their legs to support them, they retreat into the swamp to wallow in the mud, and let the water carry most of their weight. Over the decades, thousands of diseases and parasites flourish on the beast's rank hide. Eventually, roots and grass are no longer enough for the beast. The last sound many unfortunate swampfolk hear is a muffled, watery snorting before the boar devours them.



The death of a diseased boar is a great event in the swamp. When such a beast dies, it releases all the foulness and pestilence that it harbored within its flesh. The grave of a diseased boar is the epicenter of a miasma of disease and insects and foul rot. If a boar dies near a village or fishing ground, it can be disastrous. Swamp dwellers must therefore chase the boars into the uninhabited areas of the wilderness before killing them. Those brave enough to "course the boar" win great acclaim.

Combat

Diseased boars spend the majority of their lives in water, and normally attack by lunging out of the water, goring its prey, then sinking back.

Ferocity (Ex): A diseased boar is such a tenacious combatant it continues to fight without penalty even when disabled or dying.

Stench (Ex): Diseased boars are home to thousands of diseases, and the stench and foulness surrounding a diseased boar is palpable. All living creatures (except diseased boars) within 10 feet of a diseased boar must succeed on a DC 21 Fortitude save or be nauseated for 1d4 rounds. The save DC is Constitution-based. Creatures that successfully save cannot be affected by the same diseased boar's stench for 24 hours. Creatures with immunity to disease are unaffected.

Tidal Surge (Ex): A diseased boar can make a charge attack while moving through water, which creates a small tidal wave. Anyone within 10 feet of a charging diseased boar in a river or lake must succeed on a DC 22 Fortitude save or be knocked down. The save DC is Strength-based.

Skills: A diseased boar has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

Pumina Snake

Gargantuan Animal (Aquatic)
Hit Dice: 17d8 + 85 (161 hp)
Initiative: +3
Speed: 20 ft. (4 squares), climb 20 ft. (4 squares), swim 30 ft. (6 squares)
Armor Class: 18 (-4 size, +3 Dex, +9 natural), touch 9, flat-footed 15
Base Attack/Grapple: +12/+35
Attack: Bite +20 melee (2d6+16/19-20)
Full Attack: Bite +20 melee (2d6+16/19-20)
Face/Reach: 20 ft./15 ft.
Special Attacks: Constrict 2d6+16, improved grab, swallow whole
Special Qualities: Low-light vision, scent
Saves: Fort +15, Ref +13, Will +6
Abilities: Str 33, Dex 17, Con 21, Int 2, Wis 13, Cha 3
Skills: Balance +13, Climb +21, Hide +6, Listen +13, Move Silently +5, Spot +13, Swim +21
Feats: Alertness, Dodge, Improved Critical (bite), Skill Focus (Hide), Stealthy, Weapon Focus (bite)
Environment: Warm aquatic
Organization: Solitary
Challenge Rating: 8
Treasure: None
Alignment: Always neutral
Advancement: 18-34 HD (Gargantuan), 35-51 HD (Colossal)
Level Adjustment: —

These gargantuan constrictor snakes can grow to lengths exceeding 60 feet. Unlike many animals, pumina see humanoids as viable prey.

Combat

Pumina attack from underwater, wrapping around a target's legs and dragging the victim beneath the surface to drown.

Constrict (Ex): A pumina snake deals 2d6+16 points of damage with a successful grapple check.

Improved Grab (Ex): To use this ability, a pumina snake must hit with its bite attack. It can then attempt to start a grapple as a free action without provoking an attack of opportunity. If it wins the grapple check, it establishes a hold and can constrict.

Swallow Whole (Ex): A pumina snake can try to swallow a grabbed opponent of Huge or smaller size by making a successful grapple check. The swallowed creature takes 1d10 points of crushing damage plus 1d8 points of acid damage per round from the pumina snake's digestive secretions. A swallowed creature can climb out of the stomach with a successful grapple check. This returns it to the pumina's mouth, where another successful grapple check is needed to get free. A swallowed creature can also cut its way out by using a light slashing or piercing weapon to deal 16 points of damage to the pumina snake's gut (AC 12). Once the creature exits, muscular action closes the hole; another swallowed opponent must cut its own way out.

A pumina's stomach can hold up to 1 Huge, 2 Large, 4 Medium-size, 8 Small, 16 Tiny, or 32 Diminutive creatures.

Skills: Pumina snakes have a +4 racial bonus on Hide, Listen, and Spot checks and a +8 racial bonus on Balance and Climb checks.

A pumina snake can always choose to take 10 on Climb checks, even if rushed or threatened. A pumina snake has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

Lizardfolk

Medium Humanoid (Reptilian)
Hit Dice: 2d8+2 (11 hp)
Initiative: +0
Speed: 30 ft. (6 squares)
Armor Class: 15 (+5 natural) or 17 (+5 natural, +2 heavy shield), touch 10, flat-footed 15 or 17
Base Attack/Grapple: +1/+2
Attack: Claw +2 melee (1d4+1) or club +2 melee (1d6+1) or javelin +1 ranged (1d6+1)
Full Attack: 2 claws +2 melee (1d4+1) and bite +0 melee (1d4); or club +2 melee (1d6+1) and bite +0 melee (1d4); or javelin +1 ranged (1d6+1)
Special Attacks: —
Special Qualities: Hold breath
Space/Reach: 5 ft./5 ft.
Saves: Fort +1, Ref +3, Will +0
Abilities: Str 13, Dex 10, Con 13, Int 9, Wis 10, Cha 10
Skills: Balance +4, Jump +5, Swim +2
Feats: Multiattack
Environment: Temperate marshes
Organization: Gang (2–3), band (6–10 plus 50% noncombatants plus 1 leader of 3rd–6th level), or tribe (30–60 plus 2 lieutenants of 3rd–6th level and 1 leader of 4th–10th level)
Challenge Rating: 1
Treasure: 50% coins; 50% goods; 50% items
Alignment: Usually neutral
Advancement: By character class
Level Adjustment: +1

A lizardfolk is usually 6 to 7 feet tall with green, gray, or brown scales. Its tail is used for balance and is 3 to 4 feet long. A lizardfolk can weigh from 200 to 250 pounds. Lizardfolk speak Draconic.

Combat

Lizardfolk fight as unorganized individuals. They prefer frontal assaults and massed rushes, sometimes trying to force foes into the water, where the lizardfolk have an advantage. If outnumbered or if their territory is being invaded, they set snares, plan ambushes, and make raids to hinder enemy supplies. Advanced tribes use more sophisticated tactics and have better traps and ambushes.

Hold Breath: A lizardfolk can hold its breath for a number of rounds equal to four times its Constitution score before it risks drowning.

Skills: Because of their tails, lizardfolk have a +4 racial bonus on Jump, Swim, and Balance checks. The skill modifiers given in the statistics block include a –2 armor check penalty (–4 on Swim checks) for carrying a heavy shield.

Quisloi

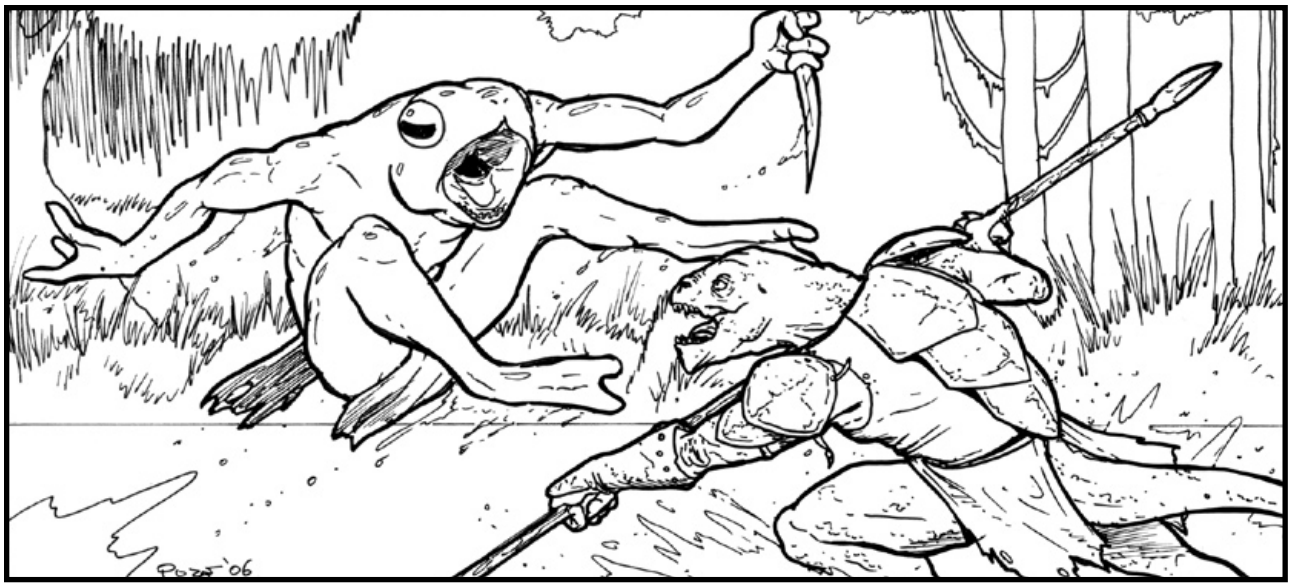
Medium Humanoid (Aquatic, Reptilian)
Hit Dice: 4d8+8 (26 hp)
Initiative: +3
Speed: 35 ft. (7 squares), swim 50 ft. (10 squares)
Armor Class: 19 (+3 Dex, +5 natural, +1 light wooden shield), touch 13, flat-footed 16
Base Attack/Grapple: +3/+3
Attack: Spit +6 ranged (poison) or dagger +6 melee (1d4/19-20 plus poison)
Full Attack: Spit +6 ranged (poison) or dagger +6 melee (1d4/19-20 plus poison)
Space/Reach: 5 ft./5 ft.
Special Attacks: Poison, spit
Special Qualities: —
Saves: Fort +3, Ref +7, Will +1
Abilities: Str 10, Dex 17, Con 15, Int 10, Wis 11, Cha 10
Skills: Hide +8*, Listen +6*, Move Silently +10*, Swim +8
Feats: Stealthy, Weapon Finesse
Environment: Temperate and warm marsh
Organization: Gang (4-5) or squad (6-12)
Challenge Rating: 3
Treasure: Standard
Alignment: Always evil
Advancement: 5-8 HD (Medium); 9-12 HD (Large)
Level Adjustment: +3

Quisloi are intelligent amphibious humanoids that make their homes on underwater enclaves lush, wet surroundings. Their rubbery skin is bright green with colorful patterning similar to frog of the rainforest. Many creatures, including the quisloi themselves, use the toxic mucus that exudes from their skin as a paralytic poison. The quisloi are often at odds with the skresh, who hunt the quisloi for their people's poison production. Quisloi speak Aquan.

Combat

Quisloi fight like most swamp and jungle creatures, relying upon camouflage and skill to lure their opponents into traps. They presume any intelligent creatures encountered work for the hated skresh, and attack in superior numbers. Their favored weapon is the dagger, useful underwater as well as on land. On land, they coat their daggers with poison. The quisloi are not poison masters like the skresh (page 100), relying instead on their shamans to brew the poison they use from their own excretions.

Taking advantage of their natural swimming abilities whenever possible, quisloi attempt to retreat into a stream or marsh lake if routed. Usually, they wait until their foe is near water before attacking. They try and flank their opponents, gaining a +2 to hit.



Poison (Ex): Contact, Fortitude DC 14, initial damage 1d3 Dex, secondary damage paralyzed for 1d6 hours. The save DC is Constitution-based.

Spit (Ex): Combat begins with hidden quisloi spitting globs of mucus at their prey as a standard action. Once a quisloi spits, it cannot spit again for 10 minutes. This yellow-green glop is treated as a ranged touch attack with a range increment of 20 feet. On a successful hit, the foe is blinded and must succeed on a DC 14 Fortitude save or be paralyzed for 1d6 hours. The save DC is Constitution-based. A creature remains blinded until it spends two full-round actions to clear off the thick and adhesive gunk.

Skills: A quisloi has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

*A quisloi has a + 10 racial bonus on Hide, Listen, and Move Silently checks when using these skills against skresh.

Skresh

Medium Humanoid (Reptilian)
Hit Dice: 6d8+6 (33 hp)
Initiative: +2
Speed: 30 ft. (6 squares)
Armor Class: 15 (+2 Dex, +2 leather armor, +1 buckler), touch 12, flat-footed 13
Base Attack/Grapple: +4/+4
Attack: Shortspear +5 melee (1d6 plus poison) or javelin +6 ranged (1d6 plus poison)
Full Attack: Shortspear +5 melee (1d6 plus poison) or javelin +6 ranged (1d6 plus poison)
Space/Reach: 5 ft./5 ft.
Special Attacks: Poison
Special Qualities: Darkvision 60 ft., jungle movement
Saves: Fort +3, Ref +7, Will +2
Abilities: Str 11, Dex 15, Con 13, Int 10, Wis 10, Cha 11
Skills: Craft (alchemy) +8, Climb +5, Hide +14, Listen +7, Move Silently +14, Spot +2, Survival +9
Feats: Alertness, Stealthy, Weapon Focus (shortspear)
Environment: Temperate and warm marsh
Organization: Scout (6-12) or family (60-100)
Challenge Rating: 5
Treasure: Standard
Alignment: Usually neutral evil
Advancement: By character class
Level Adjustment: +2

Skresh are sinister reptilian humanoids that ruthlessly seek to dominate their neighbors, whoever they may be. Their skin varies from dark green, browns, and ferrous red, and their sallow eyes merely hint at their scheming. The skresh speak their own language, a variant of Draconic.

Combat

Skresh rely on their skill at moving unseen and silently through the jungle to surprise their enemy. In battle, they depend on a wide variety of poisons to incapacitate their foes. If opposing an unknown, such as a party of PCs, the skresh usually drug their opponents, taking them back to the patriarchal head of the family for examination. Skresh use shortspears and javelins with poisoned tips. Some wear leather armor and most use bucklers made of toughened kari dragon hide. They attack from concealed positions with javelins, often making it difficult for their opponents to gauge how many skresh they face.

Jungle Movement: Skresh suffer no penalties for moving through trackless jungle or swamp.

Skills: Skresh have a +8 racial bonus on Hide, Move Silently, and Survival checks and a +5 racial bonus on Craft (alchemy) checks.

Illiterate: Skresh are illiterate and must spend two skill points to gain the ability to read and write a language they can speak (the Skresh language may not be chosen as it has no written component).

Poison: All skresh are trained in the use of poison. They learn a specialized form of the Craft (alchemy) skill targeted at the concoction of poisons. Skresh are familiar with all poisons available in any campaign although they prefer to use their own, more effective, poisons. It takes a number of days equal to the concoct DC divided by 3 to make 2d4 doses of a poison. This time is reduced by one day for every three points of success over the DC that the skresh rolls. Skresh poisons are well known throughout the world as the most potent, and command significant prices on the rare occasions that they can be found outside the skresh's native land. When first encountered in combat, most skresh use Treeblood. Only when an enemy poses a known threat to the entire skresh race is Skresh Fire used. Only patriarchal heads know how to make Skresh Fire.

Skresh Fire: Craft DC 26; Contact, DC 26; Initial paralysis 1d6 hours; Secondary death; cost 1,500 gp.

Barmik Root: Craft DC 21; Injury, DC 20; Initial 2d6 Dex; Secondary 2d6 Dex; cost 2,000 gp.

Ankala Snake Venom: Craft DC 23; Injury, DC 23; Initial 1d8 Str; Secondary 1d6 Str + 1d6 Con; cost 800 gp.

Blue Fog: Craft DC 21; Injury, DC 19; Initial 3d10 hp; Secondary 2d10 hp; cost 700 gp.

Treeblood: Craft DC 18; Injury, DC 19; Initial paralysis 2d6 hours; Secondary Unconsciousness 1d6 hours; cost 400 gp.

Spindleshank

Large Humanoid (Aquatic, Reptilian)
Hit Dice: 5d8 (22 hp)
Initiative: +5
Speed: 30 ft. (6 squares), swim 60 ft. (12 squares)
Armor Class: 15 (-1 size, +1 Dex, +5 natural), touch 10, flat-footed 14
Base Attack/Grapple: +3/+9
Attack: Trident +4 melee (2d6+2 plus poison) or sling +3 ranged (1d6+2)
Full Attack: Trident +4 melee (2d6+2 plus poison) or sling +3 ranged (1d6+2)
Space/Reach: 10 ft./10 ft.
Special Attacks: Poison
Special Qualities: Amphibious
Saves: Fort +3, Ref +5, Will -1
Abilities: Str 14, Dex 12, Con 10, Int 13, Wis 7, Cha 10
Skills: Jump +10, Spot +6, Survival +6, Swim +10
Feats: Great Fortitude, Improved Initiative
Environment: Warm forest and marsh
Organization: Gang (3-9), or tribe (10-100)
Challenge Rating: 5
Treasure: Standard
Alignment: Usually chaotic evil
Advancement: 6-10 HD (Large), 11-15 HD (Huge)
Level Adjustment: +3

Spindleshanks are a very tall, gaunt race of amphibian-like creatures that inhabit hot, steamy jungle and swamp environments. Spindleshanks come in a wide variety of colors, ranging from an almost fluorescent green color to a drab, flat gray. Many sages theorize that this wide range of coloration denotes a difference between spindleshank tribes, and in fact spindleshanks of a like color typically associate with one another and are aggressive toward those of a different color. Others think the coloration variations are due to differences in habitats, but the true reason still remains unknown.

Spindleshanks have stumpy, square-looking heads similar to turtles, with small, watery slitlike eyes, a mouth, but no visible nose or ears. A spindleshank's thin, willowy arms appear far too short in comparison to their long, spindly legs that give them their name. Their bodies are shaped like tall, narrow barrels, which the spindly legs ending in wide, flat and splayed feet support. Both their hands and feet are webbed and clawed, but their feet are huge in comparison to their hands and the rest of their body.

Spindleshanks speak Aquan, but can speak broken Common when required.

Combat

Spindleshanks are fiercely territorial, defending their territory and clan against any foe regardless of the danger. They fight best in small, tightly knit groups and specialize in ambush tactics as well as trap setting. Many believe that these creatures share an empathic link because their combined actions flow seamlessly together, as if one collective mind were directing them. This is especially true during combat, where the spindleshanks use their simple weapons (spears, tridents, nets, darts, and slings) to devastating effect. Also a potent neurotoxin exudes from their skin when they become excited, angry, or hurt. They coat their weapons' tips with this virulent substance during combat to paralyze their victims, thereby gaining the upper hand. At any given time, the spindleshank's body produces enough venom for 1d4 doses.

Poison (Ex): Injury, Fortitude DC 16, initial damage 1d4 Con, secondary damage paralysis for 2d4 hours. The save DC is Constitution-based and includes a +4 racial bonus.

Skills: A spindleshank has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

Rot, Rust and Ruin

Swamp caravans have to be especially aware of their condition and the condition of their pack animals and goods. Trudging through standing water day after day takes its toll on the feet. Trench rot is a foot infection caused by prolonged exposure to cold, wet, unsanitary conditions, such as the conditions in cold marshes and seasonally in temperate marshes. The early signs of trench foot are numb feet and discoloration of the skin, turning red or blue. If untreated, trench foot can turn gangrenous and require amputation. To prevent trench foot, travelers can dry their feet and change socks frequently, while the application of animal fat or grease on the feet adds an additional layer between their feet and the water. In warmer marshes (especially in tropical conditions), feet are susceptible to fungal foot infections, often called jungle rot. Symptoms are painful sores on the top of the feet, caused by an allergic reaction to the fungus itself. Sores may form on other parts of the body as the fungal infection progresses, including the chest, arms, and legs. Cuts and scratches may also become infected by the fungus and turn into painful sores. After a week of walking in the stated conditions, characters must make a Fortitude save DC 8 each day or contract trench rot or jungle rot (depending on climate). Characters that contract trench rot or jungle rot take 1d2 Con and 1d4 Dex damage until they leave the wet conditions for at least a week. The afflicted then makes another Fortitude save DC 8 on a daily basis until cured. Characters taking the appropriate precautions do not have to make a save until two weeks of walking in the stated conditions. Characters taking the appropriated precautions during the infection are permitted saves after a week, even if they are still walking in the wet conditions.

The humidity also takes toll on items. Paper, cloth, and dried material (herbs, incense, food stuff, etc.) have to be sealed in containers treated to resist water, such as fired ceramics sealed with wax or animal bladders. Leather items have to greased or oiled to resist absorbing water and potential rot. Metal items, like armor, shields, and weapons, have to be oiled and wiped down daily to resist rust. Wooden items are also susceptible to rot, but lacquering wood gives the wood a hard, durable finish, making it resistant to water, acid, and abrasion. Other items can also be lacquered, such as metal.

Animals

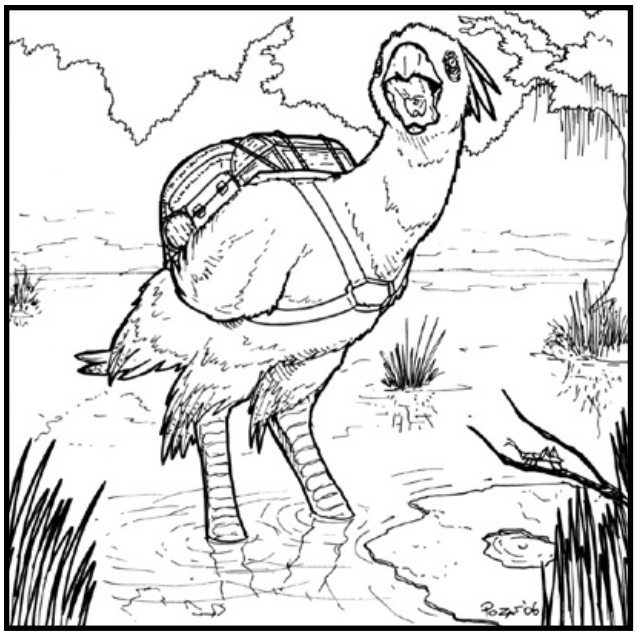
Traditional pack animals are susceptible to fungal infections, foot rot, parasites, disease, and other maladies of marshes, especially if they are not native to marshes. Hoofed animals are especially at risk for foot rot, where the foot becomes black and smells foul. Some pack animals can stave off foot rot with regular cleanings and limited exposure to water, while animals like the camel are not tolerant of standing water or moist ground. Certain animals like to plunge into water to cool down, problematic in swamps and marshes for numerous reasons. Animals that are particular about their water may find marsh water inadequate, but then again the travelers may also come to that conclusion.

Swamp caravans often use amphibious or reptilian pack animals. Although they do not have the stamina of mammalian pack animals (cold-blooded pack animals can only travel a total of 4 hours a day with frequent stops for heat regulation), they are better suited to the environment, accustomed to native diseases, and require less food (generally 1/10 of the food required for mammals of similar mass). Caravaneers also use amphibious and reptilian pack animals because there are places that cannot be traversed with mammalian creatures. Swamp caravaneers may also use aquatic animals, magical beasts, and vermin, although vermin are especially hard to train with their utter lack of intelligence. Below are two examples of wetland pack animals from *Monster Geographica: Marsh & Aquatic*.

Puddle Stalker

Large Magical Beast
Hit Dice: 6dl0+l2 (45 hp)
Initiative: +3
Speed: 40 ft. (8 squares), swim 10 ft. (2 squares)
Armor Class: 15 (-1 size, +3 Dex, +3 natural), touch 12, flat-footed 12
Base Attack/Grapple: +6/+13
Attack: Bite +8 melee (ld6+3) or eroca +8 ranged (1dl2 cold)
Full Attack: Bite +8 melee (ld6+3) or eroca +8 ranged (1dl2 cold)
Space/Reach: 10 ft./10 ft.
Special Attack: Eroca
Special Qualities: Darkvision 60 ft., lowlight vision, resistance to cold 10
Saves: Fort +7, Ref +7, Will +2
Abilities: Str 16, Dex 16, Con 14, Int 3, Wis l0, Cha l0
Skills: Jump +7, Listen +9, Spot +10
Feats: Ability Focus (eroca), Alertness, Run
Environment: Any marsh or coastal
Organization: Flock (1-8)
Challenge Rating: 3
Alignment: Always neutral
Treasure: None
Advancement: None
Level Adjustment: —

This creature appears to be a large bird of prey, with a sharp beak and long legs. Sand-colored feathers, streaked with blues and greens, cover its body and vestigial wings.



Puddle stalkers are 9-foot tall birds of prey that have lost their ability to fly due to their size and weight. Their bodies and dwarfed, vestigial wings are covered with a sand-colored feathers decorated with streaks of blues and greens. They primarily hunt with their sharp, snapping beaks, through which they spray a fluid that freezes water instantaneously. They are commonly found near water, enjoying a fish-cicle.

Combat

Eroca (Ex): Puddle stalkers can squirt a stream of eroca from their beak up to 5 times a day with a maximum range 30 feet with no range increments. A single application of this substance will instantly freeze a roughly 6-foot-diameter circle of water one foot deep. Anyone caught in the area can attempt a DC 17 Reflex save to avoid being caught. Those that fail their saves are trapped in the ice and can free themselves by dealing 20 points of damage to it (AC 10). A creature hit by the eroca stream takes 1d12 points of cold damage. The save DC is Constitution-based.

Skills: A puddle stalker has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

Training a Puddle Stalker

Puddle stalkers can be trained to serve as mounts or pack animals. A mounted puddle stalker appears ungainly, but they are quite capable of carrying a rider. Training a puddle stalker requires six weeks of work and a successful DC 18 Handle Animal check. Riding a puddle stalker requires an exotic saddle. A puddle stalker can fight while carrying a rider, but the rider cannot also attack unless he or she succeeds on a Ride check.

Carrying Capacity: A light load for a puddle stalker is up to 152 pounds; a medium load, 153-306 pounds, and a heavy load, 307-460 pounds. A puddle stalker can drag 1,840 pounds.

Eroca Bladders: These dried animal bladders filled with liquid eroca can be thrown as ranged weapons or spilled. Treat this as a splash weapon with the same effect as a dose of eroca spouted by a puddle stalker. Cost 40 gp.

Blight Belcher

Large Magical Beast (Aquatic)
Hit Dice: 12d8+36 (90 hp)
Initiative: +6
Speed: 15 ft. (3 squares), swim 40 ft. (8 squares)
Armor Class: 21 (-1 size, +2 Dex, +10 natural), touch 11, flat-footed 19
Base Attack/Grapple: +12/+23
Attack: Bite +18 melee (1d12+7)
Full Attack: Bite +18 melee (1d12+7) and claw +16 melee (ld8+3)
Space/Reach: 10 ft./5 ft.
Special Attack: Breath weapon
Special Qualities: Amphibious, darkvision 60 ft., low-light vision, scent
Saves: Fort +11, Ref +10, Will +3
Abilities: Str 24, Dex 14, Con 16, Int 4, Wis 8, Cha 8
Skills: Hide +5, Jump +1, Listen +6, Move Silently +4, Spot +6, Swim +15
Feats: Alertness, Improved Initiative, Multiattack, Power Attack, Stealthy
Environment: Any aquatic
Organization: Solitary
Challenge Rating: 6
Alignment: Always neutral
Treasure: None
Advancement: 13-16 HD (Large), 17-20 HD (Huge)
Level Adjustment: —

This 8-foot long beast looks like a cross between a salamander and an alligator. It has green-brown scales, short, stocky legs, and a muscular tail.

Blight belchers are scaled amphibious creatures that are equally at home on land, in salt water, or in fresh water. Their powerful tail helps them maneuver in the water while their short stocky legs allow them to move through sand, soil, and mud.

Though typically found in saltwater, blight belchers enjoy bathing on beaches, rolling in mudflats, swimming up inlets, and hunting in freshwater as well. Blight belcher jaunts on land eventually lead to water, least their scales dry out.

Combat

Blight belchers are typically docile unless they are hungry or other creatures threaten their territory. Besides attacking with bite and claws, blight belchers also unleash a noxious gas that affects that works equally well underwater or on the surface.

Breath Weapon (Su): 30-foot cone of poisonous gas, once every 1d4 rounds, damage 1d4 Str and 1d4 Con, Fortitude DC 19 half. The save DC is Constitution-based. If a blight belcher uses its breath weapon underwater, it rises up to the surface and engulfs all within a 10-foot radius directly above the blight belcher.

Amphibious (Ex): Although blight belchers are aquatic, they can survive indefinitely on land.

Skills: A blight belcher has a +8 racial bonus on any Swim check to perform some special action or avoid a hazard. It can always choose to take 10 on a Swim check, even if distracted or endangered. It can use the run action while swimming, provided it swims in a straight line.

Training a Blight Belcher

Young blight belchers can be trained to serve as mounts or pack animals. The advantages of a blight belcher mount are threefold; the rider is often able to goad the creature into using its breath weapon against foes, blight belchers can move on land as well as in the water, and they make excellent trackers due to their acute sense of smell.

Training a blight belcher requires six weeks of work and a successful DC 20 Handle Animal check. Once an untrained blight belcher reaches full maturity it is almost impossible to train (DC 35). Riding a blight belcher requires an exotic saddle. A blight belcher can fight while carrying a rider, but the rider cannot also attack unless he or she succeeds on a Ride check.

Carrying Capacity: A light load for a blight belcher is up to 699 pounds; a medium load, 700-1,398 pounds, and a heavy load, 1,399-2,100 pounds. A blight belcher can drag 10,500 pounds.

Procedure

An average day's travel in the swamp is largely dependent on the caravaneers and pack animals used. For humanoids and pack animals unaccustomed to marsh conditions, expect 12-16 miles a day. For native humanoids with marsh creatures (not reptiles and amphibians) acting as pack animals, 24 miles is a safe estimate for a day's travel. For native humanoids using reptilian pack animals, expect 16 miles a day.

The bulk of travel is during sunlight hours, although travel in tropical wetlands may start earlier to minimize travel during the heat of the day. Reptilian and amphibious pack animals have to make frequent stops for heat regulation due to their cold-blooded nature, but caravaneers do not have to bring feed for these wetland natives. For travelers with mammalian animals, feed and clean water may be more of an issue, as well as predation at night.

Solid ground that is relatively dry constitutes a camp in the wetlands. Animal dung, plant material, and wood serve as fuel, although it is harder to kindle a flame with wet materials. For travel in swamps, hammocks and hanging sleeping quarters assure travelers some respite from water. Nighttime is the greatest danger to pack animals and travelers alike, both from hostile natives and nocturnal predators. Regular guard rotations may alarm the camp of danger, but not before an errant horse or traveler becomes a midnight snack.

Underground Caravans

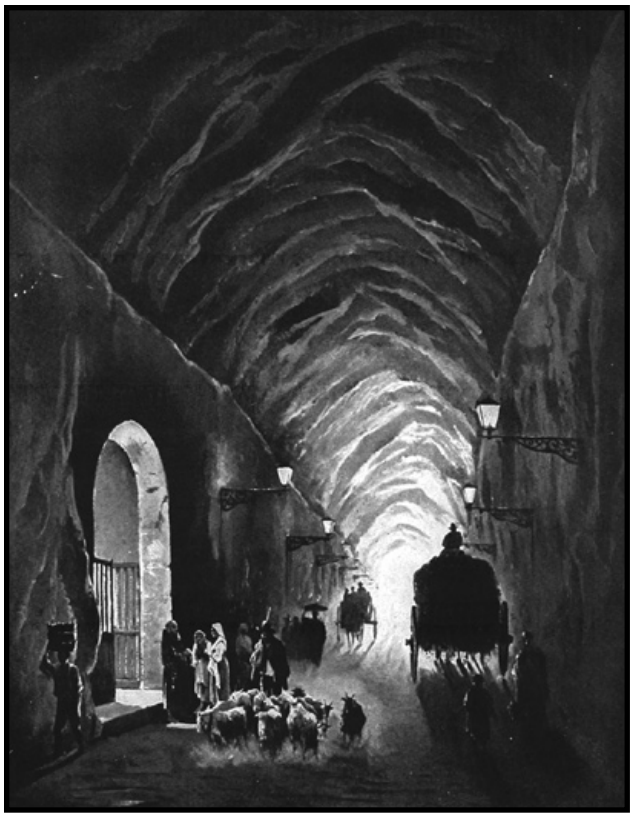
"If anyone was to ask for my opinion, which I note they're not, I'd say we were taking the long way around."

~Gimli upon making the suggestion of traveling through Moria.

Fantasy worlds have their cadre of underground inhabitants, opening up another realm for caravans. Traveling through the earth may reduce the distance and time of a trip, especially when avoiding mountains where much of the travel is moving up and down the slopes. Underground travel may be safer with the presence of flying predators or an ongoing war between surface dwellers. Taxation on the surface may become burdensome, especially if caravans pass through the domain of dragons and other avaricious figures. For underground natives, traveling through the earth may be common place, and surface dwellers are just discovering the possibilities. Whatever the reason, traveling through the depths of the earth bears its own set of hazards and provisions.

Landscape

Underground realms vary in composition. There may be fungi forests and grasslands, stone and gravel deserts, underground river systems and lakes, and natural caves complexes. There are three main types of natural caves: limestone caves, lava caves, and ice caves. Limestone caves are the caves most familiar to explorers, and they are the most common. They form when water dissolves limestone on its way through the water table or down to the table. The water dissolves limestone due the acidity picked up as it falls through the air and travels through stone. Most other stones are more resistant than limestone (although gypsum and halite are exceptions to this rule) and are not eroded in such a manner. Over long periods of time, these small erosions create large caves or cave complexes. Within the cave proper, the same erosive process creates many mineral decorations. As the mineral-laden water moves, it deposits some of its load through evaporation. This creates the numerous pleasing formations found in caves. Many of them are carbonate speleothems, and they're classified according to their shape. Stalactites, stalagmites, soda straws, cave bacon, columns, draperies, and flowstones are all carbonate speleothems, decorating natural underground environments.



Opposite of limestone caves are lava caves, created through the movement of lava from geological hotspots (mostly volcanoes). Lava flows eventually enclose themselves because the outer layers harden while the inner layers still flow, carving long tubes under the hardened shell. If the lava evacuates the tube, lava caves are born. Lava caves share formations with limestone caves, but they're formed differently. Cooling lava creates tube formations as it splashes, drips, flows, and spatters.

Ice caves are caves created in large pieces of ice, usually glaciers. Most ice caves form as flowing water etches open areas within the ice. Sometimes ice caves form when ice breaks open, snow fills the crack, and the snow compacts into ice, though this method is more rare. Ice caves are particularly dangerous to explore, as they are the most transitory of all caves and often unstable. Unlike limestone caves and lava tubes, ice caves fluctuate faster than typical geography since water cuts through ice rather than stone.

In general, caves have a very stable environment in comparison to the surface. Everything changes much slower, though change does occur. Temperatures vary based upon air movement, and the slight discrepancies between the deep cave and the surface cave create wind. The slight differences in humidity also create the cave's form of rain: the alteration of the dew point. Some places are naturally more humid and wet than others. But all of these things only occur in "live" caves. "Dead" caves no longer have water flowing through them and contain almost no life. Cave life is minimal without photosynthesis. There are three types of cave life. Troglobites can only complete their life cycles inside a cave system (eyeless fish, shrimp, and crayfish). Troglophiles can complete their life cycles in caves if there is food enough (worms, snails, cave crickets, cave spiders). Troglexenes cannot complete their life cycles inside a cave, but use caves for shelter or other important behaviors (bats, rats, flies). Much of the life depends upon the detrital chain; for example, flowing water brings decomposing creatures to feed the eyeless fish, shrimp and crayfish. Some caves support chemosynthetic life, though this relies on hydrothermal venting or water traveling through super-saturated stone. Magic plays its greatest role underground, where magiotrophs (life forms that create food by absorbing ambient magic prevalent in fantasy worlds) form the base for a complex underground food chain.

In this subterranean realm, humanoids sculpt homes, cities, and kingdoms subject to the same demographical forces as surface dwellers. Places with limited access to water and natural resources will encourage grouping, creating a string of high-density settlements amid a barren landscape. Places with ample water and natural resources are likely to have more settlements of smaller density with one or two cities in their mist. Native races are likely to have adaptations of subterranean living, such as low-light or dark vision (depending on how many generations they have been underground). Natural resources

rely on detrital matter, water, and magic rather than sunlight. Underground realms have fewer resources overall in comparison to the surface, but subterranean people are known for their industrious and resourceful nature. Fungi of all sorts thrive in caves, sometimes growing in huge forests of mushrooms and puffballs. Subterranean predators prowl these forests, looking for those feeding upon the fungi. Some varieties of fungus give off a phosphorescent glow, providing a natural cavern complex with its own limited light source. In other areas, a *daylight* spell or similar magical effect can provide enough light for green plants to grow.

Magiotrophs

In most fantasy worlds, magic is a real force that produces real results. Part of the world concept introduced in *A Magical Society: Ecology and Culture* is the idea of magic as a source of energy, like the sun or geothermal vents. Magic as a source of energy fuels the results when people cast spells, whether they attribute such power from understanding the universe or from gods. Magic as a source of energy is captured when people create magic items. Magic can also fuel life.

Like any good food chain, the bottom layer are magiotrophs, things which sustain themselves by absorbing the ambient magic present in fantasy worlds, similar to photosynthesis in plants. Certain creatures are magiovores, in that they "eat" magic through eating magiotrophs and more complex creatures in the magiotrophic pyramid. Some creatures require magic (like plants require sunlight) to activate special abilities and special qualities.

Although magic is distributed throughout a fantasy world, on a biological level, it plays the largest role in places with scarce natural resources, like deserts or underground. Creatures native to such terrains are truly creations of magic, biologically speaking.

Game Mechanics

Game mechanics are well equipped for underground environments. Below are a series of features commonly found underground, especially in natural caves. Humanoid-built places (settlements, cities, and kingdoms) are a different matter altogether, containing all the architectural complexity of the greatest surface realms.

Natural Cavern Complex: Underground caves provide homes for all sorts of subterranean monsters. Created naturally and connected by a labyrinthine tunnel system, these caverns lack any sort of pattern, order, or decoration. With no intelligent force behind its construction, this type of dungeon is the least likely to have traps or even doors. Often, a natural cavern complex connects with humanoid-made architecture, the caves having been discovered during scouting or construction. A cavern complex often connect subterranean cities, taking advantage of pre-carved routes for travel.

Bridge: A bridge connects two higher areas separated by a lower area, stretching across a chasm, over a river, or above a pit. A simple bridge might be a single wooden plank, while an elaborate one could be made of mortared stone with iron supports and side rails. In subterranean realms, the width and construction of a bridge largely depends on use. Bridges that lead into a prominent cities are more likely to be built sturdy and wide (and perhaps retractable for defensive purposes) than a bridge connecting smaller communities for local use.

Narrow Bridge: If a bridge is particularly narrow, such as a series of planks laid over lava fissures, treat it as a ledge (see Special Floors). It requires a Balance check (DC dependent on width) to cross such a bridge.

Rope Bridge: Constructed of wooden planks suspended from ropes, a rope bridge is convenient because it's portable and can be easily removed. It takes two full-round actions to untie one end of a rope bridge, but a DC 15 Use Rope check reduces the time to a move action. If only one of the two supporting ropes is attached, everyone on the bridge must succeed on a DC 15 Reflex save to avoid falling off, and thereafter must make DC 15 Climb checks to move along the remnants of the bridge. Rope bridges are usually 5 feet wide. The two ropes that support them have 8 hit points each.

Drawbridge: Some bridges have mechanisms that allow them to be extended or retracted from the gap they cross. Typically, the winch mechanism exists on only one side of the bridge. It takes a move action to lower a drawbridge, but the bridge doesn't come down until the beginning of the lowering character's next turn. It takes a full-round action to raise a drawbridge; the drawbridge is up at the end of the action. Particularly long or wide drawbridges may take more time to raise and lower, and some may require Strength checks to rotate the winch.

Railings and Low Walls: Some bridges have railings or low walls along the sides. If a bridge does, the railing or low walls affect Balance checks and bull rush attempts as described for ledges (see below). Low walls likewise provide cover to bridge occupants.

Ledge: Ledges allow creatures to walk above some lower area. They often circle around pits, run along underground streams, form balconies around large rooms, or provide a place for archers to stand while firing upon enemies below. Narrow ledges (12 inches wide or less) require those moving along them to make Balance checks. Failure results in the moving character falling off the ledge. Ledges sometimes have railings. In such a case, characters gain a +5 circumstance bonus on Balance checks to move along the ledge. A character who is next to a railing gains a +2 circumstance bonus on his or her opposed Strength check to avoid being bull rushed off the edge. Ledges can also have low walls 2 to 3 feet high along their edges. Such walls provide cover against attackers within 30 feet on the other side of the wall, as long as the target is closer to the low wall than the attacker is.

Pillar: A common sight in any dungeon, pillars and columns give support to ceilings. The larger the room, the more likely it has pillars. As a rule of thumb, the deeper in the earth a room is, the thicker the pillars need to be to support the overhead weight. Pillars tend to be polished and often have carvings, paintings, or inscriptions upon them.

Slender Pillar: These pillars are only a foot or two across, so they don't occupy a whole square. A creature standing in the same square as a slender pillar gains a +2 cover bonus to Armor Class and a +1 cover bonus on Reflex saves (these bonuses don't stack with cover bonuses from other sources). The presence of a slender pillar does not otherwise affect a creature's fighting space, because it's assumed that the creature is using the pillar to its advantage when it can. A typical slender pillar has AC 4, hardness 8, and 250 hit points.

Wide Pillar: These pillars take up an entire square and provide cover to anyone behind them. They have AC 3, hardness 8, and 900 hit points. A DC 20 Climb check is sufficient to climb most pillars; the DC increases to 25 for polished or unusually slick ones.

Pool: Pools of water collect naturally in low spots in live caves. Pools can also be wells or natural underground springs, or they can be intentionally created basins, cisterns, and fountains. In any event, underground water sources harbor sightless fish and sometimes aquatic monsters. Pools provide water for subterranean residents and thus are as important (if not more important) to control watering holes underground than aboveground in the wild.

Some pools have fountains. Occasionally these are merely decorative, but they often serve as the focus of a trap or the source of a pool's magic. Most pools are made of water, but anything's possible in a dungeon. Pools can hold unsavory substances such as blood, poison, oil, or magma. And even if a pool holds water, it can be holy water, saltwater, or water tainted with disease.

Shallow Pool: If a square contains a shallow pool, it has roughly 1 foot of standing water. It costs 2 squares of movement to move into a square with a shallow pool, and the DC of Tumble checks in such squares increases by 2.

Deep Pool: These squares have at least 4 feet of standing water. It costs Medium or larger creatures 4 squares of movement to move into a square with a deep pool, or characters can swim if they wish. Small or smaller creatures must swim to move through a square containing a deep pool. Tumbling is impossible in a deep pool. The water in a deep pool provides cover for Medium or larger creatures. Smaller creatures gain improved cover (+8 bonus to AC, +4 bonus on Reflex saves). Medium or larger creatures can crouch as a move action to gain this improved cover. Creatures with this improved cover take a –10 penalty on attacks against creatures that aren't also underwater.

Deep pool squares are usually clustered together and surrounded by a ring of shallow pool squares. Both shallow pools and deep pools impose a –2 circumstance penalty on Move Silently checks.

Special Pools: Through accident or design, a pool can become magically enhanced. Rarely, a pool or a fountain may be found that has the ability to bestow beneficial magic on those who drink from it. However, magic pools are just as likely to curse the drinker. Typically, water from a magic pool loses its potency if removed from the pool for more than an hour or so.

Hazards

For surface caravans using subterranean routes, the most challenging elements are the lack of sunlight, introduction of new diseases from the abundance of fungi and slimes, and underground predators.

Getting Lost

It is easy to get turned around underground, especially for those unaccustomed to subterranean travel without the trained eye for differences in stone composition and formations. Caravans may travel quite a distance before they realize they have chosen the wrong path. On-site regrouping and trailblazing is necessary when cave-ins, fighting, flooding, or construction make caves and caverns inaccessible. Treat getting lost in underground similar to getting lost in the desert, requiring a Survival check DC 15 each time there is a change in bearing. Having a guide or a seasoned traveler familiar with the terrain greatly reduces the chance you will get lost; such a person [effectively a person with 5 ranks in Knowledge (local) or Knowledge (Geography)] adds a +2 circumstantial bonus to Survival checks when a party changes bearing, recognizes that they are lost, and sets a new course. For those limited vision in the dark and without adequate light, treat as if traveling at night.

Sun Deprivation

The sun is a major stabilizer for surface dwellers. There is a deep connection with the great ball of fire in the sky that gives warmth, food, and light. Surface dwellers naturally make vitamin D when exposed to sunshine, and prolonged vitamin D deficiency leads to weak bones, muscular weakness and twitching, joint pains, and irritability. More serious effects like breast cancer, colon cancer, scoliosis, rickets, and osteoporosis are also linked with vitamin D deficiency. While few things are as effective as exposure to sunshine, a person can eat fish or take doses of fish liver oil to supplement their body while traveling underground. Lack of sun also affects mood, making people anxious, irritable, withdrawn, or depressed. Besides affecting mood, lack of sun can also affect circadian rhythm, throwing off one's internal clock. This may cause sluggishness, overeating, and excessive sleeping or insomnia. The key to resetting circadian rhythms and improving mood is light, in excess of 2500 lux (a measurement of brightness or the density of light that falls on a given a surface).

Game Mechanics

Surface dwellers need light, and they need it regularly if they do not want to suffer from sun deprivation. For caravans, a morning dose of *daylight* is enough to create sufficient vitamin D and reset circadian rhythm, although larger caravans may not all fit within a 60 ft. radius. However, this is insufficient to counteract moodiness, granting a -2 circumstance penalty to Charisma checks and skill checks based on Charisma. Surface natives that cannot receive a daily dose of bright light while underground are subject to vitamin D deficiency. After three months without sufficient sunlight, vitamin D deficiency sets in, granting surface natives -2 circumstance penalty to Strength, Dexterity and Constitution.

Slimes, Molds, and Fungi

The absence of sunlight makes underground environment ripe for slimes, molds, and fungi and their affiliated diseases. Molds and fungi flourish in dark, cool, damp places, and most are harmless to native caravaneers and their animals. However, travelers from the surface should beware. A form of glistening organic sludge coats almost anything that remains in the damp and dark for too long. This kind of slime, though it might be repulsive, is not dangerous.

Game Mechanics

Green Slime (CR 4): This dungeon peril is a dangerous variety of normal slime. Green slime devours flesh and organic materials on contact and is even capable of dissolving metal. Bright green, wet, and sticky, it clings to walls, floors, and ceilings in patches, reproducing as it consumes organic matter. It drops from walls and ceilings when it detects movement (and possible food) below.

A single 5-foot square of green slime deals 1d6 points of Constitution damage per round while it devours flesh. On the first round of contact, the slime can be scraped off a creature (most likely destroying the scraping device), but after that it must be frozen, burned, or cut away (dealing damage to the victim as well). Anything that deals cold or fire damage, sunlight, or a *remove disease* spell destroys a patch of green slime. Against wood or metal, green slime deals 2d6 points of damage per round, ignoring metal's hardness but not that of wood. It does not harm stone.

Brown Mold (CR 2): Brown mold feeds on warmth, drawing heat from anything around it. It normally comes in patches 5 feet in diameter, and the temperature is always cold in a 30-foot radius around it. Living creatures within 5 feet of it take 3d6 points of nonlethal cold damage. Fire brought within 5 feet of brown mold causes it to instantly double in size. Cold damage, such as from a *cone of cold,* instantly destroys it.

Cracked Foot: contact, Fortitude save DC 13, incubation 1d3 days, damage ½ movement. Victims catch cracked foot through exposure to warm water teeming with microscope fungi, often from prolonged waters through very moist, subterranean mud or by the slightest immersion of their feet in an underground body of water. Commensurate with its name, cracked foot affects the feet. During the incubation period, the soles of the feet slowly transform from their normal color to a scarlet red. When the disease fully manifests, deep painful fissures and cracks scar the sole of the foot. Cracked foot reduces the victim's movement in half, making walking extremely painful and prohibiting the affected individual from running. There is a 1% chance of contracting cracked foot for every hour spent walking through damp, moist environments. There is a 5% chance of contracting cracked foot for every minute spent immersed in an underground body of water.

Dark Mold: inhaled, Fortitude Save DC 16, incubation 1d6 days, damage special. This sickly, black fuzzy mold grows on the damp floors of cave entrances, feeding on the decaying seeds and vegetation left by transient cave dwelling animals. A prolific reproducer, dark mold constantly spews its infectious microscopic spores into the surrounding are, a phenomena only visible on a Spot check (DC 32) as a slightly hazy cloud. Living creatures passing through the cloud notice no discernible effects; however the miniscule particles venture through the victim's nasal cavity before entrenching themselves within the lining of the lungs. During the incubation period, the mold reproduces rapidly until the downy fungus coats large portions of the lungs, inhibiting breathing and causing a constant, unproductive

cough. As the disease peaks, the victim suffers 1d3 points of Constitution damage, and the persistent cough makes speech difficult. A spellcaster suffering from an infestation of dark mold miscasts any spells with a verbal component half of the time. In addition, the incessant hacking also imposes a -4 penalty to Concentration, Hide, Listen, and Move Silently checks. There is a 3% chance of encountering dark mold per week spent traveling through caverns.

Nerve Twister: contact, Fortitude Save DC 17, 2d6 hours, damage special. Nerve twister severely tests its victim's threshold of pain, wracking the afflicted person's contorted body with waves of excruciating agony. The fungus responsible (forsaken mold) feeds exclusively on decaying bodies of humanoids. Often mistaken for normal decomposition, the membranous black mold tinged with round green splotches very slowly eats away at its host's flesh. Only direct contact with mold risks transmission. Once contracted, the mold burrows through the skin, attacking the upper layer of epidermis. As first, the victim only experiences a mild, throbbing sensation in affected areas of the skin; however there are no visible signs of infection. At the conclusion of the incubation period, thin black twisted thread-like organisms manifest just below the skin, strangling the adjacent nerve endings. Waves of unbearable agony surge through the victim's body. Every hour, the victim suffers 1d8 points of nonleathal damage. In addition, the wrenching pain contorts the limbs, imposing a -2 circumstance penalty to all attack rolls and skill checks with the exception of Concentration check which is automatically failed. Once a character fails unconscious, nerve twister deals 1d3 points of normal damage until the victim recovers or dies. There is a 3% chance of encountering forsaken mold on any dead humanoid body found below the earth's surface.

Phosphorescent Fungus (No CR): This strange underground fungus grows in clumps that look almost like stunted shrubbery. Dark elves cultivate it for food and light. It gives off a soft violet glow that illuminates underground caverns and passages as well as a candle does. Rare patches of fungus illuminate as well as a torch does.

Yellow Mold (CR 6): If disturbed, a 5-foot square of this mold bursts forth with a cloud of poisonous spores. All within 10 feet of the mold must make a DC 15 Fortitude save or take 1d6 points of Constitution damage. Another DC 15 Fortitude save is required 1 minute later—even by those who succeeded on the first save—to avoid taking 2d6 points of Constitution damage. Fire destroys yellow mold, and sunlight renders it dormant.

Cave-ins and Collapses

Cave-ins and collapsing tunnels are extremely dangerous. Not only do travelers face the danger of being crushed by tons of falling rock, even if they survive they may be buried beneath a pile of rubble or cut off from the only known exit. A cave-in buries anyone in the middle of the collapsing area, and then sliding debris damages anyone in the periphery of the collapse. A typical corridor subject to a cave-in might have a bury zone with a 15-foot radius and a 10-foot-radius slide zone extending beyond the bury zone. A weakened ceiling can be spotted with a DC 20 Knowledge (architecture and engineering) or DC 20 Craft (stonemasonry) check. Remember that Craft checks can be made untrained as Intelligence checks. A dwarf can make such a check if he simply passes within 10 feet of a weakened ceiling.

A weakened ceiling may collapse when subjected to a major impact or concussion. A character can cause a cave-in by destroying half the pillars holding the ceiling up.

Characters in the bury zone of a cave-in take 8d6 points of damage, or half that amount if they make a DC 15 Reflex save. They are subsequently buried. Characters in the slide zone take 3d6 points of damage, or no damage at all if they make a DC 15 Reflex save. Characters in the slide zone who fail their saves are buried.

Characters take 1d6 points of nonlethal damage per minute while buried. If such a character falls unconscious, he must make a DC 15 Constitution check. If he fails, he takes 1d6 points of lethal damage each minute thereafter until freed or dead.

Characters who aren't buried can dig out their friends. In 1 minute, using only her hands, a character can clear rocks and debris equal to five times her heavy load limit. The amount of loose stone that fills a 5-foot-by-5-foot area weighs one ton (2,000 pounds). Armed with an appropriate tool, such as a pick, crowbar, or shovel, a digger can clear loose stone twice as quickly as by hand. You may allow a buried character to free himself with a DC 25 Strength check.

Any character in the direct path of a falling stalactite must make a Reflex save DC 15; otherwise the stone spear skewers them and deals 2d6 point of damage plus an additional 1d6 points of damage per 10 feet traveled. A person may also cause the collapse

of a stalactite by dealing physical damage directly to the stalactite. The amount of damage required to accomplish this feat depends upon the stalactite's thickness. A stalactite is stone that has a hardness of 8 and 15 hp per inch of thickness.

Foul Air

Foul or bad air is applied to cave air that has low levels of oxygen, often in conjunction with high levels of other gases like methane, ammonia, or carbon dioxide. Although foul air is relatively uncommon in caves, the threat increases the deeper in the earth (especially in man-made shafts greater than 1,000 ft+ in descent), in the presence of geothermal vents and other volcanic activity. Foul air is also attributed to decomposing vegetation and high quantities of bat guano. In the case of methane, bad air is flammable, causing an explosion the size of the pocket of methane. Explosions of flammable gases in caves are rare, but when they do occur they are more lethal than foul air. In some caves, small bubbles of flammable gases trapped in stream-bottom mud create mini-explosions and flares when exposed to open flames. Small flares from bubbles of methane trapped in mud do 1 point of fire damage. Large pockets of volatile gases are another matter. Large pockets of flammable volatile gas are considered *fireballs* (10d6 fire damage).

Foul air has two separate but related events: oxygen deprivation and elevated carbon dioxide levels. Caves typically contain around 20% oxygen, and most of foul air's ill effects come from high concentrations of CO_2 in the air. Carbon dioxide can enter cave systems through water which has absorbed high levels of CO_2 from surface soil (often due to decay of vegetation) and displacing oxygen and nitrogen as the water evaporates. In deep caves with minimal air movement, CO_2 collects in the lower parts of the cave, making the lowest point contain the highest concentration of CO_2.

Increased pulse and breathing rates are the first signs of foul air. Further lack of oxygen impairs judgment and the ability to focus and maintain attention, while increasing levels of CO_2 make victims flush pink, feel hot, and increase clumsiness and fatigue. Severe oxygen deprivation can causes nausea and vomiting and extreme weakness, while CO_2 levels above 5-10% cause severe headaches, dizziness, intense panting, exhaustion, and could lead to coma or death with prolonged exposure.

Subterranean cities and tended routes will have proper ventilation shafts to prevent the occurrence of foul air, however on the open subterranean road, there is a chance, however small, that caravans may stumble upon foul air. Like caravans on the surface, subterranean caravans send scouts to check for bandits, examine upcoming conditions, and notify appropriate persons if a change in route must take

place. More than likely, it will be these scouts that encounter foul air, however large areas of foul air may be uncovered in mining expeditions or exploratory digging. While most oxygen deficient areas have a high level of CO_2, there are areas where hydrothermal vents superheat water with high sulfuric content, where elevated levels of sulfur co-inside with oxygen deficiency.

The naked flame test is one method of checking the oxygen content in the air. A flame will start reacting when in the oxygen is merely 19.5% of the air. At 17% oxygen, the flame will snuff out, which is good indicator to stop and go no further. Characters are likely to encounter foul air incrementally; the deeper one goes into a cave complex or the closer one travels to the source of CO_2, methane, or sulfur, the less oxygen in the air.

Floods

Flooding is a possibility in any place with moving water. Under ground, the most likely places to experience flooding are areas near rivers or lakes fed by continual water sources. Caves and caverns may experience seasonal flooding, due to snow melt for example, or there may be an unusual event, such as a giant sinkhole filled with water that suddenly becomes unplugged, introducing a large amount of water into a limited space. Conversely, erosion may wear away stone partitions that introduce water into new areas and cause flooding. For rules on flooding, see *Hazards* under "Swamp Caravans".

Horrors of the Deep

What would role-playing be if venturing into the earth didn't entail monster found in places that should not be opened? Tombs, lairs, prisons, and dungeons are all found in subterranean realms, while the deep has its own brand of large predators. While well-established trade routes and knowledgeable subterranean partners may reduce the chance of encountering the horrors of

the deep, anything can happen when you travel in the realm of stone and earth. For monsters of deep, pick up *Monster Geographica: Underground* for 200 monsters ranging from CR<1 to 20+ along with custom counters from Fiery Dragon Production's *Counter Collection: Ancient Darkness*.

Animals

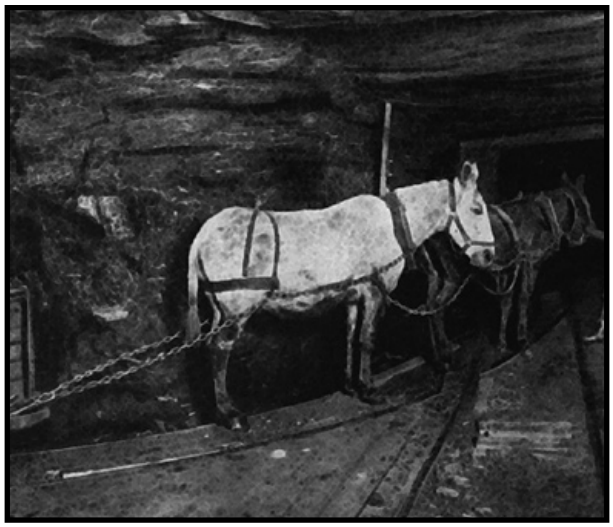
Native pack animals are always the first preference and especially so underground. While intelligent surface races can stomach cod liver oil or expose their skin to *daylight* every morning, surface animals do not fare well without sunlight. However, surface dwellers traveling underground must choose animals that are not adversely affected by light. Here are a few examples of subterranean pack animals and subterranean merchant races from *Monster Geographica: Underground*.

Ophean

Large Magical Beast
Hit Dice: 6d10+12 (45 hp)
Initiative: +0
Speed: 30 ft. (6 squares)
Armor Class: 15 (-1 size, +6 natural), touch 9, flat-footed 15
Base Attack/Grapple: +6/+14
Attack: Claw +9 melee (1d6+4) or tail club +4 melee (2d6+6/19-20)
Full Attack: 2 claws +9 melee (1d6+4) or tail club +4 melee (2d6+6/19-20)
Space/Reach: 10 ft./5 ft.
Special Attacks: Tail club, vocalization
Special Qualities: Darkvision 60 ft., lowlight vision, call ophean
Saves: Fort +7 Ref +5 Will +2
Abilities: Str 18, Dex 10, Con 15, Int 3, Wis 10, Cha 10
Skills: Listen +5, Spot +4
Feats: Improved Critical (tail club), Improved Overrun, Power Attack
Environment: Underground
Organization: Herd (4-16)
Challenge Rating: 3
Treasure: None
Alignment: Always neutral
Advancement: 6-12 HD (Large); 13-18 HD (Huge)
Level Adjustment: —

Opheans are large, bulky quadrupeds with a long tail, a short neck, and a billed-mouth. They have thick hides akin to rhinoceros, and they use their long bony-plated tails and thick claws for defense.

Low to the ground, these docile vegetarians typically graze on fungus and are found throughout the fungal forests of the deep. Wild opheans are



social animals and move in matriarchal herds. Some subterranean humanoids raise opheans for labor, milk, and meat.

Combat

An ophean attacks with raking claws or a tail swipe, depending on the position of its enemy.

Tail Club (Ex): If an ophean scores a successful critical hit with a tail club attack, the target must succeed on a DC 17 Fortitude save or have a bone broken. A target with a broken bone suffers a –2 penalty to Dexterity and Strength until the bone heals. The save DC is Strength-based.

Vocalization (Ex): As a full round action, an ophean can honk at a particular pitch to cause nausea. All creatures within a 40-foot cone must succeed on a DC 13 Fortitude save or be nauseated for 1d4 rounds. Other opheans are immune to this attack. This is a sonic effect. The save DC is Charisma-based.

Call Ophean (Ex): An ophean can make a loud honk to attract others of its kind, which can be heard at a range of up to 2 miles.

Undal

Large Magical Beast
Hit Dice: 5d10+10 (37 hp)
Initiative: +3
Speed: 30 ft. (6 squares)
Armor Class: 17 (-1 size, +3 Dex, +5 natural), touch 12, flat-footed 14
Base Attack/Grapple: +5/+12
Attack: Thumb spike +8 melee (1d8+5)
Full Attack: Thumb spike +8 melee (1d8+5)
Space/Reach: 10 ft./10 ft.
Special Attacks: Crown of horns
Special Qualities: Darkvision 60 ft., lowlight vision
Saves: Fort +6, Ref +7, Will +2
Abilities: Str 16, Dex 16, Con 15, Int 5, Wis 12, Cha 15
Skills: Listen +7, Spot +7
Feats: Alertness[B], Power Attack, Weapon Focus (thumb spike)

Environment: Underground
Organization: Solitary or herd (5-20)
Challenge Rating: 4
Treasure: None
Alignment: Always neutral
Advancement: 6-10 HD (Large); 11-15 HD (Huge)
Level Adjustment: —

The undal is a large quadruped that roams subterranean lands in large herds. Sometimes called the cattle of the deep, the undal is a peaceful, large vegetarian that grazes on mushrooms, mosses, and lichen. The most distinguishing characteristic of the undal is its majestic crown of horns. Unlike antlers, the undal's horns do not branch but grow from its head like hair.

The noja have a long tradition of domesticating undals, using them as draft animals, food, and trade. Wild undals roam the deep and are highly prized for their warm fur and horns.

Combat

An undal enters combat with a ferocious charge, then flails about with its thumb spike.

Crown of Horns (Ex): When an undal charges, it lowers its head to gore its enemy with its head full of horns. On a successful charge, the undal deals 4d4+5 points of damage with its horns. This attack takes the place of its thumb spike attack, and can only be performed if the undal is at least 30 feet away from its target.

Wyrdwolf

Large Magical Beast
Hit Dice: 8d10+8 (52 hp)
Initiative: +3
Speed: 30 ft. (6 squares)
Armor Class: 18 (-1 size, +3 Dex, +6 natural), touch 12, flat-footed 15
Base Attack/Grapple: +8/+16
Attack: Claw +11 melee (1d6+4)
Full Attack: 2 claws +11 melee (1d6+4) and bite +7 melee (2d8+2/19-20)
Space/Reach: 10 ft./10 ft.
Special Attacks: Pack attack, rend 1d6+4, strobe
Special Qualities: Darkvision 60 ft., lowlight vision
Saves: Fort +7, Ref +9, Will +3
Abilities: Str 18, Dex 16, Con 12, Int 5, Wis 12, Cha 10
Skills: Listen +6, Spot +7
Feats: Improved Critical (bite), Power Attack, Weapon Focus (bite)
Environment: Underground
Organization: Solitary or pack (2-4)
Challenge Rating: 5
Treasure: None
Alignment: Always lawful evil
Advancement: 9-16 HD (Large); 17-24 HD (Huge)
Level Adjustment: —

The wyrdwolf is a fierce pack hunter in the subterranean realm. Its long, lean body is over 7 feet tall and packed with taut muscles. Its hairless body is well armored by thick, leathery bone-white skin. A wyrdwolf has large claws and a huge jaw full of sharp fangs, but is most notable for its huge glowing eyes. Although relatively uncommon, wyrdwolves have an unsavory reputation among underground dwellers.

Combat

A wyrdwolf attacks with savage biting and clawing. It will usually begin combat with its strobe attack, hoping to disorient foes to make it easier to rip them to shreds.

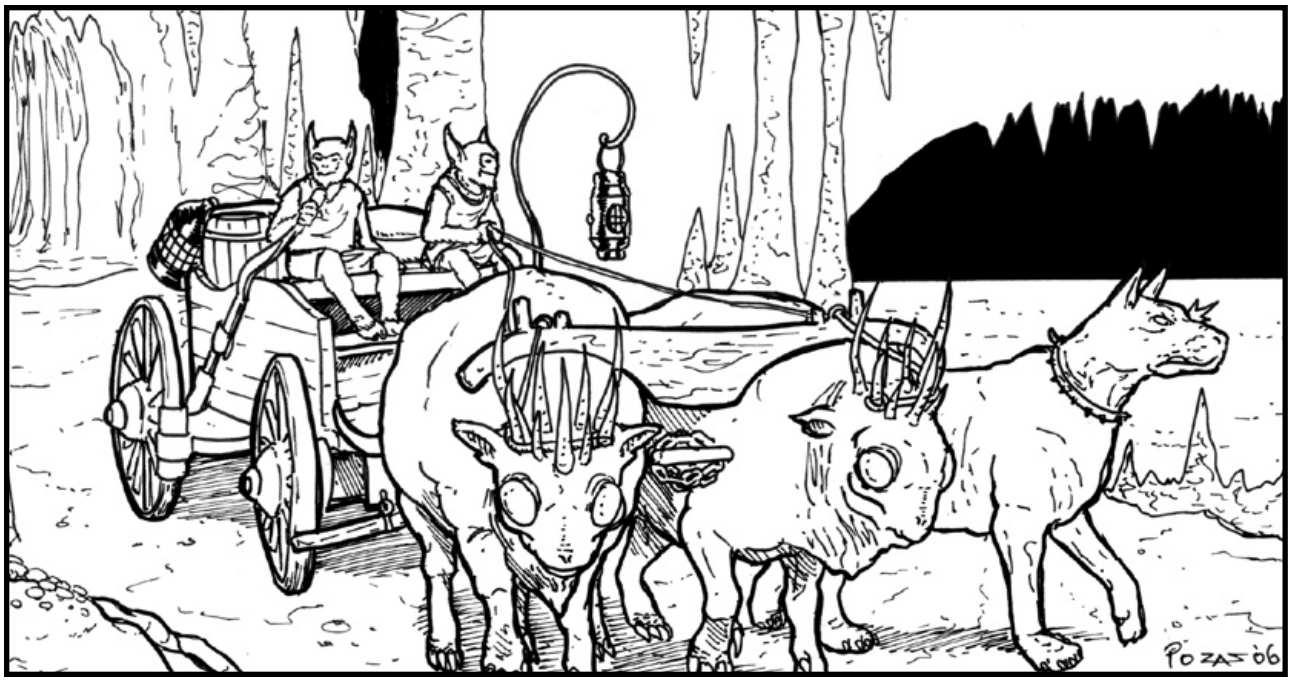
Pack Attack (Ex): Wyrdwolves are intelligent and coordinate their attacks. If two wyrdwolves flank the same opponent, they have a +4 flanking bonus on attacks instead of the usual +2.

Rend (Ex): If a wyrdwolf hits with both claw attacks, it latches onto the opponent's body and tears the flesh. This attack automatically deals an additional 1d6+4 points of damage.

Strobe (Su): A wyrdwolf can disorient its prey by momentarily increasing the brightness of its glowing eyes, as a free action once per minute. All creatures within 40 feet must succeed on a DC 14 Fortitude save or be blinded for 1d2+1 rounds. Creatures can avoid this attack in the same manner as a gaze attack. The save DC is Charisma-based.

Noja

Small Fey
Hit Dice: 3d6 (10 hp)
Initiative: +6
Speed: 30 ft. (6 squares)
Armor Class: 16 (+1 size, +2 Dex, +3 natural), touch 13, flat-footed 14
Base Attack/Grapple: +1/-3
Attack: Shortbow +4 ranged (1d4/x3 plus poison)
Full Attack: Shortbow +4 ranged (1d4/x3 plus poison)
Space/Reach: 5 ft./5 ft.
Special Attacks: Spell-like abilities
Special Qualities: Homebrew, low-light vision
Saves: Fort +1 Ref +5 Will +4
Abilities: Str 10, Dex 15, Con 11, Int 14, Wis 12, Cha 15
Skills: Appraise +6, Craft (any one) +6, Diplomacy +4, Escape Artist +8, Hide +8, Listen +8, Move Silently +6, Perform (any one) +4, Sense Motive +6, Sleight of Hand +7, Spot +8, Survival +7, Use Rope +2 (+4 bindings)
Feats: Alertness [B], Dodge, Improved Initiative
Environment: Underground
Organization: Band (1 female, 4-16 males)
Challenge Rating: 4
Treasure: Standard coins; standard goods; double items (potions only)



Alignment: Usually chaotic neutral
Advancement: 4-6 HD (Small)
Level Adjustment: +4 (female), +3 (male)

Noja are hairy little humanoids 3-4 feet tall with dark brown skin covered in thick black hair. Renown as traders in the subterranean realm, noja are a welcomed sight in underground cities, carrying fungi, lichens, and other exotic wear. Their carts are pulled by opheans and undals, and they often use wyrdwolfs in guarding their trade goods. Noja females are known for their shrewd intellect, and noja males for their penchant for mischief.

Combat

Noja shun combat, preferring trickery and magic to actual confrontation, but they can be quite adept at fighting if pressed.

Spell-Like Abilities: Female noja can use the following spell-like abilities: At will—*augury*, *cure serious wounds*, *detect magic*, *feather fall*, *grease*, *haste*, *silence* (DC 15), *tongues*; 3/day—*dream*, *sleep* (DC 14); 1/day—*eyebite* (DC 19), *heal* (DC 19). Caster level 10th. The save DCs are Charisma-based.

Male noja can use the following spell-like abilities: At will—*detect magic*, *flare* (DC 13), *silent image* (DC 14); 3/day—*cure light wounds* (DC 14); 1/day—*modify memory* (DC 15). Caster level 10th. The save DCs are Charisma-based.

Homebrew (Ex): A noja can make an alchemical brew that can emulate the effects of any first through third level spell that targets a creature. These non-magical concoctions function in the same manner as magical potions, and are made with a caster level of 10th. The noja are very secretive about their methods and ingredients.

Procedure

Like deserts and to some degree wetlands, finding sources of fresh water for travelers and their animals will largely dictate underground routes. However, subterranean caravans are effectively moving through a three dimensional space, unlike traveling on foot on the surface. One nice thing about traveling underground is walking on road all the way, with the notable exception of some bridges; slope, the presence of scree, and vegetation may slow movement in some areas but for the most part, movement is unhampered traveling underground.

One big difference in traveling through subterranean realms is construction: everywhere you travel was carved from stone, whether by natural forces (like water or lava), monstrous tunneling, or humanoid persistence. Large caravans with many animals will have less flexibility in which routes it they can take, since caves can get quite narrow. Environmental conditions are relatively stable underground, with little variation of day time temperatures from night time temperatures and minimal seasonal climate changes.

As always, security is an issue for caravans, both from raiders and predators. Regular scouting and constant vigilance keep most caravans safe as they travel from trading center to trading center in the depths of the earth.

Chapter 4: Money Matters

This chapter explains different levels of trade, how they work, and how to integrate such concepts in your game. Besides explaining micro and macro trade, this chapter also breaks down the kinds of goods traded on silk roads, ideas for luxury items (both mundane and magical), and how to simulate trading in a role-playing environment with mechanics for expenses and income through caravan trading.

Micro Trade

Although silk roads connect major civilizations across a physical barrier zone through a spider web of smaller roads, the bulk of trade is local in nature. Micro trade is moving goods from their production centers to consumers (such as village-to-village trading) or to a trading center (to distribute to consumers and macro traders). In general, if people are buying or bartering for goods mostly for consumption and not to sell to third parties, that trade is micro trade. The simplest type of micro trade is villages trading for basic necessities, such as herding villages trading for grain. Some micro traders distribute their goods through smaller trade cities. For example, consider the humble lettuce farmer a day's travel from a small trade city. During harvest, he takes his heads of lettuce to the small trade city and sells directly to consumers as well as selling half his harvest to a merchant (on his way to the next small trading city with a taste for roughage). The humble lettuce farmer is engaging in micro trade, but the merchant taking his lettuce to the next small trading city is conducting macro trade (see below).

Although trade is vital for existence, transactions need not be limited to basic necessities; annual trading trips are ideal times to acquire luxuries as well. Villages often have partners in trade, specific to the goods they are trading, and these trade partnerships become social and cultural ties with enough time and cooperation. Agricultural villages often send representatives (all the men, the leader of the village, or a well-respected mercantile family of the village) to conduct trade on behalf of the village, while other villages receive (or host depending on the social arrangement) traders from their partnering villages. Pastoral villages often move the entire village to conduct trade, all except the old and poor who stay at established winter or summer camps.

To borrow an example from the historic Silk Road, consider three villages on the side of the mountains. The village in the highest altitude (10,000 ft +) is a pastoral village that conducts little to no agriculture but collects salt from the shores of a nearby briny lake. The second village is still well into the mountains, but they can conduct agriculture with some success (8,000-10,000 ft). They also raise sheep and goats to increase their resources. The third village resides well into the agriculture zone (below 5,000 ft), conducting intense agriculture.

In this instance, the upper-most village of herders leave after harvest time (late fall) and head down the mountain with their entire herd and population, save the old, infirm, and poor (those that have no animals) who stay at the winter camp. They travel to their partner village, the agricultural village that is still solidly in mountainous terrain. This agricultural village has just finished harvest, and the village elders negotiate terms for the trade. In this instance, the agricultural village would trade grain for salt (for human consumption and husbandry), and negotiate winter foraging for the pastoral village's animals and taxation for moving through their territory to trade with other nearby villages. The grain and salt are carefully measured, the herders have established their winter grazing and movement rights, and they can continue to trade with other villages to acquire more goods, both basic and luxurious.

After successfully conducting trade with the herders, the agricultural mountain village loads up their sheep and goats with excess grain, dried beans, surplus salt (from the trade with the herders which will fetch a fine price further down the mountain), and wool and blankets from their livestock. This village caravan makes its way down the mountain into the lowlands, stopping at the village conducting intense agriculture. Not only do the sheep and goats have winter grazing, but the mountainous agricultural village can trade their wares for more grain, different staples, and luxury goods of the lowlands. In early spring, the mountainous agricultural village traders head home with their traded treasures, arriving in time for planting. In middle to late spring, the herding village moves up the mountain, following the trail of renewed grazing pastures, carrying their grains and trade goods home.

Micro trade also encompasses merchants who move goods for a living, so long as their scope do not encompass more than one civilization tangent to the barrier zone. Village merchants move local specialties to the smaller trade cities, traders from smaller trade cities move goods to crossroad cities, crossroad city merchants make the journey out of the barrier zone into an adjacent civilization, and those that can generate enough capital can hit all four tiers of micro trading on silk roads. An important aspect of micro trading is making mercantile endeavors social ones as well. For example, traders from smaller trade

cities have a cadre of trade partners (depending on commodity traded) that they conduct business with in a crossroad city. In this way, larger micro trading endeavors follow a pattern similar to village-to-village trade.

Micro trade is a vital part of silk roads because it is the most persistent type of trade. It will happen regardless if the protector state falls. It will happen even if sea trade becomes popular among the tangent civilization. It will happen if a new league of invaders and conquerors move into the barrier zone. Micro trade keeps the arteries and veins of the silk road open; it continues the movement of people and goods even in the worst of times.

Macro Trade

Unlike micro trade, the overarching goal of macro trade is to get an item from one side of the barrier zone (its production center or portal to the civilization which produces the good) to the other side, where the demand and price tempt men to cross deserts and scale mountains for such wealth. However, it is rare for one person to go from one end to the other and back, and most goods trade hands several times. Macro trade is any trade from trading center to trading center, although they often service communities and villages along their route to help fund the endeavor. In general, any transaction in which the bulk of the buying is not for consumption or selling to consumers but for selling to a third party (hopefully at a profit), it is a segment of macro trade.

How does one accomplish such an endeavor? Capital. Wealthy families pool their individual resources, merchants find partners with well-lined pockets, or people can take out loans with the expectation getting rich, even after paying off the loan with interest. Expeditions are typically funded by wealthy institutions: social (patrons), political (monarchs), or religious. Some fiscally-sophisticated areas may have established banking, but banking is often tied to the same parameters. Once funding is acquired, the journey begins; for more details on planning a caravan trip, refer to Chapter 2: Traveling on Silk Roads.

The definitions for micro and macro trading are based on how a good is bought and sold, rather than trying to label the trader involved in the transaction. This is because merchants often diversify their trade goods and deal on both schemes of trading. Typically, an item introduced into the macro trade will be bought and sold at least twice before reaching its consumer. For example, consider merchant A, who lives in a small trading city on his way to the crossroad city, approximately two weeks travel. He stocks up on local specialties as well as some foreign cloth that he bought for a fair price. Along the way, he sells his wares to smaller villages and buys some fine wool hats from a village renowned for their craftsmanship. When he reaches the crossroad city, he sets up shop, sells to consumers, and also sells some of the cloth, wool hats, and local specialties to merchant B traveling to another trade city. Merchant A loads up on personal shopping as well as items sought after in his home trading city and has engaged in both micro and macro trade, although most of his transactions fall under micro trading. However, everything that merchant B bought from merchant A is now in the macro trade.

Kinds of Goods

The mind reels at the endless wonders traveling along silk roads, strapped to the side of an animal or hidden in the jacket of the merchant. Below is a list of categories for trade goods. There are numerous factors that affect demand, supply, and price: availability, how far away it is being sold from its center of production, how many hands have exchanged that particular good, cultural significance, personal preference, and distinction through conspicuous consumption.

Cloth

Cloth covers a wide array of goods, from thread to embroidered tapestries. The most basic textile is plain cloth, woven from plant material (cotton, linen, hemp, etc.), made from woolen products (woven, knitted, or pressed into felt from animals like sheep, goats, yaks, and camels), or from insects, like silk from the bombyx moth. Textiles may be dyed, with various colors popular in different regions. Textiles may be made into clothing, shoes, hats, gloves, purses, and other accessories. They may be trimmed with satins, ribbons, silks, and velvets, or lined with furs. They can be embroidered with needle and thread or appliquéd for decoration. Textiles are also made into household items, such as rugs, wall hangings, and tapestries. Again, luxury of such items manifests in different fields: size, colors, quality of raw goods and craftsmanship, and desirability and difficulty in patterning.

Food Stuffs

Food stuffs are common in micro trading between villages and trading centers disseminating grain. They are seasonal items centered around harvest. Some are perishable, while others can be dried or preserved. As with all consumption, there are luxury goods, typically labeled because only the rich can afford diversity of food and high-priced food stuffs. The most accessible and cheapest foods are staple foods grown in the area. Common staple foods are wheat, barley, millet, rice, maize, legumes, and tubers.

Specialty foods are anything beyond what is required for bare sustenance. It's the flavor of eating. Fresh fruit and vegetables are available seasonally,

while dried fruits and nuts, pickles, and wine are more durable for travel and distribution. Dried herbs and exotic spices add flavor to food, and they are also attributed medicinal qualities. Variety and limited availability (either from distance traveled or seasonal availability) are the desirable factors to specialty foods.

Livestock

Whether for eating, herding, or carrying trade wares, there is always a demand for animals. Common animals for trading are horses, mules, camels, sheep, goats, llamas, yaks (mountains only), cattle, and elephants. These animals require specific tackle and barding as well as feed for animals on the road. Merchants selling tools for husbandry (grooming, shoeing, nursing, and steering animals) are also found where livestock trade flourishes. In addition to livestock, there is a high demand for slave labor. In a fantasy world, there are many social and racial dynamics for the slave trade.

Raw Materials

Raw materials of all types are traded along silk roads, from basic building materials to materials of luxury that will be made into fineries. Scarcity of a certain good in an area drives up demand and price of raw materials. Wood is used for buildings as well as furniture, housewares, containers (boxes and chests), and art (painting, carving, etching, etc). Stone is another dependable building material with plain stone at the low end and finer stone (granite, marble, etc) on the high end. Precious and semi-precious stones are found along silk roads, and gems are often attributed with deities, luck, or fortune. Stone is also used in sculpture as well as metal. Some metals are used for tools, others for instruments of war, while some are decorative. Common metals are brass, bronze, copper, iron, lead, silver, tin, and zinc. More expensive metals are gold, platinum, mithral, electrum, and adamantine. Animal products are another source of raw materials, such as wool, bone, fur, and hide. Although not strictly a raw material, glass is another raw material traded in the historic Silk Road, transported in bulb-shaped opaque ingots and sorted by color (pink, white, black, green, yellow, blue, brown, azure, red, or violet).

House wares

Many of the raw materials go into making finished goods for the house, and their level of adornment attest to the wealth and prestige of the owner. Every household needs containers and domestic tools, and specialization of domestic goods is another method of emphasizing wealth. Here are a few ideas of household wares: wooden and metal boxes; ceramic, wooden, metal, or glass jars, jugs, and glasses; utensils and dishes; leather or cloth sacks and bags; wooden or woven furniture; and other domestic tools for cooking, serving, and cleaning. Tools of the trade (from farmers to herders to craftsmen) are also common trade goods on silk roads, with finer specimens available for those who can afford it.

Jewelry and Adornment

Although technically not clothing, house wares, or tools, people spend a lot of money on ornamentation. Sometimes they are reserved for special occasions (festivals, weddings, and holy events), while others use finery every day of the week. Starting from the top: hats, headdresses, and hair accessories; make up for the face and body; earrings and ornaments for additional piercing of the face and body; necklaces and charms around the neck; bracelets around the wrists; rings for all fingers; belts around the waist and hips; and anklets. Pieces of stone, beads, metal, bells, coins, and expensive fabric can be sewn on clothing, worn in hair, or adorn displayed personal possessions.

Art

Art is a broad heading, and many adorned pieces of practical items can surely count as art by their craftsmanship. Examples of tangible art are paintings, illuminated books, and sculptures. Music, songs, poetry, storytelling, and folktales are oral art, another common commodity on silk roads. The tools of artists from musical instruments to pigments are traded wherever people ply their craft.

Magic and Religious Accoutrements

With the convergence of cultures, religions, and knowledge, great overland trade routes are a true melting pot, offering goods to sate a variety of divergent philosophical interests. Traders often carry and disseminate their own cultural philosophies within and across the barrier zone, and when a

religion or practice takes route, traders also supply the appropriate accoutrements. While the purpose and use of such items may vary from their original intent or design, silk roads bear in their arteries medicinal items and fetishes, paper and parchment, ink and writing utensils, incense and coals, drums and cymbals, and just about anything else you could build a study or religion around.

Trade System

This system is designed under the basic assumption that there is not a set price for items; the price evaluation system gives GMs and PCs a place to start negotiations, and the Buy DC and Sell DC allow GMs and PCs to simulate complex economies while introducing bargaining mechanics that do not rely on making opposed checks.

Trade System Terminology

Buy DC: The difficulty in purchasing an item (or bulk of items for traders) for the price calculated in the Price Evaluation process. It is modified by community size, the price of the item, and the bargaining modifier. The buyer attempting to purchase the item adds a bonus according to his prowess as a merchant.

Commerce Demand: The value of an item or commodity as a trade good, subject to market forces determined by campaign specifics and the GM. Commerce Demand effects the price in the Price Evaluation process before calculating the effect of days traveled.

Days Traveled: The average number of days it takes to travel from the Point of Origin to the Sales Point, dependent on animals, the use of wagons or carts, and terrain.

Merchant Quality: The prowess of a merchant based on the skill bonus to the following skills, crucial to mercantile endeavors—Appraise, Bluff, Diplomacy or Intimidate, Gather Information, and Sense Motive.

Point of Origin: The place where a good is extracted, manufactured, or finished (depending on the nature of the good).

Sales Point: The place where a good is bought and sold.

Sell DC: The difficulty is selling an item (or bulk of items for traders) for the price calculated in the Price Evaluation process. It is modified by community size, the price of the item, and the bargaining modifier. The seller attempting to unload his wares adds a bonus according to his prowess as a merchant.

Price Evaluation

Determining the price of an item for trade purposes hinges on a four distinct but related factors. This process gives GMs a toolset to simulate economic forces and unique mitigating factors in their worlds. These prices are geared for trading and traders, although they can be extrapolated for buying and selling single units for campaign purposes.

First, find the product or comparable item on the extensive charts provided (see *Chapter 5: Trade Goods*). These prices are representations of the cost of the goods at their Point of Origin, and the prices are listed for bulk purchasing. Next, modify the price by the Commerce Demand of the item; refer to Table 4.1 Commerce Demand. Commerce Demand represents the value of the item as a trade good and allows GMs to simulate market forces to their liking. For example, higher demand in specific locales (famine, war, changes in fashion, new trade routes to exotic locales) can increase a good's Commerce Demand. It also gives mechanical support to the idea that some goods are just more valuable as trade goods, even at the Point of Origin, because of the overall demand for the good.

The next factor is distance, measured in the number of days traveled from Point of Origin to Sales Point. Days traveled is the average amount of time it takes from Point of Origin to Sales Point, and that effects the price of the good. Every 20 days traveled from the nearest Point of Origin doubles the base price. Days traveled after the last complete 20-day segment increases the base price according to the following equation:

Remaining days/20 x Price after last doubling.

Merchants traveling within a shorter time period than the established average sell their goods for the same price, but have the advantage of lower transport cost. Merchants that travel longer than the established average days traveled sell their goods for the same price, but their extended traveling has eaten into their profits.

Table 4.1 Commerce Demand

Commerce Demand	Effect on Price
Low	-0.1
Average	—
Moderate	0.1
High	0.25
Exceptional	0.5

Table 4.2 Quality at Sales Point

Quality at Sales Point	Effect on Price
Low grade	-0.1
Average	—
Moderate	0.1
High	0.25
Exceptional	0.5

Lastly, the price is adjusted to reflect the quality of the good available at the Sales Point according to Table 4.2 Quality at Sales Point.

Pricing Examples

Consider 2 transport units of low grad silk purchased from a Point of Origin, the trading metropolis of Isfala. From the chart, silk is 200gp/ transport unit, or a total of 400 gp. In this campaign, silk has an exceptional commerce demand, raising the price 50% (200 gp), bringing the price for this load of silk to 600 gp. However, the silk is low-grade in comparison to the other silks available at Isfala, which drops the price 10% to 540gp.

Now, let's follow the same load of silk at its next stop at a trading post called Kalik, an average 20 days traveled from Isfala. Again, silk is 200gp/transport unit, and the merchant is carrying 2 transport units, totaling 400 gp. An exceptional commerce demand adds 50% to the price, making it 600 gp. 20 days traveled doubles the price of the silk for a total of 1200 gp. The silk is average quality in comparison to what is available at Kalik, so the final price at this trading stop is 1200 gp for 2 transport units of silk.

If a different merchant purchased this load of silk and traveled to Anguran, an area that does not manufacture silk (say, an average distance of 63 days traveled), he can make a tidy profit. When he purchased the silk, it was already 20 days travel from its nearest Point of Origin. Assuming that the merchant travels the slow way (no magical travel), the silk will be 83 days away from the nearest Point of Origin. Doubling the price 4 times brings the price of silk to 9,600 gp with an additional 1,440 gp for the 3 days traveled after the last complete 20-day segment. After traveling considerations, the price is 11,040 gp, however it is high quality silk compared to what is available so far from the production source. This raises the price an additional 2,760 gp, making the final price 13,800 gp for 2 transport units of silk.

Using the same 2 transport units of silk, consider the merchant who discovers a different path to the same area. Perhaps he makes an arrangement with dwarves in the area to travel through the mountains rather than over, and in doing so he cuts his travel time from the average 63 days traveled to 50 days. In the short term, he will save money in reduced traveling expenses while still charging as if it took him 63 days traveled. Overtime, as more traders switch to the more expeditious route, the price will eventually decrease as journey average shifts to 50 days traveled. At that time, the price will drop to 9,000 gp for the same 2 transport units of silk (total of 70 days traveled from the nearest Point of Origin to the Sales Point where the silk is high quality; taking into account an exceptional commerce demand for silk).

This same inventive merchant, greatly annoyed that everyone is using his route and cutting into his profits, has another idea to save time and in doing so make more money! He makes an arrangement with the local elves to teleport him and his goods from one end of the Great Forest to the other side, shaving off another 5 days from his trip while still charging 9,000 gp for his 2 transport units of silk. All is well for this ambitious merchant until the elves realize that teleporting merchants and caravans helps preserve the natural state of the Great Forest as well as give them additional income. They open up their teleportation services to all caravans willing to pay their price. Soon, the average time of the trip reduces to 45 days traveled. In addition, the increased efficiency in traveling injects more silk into Anguran, and comparatively higher quality silk is now available at the Sales Point (remember, this silk was low grade silk at the Point of Origin). His silk is now only moderate grade silk, whose price is 6,600 gp for 2 transport units (total of 65 days traveled from nearest Point of Origin to the Sales Point where the silk is moderate quality, but silk still has an exceptional commerce demand).

Buy DC and Sell DC

Once you've determined price, now you can set the Buy DC and Sell DC. These DCs reflect the difficulty in purchasing and selling goods for the evaluated price. They are modified by the size of the community you are conducting trade, the price of the transaction. Making a successful roll on the Buy DC means a player successfully purchased the item for an agreed price. Making a successful roll on the Sell DC means a player successfully sold the item for an agreed price.

Determine DC

First, determine the ease of trading the good at the location of trade, and then modify the base Buy/Sell DC by the price of the good. There are many mitigating factors that affect the ease of trade, more than likely things specific to your campaign. For example, trading a good at its Point of Origin is more than likely very easy. High demand with regular supply is another situation with easy trade. Conversely, limited or interrupted supply and negative social stigma may make items more difficult to trade. Illegal goods may be generally more difficult to trade, because they are not openly traded, and people have to know where to look for such things.

Determine Bonuses

Next, determine the bonuses that will affect the buyer's or seller's roll (respectively). There are a number of factors that modify a buyer's or seller's roll. First and foremost is the size of the community. In general, it is more difficult to conduct trade in smaller communities; however, if a small community (less than 900 people) functions as a caravanserais or established trading post frequented by merchants and those interested in trade goods, mechanically treat that community as a Small Town for the purpose of modifying buyer's and seller's rolls. Special events may also affect community size; consider the Small Town that hosts an annual fair or religious celebration, causing their typical population to temporarily swell to the population of a Large Town. During that time period, the community is mechanically treated as a Large Town.

The next consideration is the buyer's or seller's quality as a merchant. The quality of a merchant is determined by the total bonus (ranks+stat modifier+misc. bonuses) in the following skills: Appraise, Bluff, Diplomacy or Intimidate, Gather Information, and Sense Motive. These skills epitomize the tools merchants use in that delicate dance better known as bargaining. For example, a merchant with +5 in Appraise, Bluff, Diplomacy, Gather Information, and Sense Motive is considered a skilled merchant and adds a +1 to all rolls concerning Buy DCs and Sell DCs. If a merchant has +10 in Bluff, Diplomacy, Gather Information, and Sense Motive, but he only has +7 in Appraise, then the merchant is still considered a skilled merchant and adds a +1 to all rolls concerning Buy DCs and Sell DCs. Those with negative skill bonus in any of the merchant skills are considered poor merchants and have a -1 penalty to all rolls concerning Buy DCs and Sell DCs.

Last, buyers and sellers can affect their rolls (and the final price) through bargaining. Attempting to buy goods for less that their evaluated price adds a penalty to the buyer's roll while offering more than the evaluated price adds a bonus to the buyer's roll. Selling goods for more than their evaluated price adds a penalty to the seller's roll while selling goods at a discounted price adds a bonus to the seller's roll.

Traders Beware: buyers get limited chances to beat the Buy DC before they must offer more money for their purchase. Sellers get limited chances to beat the Sell DC before they must reduce their asking price. The size of the community determines the number of attempts before buyers or sellers must changing the bargaining price as well as the number of pricing changes through bargaining, see Table ??. GMs may use social ramifications to affect the mechanics behind bargaining. For example, if a merchant has approached many people to unload his wares, all of whom were not interested in his goods or his price, word may spread of his difficulty and other potential purchasers may hold out for lower prices (effectively raising the Sell DC).

Table 4.3 Determining Base DC

Ease of Trade	Base Buy/Sell DC
Easy	5
Moderate	10
Hard	15

Table 4.4 Price Modifier

Price of Item (gp)	Modifier to Buy/Sell DC
<1	-1
1-50	0
51-200	1
201-500	2
501-1,000	3
1,001-1,500	4
1,501-3,000	5
3,001-6,000	6
6,001-12,000	7
12,001-24,000	8
24,001-48,000	9
48,001-96,000	10
96,001-192,000	11
192,001-384,000	12

Table 4.5 Community Size Modifier

Community Size	Population*	Modifier to Buy/Sell DC	Number of Attempts Before Bargaining Price Change	Maximum Number of Bargaining Price Changes
Thorp	20-80	-3	1	1
Hamlet	81-400	-2	1	1
Village	401-900	1	1	2
Small Town	901-2,000	0	2	2
Large Town	2,001-5,000	3	2	3
Small City	5,001-12,000	6	3	4
Large City	12,001-25,000	9	3	5
Metropolis	25,001 or more	12	4	6

*Adult population. Depending on the dominant race of the community, the number of nonadults will range from 1-% to 40% of this figure.
**Treat all caravanserais with less than 900 people as "Small Towns" for purposes of trading.

Table 4.6 Merchant Quality

Merchant Quality	Minimum Bonus in Merchant Skills*	Bonus
Poor	<0	-1
Average	0	0
Skilled	5	1
Good	10	2
Exceptional	15	4
Legendary	20	8

*Appraise, Bluff, Diplomacy or Intimidate, Gather Information, and Sense Motive

Table 4.7 Bargaining Modifier

Buying Price Modifier	Modifier to Roll	Selling Price Modifier
0.7	-24	4
0.75	-20	3
0.8	-16	2
0.85	-12	1.75
0.9	-8	1.5
0.95	-4	1.25
1.25	1	0.95
1.5	2	0.9
1.75	3	0.8
2	4	0.7
3	5	0.6
4	6	0.5

Buy DC Example

Using the prices derived from the pricing examples, consider the merchant buying silk in Isfala. A load comprising of 2 transport units of low-grade silk is priced 540 gp. Begin the process with assessing the ease of trading for silk in Isfala, more than likely "easy" because Isfala is a Point of Origin for silk. Then, modify the base Buy DC 5 by the price of the transaction, +3 for the 501gp-1,000gp range. Therefore, purchasing 2 transport units of low-grade silk from Isfala at 540 gp is Buy DC 8.

The merchant is looking at a sizable bonus to his roll. He is trading in a metropolis, giving him a +12 bonus, and he is a good merchant (+10 bonus in all the merchant skills) which gives him a +2 bonus, for a total of +14. Given the ease of trading silk, the resources of the city, and his prowess as a merchant, the prospective buyer considers aggressive bargaining. Weighing his odds, he starts bargaining with one silk merchant for 0.85 of the evaluated price, taking a -12 penalty to his sizable bonus.

Therefore, purchasing 2 transport units of low-grade silk in Isfala for 459 gp is Buy DC 8 (note that the drop in price does not retroactively affect the Buy DC in the first determination step). The merchant rolls 1d20+2. He rolls an 11, making his total 13, which beats the Buy DC and the merchant has successfully purchased 2 transport units of low-grade silk for 459 gp.

Sell DC Example

This industrious merchant is much pleased with his silk purchase and travels to Kalik, where the price was evaluated at 1,200 gp for the same 2 transport units of silk (see price evaluation example above). Trading silk is moderately difficult in Kalik, where more sensible goods are traditionally traded (like food, animals, and tools), but there are traders

who dabble in luxury goods. If the merchant wants to unload his silk in one transaction in Kalik, he will have to beat a Sell DC 14.

Kalik is a small settlement with only 500 people, but it is an established trading post and is mechanically treated as a Small Town with no bonus for the merchant. However, he is still a good merchant (+10 bonus in all the merchant skills), which grants him a +2 bonus. Weighing his odds, he decides to stick with the evaluated price of 1,200 gp, still a sizable gain for his effort.

Our merchant plies his trade, rolling 1d20+2, to beat a Sell DC 14. Unfortunately, he insults his first potential buyer's prize camel (rolled a 3) and fails to seal the deal. Our merchant tries again, but he fails to entice the next potential buyer (rolled a 6). The merchant lowers his price to 0.95 of the price evaluated (1,140 gp) and adds a +1 to his next attempt (1d20+3). Our merchant finds a third potential buyer in the tea shop, and over swapping news finds out the trader is heading toward Anguran, a place where silk is a rare and precious commodity. Over drinks an agreement is made (rolled a 13), and our merchant has successfully sold 2 transport units of silk for 1,140 gp.

Time to Divest

"Time is money," the adage goes. Finding buyers, scouting out for new trade goods, negotiating a transaction, and coordinating the actual transfer of goods all takes time, and a single person can only do so much in a day. There are two factors to consider in determining the time it takes a merchant to divest his goods. First, a person can only conduit a maximum number of transactions per day, determined by community size. The maximum number encompasses both buying and selling transactions. Failed Buy DC and Sell DC attempts count against the maximum number of transactions per day. Second, the largest transaction in monies determines the amount of time it takes to divest a merchant's goods: the higher the evaluated price for the transaction, the longer is takes to find appropriate buyers and coordinate the exchange of goods. The time of divest is modified by the community size: the larger the community, the larger the pool of prospective buyers and labor to exchange goods. In game circumstances can increase the amount of money traded in a day. For example, a regional fair may infuse in area with extra people and wealth, causing a humble Small Town to swell to the population and wealth of a Large Town.

What's all this costing me?

As with any investment venture, one must always look at the bottom line. While counting profit hand-over-fist brings gleeful giggles from the most hardened merchants, one must also calculate how much money is required upfront and how much money is at risk.

Animals

If you do not already own animals, the largest expense, besides the cost of the actual trade goods, is the animals. Animals have different transport capacities based on strength and physiology. In addition, they also have different upkeep costs and speeds, making each caravan a compromise between environment, carry capacity, speed, and money. The following table summaries the real and fantastic animals discussed in *Chapter 3: Types of Caravans*.

Table 4.8 Time to Divest by Community Size

Community Size	Population*	Maximum Number of Transactions Per Day	Time to Divest (price)
Thorp	20-80	5	1 day/100 gp
Hamlet	81-400	5	1 day/1,200 gp
Village	401-900	5	1 day/3,600 gp
Small Town	901-2,000	6	1 day/7,200 gp
Large Town	2,001-5,000	7	1 day/14,400 gp
Small City	5,001-12,000	8	1 day/21,600 gp
Large City	12,001-25,000	9	1 day/36,000
Metropolis	25,000+	10	1 day/57,600 gp

*Adult population. Depending on the dominant race of the community, the number of nonadults will range from 1-% to 40% of this figure.
**Treat all caravanserais with less than 900 people as "Small Towns" for purposes of trading.

Table 4.9 Pack Animal Information

Name	Upkeep	Favored environment	Miles Per Day	Maximum Packing Weight (lbs)	Transport Capacity (weight/bulk)	Miles per Day with Vehicle	Vehicle (lb) per animal
Aecanopyornis	2 cp	Desert	28 miles	150	3/4	16 miles	300
Blight Belcher	8 cp	Swamps	24 miles (swim), 12 miles	900	18/36	–	–
Camel	8 cp	Desert	28 miles	600	12/24	16 miles	1800
Droth'yar	8 cp	Cold or Desert	28 miles	400	8/12	16 miles	800
Elephants	1gp 7sp 7cp	–	24 miles	3250	65/72	16 miles	9750
Goats	–	–	16 miles	20	.5/2	16 miles	40
Horse, Heavy	1sp 4cp	–	28 miles	400	8/20	16 miles	1200
Horse, Light	1sp 1cp	–	32 miles	300	6/16	16 miles	900
Pony	4 cp	–	24 miles	150	3/8	16 miles	450
Llama	8 cp	Cold or Mountains	16 miles	80	2/6	16 miles	160
Mule	4 cp	–	16 miles	400	8/20	16 miles	1200
Ophean	8 cp	Underground	16 miles	600	12/28	16 miles	1200
Puddle Stalker	8 cp	Swamps	24 miles	300	6/8	–	–
Sheep	–	–	16 miles	20	.5/2	16 miles	40
Undal	8 cp	Underground	16 miles	450	9/22	16 miles	1350
Yak	8 cp	Cold and High Altitude	24 miles	300	6/16	16 miles	600

Name: The name of the animal. Note that all animals discussed in Chapter 3: Types of Caravans are found on the list.

Upkeep: The cost of upkeep per animal per day, including food and equipment maintenance.

Favored Environment: Some animals have a specific environment where they are employed as pack animals. If there is no listing, assume that the animals are appropriate in multiple terrain conditions.

Miles Per Day: Under the best circumstances for travel, this is how fast an animal can move a day while carrying the maximum packing weight. Different terrains and situations will modify this figure.

Maximum Packing Weight (lbs): Packing directly on the animal, this is the average amount of weight the animal carries while moving the average miles-per-day listed in *Chapter 3: Types of Caravans*. Animals can often carry more and travel slower, but time is money on the road and caravaneers do not wish to overburden animals that are supposed to last a long and arduous journey.

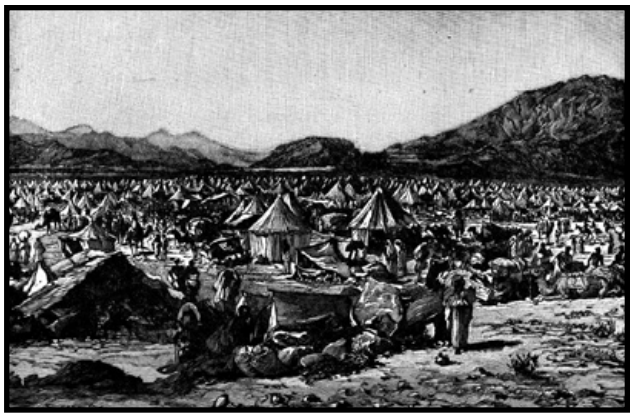
Transport Capacity: Transport capacity is a ratio between weight and bulk, using the same ratio system as the transport values listed on the Master List of Trade Goods. The base weight is 50 pounds and the base bulk is roughly a 15inx15inx15in cube, roughly the size of a bushel. To give a real life comparison, grains are generally 1/1, or 50 pounds for 1 bushel. Animals are packed until either the weight or the bulk surpasses their Transport Capacity. For example, a camel has a Transport Capacity of 12/24. That means the camel can either carry 12 transport units (or 600 pounds), or the equivalent bulk of 24 bushels of material (or 81,000 cubic inches or three 2.5ftx2.5ftx2.5ft cubes). Don't worry, there are some examples below.

Miles Per Day with Vehicle: Vehicles have a base speed of 20, which is also subject terrain and situational modifiers. However, caravans using vehicles ignore bulk when calculating Transport Capacity, making weight the only consideration.

Vehicle (lbs) Per Animal: This is the weight one animal can pull without overburdening the animal. On carts and wagons that allow multiple animals to pull the vehicle, the weight limit is then determined by the vehicle's weight limit (listed in the Master List of Trade Goods under "Transportation"). Due to physiology or behavior, some animals cannot pull vehicles.

Loading Animals

Each animal's ability as a pack animal is expressed in transport capacity, which is a ratio between weight and bulk. For example, a camel has a transport capacity of 12/24. That means that the camel is fully loaded when is carries 12 transport units of weight or 24 transport units of bulk. Consider four camels, all alike in dignity. If camel #1 is loaded with 12



transport units of canvas (transport value of 1/2), the camel is fully loaded with 12/24 exactly. However, camel #2 is loaded with wool (transport value of 1/3), carrying 8 transport units of wool, a total load of 8/24. All the while, camel #3 is carrying 12 transport units of poplar wood (transport value of 1/1), loaded with 12/12. Finally, camel #4 is loaded with 6 transport units of leather (transport value 2/3), for a total of 12/18. For traders with vast caravans, this system is expandable. For a train of 100 camels, the total Transport Capacity is 120/240 for the most efficient of packers, so long as no single animal is forced to carry a load exceeding its Transport Capacity.

Remember, transport units are weight/bulk values. A 1/1 load means it weighs 50 pounds and is roughly the bulk of a bushel. Items that are very heavy for their size have a greater ratio between weight and bulk, such as stone with an average transport value of 6/1. Items that are very bulky for their weight have a smaller ration between weight and bulk, such as wool with a transport value of 1/3. Sometimes packaging and the orientation of the items also makes their transportation very bulk for their weight, such as glass goods with a transport value of 1/2 or window glass with a transport value of 1/4.

Cost Per Diem

The first step is calculating your cost per diem, based on how many and what types of animals comprise your caravan and the number of days between supply stops. See table 4.? for the cost of upkeep per animal per day. For every three animals, add 2 sp for an animal handler, with the exception of elephants whose handler's cost is integrated in the upkeep cost. Then add a flat 10% expense for supply animals (not carrying trade goods), supplies for caravaneers, and other sundry expenses.

Between Stops

Now that you have established your base cost per diem, you have to consider the nature of your trip. Are there ready supply stops on the road? Will you have to load up for a long, desolate stretch? For every night camped outside of a supply stop (caravanserai,

Table 4.10 Increase Upkeep Cost

Community Size	Population*	Increase Cost
Small Town	901-2,000	2%
Large Town	2,001-5,000	5%
Small City	5,001-12,000	8%
Large City	12,001-25,000	10%
Metropolis	25,000+	12%

*Adult population. Depending on the dominant race of the community, the number of nonadults will range from 1-% to 40% of this figure.
**Treat all caravanserais with less than 900 people as "Small Towns" for purposes of trading.

Table 4.11 Warrior (NPC Class) Mercenaries

Character Level	Cost per Day
Warrior 1	2 sp
Warrior 2	6 sp
Warrior 3	12 sp
Warrior 4	18 sp
Warrior 5	24 sp
Warrior 6	30 sp
Warrior 7	36 sp
Warrior 8	42 sp
Warrior 9	48 sp
Warrior 10	54 sp

staging post, or trading city), the per diem cost increases 1%. Once the caravan hits a supply stop, the per diem cost is returned to base cost. For example, a caravan expects a 5 day stretch before reaching the next supply stop. It loads upon supplies for the animals and travelers at 105% of the base per diem cost for those 5 days and nights. Once it reaches the supply stop, the per diem cost returns to its base price before being adjusted for the next leg of the travel.

Night Out on the Town

When a caravan rolls into town, coin flows in the streets. The weary travelers want some luxury and respite from the road, and the inhabitants are all too accommodating, sensing the influx of new and ready coin. Based on the size of the community, the per diem cost of the caravan increases. Everything is more expensive in the city, right?

See Table 4.10 Increase Upkeep Cost for suggested price increases by Community Size. In game reasons can drive the prices even higher. For example, a religious celebration may attract believers to the city, driving up the prices for lodging, food, and supplies.

Table 4.12 PC Class Mercenaries

Character Level	Cost per Day
Level 1	3 sp
Level 2	6 sp
Level 3	12 sp
Level 4	24 sp
Level 5	48 sp
Level 6	96 sp
Level 7	192 sp
Level 8	384 sp
Level 9	768 sp
Level 10	1536 sp

Other Expenses

Well, you have the animals loaded and the handlers tending to the animals, but there are other expenses for the caravan. Who is protecting your goods? Who is your guide? And what about all the taxes you'll have to pay along the way? What do you mean you have never heard of the water tax/gate tax/"walking through our domain with 15 bolts of Astrakhan wool" tax?

Mercenaries do not come cheap, for everyone knows that a caravan lost to bandits and thieves brings no profit for caravaneers or their investors. While the simple farmer carrying his grain to the neighboring village in his ox-drawn cart has less reason to hire protection, traders with numerous animals and luxury wares best beware. Warriors (and other NPC classes) are hired on the following price scheme [see Table 4.11 Warrior (NPC Class) Mercenaries], increasing their cost per day at 6 sp a day after second level. PC classes have a different pay progression (see Table 4.12 PC Class Mercenaries). For characters beyond 10th level, simply double the cost of the previous level. For example, an 11th level wizard costs 3072 sp a day. If a mercenary comes with a mount and makes less than 1 gp a day, double their cost per day. If a mercenary comes with their own mount and makes more than 1 gp a day, add 1 gp to their cost per day.

Guides are crucial in difficult terrain, and they expect to be paid well for their knowledge and expertise. Guides cost 1 gp per day, and their pay as a guide stacks with all other professional pay. For example, if an 2nd level Ranger mercenary is acting as a guide, his cost per day 1 gp 6 sp.

Finally, one of the things you can't avoid: taxes. There are 3 different categories of taxes typically found in silk roads. The first is rights-usage, where a caravan pays for the right to access certain

facilities. This includes such things as stabling fees at caravanserais and in towns as well as access rights to watering holes and camp grounds, often dependent on the number of animals in your caravan. The second kind of tax is protection tax, wherein a caravan pays for the protection of their animals and wares while traveling through a certain controlled area. Lastly, the third kind of tax is the right to trade goods, often based on the kinds of goods a trader carries to market. Although each will be applied in various situations, mechanically, taxes should be around 5-10 % of the value of the caravan, depending on the power of the taxing entity. For instance, a large centralized trade city will tax higher for the same goods than a Large Town would.

Cost Example

Consider the humble trader with a modest caravan of 39 camels dedicated to carrying trade goods. At 8 cp per camel, the upkeep cost is 3.12 gp a day. Thirty-nine camels require 13 animal handlers, adding 26 sp to the per diem cost, or 5.72 gp per diem. A flat 10% expense brings the base per diem cost of the caravan to 6.29 gp.

This trader makes a circuit from the trading metropolis of Isfala to Argul and back. Leaving Isfala, he makes camp along a set of established wells and watering holes for 5 days until he reaches the first caravanserai. Spending a night in comparative luxury, he loads up supplies for a treacherous 12 day stretch through desolate terrain before reaching another Small Town, where he takes two days to conduct some trade. Then he journeys another 3 days into Argul, a Small City, where he does the bulk of his trading over 3 days (buying and selling a maximum of 64,800 gp of goods over 24 transactions). Loaded with different wares, our humble merchant travels 3 days to the same Small Town and trades for a day. He makes the 12 day stretch to the caravanserai, but only stays a night, anxious to return to Isfala to unload his camels. This circuit is relatively safe, so our trader is content with hiring 5 mercenaries (3rd level warrior and 4 1st level warriors) and a guide.

Looking at his upkeep expenses, our merchant expects the following upkeep cost:

	Days	Percentage	Cost
	5	1.05	33.02
	1	1.02	6.42
	12	1.12	84.54
	2	1.02	12.83
	3	1.03	19.44
	3	1.08	20.38
	3	1.03	19.44
	1	1.02	6.42
	12	1.12	84.54
	1	1.02	6.42
	5	1.05	33.02
Total	48		326.45

The mercenaries will cost 2 gp a day for 48 days, a total of 96 gp. He will pick up a guide for the 12 day stretch going both ways, costing him 1 gp a day for 24 days, a total of 24 gp. So far, his expenses are 446.45 gp. But then there are taxes....

Isfala is well known for its silk, and our trader dedicates 5 of his camels to silk. A camel has a transport capacity of 12/24 and silk's transport value is 1/2, meaning each camel can carry 12 transport units, for a total of 60 transport units of silk. Each transport unit of silk is priced at 600 gp in Kalik. He calculates the estimate taxes on the silk alone is (at most) 3,600 gp.

Armed with this knowledge, he selects the other wares for his journey, solid trade goods whose profits he expects to cover the upkeep costs, guards, guide, taxes, and perhaps an unforeseen set back or two. His camels leave Isfala laden with silk (5 camels), quality cotton (10 camels), quality linen (10 camels), fine tapestries (4 camels), embroidered rugs and wallhangings (6 camels), oils (2 camels), cosmetics (1 camel), and a camel carrying an odd assortment of local novelties. By the times he leaves Kalik, he hopes to unload these wares and pick up goods that will fetch a fine price in Isfala.

Renting and Investors

It is important to mention that every trader did not own their animals and cargo outright. Often times, caravans are a conglomerate of people and their respective resources in pursuit of fortune. For example, a trader may decide to rent animals in order to have more capital to spend on trade goods. Perhaps a person with limited funds but some animals offers his livestock as pack animals in exchange for a cut of the profits. Any number of creative arrangements occur when the call of coin and the open road beckon.

Caravan Random Events

Things don't always go as planned. While this table is a good start, GMs should create their own event tables based on the particulars of their silk road. For example, if the caravan is traveling through a bandit-infested area with no real centralized force to ensure protection for traders, the incidence of bandits should be much higher. Perhaps a penny-pinching caravaneer cut too many corners and didn't hire enough animal handlers or overburdened his animals, making animal health poorer and increasing the chance of animal complications or death.

Table 4.13 Caravan Random Events

d100	Event	Effect
1-10	Caravan progresses better than expected.	Reduce upkeep cost by 10% for entire journey.
11-25	Caravan progresses as planned.	None
26-40	Caravan has a minor setback.	Increase upkeep cost 10% for shortest leg.
41-50	Caravan has a small setback.	Increase upkeep cost 30% for shortest leg.
51-60	Caravan has an accident.	Add 1 day to longest leg of journey.
61-70	Sick animals.	Add 2 days to longest leg of journey.
71-80	Caravan has a significant setback.	Increase upkeep cost 30% for longest leg.
81-90	Caravan has a major setback.	Increase upkeep cost 50% for longest leg.
91-100	Bandits attack!	Encounter bandits of equal number to animal handlers.

Chapter 5: Trade Goods

The following list contains over 1,000 trade goods. Here are explanations for how to read and use the chart. Remember, these numbers are starting point. If there are mitigating factors in your campaign, feel free to change the prices so they suit your world. Remember that these prices reflect the item's cost at a production center, and that part of price evaluation for Buy DCs and Sell DCs allows GMs to modify the price by commerce demand for the item. Following the tables are descriptions of the trade goods by category.

Many of the items on the list are raw goods or general categories of finished goods. However many finished goods are simply too variable to quantify with any easy or accuracy. How much is furniture by the pound? Well, what is it made of? How much ornamentation is there in the craftsmanship? Is there any inlay or other ornamental elements in the piece? Again, use the master list as an extensive starting point to reference when determining cost per pound of finished goods.

Type: The basic categories of goods are: Arms and Armor, Cloth, Cloth Goods, Cosmetics, Foodstuffs, Gems, Glass, Glass Goods, Herbs and Spices, Instruments, Livestock, Livestock Tools, Metal (Alloy), Metal (Pure), Ore, Organic, Pen and Paper, Skins and Furs, Stone, Tobacco, Transportation, Wood, and Other.

Name: The specific name of the good.

Cost/lb: All prices are listed as cost per pound because the system is designed for mercantile trading, not buying and selling single units. There are a few exceptions. Livestock are listed cost per animal. Livestock Tools and Transportation are listed by cost per unit. Certain items are given qualifiers in their name, such as barrels (under Other), costing 1 sp per pound and the average barrel weighing 30 lbs.

Transport Value: Each item is given a transport value, which is a ratio between weight and bulk. The base weight is 50 pounds and the base bulk is a 15 inch cube, roughly the size of a bushel. To give a real life comparison, grains are generally 1/1, or 50 pounds for 1 bushel. So, a transport value of 3/2 means that 150 pounds of that item takes the same amount of space that 100 pounds of grain occupies (roughly the space of 2 bushels of grain). Conversely, a transport value of 1/3 means that 50 pounds of the item occupies the same amount of space as 150 pounds of grain (3 bushels), and that the item is comparatively bulky for its weight. Items like stone and metal have transport values of 6/1 and 21/1 respectively, meaning they are dense items, and weight is the limiting factor when loading caravans.

Cost/Transport Unit: For ease of math, we calculated the price for 50 pounds (or 1 transport unit by weight) of all goods. For goods that are impractical or impossible to trade in such large increments, simply use the cost/lb and adjust according to weight.

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Arms and Armor	Armor, Light	3 gp	1/2	150 gp
Arms and Armor	Armor, Medium	5 gp	1/2	250 gp
Arms and Armor	Armor, Heavy	12 gp	2/1	600 gp
Arms and Armor	Shield, Light	1 gp	1/1	50 gp
Arms and Armor	Shield, Heavy	1 gp	1/1	50 gp
Arms and Armor	Shield, Tower	7 sp	2/1	35 gp
Arms and Armor	Melee, Simple	1.5 gp	1/1	75 gp
Arms and Armor	Melee, Martial	3 gp	1/1	150 gp
Arms and Armor	Melee, Exotic	5 gp	1/1	250 gp
Arms and Armor	Ranged, Simple	8 gp	1/1	200 gp
Arms and Armor	Ranged, Martial	20 gp	1/1	1,000 gp
Arms and Armor	Ranged, Exotic	25 gp	1/1	1,250 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Cloth	Burlap	1 sp	1/2	5 gp
Cloth	Canvas	1 sp	1/2	5 gp
Cloth	Cotton	1 sp	1/2	5 gp
Cloth	Felt	1 sp	1/3	5 gp
Cloth	Fine Woolens	1 gp	1/3	50 gp
Cloth	Flannel	1 sp	1/2	5 gp
Cloth	Lace	5 gp	1/3	250 gp
Cloth	Linen	1 sp	1/2	5 gp
Cloth	Satin	6 gp	1/2	300 gp
Cloth	Silk	4 gp	1/2	200 gp
Cloth	Velvet	2 gp	1/2	100 gp
Cloth	Wool	4 sp	1/3	20 gp
Cloth Goods	Artisan Clothing (various)	7 sp	1/3	35 gp
Cloth Goods	Blankets	2 sp	1/3	10 gp
Cloth Goods	Common Clothing (various)	3 sp	1/3	15 gp
Cloth Goods	Fine Clothing (various)	1 gp	1/3	50 gp
Cloth Goods	Rugs	5 sp	2/1	25 gp
Cloth Goods	Shoes/Boots	1 gp	1/5	50 gp
Cloth Goods	Tapestries	1 gp	2/1	50 gp
Cloth Goods	Thread	1 cp	1/2	0.5 gp
Cosmetics	Face Powder	1.6 gp	2/3	80 gp
Cosmetics	Hair Brush	1 gp	2/3	50 gp
Cosmetics	Hair Clip	8 sp	2/3	40 gp
Cosmetics	Hair Comb	1 gp	2/3	50 gp
Cosmetics	Henna	1 gp	2/3	50 gp
Cosmetics	Kohl	1.6 gp	2/3	80 gp
Cosmetics	Lip Pomade	1.6 gp	2/3	80 gp
Cosmetics	Perfume Oils	1 gp	2/3	50 gp
Cosmetics	Pomade	1 gp	2/3	50 gp
Cosmetics	Rouge	1.6 gp	2/3	80 gp
Cosmetics	Scented Water	5 sp	2/3	25 gp
Cosmetics	Skin Cream	1 gp	2/3	50 gp
Cosmetics	Soap, Castile	1 gp	2/1	50 gp
Cosmetics	Soap, Colored and/or Perfumed	2 gp	2/1	100 gp
Cosmetics	Soap, Lye	5 sp	2/1	25 gp
Cosmetics	Wig	5 gp	1/3	250 gp
Cosmetics	Wig Powder	5 sp	2/3	25 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Dairy			
Foodstuffs	Butter	2 gp	2/1	100 gp
Foodstuffs	Cheese, Hard	2 gp	3/2	100 gp
Foodstuffs	Cheese, Semi-Soft	1 gp	1/3	50 gp
Foodstuffs	Cheese, Soft and Fresh	8 sp	1/3	40 gp
Foodstuffs	Clarified Butter	4 gp	2/3	200 gp
Foodstuffs	Cream	4 sp	1/3	20 gp
Foodstuffs	Milk	2 sp	1/3	10 gp
Foodstuffs	Yogurt	6 sp	1/3	30 gp
	Fresh Fruit	2 gp	2/3	100 gp
Foodstuffs	Apples	1 gp	1/1	50 gp
Foodstuffs	Apricots	1 gp	2/3	50 gp
Foodstuffs	Bananas	2 gp	1/1	100 gp
Foodstuffs	Blackberries	2 gp	2/3	100 gp
Foodstuffs	Blueberries	4 gp	2/3	200 gp
Foodstuffs	Boysenberries	4 gp	2/3	200 gp
Foodstuffs	Breadfruit	1 gp	1/1	50 gp
Foodstuffs	Brunchberries	1 gp	2/3	50 gp
Foodstuffs	Cactusfruit	2 sp	1/1	10 gp
Foodstuffs	Cantalope	2 sp	1/1	10 gp
Foodstuffs	Carambola	3 gp	1/1	150 gp
Foodstuffs	Cherries	3 gp	2/3	150 gp
Foodstuffs	Coconuts	5 gp	1/1	250 gp
Foodstuffs	Crabapples	8 cp	2/3	4 gp
Foodstuffs	Cranberries	3 gp	2/3	150 gp
Foodstuffs	Currents	2 gp	2/3	100 gp
Foodstuffs	Dates	3 gp	1/1	150 gp
Foodstuffs	Dewberries	4 sp	2/3	20 gp
Foodstuffs	Elderberries	1 gp	2/3	50 gp
Foodstuffs	Figs	6 sp	2/3	30 gp
Foodstuffs	Gooseberries	1 gp	2/3	50 gp
Foodstuffs	Grapefruit	5 gp	1/1	250 gp
Foodstuffs	Grapes	6 sp	2/3	30 gp
Foodstuffs	Guava	5 gp	1/1	250 gp
Foodstuffs	Huckleberries	1 gp	2/3	50 gp
Foodstuffs	Juneberries	9 sp	2/3	45 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Fresh Fruit Continued			
Foodstuffs	Kiwis	3 gp	2/3	150 gp
Foodstuffs	Kumquats	3 gp	1/1	150 gp
Foodstuffs	Lemons	7 gp	1/1	350 gp
Foodstuffs	Limes	7 gp	1/1	350 gp
Foodstuffs	Lychees	5 gp	2/3	250 gp
Foodstuffs	Mangos	5 gp	1/1	250 gp
Foodstuffs	Oranges	7 gp	1/1	350 gp
Foodstuffs	Passion Fruit	5 gp	1/1	250 gp
Foodstuffs	Peaches	2 gp	2/3	100 gp
Foodstuffs	Pears	3 gp	2/3	150 gp
Foodstuffs	Persimmons	6 sp	2/3	30 gp
Foodstuffs	Pinapples	7 gp	1/1	350 gp
Foodstuffs	Plums	3 gp	2/3	150 gp
Foodstuffs	Pomegranate	7 gp	1/1	350 gp
Foodstuffs	Quince	7 gp	1/1	350 gp
Foodstuffs	Raspberries	4 gp	2/3	200 gp
Foodstuffs	Salmonberries	2 gp	2/3	100 gp
Foodstuffs	Snowberries	2 gp	2/3	100 gp
Foodstuffs	Strawberries	4 gp	2/3	200 gp
Foodstuffs	Tangerine	7 gp	1/1	350 gp
Foodstuffs	Thimbleberries	3 gp	2/3	150 gp
Foodstuffs	Wild Plums (sloe)	8 sp	2/3	40 gp
Foodstuffs	Wintergreen	4 gp	2/3	200 gp
	Grain	5 cp	1/1	2.5 gp
Foodstuffs	Grain, Amaranth	5 cp	1/1	2.5 gp
Foodstuffs	Grain, Barley	2 cp	1/1	1 gp
Foodstuffs	Grain, Buckwheat	5 cp	1/1	2.5 gp
Foodstuffs	Grain, Maize	7 cp	1/1	3.5 gp
Foodstuffs	Grain, Millet	5 cp	1/1	2.5 gp
Foodstuffs	Grain, Oats	2 cp	1/2	1 gp
Foodstuffs	Grain, Rice	7 cp	1/1	3.5 gp
Foodstuffs	Grain, Rye	5 cp	1/1	2.5 gp
Foodstuffs	Grain, Spelt	5 cp	1/1	2.5 gp
Foodstuffs	Grain, Wheat	7 cp	1/1	3.5 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Preserves			
Foodstuffs	Candied Fruit	6 gp	1/2	200 gp
Foodstuffs	Dried Beans	1 sp	1/1	5 gp
Foodstuffs	Dried Fish	1 gp	1/2	50 gp
Foodstuffs	Dried Fruits and Nuts	5 gp	1/2	250 gp
Foodstuffs	Dried Meats	1.5 gp	1/2	75 gp
Foodstuffs	Dried Vegetables	4 sp	1/2	20 gp
Foodstuffs	Hard Sausages	3 gp	1/2	150 gp
Foodstuffs	Pickled Fish	8 sp	1/2	40 gp
Foodstuffs	Pickled Fruits	4 gp	1/2	200 gp
Foodstuffs	Pickled Vegetables	4 sp	1/2	20 gp
Foodstuffs	Preserves/Jams	8 gp	1/2	400 gp
	Vegetables (Fresh)	2 sp	1/1	5 gp
Foodstuffs	Artichokes	1 gp	1/2	50 gp
Foodstuffs	Asparagus	1 gp	1/1	50 gp
Foodstuffs	Avocados	2 gp	1/1	100 gp
Foodstuffs	Broccoli	8 cp	1/1	4 gp
Foodstuffs	Brussel Sprouts	2 cp	1/1	1 gp
Foodstuffs	Cabbages	1 cp	1/1	0.5 gp
Foodstuffs	Carrots	5 cp	1/1	2.5 gp
Foodstuffs	Cauliflower	1 sp	1/1	5 gp
Foodstuffs	Celery	1 sp	1/1	5 gp
Foodstuffs	Chickpeas	8 cp	1/1	4 gp
Foodstuffs	Chicory (Radicchio)	4 sp	1/1	20 gp
Foodstuffs	Cucumbers	2 sp	1/1	10 gp
Foodstuffs	Eggplants	3 sp	2/3	15 gp
Foodstuffs	Endives	1 gp	1/1	50 gp
Foodstuffs	Fava Beans	3 sp	2/3	15 gp
Foodstuffs	Green Beans	8 cp	2/3	4 gp
Foodstuffs	Kidney Beans	4 cp	2/3	2 gp
Foodstuffs	Leeks	1 sp	1/1	5 gp
Foodstuffs	Lentils	2 cp	1/1	1 gp
Foodstuffs	Lettice	2 sp	1/2	10 gp
Foodstuffs	Long Beans	1 sp	1/1	5 gp
Foodstuffs	Mushrooms	1 gp	1/2	50 gp
Foodstuffs	Okras	5 cp	1/2	2.5 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Foodstuffs	Olives	5 sp	1/1	25 gp
Foodstuffs	Onions	3 sp	1/1	15 gp
Foodstuffs	Parsnips	5 cp	1/1	2.5 gp
Foodstuffs	Peas	1 sp	2/3	5 gp
Foodstuffs	Potatoes	4 cp	1/1	2 gp
Foodstuffs	Pumpkins	9 cp	1/1	4.5 gp
Foodstuffs	Rhubarb	1 sp	1/1	5 gp
Foodstuffs	Rutabegas	1 sp	1/1	5 gp
Foodstuffs	Scallions	2 sp	1/1	10 gp
Foodstuffs	Soybeans	8 cp	1/1	4 gp
Foodstuffs	Spinach	2 sp	1/2	10 gp
Foodstuffs	Spring Greens	2 sp	1/2	10 gp
Foodstuffs	Squashes	1 sp	1/1	5 gp
Foodstuffs	Tomatoes	5 sp	1/1	25 gp
Foodstuffs	Turnips	1 sp	1/1	5 gp
Foodstuffs	Yams	4 cp	1/1	2 gp
	Spirits			
Foodstuffs	Ale	4 cp	1/2	2 gp
Foodstuffs	Hard Cider	8 sp	1/2	40 gp
Foodstuffs	Lager	5 sp	1/2	25 gp
Foodstuffs	Liquor	2 gp	1/2	100 gp
Foodstuffs	Spirits	1 gp	1/2	50 gp
Foodstuffs	Wine, Fine	5 gp	1/2	250 gp
Foodstuffs	Wine, Table	5 cp	1/2	2.5 gp
	Other			
Foodstuffs	Candy	10 gp	1/1	500 gp
Foodstuffs	Coffee	15 gp	2/1	750 gp
Foodstuffs	Crème of Tartar	3.2 sp	2/1	16 gp
Foodstuffs	Eggs	5 sp	1/3	25 gp
Foodstuffs	Hardtack (Sea Biscuits)	2 cp	1/1	1 gp
Foodstuffs	Honey	6 gp	1/2	300 gp
Foodstuffs	Lard	1 gp	1/1	50 gp
Foodstuffs	Molasses	2 gp	2/1	100 gp
Foodstuffs	Olive Oil	1 gp	2/1	50 gp
Foodstuffs	Sugar	5 gp	1/1	2,500 gp
Foodstuffs	Tea	5 gp	1/1	250 gp
Foodstuffs	Vinegar	1 sp	1/2	5 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Ornamental	500 gp	4/1	25,000 gp
Gem	Agate	500 gp	4/1	25,000 gp
Gem	Agni Mani (Tektite)	500 gp	4/1	25,000 gp
Gem	Allanite (Epidote)	500 gp	4/1	25,000 gp
Gem	Amazonite Microcline	500 gp	4/1	25,000 gp
Gem	Apache Tears	500 gp	4/1	25,000 gp
Gem	Augelite	500 gp	4/1	25,000 gp
Gem	Azurite	500 gp	4/1	25,000 gp
Gem	Banded Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Black and White Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Blue John Fluorite	500 gp	4/1	25,000 gp
Gem	Blue Lace Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Boracite	500 gp	4/1	25,000 gp
Gem	Borax	500 gp	4/1	25,000 gp
Gem	Chromium Diopside	500 gp	4/1	25,000 gp
Gem	Crazy Lace Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Dendritic Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Diopside	500 gp	4/1	25,000 gp
Gem	Dry-head Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Electric Obsidian (Obsidian)	500 gp	4/1	25,000 gp
Gem	Eye Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Faden Quartz (Quartz)	500 gp	4/1	25,000 gp
Gem	Fire Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Fluorspar	500 gp	4/1	25,000 gp
Gem	Frost Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Gypsum	500 gp	4/1	25,000 gp
Gem	Hematite	500 gp	4/1	25,000 gp
Gem	Holly Blue Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Howlite	500 gp	4/1	25,000 gp
Gem	Iris Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Labradorite	500 gp	4/1	25,000 gp
Gem	Lapis Lazuli	500 gp	4/1	25,000 gp
Gem	Leopard Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Lodestone	500 gp	4/1	25,000 gp
Gem	Malachite	500 gp	4/1	25,000 gp
Gem	Milky Quartz (Quartz)	500 gp	4/1	25,000 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Ornamental	500 gp	4/1	25,000 gp
Gem	Morion (Quartz)	500 gp	4/1	25,000 gp
Gem	Moss Agate (Agate)	500 gp	4/1	25,000 gp
Gem	Obsidian	500 gp	4/1	25,000 gp
Gem	Okenite	500 gp	4/1	25,000 gp
Gem	Oolite (Agate)	500 gp	4/1	25,000 gp
Gem	Pele's Hair	500 gp	4/1	25,000 gp
Gem	Petalite	500 gp	4/1	25,000 gp
Gem	Petrified Wood	500 gp	4/1	25,000 gp
Gem	Quartz	500 gp	4/1	25,000 gp
Gem	Rhodochrosite	500 gp	4/1	25,000 gp
Gem	Rutilated Quartz (Quartz)	500 gp	4/1	25,000 gp
Gem	Sagenite (Agate)	500 gp	4/1	25,000 gp
Gem	Salite (Diopside)	500 gp	4/1	25,000 gp
Gem	Sanidine	500 gp	4/1	25,000 gp
Gem	Satin Spar (Gypsum)	500 gp	4/1	25,000 gp
Gem	Silver Sheen Obsidian (Obsidian)	500 gp	4/1	25,000 gp
Gem	Snowflake Obsidian (Obsidian)	500 gp	4/1	25,000 gp
Gem	Sunstone	500 gp	4/1	25,000 gp
Gem	Turitella (Agate)	500 gp	4/1	25,000 gp
Gem	Variscite	500 gp	4/1	25,000 gp
Gem	Violane (Diopside)	500 gp	4/1	25,000 gp
Gem	Wonderstone (Jasper)	500 gp	4/1	25,000 gp
	Semi-precious	2,500 gp	4/1	125,000 gp
Gem	Albite	2,500 gp	4/1	125,000 gp
Gem	Amber	2,500 gp	3/1	125,000 gp
Gem	Andalusite	2,500 gp	4/1	125,000 gp
Gem	Apatite	2,500 gp	4/1	125,000 gp
Gem	Aqua Aura (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Augite	2,500 gp	4/1	125,000 gp
Gem	Aventurine (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Bat Cave Jasper (Jasper)	2,500 gp	4/1	125,000 gp
Gem	Benitoite	2,500 gp	4/1	125,000 gp
Gem	Bixbyite	2,500 gp	4/1	125,000 gp
Gem	Bloodstone (Chalcedony)	2,500 gp	4/1	125,000 gp
Gem	Brecchiated Agate (Agate)	2,500 gp	4/1	125,000 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Semi-precious	2,500 gp	4/1	125,000 gp
Gem	Bruneau Jasper (Jasper)	2,500 gp	4/1	125,000 gp
Gem	Carey Plume Agate (Agate)	2,500 gp	4/1	125,000 gp
Gem	Carnelian (Chalcedony)	2,500 gp	4/1	125,000 gp
Gem	Celestite	2,500 gp	4/1	125,000 gp
Gem	Chalcedony	2,500 gp	4/1	125,000 gp
Gem	Chrysolite	2,500 gp	4/1	125,000 gp
Gem	Chrysoprase (Chrysolite)	2,500 gp	4/1	125,000 gp
Gem	Citrine (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Covey Lace Agate (Agate)	2,500 gp	4/1	125,000 gp
Gem	Crown of Silver	2,500 gp	4/1	125,000 gp
Gem	Dioptase	2,500 gp	4/1	125,000 gp
Gem	Enstatite (Diopside)	2,500 gp	4/1	125,000 gp
Gem	Fayalite (Peridot)	2,500 gp	4/1	125,000 gp
Gem	Galena	2,500 gp	4/1	125,000 gp
Gem	Gold Sheen Obsidian (Obsidian)	2,500 gp	4/1	125,000 gp
Gem	Graveyard Plume Agate (Agate)	2,500 gp	4/1	125,000 gp
Gem	Hiddenite (Spodumene)	2,500 gp	4/1	125,000 gp
Gem	Hydrophane (Opal)	2,500 gp	4/1	125,000 gp
Gem	Hypersthene	2,500 gp	4/1	125,000 gp
Gem	Iolite	2,500 gp	4/1	125,000 gp
Gem	Jasper	2,500 gp	4/1	125,000 gp
Gem	Jet	2,500 gp	3/1	125,000 gp
Gem	Kunzite (Spodumene)	2,500 gp	4/1	125,000 gp
Gem	Kyanite	2,500 gp	4/1	125,000 gp
Gem	Lazulite	2,500 gp	4/1	125,000 gp
Gem	Malacon (Zircon)	2,500 gp	4/1	125,000 gp
Gem	Moonstone	2,500 gp	4/1	125,000 gp
Gem	Onyx	2,500 gp	4/1	125,000 gp
Gem	Orbicular Jasper (Jasper)	2,500 gp	4/1	125,000 gp
Gem	Phantom Quartz (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Picture Jasper (Jasper)	2,500 gp	4/1	125,000 gp
Gem	Priday Plume Agate (Agate)	2,500 gp	4/1	125,000 gp
Gem	Purple Obsidian (Obsidian)	2,500 gp	4/1	125,000 gp
Gem	Rainbow Obsidian (Obsidian)	2,500 gp	4/1	125,000 gp
Gem	Regency Plume Agate (Agate)	2,500 gp	4/1	125,000 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Semi-precious	2,500 gp	4/1	125,000 gp
Gem	Rock Crystal (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Samarskite	2,500 gp	4/1	125,000 gp
Gem	Sard (Chalcedony)	2,500 gp	4/1	125,000 gp
Gem	Sardonyx (Chalcedony)	2,500 gp	4/1	125,000 gp
Gem	Scepter Quartz (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Selenite (Gypsum)	2,500 gp	4/1	125,000 gp
Gem	Serpentine	2,500 gp	4/1	125,000 gp
Gem	Smoky Quartz (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Sodalite	2,500 gp	4/1	125,000 gp
Gem	Strawberry Quartz (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Sugilite (Tourmaline)	2,500 gp	4/1	125,000 gp
Gem	Tourmalined Quartz (Quartz)	2,500 gp	4/1	125,000 gp
Gem	Transvaal Jade (Garnet)	2,500 gp	4/1	125,000 gp
Gem	Turquois	2,500 gp	4/1	125,000 gp
Gem	Witherite	2,500 gp	4/1	125,000 gp
Gem	Woodward Ranch Plume Agate (Agate)	2,500 gp	4/1	125,000 gp
Gem	Zircon	2,500 gp	4/1	125,000 gp
	Fancy	5,000 gp	4/1	250,000gp
Gem	Alexandrite	5,000 gp	4/1	250,000gp
Gem	Amethyst (Quartz)	5,000 gp	4/1	250,000gp
Gem	Ametrine	5,000 gp	4/1	250,000gp
Gem	Angel Skin Coral	5,000 gp	4/1	250,000gp
Gem	Buegerite (Tourmaline)	5,000 gp	4/1	250,000gp
Gem	Dravite (Tourmaline)	5,000 gp	4/1	250,000gp
Gem	Elbaite (Tourmaline)	5,000 gp	4/1	250,000gp
Gem	Garnet	5,000 gp	4/1	250,000gp
Gem	Grossular (Garnet)	5,000 gp	4/1	250,000gp
Gem	Hessonite (Garnet)	5,000 gp	4/1	250,000gp
Gem	Jade	5,000 gp	4/1	250,000gp
Gem	Jargoon (Zircon)	5,000 gp	4/1	250,000gp
Gem	Kornerupine	5,000 gp	4/1	250,000gp
Gem	Mottled Jasper	5,000 gp	4/1	250,000gp
Gem	Olivine	5,000 gp	4/1	250,000gp
Gem	Royal Plume Jasper	5,000 gp	4/1	250,000gp
Gem	Schorl (Tourmaline)	5,000 gp	4/1	250,000gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Fancy	5,000 gp	4/1	250,000gp
Gem	Sinhalite	5,000 gp	4/1	250,000gp
Gem	Thulite (Zoisite)	5,000 gp	4/1	250,000gp
Gem	Tourmaline	5,000 gp	4/1	250,000gp
Gem	Uvite (Tourmaline)	5,000 gp	4/1	250,000gp
Gem	Zoisite	5,000 gp	4/1	250,000gp
	Precious	25,000 gp	4/1	1,250,000 gp
Gem	Almandine (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Andradite (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Aquamarine (Beryl)	25,000 gp	4/1	1,250,000 gp
Gem	Beryl	25,000 gp	4/1	1,250,000 gp
Gem	Burnt Topaz	25,000 gp	4/1	1,250,000 gp
Gem	Demantoid (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Euclase	25,000 gp	4/1	1,250,000 gp
Gem	Garnet Peridotite (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Heliodor (Beryl)	25,000 gp	4/1	1,250,000 gp
Gem	Melanite (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Pearl	25,000 gp	4/1	1,250,000 gp
Gem	Peridot (Olivine)	25,000 gp	4/1	1,250,000 gp
Gem	Rhodolite (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Spessartine (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Sphene	25,000 gp	4/1	1,250,000 gp
Gem	Spodumene	25,000 gp	4/1	1,250,000 gp
Gem	Topazolite (Garnet)	25,000 gp	4/1	1,250,000 gp
Gem	Uvarite (Garnet)	25,000 gp	4/1	1,250,000 gp
	Ornate	50,000 gp	4/1	2,500,000 gp
Gem	Australian Opal	50,000 gp	4/1	2,500,000 gp
Gem	Balas Ruby (Spinel)	50,000 gp	4/1	2,500,000 gp
Gem	Black Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Blue Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Boulder Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Cachalong Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Cherry Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Emery (Corundum)	50,000 gp	4/1	2,500,000 gp
Gem	Fire Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Girasol (Opal)	50,000 gp	4/1	2,500,000 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Ornate	50,000 gp	4/1	2,500,000 gp
Gem	Goshenite (Beryl)	50,000 gp	4/1	2,500,000 gp
Gem	Honduran Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Hyalite (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Imperial Topaz (Topaz)	50,000 gp	4/1	2,500,000 gp
Gem	Moss Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Mountain Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Sapphire (Corundum)	50,000 gp	4/1	2,500,000 gp
Gem	Spinel	50,000 gp	4/1	2,500,000 gp
Gem	Tomb Jade	50,000 gp	4/1	2,500,000 gp
Gem	Topaz	50,000 gp	4/1	2,500,000 gp
Gem	Water Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	White Opal (Opal)	50,000 gp	4/1	2,500,000 gp
Gem	Wood Opal (Opal)	50,000 gp	4/1	2,500,000 gp
	Exquisite	250,000 gp	4/1	12,500,000 gp
Gem	Corundum	250,000 gp	4/1	12,500,000 gp
Gem	Diamond	250,000 gp	4/1	12,500,000 gp
Gem	Emerald (Beryl)	250,000 gp	4/1	12,500,000 gp
Gem	Harlequin Opal (Opal)	250,000 gp	4/1	12,500,000 gp
Gem	Jacinth (Zircon)	250,000 gp	4/1	12,500,000 gp
Gem	Jelly Opal (Opal)	250,000 gp	4/1	12,500,000 gp
Gem	Morganite (Beryl)	250,000 gp	4/1	12,500,000 gp
Gem	Ruby (Corundum)	250,000 gp	4/1	12,500,000 gp
Glass	Aeroglass	250 gp	2/1	12,500 gp
Glass	Glass	5 gp	6/1	250 gp
Glass	Leaded Crystal	8 gp	2/1	400 gp
Glass Goods	Beakers/Vials (1oz.-6 oz. capacity)	10 gp	1/2	500 gp
Glass Goods	Bottles/Decanters with stopper (1 oz.-5 gal capacity)	10 gp	1/2	500 gp
Glass Goods	Bowls (3oz.-10oz. capacity)	8 gp	1/2	400 gp
Glass Goods	Cups/Goblets/Mugs	10 gp	1/2	500 gp
Glass Goods	Jars/Pitchers	8 gp	1/2	400 gp
Glass Goods	Lens	15 gp	1/1	375 gp
Glass Goods	Mirror	15 gp	1/2	375 gp
Glass Goods	Window Glass	25 gp	1/4	1,250 gp
Herbs and Spices	Agar	3.2 gp	1/2	160 gp
Herbs and Spices	Agrimony	1.5 gp	1/2	75 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Alfalfa, leaf	1.1 gp	1/2	55 gp
Herbs and Spices	Alfalfa, seed	9.8 sp	1/2	49 gp
Herbs and Spices	Alkanet	1.6 gp	1/2	80 gp
Herbs and Spices	Allspice	1.1 gp	1/2	55 gp
Herbs and Spices	Aloe	1.6 gp	1/2	80 gp
Herbs and Spices	Alum	1.1 gp	1/2	55 gp
Herbs and Spices	Angelica Root	1.4 gp	1/2	70 gp
Herbs and Spices	Anise Seed	9.8 sp	1/2	49 gp
Herbs and Spices	Annato Seed	9.8 sp	1/2	49 gp
Herbs and Spices	Apple Pectin	9.8 sp	1/2	49 gp
Herbs and Spices	Arabic Gum (Gum Arabic)	1.6 gp	1/2	80 gp
Herbs and Spices	Arnica Flower	1.6 gp	1/2	80 gp
Herbs and Spices	Arrowroot	8 sp	1/2	40 gp
Herbs and Spices	Artichoke	1.6 gp	1/2	80 gp
Herbs and Spices	Ashwagandha Root	1.6 gp	1/2	80 gp
Herbs and Spices	Astragalus	1.3 gp	1/2	65 gp
Herbs and Spices	Barberry Root	1.6 gp	1/2	80 gp
Herbs and Spices	Barley Grass	1.6 gp	1/2	80 gp
Herbs and Spices	Basil	8 sp	1/2	40 gp
Herbs and Spices	Bay Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Bayberry, bark	1.6 gp	1/2	80 gp
Herbs and Spices	Bayberry, root	1.6 gp	1/2	80 gp
Herbs and Spices	Bee Pollen	1.6 gp	1/2	80 gp
Herbs and Spices	Beeswax	9.8 sp	1/2	49 gp
Herbs and Spices	Beet Root	1.3 gp	1/2	65 gp
Herbs and Spices	Bell Pepper Root	1.6 gp	1/2	80 gp
Herbs and Spices	Bilberry Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Birch Bark	1.6 gp	1/2	80 gp
Herbs and Spices	Black Cohosh	1.4 gp	1/2	70 gp
Herbs and Spices	Black Haw	1.6 gp	1/2	80 gp
Herbs and Spices	Black Walnut Hulls	9.8 sp	1/2	49 gp
Herbs and Spices	Blackberry Leaf	1.4 gp	1/2	70 gp
Herbs and Spices	Bladderwrack	1.3 gp	1/2	65 gp
Herbs and Spices	Blessed Thistle	1.3 gp	1/2	65 gp
Herbs and Spices	Bloodroot	3.2 gp	1/2	160 gp
Herbs and Spices	Blue Cohosh Root	1.4 gp	1/2	70 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Blue Vervain	1.6 gp	1/2	80 gp
Herbs and Spices	Blueberry Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Boldo Leaf	1.4 gp	1/2	70 gp
Herbs and Spices	Boneset	1.6 gp	1/2	80 gp
Herbs and Spices	Borage	1.6 gp	1/2	80 gp
Herbs and Spices	Brewer's Yeast	1.1 gp	1/2	55 gp
Herbs and Spices	Broccoli Seed	3.2 gp	1/2	160 gp
Herbs and Spices	Buckthorn Bark	1.1 gp	1/2	55 gp
Herbs and Spices	Buckwheat Hulls	6.4 sp	1/2	32 gp
Herbs and Spices	Bugleweed	3.2 gp	1/2	160 gp
Herbs and Spices	Bupleurem Root	1.6 gp	1/2	80 gp
Herbs and Spices	Burdock, root	1.3 gp	1/2	65 gp
Herbs and Spices	Burdock, seed	3.2 gp	1/2	160 gp
Herbs and Spices	Butcher's Broom Root	1.6 gp	1/2	80 gp
Herbs and Spices	Calamus	9.8 sp	1/2	49 gp
Herbs and Spices	Calendula Flowers	1.6 gp	1/2	80 gp
Herbs and Spices	Camphor Crystals	1.6 gp	1/2	80 gp
Herbs and Spices	Candelilla Flakes	1.3 gp	1/2	65 gp
Herbs and Spices	Caraway Seed, black	1.6 gp	1/2	80 gp
Herbs and Spices	Caraway Seed, ground	8 sp	1/2	40 gp
Herbs and Spices	Cardamon, pod	3.2 gp	1/2	160 gp
Herbs and Spices	Cardamon, seed	3.2 gp	1/2	160 gp
Herbs and Spices	Carnauba Flakes	1.3 gp	1/2	65 gp
Herbs and Spices	Carob	8 sp	1/2	40 gp
Herbs and Spices	Carrot Powder	1.3 gp	1/2	65 gp
Herbs and Spices	Cascara Sagrada	1.6 gp	1/2	80 gp
Herbs and Spices	Catnip	1.1 gp	1/2	55 gp
Herbs and Spices	Cat's Claw Bark	1.6 gp	1/2	80 gp
Herbs and Spices	Causarina Pods	1.3 gp	1/2	65 gp
Herbs and Spices	Cayenne	9.6 sp	1/2	48 gp
Herbs and Spices	Celery, leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Celery, seed	8 sp	1/2	40 gp
Herbs and Spices	Centaury	1.6 gp	1/2	80 gp
Herbs and Spices	Ceylon	1.6 gp	1/2	80 gp
Herbs and Spices	Chamomile Flowers	8 sp	1/2	40 gp
Herbs and Spices	Chaparral Leaf	9.6 sp	1/2	48 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Chaste Tree Berries	9.6 sp	1/2	48 gp
Herbs and Spices	Chervil	1.6 gp	1/2	80 gp
Herbs and Spices	Chestnut Leaf	1.3 gp	1/2	65 gp
Herbs and Spices	Chickory Root	8 sp	1/2	40 gp
Herbs and Spices	Chickweed	1.1 gp	1/2	55 gp
Herbs and Spices	Chili Peppers, Ancho	9.6 sp	1/2	48 gp
Herbs and Spices	Chili Peppers, Chipotle	3.2 gp	1/2	160 gp
Herbs and Spices	Chives	1.6 gp	1/2	80 gp
Herbs and Spices	Chlorella	4.8 gp	1/2	240 gp
Herbs and Spices	Chrysanthemum	1.6 gp	1/2	80 gp
Herbs and Spices	Cilantro	1.6 gp	1/2	80 gp
Herbs and Spices	Cinnamon	8 sp	1/2	40 gp
Herbs and Spices	Cinquefoil	3.2 gp	1/2	160 gp
Herbs and Spices	Citric Acid	8 sp	1/2	40 gp
Herbs and Spices	Cleavers	1.6 gp	1/2	80 gp
Herbs and Spices	Cloves	1.6 gp	1/2	80 gp
Herbs and Spices	Cocoa	15 gp	1/2	750 gp
Herbs and Spices	Collinsonia	1.6 gp	1/2	80 gp
Herbs and Spices	Coltsfoot	1.6 gp	1/2	80 gp
Herbs and Spices	Comfrey, leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Comfrey, root	1.4 gp	1/2	70 gp
Herbs and Spices	Copal Resin	1.6 gp	1/2	80 gp
Herbs and Spices	Coptis	3.2 gp	1/2	160 gp
Herbs and Spices	Coriander Seed	8 sp	1/2	40 gp
Herbs and Spices	Cornsilk	1.6 gp	1/2	80 gp
Herbs and Spices	Cowslip Flower	1.6 gp	1/2	80 gp
Herbs and Spices	Cramp Bark	3.2 gp	1/2	160 gp
Herbs and Spices	Cranesbill Root	1.6 gp	1/2	80 gp
Herbs and Spices	Cumin Seed	9.6 sp	1/2	48 gp
Herbs and Spices	Damiana	1.3 gp	1/2	65 gp
Herbs and Spices	Dandelion, leaf	1.3 gp	1/2	65 gp
Herbs and Spices	Dandelion, root	1.1 gp	1/2	55 gp
Herbs and Spices	Devil's Claw Tuber	1.6 gp	1/2	80 gp
Herbs and Spices	Dill, seed	4.8 sp	1/2	24 gp
Herbs and Spices	Dill, whole	1.3 gp	1/2	65 gp
Herbs and Spices	Dong Quai	1.6 gp	1/2	80 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Dulse Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Echinacea, herb	1.3 gp	1/2	65 gp
Herbs and Spices	Echinacea, root	1.6 gp	1/2	80 gp
Herbs and Spices	Elder berries	1.4 gp	1/2	70 gp
Herbs and Spices	Elder flowers	1.6 gp	1/2	80 gp
Herbs and Spices	Elecampane Root	1.3 gp	1/2	65 gp
Herbs and Spices	Eleuthero Root	8 sp	1/2	40 gp
Herbs and Spices	Epazote	1.6 gp	1/2	80 gp
Herbs and Spices	Ephedra	1.4 gp	1/2	70 gp
Herbs and Spices	Eucalyptus Leaf	8 sp	1/2	40 gp
Herbs and Spices	Eyebright	1.6 gp	1/2	80 gp
Herbs and Spices	False Unicorn Root	12.8 gp	1/2	640 gp
Herbs and Spices	Fennel Seeds	8 sp	1/2	40 gp
Herbs and Spices	Fenugreek Seed	6.4 sp	1/2	32 gp
Herbs and Spices	Feverfew	1.4 gp	1/2	70 gp
Herbs and Spices	Figwort Herb	1.6 gp	1/2	80 gp
Herbs and Spices	Flax Seed	6.4 sp	1/2	32 gp
Herbs and Spices	Fo-Ti	1.6 gp	1/2	80 gp
Herbs and Spices	Fumitory	1.4 gp	1/2	70 gp
Herbs and Spices	Galangal Root	1.6 gp	1/2	80 gp
Herbs and Spices	Garam Masala	1.1 gp	1/2	55 gp
Herbs and Spices	Garcinia Fruit	1.6 gp	1/2	80 gp
Herbs and Spices	Garlic	8 sp	1/2	40 gp
Herbs and Spices	Gentian Root	1.6 gp	1/2	80 gp
Herbs and Spices	Ginger Root	9.6 sp	1/2	48 gp
Herbs and Spices	Ginkgo Leaf	1.1 gp	1/2	55 gp
Herbs and Spices	Ginseng	4.8 gp	1/2	240 gp
Herbs and Spices	Goldenrod	1.3 gp	1/2	65 gp
Herbs and Spices	Goldenseal, leaf	3.2 gp	1/2	160 gp
Herbs and Spices	Goldenseal, root	9.6 gp	1/2	480 gp
Herbs and Spices	Gotu Kola	8 sp	1/2	40 gp
Herbs and Spices	Grape Seed	1.4 gp	1/2	70 gp
Herbs and Spices	Grapefruit Peel	1.1 gp	1/2	55 gp
Herbs and Spices	Green Tea	1.3 gp	1/2	65 gp
Herbs and Spices	Grifola Fungus	1.6 gp	1/2	80 gp
Herbs and Spices	Grindelia	1.6 gp	1/2	80 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Guarana	1.6 gp	1/2	80 gp
Herbs and Spices	Guargum	12.8 gp	1/2	640 gp
Herbs and Spices	Gymnema Leaf	1.3 gp	1/2	65 gp
Herbs and Spices	Hawthorne, berries	9.6 gp	1/2	480 gp
Herbs and Spices	Hawthorne, flower	1.6 sp	1/2	80 gp
Herbs and Spices	Hawthorne, leaf	1.6 sp	1/2	80 gp
Herbs and Spices	Henna Leaf	8 sp	1/2	40 gp
Herbs and Spices	Hibiscus	9.6 sp	1/2	48 gp
Herbs and Spices	Hops	1.3 gp	1/2	65 gp
Herbs and Spices	Horehound	1.3 gp	1/2	65 gp
Herbs and Spices	Horny Goat Weed	1.6 gp	1/2	80 gp
Herbs and Spices	Horse Chestnut	1.6 gp	1/2	80 gp
Herbs and Spices	Horsetail	8 sp	1/2	40 gp
Herbs and Spices	Hydrangea Root	1.6 gp	1/2	80 gp
Herbs and Spices	Hyssop	1.1 gp	1/2	55 gp
Herbs and Spices	Iress Moss	1.4 gp	1/2	70 gp
Herbs and Spices	Jalap	3.2 gp	1/2	160 gp
Herbs and Spices	Jasmine	1.6 gp	1/2	80 gp
Herbs and Spices	Juniper Berries	1.1 gp	1/2	55 gp
Herbs and Spices	Kaolin	9.6 sp	1/2	48 gp
Herbs and Spices	Kava Kava	1.1 gp	1/2	55 gp
Herbs and Spices	Kelp	1.6 sp	1/2	80 gp
Herbs and Spices	Kesu	1.1 gp	1/2	55 gp
Herbs and Spices	Kola Nut	8 sp	1/2	40 gp
Herbs and Spices	Lady's Mantle	1.6 gp	1/2	80 gp
Herbs and Spices	Lavender	1.6 gp	1/2	80 gp
Herbs and Spices	Lemon Balm	1.6 gp	1/2	80 gp
Herbs and Spices	Lemon Peel	1.4 gp	1/2	70 gp
Herbs and Spices	Lemon Verbena Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Lemongrass	9.6 sp	1/2	48 gp
Herbs and Spices	Licorice Root	8 sp	1/2	40 gp
Herbs and Spices	Lily of the Valley	3.2 gp	1/2	160 gp
Herbs and Spices	Linden	1.4 gp	1/2	70 gp
Herbs and Spices	Lobelia	3.2 gp	1/2	160 gp
Herbs and Spices	Lomatium	3.2 gp	1/2	160 gp
Herbs and Spices	Mace	1.6 gp	1/2	80 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Mandrake Root	1.6 gp	1/2	80 gp
Herbs and Spices	Marjoram	6.4 sp	1/2	32 gp
Herbs and Spices	Marshmallow Root	1.1 gp	1/2	55 gp
Herbs and Spices	Meadowsweet	1.4 gp	1/2	70 gp
Herbs and Spices	Menthol	3.2 gp	1/2	160 gp
Herbs and Spices	Milk Thistle Seed	8 sp	1/2	40 gp
Herbs and Spices	Mineral Clay/Oil	3.2 gp	1/2	160 gp
Herbs and Spices	Mistletoe	1.1 gp	1/2	55 gp
Herbs and Spices	Moss Oak	1.3 gp	1/2	65 gp
Herbs and Spices	Motherwort	1.6 gp	1/2	80 gp
Herbs and Spices	Mugwort	8 sp	1/2	40 gp
Herbs and Spices	Muira Puama	1.3 gp	1/2	65 gp
Herbs and Spices	Mullein, flower	1.6 gp	1/2	80 gp
Herbs and Spices	Mullein, leaf	9.6 sp	1/2	48 gp
Herbs and Spices	Mustard, brown	4.8 sp	1/2	24 gp
Herbs and Spices	Mustard, yellow	6.4 sp	1/2	32 gp
Herbs and Spices	Neem Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Nettle, herb	1.4 gp	1/2	70 gp
Herbs and Spices	Nettle, leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Nettle, root	1.1 gp	1/2	55 gp
Herbs and Spices	Nutmeg	1.6 gp	1/2	80 gp
Herbs and Spices	Oatstraw Green-tops	9.6 sp	1/2	48 gp
Herbs and Spices	Olive Leaf	9.6 sp	1/2	48 gp
Herbs and Spices	Onion	9.6 sp	1/2	48 gp
Herbs and Spices	Orange Peel	9.6 sp	1/2	48 gp
Herbs and Spices	Orange Pekoe	1.6 gp	1/2	80 gp
Herbs and Spices	Oregano	9.6 sp	1/2	48 gp
Herbs and Spices	Orris Root	1.6 gp	1/2	80 gp
Herbs and Spices	Osha Root	3.2 gp	1/2	160 gp
Herbs and Spices	Papaya Leaf	1.1 gp	1/2	55 gp
Herbs and Spices	Paprika	9.6 sp	1/2	48 gp
Herbs and Spices	Parsley, leaf	1.1 gp	1/2	55 gp
Herbs and Spices	Parsley, root	1.6 gp	1/2	80 gp
Herbs and Spices	Partridge Berry	3.2 gp	1/2	160 gp
Herbs and Spices	Passion Flower	9.6 sp	1/2	48 gp
Herbs and Spices	Patchouli	1.6 gp	1/2	80 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Pennyroyal	9.6 sp	1/2	48 gp
Herbs and Spices	Peony Root	1.3 gp	1/2	65 gp
Herbs and Spices	Pepper, black	1.6 gp	1/2	80 gp
Herbs and Spices	Pepper, white	1.6 gp	1/2	80 gp
Herbs and Spices	Peppercorns	9.6 sp	1/2	48 gp
Herbs and Spices	Peppermint	9.6 sp	1/2	48 gp
Herbs and Spices	Periwinkle	1.6 gp	1/2	80 gp
Herbs and Spices	Pipsissewa	1.6 gp	1/2	80 gp
Herbs and Spices	Plantain	1.6 gp	1/2	80 gp
Herbs and Spices	Pleurisy Root	1.6 gp	1/2	80 gp
Herbs and Spices	Poke Root	1.6 gp	1/2	80 gp
Herbs and Spices	Poppy, flowers	3.2 gp	1/2	160 gp
Herbs and Spices	Poppy, seeds	4.8 sp	1/2	24 gp
Herbs and Spices	Prickly Ash Bark	1.6 gp	1/2	80 gp
Herbs and Spices	Psyllium, seed	1.1 gp	1/2	55 gp
Herbs and Spices	Psyllium, seed husk	6.4 sp	1/2	32 gp
Herbs and Spices	Pugeum Bark	1.6 gp	1/2	80 gp
Herbs and Spices	Queen Meadow Root	1.6 gp	1/2	80 gp
Herbs and Spices	Radish Seed	1.1 gp	1/2	55 gp
Herbs and Spices	Red Clover Blossoms	1.4 gp	1/2	70 gp
Herbs and Spices	Red Clover Blossoms, leaf	1.4 gp	1/2	70 gp
Herbs and Spices	Red Clover Blossoms, seed	8 sp	1/2	40 gp
Herbs and Spices	Red Raspberry Leaf	9.6 sp	1/2	48 gp
Herbs and Spices	Red Root	1.6 gp	1/2	80 gp
Herbs and Spices	Rhubarb Root	1.3 gp	1/2	65 gp
Herbs and Spices	Rooibos	1.1 gp	1/2	55 gp
Herbs and Spices	Rose, bud	3.2 gp	1/2	160 gp
Herbs and Spices	Rose, petals	9.6 sp	1/2	48 gp
Herbs and Spices	Rosehips	9.6 sp	1/2	48 gp
Herbs and Spices	Rosemary	1.6 gp	1/2	80 gp
Herbs and Spices	Rue	1.6 gp	1/2	80 gp
Herbs and Spices	Saffron	40 gp	1/2	2,000 gp
Herbs and Spices	Sage	9.6 sp	1/2	48 gp
Herbs and Spices	Sandalwood	3.2 gp	1/2	160 gp
Herbs and Spices	Sarsaparilla	1.6 gp	1/2	80 gp
Herbs and Spices	Sassafras, bark	3.2 gp	1/2	160 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Sassafras, root	3.2 gp	1/2	160 gp
Herbs and Spices	Savory	8 sp	1/2	40 gp
Herbs and Spices	Saw Palmetto Berries	1.6 gp	1/2	80 gp
Herbs and Spices	Schisandra Berries	1.4 gp	1/2	70 gp
Herbs and Spices	Scullcap	1.6 gp	1/2	80 gp
Herbs and Spices	Sea Salt	5 gp	2/1	250 gp
Herbs and Spices	Senna, leaf	1.3 gp	1/2	65 gp
Herbs and Spices	Senna, pod	6.4 sp	1/2	32 gp
Herbs and Spices	Sesame Seeds	6.4 sp	1/2	32 gp
Herbs and Spices	Sheep Sorrel	3.2 gp	1/2	160 gp
Herbs and Spices	Shepard's Purse	8 sp	1/2	40 gp
Herbs and Spices	Slippery Elm	1.6 gp	1/2	80 gp
Herbs and Spices	Soapwort Root	1.6 gp	1/2	80 gp
Herbs and Spices	Spearmint	8 sp	1/2	40 gp
Herbs and Spices	Spina Crista	1.3 gp	1/2	65 gp
Herbs and Spices	Spirulina	3.2 gp	1/2	160 gp
Herbs and Spices	St. John's Wort	1.6 gp	1/2	80 gp
Herbs and Spices	Star Anise	1.4 gp	1/2	70 gp
Herbs and Spices	Stevia	1.4 gp	1/2	70 gp
Herbs and Spices	Stillingia	3.2 gp	1/2	160 gp
Herbs and Spices	Stone Root	1.6 gp	1/2	80 gp
Herbs and Spices	Strawberry Leaf	1.1 gp	1/2	55 gp
Herbs and Spices	Suma Root	3.2 gp	1/2	160 gp
Herbs and Spices	Tansy	1.6 gp	1/2	80 gp
Herbs and Spices	Tarragon Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Thyme	9.6 sp	1/2	48 gp
Herbs and Spices	Tien Chi Flowers	6.4 gp	1/2	320 gp
Herbs and Spices	Tilia Star	1.4 gp	1/2	70 gp
Herbs and Spices	Tonka Beans	1.6 gp	1/2	80 gp
Herbs and Spices	Turkey Rhubarb Root	1.6 gp	1/2	80 gp
Herbs and Spices	Turmeric	8 sp	1/2	40 gp
Herbs and Spices	Usnea	3.2 gp	1/2	160 gp
Herbs and Spices	Valerian Root	1.4 gp	1/2	70 gp
Herbs and Spices	Vanilla, pod	15 gp	1/2	750 gp
Herbs and Spices	Vanilla, root	1.6 gp	1/2	80 gp
Herbs and Spices	Vitex Berries	9.6 sp	1/2	48 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Herbs and Spices	Voilet Leaf	1.6 gp	1/2	80 gp
Herbs and Spices	Wahoo	4.8 gp	1/2	240 gp
Herbs and Spices	Wheat Grass	1.6 gp	1/2	80 gp
Herbs and Spices	White Sage Leaf	6.4 sp	1/2	32 gp
Herbs and Spices	White Willow Bark	9.6 sp	1/2	48 gp
Herbs and Spices	Wild Cherry Bark	9.6 sp	1/2	48 gp
Herbs and Spices	Wild Indigo Root	3.2 gp	1/2	160 gp
Herbs and Spices	Wild Yam	1.6 gp	1/2	80 gp
Herbs and Spices	Wintergreen	1.1 gp	1/2	55 gp
Herbs and Spices	Witchhazel	1.4 gp	1/2	70 gp
Herbs and Spices	Wood Betony	1.6 gp	1/2	80 gp
Herbs and Spices	Wormwood	8 sp	1/2	40 gp
Herbs and Spices	Yarrow Flowers	8 sp	1/2	40 gp
Herbs and Spices	Yellowdock	8 sp	1/2	40 gp
Herbs and Spices	Yohimbe	1.6 gp	1/2	80 gp
Herbs and Spices	Yucca Root	1.6 gp	1/2	80 gp
Instruments	Basic Insturments	2 gp	1/2	100 gp
Instruments	Keyboard Instrument	5 gp	1/2	200 gp
Instruments	Percussion Instrument	2 gp	1/2	100 gp
Instruments	Stringed Instrument	5 gp	1/2	250 gp
Instruments	Wind Instrument	5 gp	1/2	250 gp
	Live Animals	**Cost/Unit**	**Weight/Unit**	
Livestock	Camel	200 gp	1,155 lbs	–
Livestock	Cattle, Bull	15 gp	1,225 lbs	–
Livestock	Cattle, Cow	10 gp	1,000 lbs	–
Livestock	Cattle, Heifer	8 gp	900 lbs	–
Livestock	Cattle, Steer/Ox	15 gp	1,400 lbs	–
Livestock	Chicken, Capon/Cockerel/Pullet	2 cp	varies	–
Livestock	Chicken, Chick (clutch 25)	1 sp	1 oz	–
Livestock	Chicken, Hen	2 cp	4 lbs	–
Livestock	Chicken, Rooster	5 cp	6 lbs	–
Livestock	Donkey	8 gp	400 lbs	–
Livestock	Duck, Drake	1 sp	11 lbs	–
Livestock	Duck, Duckling	5 cp	1 lb	–
Livestock	Duck, Hen	9 cp	9 lbs	–
Livestock	Elephant	500 gp	8,800 lbs	–

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Live Animals Continued	**Cost/Unit**	**Weight/Unit**	
Livestock	Elephant, War	1,000 gp	9,500 lbs	—
Livestock	Falcon, Adult (trained)	100 gp	7 lbs	—
Livestock	Falcon, Chick	50 gp	2 lbs	—
Livestock	Falcon, Egg	5 gp	1/2 lbs	—
Livestock	Geese, Gander	5 sp	20 lbs	—
Livestock	Geese, Goose	3 sp	18 lbs	—
Livestock	Geese, Gosling	1 sp	2 lbs	—
Livestock	Goat, Billy	2 gp	155 lbs	—
Livestock	Goat, Kid	8 sp	55 lbs	—
Livestock	Goat, Nanny	2 gp	135 lbs	—
Livestock	Hawk, Adult (trained)	100 gp	5 lbs	—
Livestock	Hawk, Chick	50 gp	2 lbs	—
Livestock	Hawk, Egg	5 gp	1/2 lbs	—
Livestock	Heavy Horse, Foal	60 gp	300 lbs	—
Livestock	Heavy Horse, Gelding	200 gp	2,500 lbs	—
Livestock	Heavy Horse, Mare	200 gp	1,750 lbs	—
Livestock	Heavy Horse, Stallion	200 gp	2,000 lbs	—
Livestock	Heavy Horse, Warhorse	400 gp	2,500 lbs	—
Livestock	Llama	8 gp	300 lbs	—
Livestock	Light Horse, Foal	25 gp	225 lbs	—
Livestock	Light Horse, Gelding	75 gp	950 lbs	—
Livestock	Light Horse, Mare	75 gp	800 lbs	—
Livestock	Light Horse, Stallion	75 gp	900 lbs	—
Livestock	Light Horse, Warhorse	100 gp	1,300 lbs	—
Livestock	Mastiff, Bitch	40 gp	165 lbs	—
Livestock	Mastiff, Dog	40 gp	190 lbs	—
Livestock	Mules	8 gp	400 lbs	—
Livestock	Pigeon, Cock	8 cp	3 lbs	—
Livestock	Pigeon, Hen	5 cp	3 lbs	—
Livestock	Pigeon, Squab	1 sp	2 lbs	—
Livestock	Pony, Foal	15 gp	90 lbs	—
Livestock	Pony, Gelding	30 gp	445 gp	—
Livestock	Pony, Mare	30 gp	320 lbs	—
Livestock	Pony, Stallion	30 gp	400 lbs	—
Livestock	Pony, Warpony	100 gp	575 lbs	—

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Live Animals Continued	**Cost/Unit**	**Weight/Unit**	
Livestock	Sheep, Ewe	2 gp	150 lbs	–
Livestock	Sheep, Ram	2 gp	175 lbs	–
Livestock	Sheep, Whether	1 gp	200 lbs	–
Livestock	Swan, Cob	1 gp	16 lbs	–
Livestock	Swan, Cygnet	2 sp	2 lbs	–
Livestock	Swan, Pen	8 sp	14 lbs	–
Livestock	Swine, Barrow Pig	3 gp	200 lbs	–
Livestock	Swine, Boar	4 gp	350 lbs	–
Livestock	Swine, Hog	3 gp	300 lbs	–
Livestock	Swine, Shoat Pig	2 gp	140 lbs	–
Livestock	Swine, Sow	4 gp	420 lbs	–
Livestock	Yak	30 gp	1,200 lbs	–
Livestock Tools	Bit, Bridle, & Reins	1 gp	1 lb	–
Livestock Tools	Cage, Fine-Tiny	3 gp	1 lb	–
Livestock Tools	Cage, Huge	500 gp	500 lbs	–
Livestock Tools	Cage, Large	250 gp	350 lbs	–
Livestock Tools	Cage, Medium	100 gp	100 lbs	–
Livestock Tools	Cage, Small	25 gp	35 lbs	–
Livestock Tools	Falconer Equiptment	50 gp	5 lbs	–
Livestock Tools	Feedbag	3 sp	1 lb	–
Livestock Tools	Halter	5 cp	1 lb	–
Livestock Tools	Harness, Breast Band	40 gp	35 lbs	–
Livestock Tools	Harness, Collar	25 gp	35 lbs	–
Livestock Tools	Harness, Saddle	20 gp	20 lbs	–
Livestock Tools	Hobbles	1 gp	3 lbs	–
Livestock Tools	Horseshoes, Iron	8 sp	12 lbs	–
Livestock Tools	Horseshoes, Steel	2 gp	18 lbs	–
Livestock Tools	Howdah	30 gp	40 lbs	–
Livestock Tools	Saddle Blanket	5 sp	4 lbs	–
Livestock Tools	Saddle Cloth	1 gp	8 lbs	–
Livestock Tools	Saddle Pack	3 gp	5 lbs	–
Livestock Tools	Saddle, Military	20 gp	30 lbs	–
Livestock Tools	Saddle, Pack	5 gp	15 lbs	–
Livestock Tools	Saddle, Riding	10 gp	25 lbs	–
Livestock Tools	Stabling (1 day)	5 sp	–	–

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/ Transport Unit
Livestock Tools	Yoke	5 gp	30 lbs	—
Metal (Alloy)	Adamantine	2,000 gp	10/1	100,000 gp
Metal (Alloy)	Brass	3 sp	21/1	15 gp
Metal (Alloy)	Bronze	3 sp	20/1	15 gp
Metal (Alloy)	Electrum	25 gp	35/1	1,250 gp
Metal (Alloy)	Mithral	1,000 gp	9/1	50,000 gp
Metal (Alloy)	Steel	1 sp	19/1	5 gp
Metal (Pure)	Adamantium	5,000 gp	8/1	250,000 gp
Metal (Pure)	Aluminum	1 gp	6/1	50 gp
Metal (Pure)	Copper	5 sp	21/1	25 gp
Metal (Pure)	Gold	50 gp	47/1	2,500 gp
Metal (Pure)	Iron	1 sp	18/1	5 gp
Metal (Pure)	Lead	5 cp	27/1	2.5 gp
Metal (Pure)	Nickel	1 sp	21/1	5 gp
Metal (Pure)	Platinum	500 gp	52/1	25,000 gp
Metal (Pure)	Silver	5 gp	25/1	250 gp
Metal (Pure)	Tin	3 sp	17/1	15 gp
Metal (Pure)	Titanium	150 gp	11/1	7,500 gp
Ore	Bauxite (Aluminium Ore)	8 sp	7/1	40 gp
Ore	Biotite (Iron Ore)	8 cp	7/1	4 gp
Ore	Cassiterite (Tin Ore)	5 cp	16/1	2.5 gp
Ore	Cinnabar (Mercury Ore and Common Red Dye)	8 sp	20/1	40 gp
Ore	Cobaltite (Cobalt Ore)	6 cp	15/1	3 gp
Ore	Galena (Lead Ore)	5 cp	18/1	2.5 gp
Ore	Hematite (Iron Ore)	8 cp	12/1	4 gp
Ore	Limonite (Iron Ore)	8 cp	9/1	4 gp
Ore	Magnetite (Iron Ore)	8 cp	12/1	4 gp
Ore	Malachite (Copper Ore)	8 cp	9/1	4 gp
Ore	Pyrite (Sulfur, Iron, Gold, and Copper Ore)	8 sp	11/1	40 gp
Organic	Amber	2,500 gp	4/1	125,000 gp
Organic	Angel Skin Coral	5,000 gp	4/1	250,000 gp
Organic	Coral	6.5 gp	4/1	325 gp
Organic	Horn Coral	100 gp	4/1	50,000 gp
Organic	Hornbill Ivory	60 gp	4/1	3,000 gp
Organic	Ivory	40 gp	4/1	2,400 gp
Organic	Jet	2,500 gp	3/1	125,000 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Organic	Nacre	10 gp	4/1	500 gp
Organic	Pearl	25,000 gp	4/1	1,250,000 gp
Organic	Petrified Wood	500 gp	4/1	25,000 gp
Pen and Paper	Black Carbon Ink (Stick)	1.6 gp	1/1	80 gp
Pen and Paper	Book Paste	2 cp	2/1	1 gp
Pen and Paper	Fixative	2 sp	2/1	10 gp
Pen and Paper	Gesso	2 sp	2/1	10 gp
Pen and Paper	Glair	8 sp	2/1	40 gp
Pen and Paper	Inkhorn	2 gp	1/1	100 gp
Pen and Paper	Ink-Pot	1 gp	1/1	50 gp
Pen and Paper	Isinglass (Fish Glue)	1 sp	2/1	5 gp
Pen and Paper	Journal (approx. 50 pages/lb)	1 gp	2/1	50 gp
Pen and Paper	Ledger (approx. 25 pages/lb	3 gp	2/1	150 gp
Pen and Paper	Paint Brush	2 sp	1/1	10 gp
Pen and Paper	Paint, Oil	3 gp	1/1	150 gp
Pen and Paper	Paint, Watercolor	1.6 gp	1/1	80 gp
Pen and Paper	Paper	2 sp	2/1	10 gp
Pen and Paper	Papyrus	2 sp	2/1	10 gp
Pen and Paper	Parchment	4 sp	2/1	20 gp
Pen and Paper	Pen	5 sp	1/1	25 gp
Pen and Paper	Pen Knife	1 gp	1/1	50 gp
Pen and Paper	Quills	2 cp	1/1	1 gp
Pen and Paper	Scroll Cases	5 gp	1/1	200 gp
Pen and Paper	Tome (approx. 25 pages/2 lbs.)	5 gp	2/1	250 gp
Pen and Paper	Vellum	6 sp	2/1	30 gp
Skins and Furs	Bear	5 gp	2/3	250 gp
Skins and Furs	Beaver	2 gp	2/3	100 gp
Skins and Furs	Bobcat	2 gp	2/3	100 gp
Skins and Furs	Dragon Hide	300 gp	2/3	15,000 gp
Skins and Furs	Ermine	4 gp	2/3	200 gp
Skins and Furs	Fox	3.5 gp	2/3	175 gp
Skins and Furs	Giraffe	5 gp	2/3	250 gp
Skins and Furs	Leather	1 sp	2/3	5 gp
Skins and Furs	Lynx	2 gp	2/3	100 gp
Skins and Furs	Mink	3 gp	2/3	150 gp
Skins and Furs	Nilgai	8 gp	2/3	400 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Skins and Furs	Otter	2.5 gp	2/3	125 gp
Skins and Furs	Owlbear	5 gp	2/3	250 gp
Skins and Furs	Panther	7 gp	2/3	350 gp
Skins and Furs	Sable	5 gp	2/3	250 gp
Skins and Furs	Seal	5 gp	2/3	250 gp
Skins and Furs	Snake	4 gp	2/3	200 gp
Skins and Furs	Snow Leopard	8 gp	2/3	400 gp
Skins and Furs	Tiger	5 gp	2/3	250 gp
Skins and Furs	Winter Wolf	7 gp	2/3	350 gp
Skins and Furs	Wolverine	3 gp	2/3	150 gp
Skins and Furs	Yeti	10 gp	2/3	5,000 gp
Skins and Furs	Zebra	6 gp	2/3	300 gp
	Stone		6/1	
Stone	Alabaster	20 gp	6/1	1,000 gp
Stone	Anorthite	25 gp	6/1	1,250 gp
Stone	Arkose	9 gp	6/1	450 gp
Stone	Basalt	4 gp	7/1	200 gp
Stone	Biotite	1 gp	6/1	50 gp
Stone	Catlinite	1 gp	6/1	50 gp
Stone	Chert	3.3 gp	6/1	165 gp
Stone	Chondrodite	1.5 gp	6/1	75 gp
Stone	Chrysocolla	5 sp	6/1	25 gp
Stone	Diorite	7 gp	6/1	350 gp
Stone	Dolomitic Marble	9 gp	7/1	450 gp
Stone	Dripstone	2.5 gp	6/1	125 gp
Stone	Feldspar	4 gp	6/1	200 gp
Stone	Flowstone	3 gp	6/1	150 gp
Stone	Gabbro	3 gp	7/1	150 gp
Stone	Geyserite	2 gp	6/1	100 gp
Stone	Gneiss	4 gp	7/1	200 gp
Stone	Granite	6 gp	13/2	300 gp
Stone	Graywacke	3 sp	7/1	15 gp
Stone	Greensand	1.2 gp	6/1	60 gp
Stone	Hornblende	4.5 gp	6/1	225 gp
Stone	Hornfels	2.3 gp	6/1	115 gp
Stone	Kaolin	3 sp	6/1	15 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
	Stone Continued		6/1	
Stone	Limestone	1.5 gp	6/1	75 gp
Stone	Marble	10 gp	6/1	500 gp
Stone	Mica	1 gp	6/1	50 gp
Stone	Phylitte	2.8 gp	6/1	140 gp
Stone	Pumice	6 sp	3/2	30 gp
Stone	Quartz Sandstone	1.7 gp	6/1	85 gp
Stone	Sandstone	2 sp	11/2	10 gp
Stone	Scoria	1.4 gp	7/1	70 gp
Stone	Shale	1.5 gp	5/1	75 gp
Stone	Slate	3 gp	5/1	150 gp
Stone	Soapstone	1 gp	13/2	50 gp
Stone	Tufa	8 sp	5/1	40 gp
Stone	Unakite	8 gp	6/1	400 gp
Tobacco	Burley	5 sp	2/3	25 gp
Tobacco	Cavendish	8 sp	2/3	40 gp
Tobacco	Kentucky	8 sp	2/3	40 gp
Tobacco	Latakia	8 sp	2/3	40 gp
Tobacco	Oriental	5 sp	2/3	25 gp
Tobacco	Perique	1.5 gp	2/3	75 gp
Tobacco	Virginia	5 sp	2/3	25 gp
Transportation	**Name**	**Cost/Unit**	**Weight/Unit**	**Load Capacity**
Transportation	Carriage	200 gp	200 lbs	500 lbs
Transportation	Cart	15 gp	200 lbs	500 lbs
Transportation	Cart, light	10 gp	150 lbs	250 lbs
Transportation	Wagon	35 gp	400 lbs	2 tons
	Name	**Cost/lb**	**Transport Value (weight/bulk)**	**Cost/Transport Unit**
Wood	Alder	4 sp	1/1	20 gp
Wood	Apple	1.2 gp	2/1	60 gp
Wood	Ash, Black	6 sp	5/3	30 gp
Wood	Ash, White	6 sp	3/2	30 gp
Wood	Aspen	5 sp	1/1	25 gp
Wood	Balsa	2 sp	1/2	10 gp
Wood	Bamboo	1 gp	1/1	50 gp
Wood	Basswood	7 sp	1/1	35 gp
Wood	Beech	6 sp	1/1	30 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Wood	Birch	5 sp	2/1	25 gp
Wood	Black Cherry	1.3 gp	1/1	65 gp
Wood	Black Walnut	1.2 gp	1/1	60 gp
Wood	Blackthorn	2.2 gp	3/2	110 gp
Wood	Boxwood	1.5 gp	2/1	75 gp
Wood	Brazilwood	8 sp	3/2	40 gp
Wood	Bubinga	1.2 gp	1/1	60 gp
Wood	Butternut	1.3 gp	1/1	65 gp
Wood	Cedar	8 sp	1/1	40 gp
Wood	Cherry	2 gp	3/2	100 gp
Wood	Chestnut	1.3 gp	3/2	65 gp
Wood	Cocobolo	5 gp	1/1	250 gp
Wood	Cypress	7 sp	5/4	35 gp
Wood	Ebony	3.1 gp	5/2	155 gp
Wood	Elm	1.2 gp	3/2	60 gp
Wood	Fir	4 sp	1/1	20 gp
Wood	Goncalo Alves	2.3 gp	1/1	115 gp
Wood	Hard Maple	1.6 gp	1/1	80 gp
Wood	Hickory	2.6 gp	3/2	130 gp
Wood	Ipé	2 gp	3/2	100 gp
Wood	Jelutong	1 sp	1/1	5 gp
Wood	Juniper	1.7 gp	1/1	85 gp
Wood	Kingwood	5 sp	1/1	25 gp
Wood	Larch	5 sp	1/1	25 gp
Wood	Lignum Vitae	5 gp	3/1	250 gp
Wood	Linden	1.8 gp	1/1	90 gp
Wood	Magnolia	6 sp	3/2	30 gp
Wood	Mahogany	1.3 gp	3/2	65 gp
Wood	Oak	1.5 gp	2/1	75 gp
Wood	Olivewood	9 sp	1/1	45 gp
Wood	Ósanwëtaurë Wood	150 gp	1/1	7,500 gp
Wood	Ovankol	1.7 gp	1/1	85 gp
Wood	Pecan	1.2 gp	3/2	60 gp
Wood	Pine	4 sp	1/1	20 gp
Wood	Poplar	2 sp	1/1	10 gp
Wood	Purplewood	1.5 gp	1/1	75 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Wood	Red Alder	3.1 gp	1/1	155 gp
Wood	Red Cedar	1.1 gp	1/1	55 gp
Wood	Red Oak	1.4 gp	3/2	70 gp
Wood	Redwood	9 sp	1/1	45 gp
Wood	Rosewood	1.8 gp	1/1	90 gp
Wood	Rowan	1.9 gp	1/1	95 gp
Wood	Shittim	9 sp	1/1	45 gp
Wood	Soft Maple	6 sp	1/1	30 gp
Wood	Spruce	5 sp	1/1	25 gp
Wood	Steelwood	100 gp	3/2	5,000 gp
Wood	Sycamore	8 sp	3/2	40 gp
Wood	Teak	1 gp	3/2	50 gp
Wood	Tulipwood	3 gp	1/1	150 gp
Wood	Walnut	1.1 gp	3/2	55 gp
Wood	White Elm	5.2 gp	1/1	260 gp
Wood	White Oak	1.5 gp	1/1	75 gp
Wood	Willow	4 sp	1/1	20 gp
Wood	Yellow Birch	3.3 gp	1/1	165 gp
Wood	Yellow Cedar	1.3 gp	1/1	65 gp
Wood	Yellow Poplar	4 sp	1/1	20 gp
Wood	Yew	1.2 gp	1/1	60 gp
Wood	Zebrawood	1.4 gp	1/1	70 gp
Other	Barrels (average weight 30 lbs.)	1 sp	1/2	5 gp
Other	Beeswax	5 sp	7/3	20 gp
Other	Candles (Tallow)	1 sp	7/3	5 gp
Other	Candles (Wax)	1 gp	7/3	50 gp
Other	Ceramic	5 sp	2/1	25 gp
Other	Chalk	1 sp	6/1	5 gp
Other	Charcoal	8 cp	1/2	4 gp
Other	Clay	1 sp	5/1	5 gp
Other	Coal	5 sp	7/2	25 gp
Other	Cork	2 gp	1/2	100 gp
Other	Dung	1 sp	1/1	5 gp
Other	Firestarter	2 gp	1/1	100 gp
Other	Flint	8 sp	6/1	40 gp
Other	Graphite	8 sp	5/1	40 gp

Type	Name	Cost/lb	Transport Value (weight/bulk)	Cost/Transport Unit
Other	Gum Arabic	8 gp	3/1	400 gp
Other	Ice	5 sp	2/1	25 gp
Other	Incense	20 gp	1/2	1,000 gp
Other	Lamp Oil	1 sp	2/1	5 gp
Other	Meerschaum	20 gp	3/2	1,000 gp
Other	Peat	3 sp	2/1	15 gp
Other	Pitch	5 sp	3/1	25 gp
Other	Porcelain	2 gp	1/3	100 gp
Other	Rocksalt	3 gp	5/1	150 gp
Other	Saltpeter	3 gp	3/1	150 gp
Other	Sand	5 cp	4/1	2.5 gp
Other	Sawdust	5 cp	1/2	2.5 gp
Other	Sealing Wax	1 gp	7/3	50 gp
Other	Talc	3 gp	5/1	150 gp
Other	Tallow	5 cp	2/1	2.5 gp
Other	Tar	5 sp	3/1	25 gp
Other	Water	1 cp	5/2	0.5 gp

Cloth

Burlap: This is a rough fabric made from the strong fibers of the jute plant. The earliest goods woven of jute were coarse rope, paper, and rugs. With longer experience this burlap, or hessian, was produced. It has become popular with merchants and sailors as a durable and inexpensive sack material.

Canvas: Canvas is a heavy, coarse, closely woven fabric of cotton, hemp, or flax, used for tents and sails. It can be dyed to take nearly any color desired.

Cotton: In the sense implied in this work, cotton is not the plant itself, but the cloth made from the fibers of the cotton plant. It takes dyes well and can be dyed into almost any color.

Felt: This is a non-woven fabric made of animal fibers. Instead of weaving or spinning, wool or animal fur is subjected to heat, moisture and pressure or agitation. This results in a permanent bond between the fibers and makes a suitable and versatile cloth.

Flannel: Made of a blend of cotton and wool fibers, flannel is a very warm, if slightly stiff and itchy, material. It is sometimes referred to as "tweed."

Lace: A fabric made of fine threads of linen, silk, or cotton and often ornamented with patterns of flowers, swirls, or other items, lace is usually used for the trim of clothing and for ornamentation on tables, chairs, and so forth. The intricate labor involved in its creation is reflected in the price, making it available (in a fantasy world) only to the very affluent.

Linen: Cloth woven from thread made from fibers of the flax plant (as opposed to the cotton plant), linen tends to be in common use in fantasy worlds. Everyday clothing may be assumed to be made of linen.

Satin: Satin is a cloth made of silk or very fine-spun thread that is tightly woven to create a garment that has a sheen on one side and is dull on the other (the side with the sheen is usually worn facing "out"). Originally woven from silk, cheaper threads can be used in the same weaving technique, forming sateen, or faux satin. The sheen gives it the look of silk, while the dull inside provides warmth and comfort for the wearer. Satin can be dyed into nearly any color; purple and red are usually reserved for royalty.

Silk: Produced in the first instance by silkworms, silk thread is valued for its strength and durability. The silk from the worms is harvested and woven into a tight-knit cloth. This cloth has a highly glossy sheen. Silk itself is white, though it takes dyes well and hence can be dyed into nearly any color.

Velvet: A derivative of silk, one side of a piece of velvet cloth has small loops of thread standing nearly erect, almost like very short fur, while the other side is dull and without sheen and feels a little rougher to

the touch. Velvet is warmer than silk (from which it is made) but lacks some of the innate shine and beauty of silk. The extra warmth makes it a popular substitute for silk in colder climes and among travellers.

Wool: Though "wool" can also refer to the furry coat of a sheep, in this instance, wool refers to cloth woven from the fur of a sheep (or goat or other similar animal). It is warm (if a bit scratchy and rough) and due to the hardiness of sheep (from which it is made) is among the most widespread and popular clothing materials in most fantasy worlds. Fine woolens are a different league of wool. They are often made from breeds of animal renown for their delicate coats or sheared from the soft underfur of animals.

Cosmetics

Face Powder: A white or pastel face powder used to cover blemishes and imperfections.

Hair Brush: Used for brushing, tidying, and detangling hair. Historically, hair brushes were made of boar's hair affixed to a stiff, hard backside, often hardwood but also metals.

Hair Clip: This category contains all the sundries that people use to decorate their hair and hold it in place.

Hair Comb: A toothed device for hair care, detangling hair, decorating hair, and keeping pieces of hair in place.

Henna: A dye used in hair coloring and temporary body art. It is extracted from the dried leaf and petioles of the henna plant. Strong tea, lemon juice, and essential oils are added to release the dye from the powder, resulting in a paste that adds a deep red or brown tint to whatever it dyes.

Kohl: A dark mineral powder used as an eyeliner.

Lip Pomade: A colored pomade painted on the lips.

Perfume Oils: Fragrances made from aromatic substances, alcohol, and oils. Used for formulating cosmetics, creams and soaps as well as personal use.

Pomade: A hair product made from a mixture of purified pork fat and wax, then scented with essential oils. Allows hair or wigs to be shaped and sculpted as well as provide a sheen in appearance.

Rouge: A red or pink cosmetic for coloring the cheeks.

Scented Waters: The scented remains of distilled essential oils. Used for formulating cosmetics, creams and soaps; also used on a person like a perfume.

Skin Cream: Creams used to soften and scent the skin.

Soap, Castile: A soap made from vegetable oils (such as olive oil).

Soap, Colored and/or Perfumed: A soap with added pigment and scents. Soapmakers may also add emollients (like shea butter) to moisturize the skin.

Soap, Lye: A soap made with mixing ashes and tallow (animal fat).

Wig: A false head of hair, often made of human or horse hair.

Wig Powder: A powder made of starch used to color and/or scent wigs

Gems

Ornamental: The least valuable and most common of gems; a 1/50th of a pound sample averages 10 gp in value.

Semi-precious: Slightly more valuable and less common than ornamental gems, a 1/50th of a pound sample averages 50 gp in value.

Fancy: About "average" value for gems, a 1/50th of a pound sample averages 100 gp in value.

Precious: More durable and/or rarer and/or beautiful than Fancy stones, a 1/50th of a pound sample averages 500 gp in value.

Ornate: Some of the most valuable and/or rare samples around, a 1/50th of a pound sample averages 1,000 gp in value.

Exquisite: The rarest, most coveted, and/or durable gems around, a 1/50th of a pound sample averages 5,000 gp in value.

Ornamental

Agate: Agates are a particular variety of chalcedony that forms in rock cavities, usually in concentric layers. This produces bands and stripes, though occasionally "plumes" can be found, as well. The most common color is brownish-red, though nearly all colors can be found.

Agni Mani (Tektite): Sanskrit for "fire pearl" or in some translations, "teardrops from the moon," agni mani is a type of tektite that is usually black-red to black in color. Like most tektites, agni mani comes in shapes ranging from spheres to elongated ovals to "tear drops" but is almost always smooth, though it may have pitted areas on it.

Allanite (Epidote): Also known as "orthite," allanite is frequently radioactive. It is usually black but some translucent pieces can be brown to violet and is vitreous to greasy in luster. It tends to form in

elongated crystals or long, flat tablets. The ends of the crystal are usually wedgeshaped, though pyramid-shaped ends are not uncommon.

Amazonite Microcline: A vitreous, opaque to translucent stone, amazonite is the light green to green-blue form of microcline. It is frequently found in blocky crystals with nearly square or rectangular cross-sections. While vitreous in its natural state, it wears easily and will become pearly or dull with use.

Apache Tears: Apache tears are small droplets of black, smoky black, reddish, greenish black, or purplish black obsidian. Often they have flattened areas or indentations that occur as the stone is formed. They are clear when held up to a light source, but are black when placed on a surface. They are vitreous in luster and translucent when held to a light source, but opaque when placed on a surface.

Augelite: Augelite is frequently found in clusters of small, clear and colorless crystals, though varieties with white shading or pale yellow, blue, pink, and rose coloration also exist. It is glassy and usually transparent to translucent.

Azurite: Azurite is a rich blue in color – the blue runs from pale blue to a blue so dark as to be easily mistaken for black. Azurite crystals tend to be long and flat ("bladed") with a glassy to dull luster. Thin crystals are translucent, but thicker crystals are translucent to opaque.

Banded Agate (Agate): Banded agate typically refers to brown agate with red, pink, gray, black or clear stripes. Like most other agates, it has a dull vitreous to greasy luster, and is opaque in all but very thin slices.

Black and White Agate (Agate): Black and white agate is usually a black agate with white "striped" inclusions, though occasionally it is black stripes on white agate. Spots, stripes, and simply "blotchy" areas of white color the black agate.

Blue John Fluorite: Blue john fluorite is has bands of purple and white, and sometimes yellow mixed with the blue background of the stone. It is transparent to translucent and forms in cubes (rather than long crystals).

Blue Lace Agate (Agate): Blue Lace Agate is pale blue agate with white lacy patterns running across it.

Boracite: Usually colorless to white, boracite sometimes has pale tints of yellow, green, or blue. It forms in translucent masses instead of crystals and has a vitreous luster.

Borax: Borax is white to clear with a vitreous luster. It forms in large, blocky transparent to translucent crystals with almost square cross-sections.

Chromium Diopside: A brilliant, deep green form of diopside, chromium diopsite is sometimes mistaken for emerald. It has a vitreous luster and is transparent to translucent.

Crazy Lace Agate (Agate): Gray "base" agate with lacy or snowflake patterns of blue, white, or brown (or all of the above) is referred to as "crazy lace" agate.

Dendritic Agate (Agate): A milky, translucent agate with black or brown fernlike patterns, dendritic agate otherwise shares the properties of all agates.

Diopside: Diopside is typically white or green and can have a nice glassy luster. Its crystals are transparent to translucent, and some specimens are blue or greenish brown in color as well. It tends to form in short crystals.

Dry-head Agate (Agate): The name given to rust, red, or orange agate with thin black stripes is "dry-head" agate.

Electric Obsidian (Obsidian): Black obsidian with that seems to reflect light as blue is called "electric obsidian." Occasionally, veins of light blue or cyan will streak the surface. Like other obsidians, electric obsidian is vitreous in luster and is translucent to opaque. It forms in amorphous masses rather than crystals.

Eye Agate (Agate): A white agate with green "eyes," the green inclusions are actually spherical; they only appear to be "eyes" when cut, exposing only a circle on the surface of the stone.

Faden Quartz (Quartz): Faden is a German word meaning thread, and these quartz crystals are characterized by the white, threadlike lines running through them. The quartz is usually clear save for the threads.

Fire Agate (Agate): Fire agate is actually a brown variety of agate, not red as many would expect. It is agate with a thin layer of water or small crystals caught near the surface, providing it with a slightly iridescent face.

Fluorspar: Forming large, transparent to translucent cubic crystals in all colors of the rainbow, fluorspar can be almost any color and has a vitreous luster.

Frost Agate (Agate): Composed of translucent gray agate with white, opaque "snowflakes," frost agate is a name given to a certain coloration pattern of agate.

Gypsum: Usually white, colorless or gray, gypsum can also be shades of red, brown and yellow. It is vitreous to pearly in luster and is transparent to translucent. It forms in large "blades" of crystal.

Hematite: Hematite can form in small "blades" of crystal (usually arranged around a central point and forming a "rose") or in large, amorphous masses. It is silvery gray to earthy red in color, with a metallic to dull luster and is quite opaque. With its high

iron content, hematite is among the heavier of the gemstones, but this also makes it an excellent pigment; when ground to powder, it is a blood-red color and can be used to dye materials a dull red.

Holly Blue Agate (Agate): More of a lavender color than being truly blue in hue, holly blue agate is translucent and is sometimes banded. In other respects, it can be treated as agate.

Howlite: Although howlite is always white or gray, accepts dyes fairly easily and be dyed a turquoise blue. The look of turquoise is so good that unscrupulous gem cutters sometimes attempt to scam the uninformed. It is, however, an affordable substitute for turquoise carvings, beads, polished stones and cabochons. It accepts a nice polish and its dull to sub vitreous luster looks much like porcelain. It is translucent to opaque and forms in masses rather than crystals. The masses tend to be bulbous and are somewhat reminiscent of cauliflower.

Iris Agate (Agate): Clear agate with white and blue bands is called iris agate. It is only the coloration that gives it the name; in other respects it can be treated as agate.

Labradorite: Gray to smoky black in color, labradorite appears unremarkable until the stone is held up to light; when this happens, the light shining through the stone is iridescent and looks to be tinted blue, yellow, green, and pink. Labradorite forms in blocky crystals, is translucent to transparent, and has a dull to vitreous luster.

Lapis Lazuli: Lapis lazuli is a rock composed of a mixture of minerals; it is a lovely dull translucent dark blue and tends to form in masses rather than crystals. Sometimes the dark blue takes on a purplish or greenish hue (depending on exactly which minerals are in the mixture composing it). When acid is poured on lapis lazuli, it emits the pungent odor of rotten eggs; applying a tiny amount of acid to a stone is one way to test that it is lapis lazuli.

Leopard Agate (Agate): Leopard agate is a black agate with swirls of white, brown, and yellow (similar to the coloration of - surprise - a leopard). This is simply a name for a particular coloration pattern; the stone itself may be otherwise treated as agate.

Lodestone: Found in deposits of cubes or amorphous masses, lodestone is an opaque dull gray to black color with a dull luster. It has the well-known property of being magnetized and slivers of lodestone are often used in navigation for this reason.

Malachite: From the Greek from "mallow" (a distinctive green herb), malachite has banded light and dark green designs upon it when formed in masses, though crystals are merely a dark green. It is opaque with a dull luster in masses, and translucent with a silky luster in crystalline form. It is slightly effervescent (as carbonated bubbling and hissing) when exposed to acid. The crystals are usually long and similar in appearance to fibers, while the massive form is globular.

Milky Quartz (Quartz): Milky quartz is another name for quartz crystals that are white in color but are "cloudy" due to small inclusions of fluids encased in the crystal as it grew. Its other properties are that of simple quartz.

Morion (Quartz): Very dark brown to black smoky quartz is known as morion. In all respects other than color, treat it as quartz.

Moss Agate (Agate): A clear or milky agate with green or red moss-like patterns, moss agate is in other ways similar to agate.

Obsidian: Obsidian is an almost glassy form of rock formed by volcanic activity. It forms in amorphous masses and is translucent with a vitreous luster. It is usually black in color but can also be dark green to dark brown. Obsidian comes from the Greek "opsianos", meaning "vision," because obsidian was used to make mirrors in ancient Greece.

Okenite: One of the more usual minerals, okenite forms in small, thin crystals that form in clusters that look much like anemones or cotton balls. The crystals are white to colorless and are transparent to translucent with a resinous to pearly luster. The incredible thinness of the crystals makes them exceedingly fragile.

Oolite (Agate): A light gray form of agate, oolite tends to be translucent to opaque in color. It otherwise takes the usual characteristics of agate.

Pele's Hair: Thin strands of volcanic glass drawn out from molten lava have long been called Pele's hair, named for Pele, the Hawaiian goddess of volcanoes. A single strand, with a diameter of less than 1/50th of an inch, may be as long as 6 feet. The strands are formed by the stretching or blowing-out of molten basaltic glass from lava, usually from lava fountains, lava cascades, and vigorous lava flows (for example, as lava plunges over a small cliff and at the front of a flow). Pele's hair is often carried high into the air during eruptions, and wind can blow the glass threads several tens of miles from a vent

Petalite: Found in colorless to pink to light greenish hues, petalite is a transparent to translucent stone with a vitreous luster.

Petrified Wood: To form petrified wood, the wood must first be covered with volcanic ash, mud, sediment, or other material that would prevent decay. The most common mineral that causes petrifaction is

silica (sand). Complex chemical processes cause the silica to replace the water inside individual cells in the wood, causing the wood to become petrified. Petrified wood may be an agate, jasper, chalcedony or opal.

Coloration of petrified wood is caused by the presence of other minerals that enter the wood in solution with the silica. Petrified wood is usually opaque and has a waxy to vitreous luster, and is differentiated from other forms of agate, jasper, etc. merely by the manner of its formation (which preserves the form and appearance of wood).

Quartz: Quartz comes from the Greek word for "ice" and it is the most common mineral on earth. Found in almost every environment, it is often a (major) component of nearly every rock type. It quite varied in terms of varieties, colors and forms. It is also known as "crystal" - frequently this name is used when substituting quartz for glass when creating an item. Quartz is transparent to translucent and has a vitreous luster. It is popular due mostly to its plentiful supply, but also for its versatility and durability.

Rhodochrosite: Most commonly a pink or red color (though white, yellow, and brown are not unknown), rhodochrosite forms with rounded crystals that have a vitreous to a resinous luster and a transparent to translucent appearance. Sometimes it has white or pink opaque "bands" running through it as well.

Rutilated Quartz (Quartz): Clear, transparent quartz with large golden inclusions of rutile (an ore of titanium) is called "rutilated quartz." The inclusions often look like golden needles sprinkled inside the quartz.

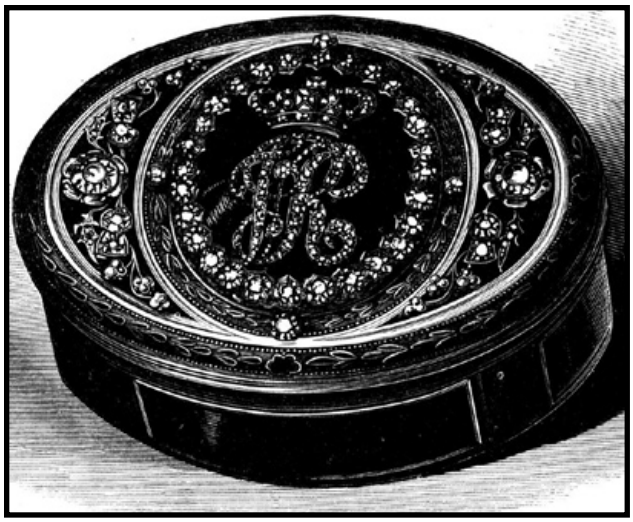
Sagenite (Agate): Purple agate with thin white inclusions (similar to threads in appearance), sagenite is often opaque, though translucent varieties also exist. It is in other respects typical of the agate family.

Salite (Diopside): A form of diopside, salite is almost dark brown in color. It forms in small transparent to translucent crystals that have a glassy luster.

Sanidine: Pale in color, from off-white to pastels, and possessed of a dull luster, sanidine crystals are transparent to translucent. They have the curious property of breaking into pieces with edges at perfect right angles to each other when shattered.

Satin Spar (Gypsum): Gypsum that is milky white in color and transparent to slightly translucent in color is sometimes referred to "satin spar." It forms in long crystals and is sometimes used to create wands. It has a silky luster and, being bypsum, is not exceptionally durable.

Silver Sheen Obsidian (Obsidian): Black obsidian with that seems to reflect light as silver in color is called "silver sheen obsidian." Like other obsidians,



silver sheen obsidian is vitreous in luster and is translucent to opaque. It forms in amorphous masses rather than crystals.

Snowflake Obsidian (Obsidian): Obsidian that is a mix of black and gray (and occasionally white) is called "snowflake obsidian." Like other obsidians, snowflake obsidian is vitreous in luster and is translucent to opaque. It forms in amorphous masses rather than crystals.

Sunstone: Sunstone and moonstone are essentially the same stone, but with different colors. Whereas moonstone runs in soft whites and grays, sunstones are rich yellow to orange to almost red in color, with a few rare stones having a green tint. It has a vitreous luster, and, like moonstone, forms in blocky crystals with rounded ends. It is often cut cabochan. It is translucent to transparent and when illuminated, seems to glow slightly as the light is diffused by passing through the crystal.

Turitella (Agate): Turitella agate is the name given to black agate that contains small fossils (usually gray or white in color). Other than the inclusions of the fossils, it is otherwise identical to black-colored agate.

Variscite: Translucent and possessed of vitreous or waxy transparency, variscite is often confused with turquoise because of its light blue-green color (the difference is that variscite is translucent while turquoise is opaque). It usually occurs in masses of fine grains, packed tightly together, so the surface feels somewhat rough (another clue that it is not turquoise). Sometimes impurities give it streaks of yellow or white color.

Violane (Diopside): The violet (purple) variety of diopside, violane otherwise possesss the qualities of diopside (q.v.).

Wonderstone (Jasper): Opaque jasper which is a pale blue in color and is flecked with black impurities is called wonderstone (similar to bloodstone save in coloration). It otherwise has the properties of jasper.

Semi-precious

Albite: Albite is usually white, though occasionally specimens that are colorless or have a light blue, green, pink, orange, or brown tint can be found. It has a vitreous luster, and is usually opaque to translucent.

Amber: Unique among gems, amber is not formed of crystallized minerals, but rather of hardened tree sap. It is usually transparent with a resinous luster and most often runs from yellow to red in color, though nearly all colors are possible.

Andalusite: Andalusite is a tough gemstone with a unique red-green coloration. It is sometimes confused with alexandrite because of its similar color. It is transparent to translucent and has a vitreous luster.

Apatite: Vitreous to resinous in luster and running the gamut of transparency (transparent all the way to opaque), apatite is usually yellow, green, or brown in color with occasional rare and more valuable specimens being colorless, violet, or blue.

Aqua Aura (Quartz): Aqua Aura is a unique form of quartz – it consists of clear or cloudy blue crystals with flecks of the metal gold embedded on the surface, creating a look not unlike starry skies. The crystal usually has a vitreous luster and is translucent.

Augite: Augite is a somewhat brittle gem that comes in greens, browns, and black colors. It is translucent to opaque, with a vitreous to resinous luster.

Aventurine (Quartz): There are three main varieties of aventurine, distinguished by color. Regardless of color, aventurine is opaque and has a dull vitreous luster. The three varieties are green aventurine (usually flecked with gold), blue aventurine, and red aventurine. Their physical properties are identical; the difference in color is due to the inclusion of various impurities but does not substantially affect the physical makeup of the gem.

Bat Cave Jasper (Jasper): Translucent to opaque, and with a dull vitreous to greasy luster, bat cave jasper is the variety of jasper which is chocolate brown to tan color.

Benitoite: Blue in color and transparent to translucent, crystals of benitoite are sometimes mistaken for sapphire. They are possessed of a vitreous luster and appear to glow (blue) to darkvision.

Bixbyite: A deep black color, bixbyite tends to form in cubes. It has a metallic to sub-metallic luster and is opaque.

Bloodstone (Chalcedony): Bloodstone is green chalcedony with flecks of red jasper interspersed. The deep red of the jasper lends to the stone its name.

Brecchiated Agate (Agate): Brecchiated Agate is made up of broken agate pieces held together with (clear) quartz. The agate is usually brown in color.

Bruneau Jasper (Jasper): Bruneau jasper is jasper that appears as a blend of red and tan-gray opaque jasper.

Carey Plume Agate (Agate): White agate with brilliant, almost metallic orange and silvery inclusions in the shape of plumes (shaped like long "fingers" or ferns), carey plume agate is quite beautiful and popular for jewelry.

Carnelian (Chalcedony): Orange to orange-red in color, carnelian is usually translucent to transparent with a vitreous luster.

Celestite: Celestite is usually blue but can also be colorless, yellow and tints of red, green and brown. It has a vitreous luster and is transparent to translucent. It sometimes forms in long, flat "blades" but also is known to form in small fiberlike shapes.

Chalcedony: Chalcedony is a term that includes many well-known varieties of gemstones. In particular, it refers to quartz crystals that are opaque (as opposed to transparent or translucent crystals; "quartz" usually refers only to the transparent or translucent crystals, while "chalcedony" refers to opaque crystals). Chalcedony comes in all colors and can be striped, flecked, or spotted as well.

Chrysolite: Yellow in color and tinged slightly with green, chrysolite is transparent to translucent with a vitreous to oily luster. It is closely related to peridot.

Chrysoprase (Chrysolite): The green form of chalcedony, chrysoprase is an apple green in color. It is not usually used for jewelry, as the green color tends to fade when exposed to sunlight.

Citrine (Quartz): Citrine is a rich yellow color, and is one of the more common forms of quartz. It is transparent with a vitreous luster. It can be found naturally occurring or formed by heating amethyst to very high temperatures.

Covey Lace Agate (Agate): The name "covey lace" is given to agates with turqouise and white coloration forming snowflake or lace patterns.

Crown of Silver: The common name for the mineral psilomelane, "crown of silver" is in fact an iron-black to bluish black to steel gray color rather than silvery. It has a submetallic to dull luster and is opaque. It forms in masses or, occasionally, blocky columns.

Dioptase: Dioptase is one of the few minerals that can challenge the emerald's deep green color

for beautiful green coloration. It has a vitreous luster, with transparent to translucent crystals. It usually forms in small, stubby crystals, though masses are not unheard of.

Enstatite (Diopside): Vitreous to pearly in luster, enstatite tends to take on a submetallic luster as it is weathered. It is usually white or colorless, though grays, light browns, and pale greens are not unknown. It usually forms in masses and is generally translucent.

Fayalite (Peridot): Fayalite usually forms in masses or in small grains lumped together. It is transparent to translucent, with a vitreous luster and a is usually a dirty brown color.

Galena: Forming in cubes that are gray to silver in color (occasionally with a bluish tint), galena has a metallic to dull luster and is opaque. It is one of the leading ores of silver, but is rather beautiful of its own accord as well.

Gold Sheen Obsidian (Obsidian): Black obsidian with that seems to reflect light as gold is called "gold sheen obsidian." This is due to a layer of fine gold particles trapped just beneath the surface of the black obsidian. Like other obsidians, gold sheen obsidian is vitreous in luster and is translucent to opaque. It forms in amorphous masses rather than crystals.

Graveyard Plume Agate (Agate): Black or gray agate with orange and white inclusions in the shape of plumes (shaped like long "fingers" or ferns), graveyard plume agate looks something like a cloudy sky on a rainy day.

Hiddenite (Spodumene): The name given to the green variety of spodumene, hiddenite comes in shades from almost yellow to almost blue. The darkness of the color depends on which angle it is viewed from (pleochroism). It is transparent or translucent with a vitreous luster, and tends to form in long, flat crystals, sometimes as much as 30 feet long!

Hydrophane (Opal): Hydrophane is a beautiful stone but is not nearly as valuable as other opals for several reasons; the most important reason is that it is very slightly water-soluble. While it soaks up water well, it also tends to dissolve just a bit when it does so (while the amount dissolved is very small, so as not to be immediately noticeable, the obvious effect is that over time, a hydrophane stone exposed to the elements will begin to have a noticeable mass loss). In addition, this variety of opal (usually with a white background) has many "potches" - spots where light does not play off the opal (the play of light is the signature of the opal) unless the spots are moistened. Because hydrophane is composed mostly of potches, it is usually mistaken for other translucent white stones until it becomes wet, at which point its true nature emerges. This ability to absorb water makes it slightly stick to moist surfaces.

Hypersthene: From the Greek for "over strength," another name for hypersthene is "bronzite." It has a usually bronze-like color and when weathered has a submetallic luster, though the coloration sometimes takes on shades of green and unweathered hypersthene has a pearly luster. It is generally translucent and usually forms in masses rather than crystals.

Iolite: Sometimes known as "water sapphire," the name "iolite" comes from the Greek word "ios" (violet). Iolite exhibits pleochroism; that is, it appears to be different colors when viewed from different directions. The darkest color is a purplish blue color; looking at the stone from different directions provides a range of colors from a dark yellow to clear. In fact, a six-sided die (cube) of iolite that looked purplish blue when looking at one face or its opposite face (perhaps on the 1 and the 6) would appear yellow when viewed on another pair of opposing faces (say, the 2 and 5) and clear when viewed on the final pair of faces (the 3 and the 4). This makes it an extremely difficult stone to cut. It is this change from deep blue to clear that lends the nickname "water sapphire" to the stone.

Jasper: Translucent to opaque and with a dull to greasy luster, jasper is the massive form of quartz, though since quartz is typically thought of as crystals and jasper as masses, it suffices to leave the distinction at that; the mineral makeup is (for the most part) the same, only the crystalline structure differs. It is usually red, brown, or yellow in color.

Jet: Dark black in color, jet is fossilized driftwood which was subjected to chemical action in stagnant water, before being subjected to heat and pressure. It usually will create static electricity when rubbed, but not always and feels strangely warm to the touch.

Kunzite (Spodumene): The name given to pink spodumene, kunzite is transparent to translucent and has a vitreous luster. It forms in long, flattened

crystals, some of which can become enormous. It tends to splinter when cut, making it somewhat challenging to work with.

Kyanite: With its distinctive blue color, vitreous to pearly luster, and transparent to translucent appearance, kyanite is similar in appearance to (blue) sapphire. Kyanite tends to form in smaller, blocky crystals rather than large masses.

Lazulite: Not to be confused with lapis lazuli, lazulite is characterized by an azure blue to bright blue color and form in small crystals or in larger masses. It is translucent and occasionally transparent, with a vitreous to dull luster.

Malacon (Zircon): A water-altered form of zircon, (zircon with a little extra water involved in its formation), malacon is brown in color but retains the other properties of zircon.

Moonstone: Moonstone is usually off-white or gray with pastel-colored green, yellow, or brown tinges from time to time. It forms in blocky crystals that taper to rounded ends. It is translucent to transparent and has a vitreous luster that becomes dull as it is weathered. When illuminated, moonstone seems to glow slightly as the light is diffused by passing through the crystal.

Onyx: A type of opaque quartz that naturally occurs in black colors, though it can be dyed to achieve other colors.

Orbicular Jasper (Jasper): This is a name for jasper with spherical inclusions of a different color than the main body of the jasper. When cut, these spheres appear as circles on the surface of the cut stone, resembling eyes (orbs) on the jasper.

Phantom Quartz (Quartz): "Phantom" quartz refers to the growth of a crystal on a crystal. It is formed when a quartz crystal stops grows on top of another crystal of a different color. Usually this occurs with a colorless crystal forming over a slightly-colored crystal; however, the contrast in colors makes the division between the two crystals quite clear. Phantom quartz, then, cannot properly be described as having a single luster or color (though obviously it is transparent so as to make the interior crystal visible); rather, it is characterized as being two quartz crystals of any type, one contained inside the other.

Picture Jasper (Jasper): Comprised mostly of soft tans and browns, picture jasper is formed in riverbeads and streams. As such, it often has different colors swirled together in a mix that has a form reminiscent of a desert sunset. Picture jasper is otherwise treated as conventional jasper.

Priday Plume Agate (Agate): A rich brownish-red color with black and white plumes (patterns that look like flames or ferns), priday plume agate is, in all respects save coloration, identical to agate.

Purple Obsidian (Obsidian): Purple obsidian is obsidian that appears a dark purple color. It is actually mostly opaque black obsidian with but a thin layer of translucent purple caught near the surface; this purple layer has reflective particles in it that reflect light out; passing through the purple layer gives this gem a purple sheen. It is vitreous in luster and is translucent to opaque, forming in amorphous masses rather than crystals.

Rainbow Obsidian (Obsidian): Rainbow obsidian appears to contain bands of color, ranging from purple, to blue, to green, and even some orange bands of color. It seems to be dark gray to black when viewed from most angles, however, from the proper angle, tiny crystals encased in the amorphous flow that forms obsidian are able to reflect the light through its slightly translucent structure, causing rainbow colors to be reflected. Rainbow obsidian has a vitreous to oily luster.

Regency Plume Agate (Agate): Regency plume agate is an agate with a background of yellow and grey overlaid with "plumes" of white (which appear to be flames or feathers in the agate). Frequently, the colors have a slight sparkle to them.

Rock Crystal (Quartz): Quite simply the name given to colorless, translucent to transparent quartz, rock crystal is among the most common forms of quartz. As quartz, it has a vitreous to glassy luster.

Samarskite: Nearly opaque and velvety black to dark brown in color, samarskite has a resinous to vitreous luster. It forms in small, stubby crystals or amorphous masses.

Sard (Chalcedony): Brown-colored chalcedony is known as sard; its physical properties other than color are the same as normal chalcedony.

Sardonyx (Chalcedony): Sard (brown-colored chalcedony) with lighter-colored bands running across it is referred to as sardonyx. It is otherwise treated as chalcedony.

Scepter Quartz (Quartz): Scepter quartz is the name given to cluster of crystals when a quartz crystal of one color is growing out of a quartz crystal of another color (or out of another gem, such as beryl). This gives the formation the appearance of one crystal embedded in another (which is in fact true).

Selenite (Gypsum): Another name for colorless gypsum, selenite has all the characteristics of gypsum.

Serpentine: Serpentine is possessed of a green, yellow, or brown coloration and a waxy, greasy, or silky luster. When found in crystal form it is translucent, but when found in masses, it is opaque. The luster and color make it appear almost as snake's

skin, hence the appellation "serpentine." It is usually found in masses, though when crystals occur, they are usually long and fairly thin. Strangely, the most frequent place to find serpentine crystals in inside of serpentine masses.

Smoky Quartz (Quartz): The common name for quartz that is dark grayish-brown in color (similar to the color of smoke), smoky quartz tends to be translucent and somewhat waxy in luster.

Sodalite: Sodalite runs in pale to deep blue colors, though white, gray, and pink sodalite stones also exist. It is frequently translucent though a few transparent stones exist. It has a greasy to vitreous luster.

Strawberry Quartz (Quartz): Deep pink to light red quartz is sometimes called strawberry quartz (as it is the same general hue as a strawberry). It is otherwise the same as normal quartz.

Sugilite (Tourmaline): When found naturally, sugilite has an opaque, deep color, though polishing the stones will lighten and change the color a bit (for instance, a deep purple stone usually can be polished to a deep, dull red). It usually comes in purples and reds, though pale pinks and blacks are not unheard of. When found in nature, it has a waxy luster, though polishing and tumbling can bring this luster to a vitreous or dull finish (depending on the gem). It is translucent to opaque and almost always forms in masses rather than crystals, though very rarely, thinner splinters of sugilite in crystal form can be found.

Tourmalined Quartz (Quartz): Though similar in appearance to rutilated quartz (q.v.), tourmalined quartz is quartz with flecks and inclusions of black tourmaline (schorl). These appear as small flecks or needles within the quartz crystals. It is otherwise treated as quartz.

Transvaal Jade (Garnet): Not truly a jade at all, but rather a form of whitish green, opaque to translucent garnet, transvaal jade is vitreous in luster and shares all the typical properties of garnets.

Turquois: Famous for its distinctive opaque blue-green color, and its waxy to dull luster, turquoise usually forms in masses as opposed to crystals and is quite smooth. It has the peculiar property of fading with exposure to oils (including skin oils) so its ornamental use is limited to jewelry where the turquoise does not touch the skin (a turquoise set on the outside of a gold pendant is fine, a turquoise necklace where the stone is the pendant is not).

Witherite: Pastel colors, from white to light browns, yellows, and greens, characterize witherite. It has a vitreous to dull luster and is transparent to translucent. It forms in six-sided crystal "blades" that end as the two sides come together - literally, in the form of a blade. It also seems to glow slightly to darkvision (and is fluorescent under ultraviolet light).

Woodward Ranch Plume Agate (Agate): Black agate with red, yellow, and white plumes (inclusions in the shape of feathers or flames) is known as woodward ranch plume agate; save for coloration, they exhibit all the properties of agates.

Zircon: Zircon (a corruption of the arabic "zar gun") can be brown, yellow, green, blue, or black, (the deep red and purple variety is referred to as jacinth, while the colorless variety is referred to as jargoon). It is transparent to translucent and forms in long crystals that have an adamantine to vitreous luster. It is sometimes passed off as diamond by less-than-honest gemcutters (and sometimes replaces real diamonds in items like crown jewels when worn in public places).

Fancy

Alexandrite: Alexandrite is a peculiar gem in that it appears to change color depending on how light hits it. It appears to be a deep green color except when a light source is behind it, in which case the transmitted light appears red instead of green. This property makes it popular in jewelry. It has a vitreous to greasy luster and is transparent.

Amethyst (Quartz): Among the most easily recognizable of all gems, amethyst is renowned for its beautiful deep purple to lavender crystals. It also ranges from transparent to translucent and has a vitreous luster. It is the most valuable form of quartz.

Ametrine: Ametrine is something of a composite stone, constituted of alternating layers of amethyst (purple) and citrine (yellow).

Angel's Skin: Not a gem proper, but rather the collected calcium of excretion from coral polyps, angel's skin varies in color from white to deep red. Because of its delicate nature, it is ill-suited for use in everyday jewelry, though use in ceremonial or display jewelry is seen from time to time. It has a silky luster and is quite opaque.

Buegerite (Tourmaline): Buegerite is the name given to black tourmaline.

Dravite (Tourmaline): Dravite is the name given to brown tourmaline (q.v.). It has a vitreous luster and is translucent to opaque.

Elbaite (Tourmaline): A variety of tourmaline, elbaite comes in many colors, most commonly red, pink, green, blue, orange, and yellow. It is vitreous and transparent to translucent and forms in long three-sided crystals.

Garnet: Garnets tend to form in cubes or long, twelve-sided crystals. Though most think of garnets as red, a few garnets come in other colors (though these have their own names). Garnets are transparent to translucent and vitreous in luster.

Grossular (Garnet): Grossular is the term for garnets that are gray in color and have formed in masses instead of crystals. They are often opaque or translucent with a vitreous luster.

Hessonite (Garnet): Usually brown in color (though sometimes orange), hessonite is a variety of garnet. It is usually transparent or translucent with a vitreous luster, and the long crystals usually have twelve sides along the shaft, though (more rarely) crystals with twenty-four or even forty-eight sides can be found (these last look almost round).

Jade: The common name for nephrite, jade is a hard fibrous green to white rock with a translucent to opaque appearance and a pearly luster. It was often used as adornment for tombs in ancient times.

Jargoon (Zircon): A corruption of the arabic "zar gun" (from which the word "zircon" is also derived), jargoon refers to colorless, transparent zircon stones. These form in long, four-sided crystals that terminate in pyramids on either end and have an adamantine luster.

Kornerupine: Kornerupine is characterized by its deep green color, similar to emeralds, though it changes color when viewd from different angles, changing from yellowish-green to a brownish-red as the crystal or gemstone is turned with respect to the viewer. It has a vitreous luster and is translucent to transparent; it forms in long crystals though it is sometimes cut cabochon.

Mottled Jasper: Simply another name for jasper of any color with flecks of other colors mixed in. Otherwise it has the properties of normal jasper.

Olivine: Though commonly a pale yellow green, some varieties are a light green, with a vitreous luster and transparent and translucent crystals. It usually forms in flat or box-shaped crystals.

Royal Plume Jasper: Royal plume jasper is rich purple jasper with plumes (impurities in the form of flames or feathers) of nearly any color evident. Save for the coloration, it may be treated as normal jasper.

Schorl (Tourmaline): Black tourmaline, schorl is characterized by a vitreous to submetallic luster and opaque crystals. It frequently forms in long, three-sided crystals or in formless masses.

Sinhalite: Vitreous luster, green-brown to brown in color, and transparent to translucent in appearance, sinhalite is rarely found in large crystals; it instead forms in small, pebble-sized (and shaped) stones.

Thulite (Zoiste): Thulite is the pink form of zoisite.

Tourmaline: Appearing in nearly every color, tourmaline can be transparent to opaque and has a vitreous to resinous luster. Some crystals are chatoyant (light passing through the gem appears to be different colors when viewed from different angles); this is due to tiny tubular cavities, imperceptible to the naked eye, in the crystal structure of the gem. Some of the more common varieties include buergerite, dravite, elbaite, and schorl.

Uvite (Tourmaline): Green, white, light brown, or black, uvite is a form of tourmaline that most often occurs in short, stubby crystals with triangular cross-sections. It is transparent to translucent (though very dark black crystals often appear opaque at first glance) and has a vitreous luster.

Zoisite: Though the best known colors of zoisite are green, blue to violet and pink to reddish in color, it can also be grey, white or brown. It is vitreous in luster and translucent to transparent. It tends to form in masses or long crystals and when worked into jewelry is usually used for items that do not see much wear, such as earrings or pendants (but not rings, for instance).

Precious

Almandine (Garnet): Vitreous to resinous in luster, Almandine is a deep red to bright red variety of the garnet. It can have any transparency, and tends to form in long crystals that have 12, 24, or (rarely) 48 sides, though occasionally it will form as a massive stone.

Andradite (Garnet): Varying in color from black to grey to greenish yellow to red, to yellowish brown, andradite is one of the forms of garnet. It has a vitreous luster and is transparent to translucent. It usually forms in large, coarse crystals or occasionally in large masses.

Aquamarine (Beryl): A beautiful blue-green color reminiscent of the sea (hence its name), aquamarine is one of the better-known varieties of beryl. It is transparent to translucent with a vitreous luster. Occasionally, it can have cat's eye and star varieties. It usually forms in long hexagonal crystals.

Beryl: The term "beryl" usually refers only to the red and yellow varieties of the gem; the most famous beryl is green beryl (known as emerald). Beryl has a vitreous luster and is transparent to translucent. It can grow in very large crystals; the crystals tend to be long, with six sides around the length of the crystal.

Burnt Topaz: Orange-brown to yellow-brown in color, burnt topaz is simply the name given to topaz of this color.

Demantoid (Garnet): Demantoid's colour spectrum includes many shades of green and ranges from slightly yellowish green to brownish green with a golden shine. Most valuable is a deep emerald green, which, however, is very rare indeed. The word "demantoid" comes from Dutch and means something to the effect of "similar to diamond". Demantoid's unique brilliance and luminosity are almost unparalleled among gemstones; it scatters incoming light extremely well. It has a vitreous luster and is transparent.

Euclase: Sea-green or light blue in color, euclase forms in transparent crystals that are stubby and tend to form unevenly. It tends to take a vitreous luster.

Garnet Peridotite (Garnet): Rusty yellow to yellow-green in color, the garnet peridotite is a form of garnet.

Heliodor (Beryl): The yellow variety of beryl, heliodor has all the qualities normally associated with beryl.

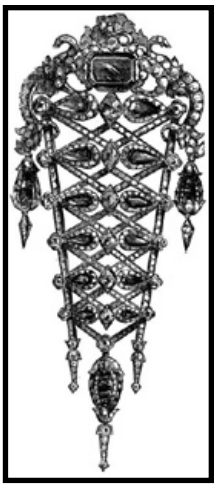
Melanite (Garnet): Melanite is simply the name for black-colored garnet.

Pearl: Pearls are formed when a grain of sand or other small, insoluble object enters a mollusk (such as an oyster or clam). The mollusk defends itself against the irritation caused by the sand by coating it with layers of mother-of-pearl (q.v.). A single pearl can take up to three years to form; the larger the pearl, the longer the formation time. Pearls have a pearly luster and an opaque, irridescent surface. The color a pearl is the same color as the inner shell of the mollusk that created it; however, pearls can be dyed to produce other colors.

Peridot (Olivine): Peridot is the best-known gem variety of olivine. It is a bright yellow-green to green color and is transparent to translucent with a vitreous to oily luster.

Rhodolite (Garnet): Rhodolite is simply the name given to garnets with a deep pink to wine color; they are in all ways garnets.

Spessartine (Garnet): This form of garnet is deep orange to red in color to dark yellow and brownish, and is sometimes called the "pomegranate of the gem world." A few spessartines exhibit chatoyancy (where light passing through the gem in one direction appears to be a different color than light passing through the gem from another direction).



Sphene: From the Greek for "wedge," sphene forms in wedge-shaped crystals and is found in a variety of colors; it can be green, yellow, white, brown, or black. It has an adamantine luster and is transparent to translucent.

Spodumene: With a vitreous luster and transparent to translucent crystals, spodumene tends to form in large, long, flat crystals. The faces of the crystals are somewhat rough, and spodumene's color seems to darken or lighten as the gem is viewed from different angles. Though some of its varieties are known by their own names (such as kunzite and hiddenite), spodumene can be white, colorless, yellow, green, gray, pink, and light purple. The colors are usually somewhat light.

Topazolite (Garnet): The yellow variety of garnet, topazolite gains its name from its color (the same as that of most topaz stones). Its other characteristics are the same as garnet.

Uvarite (Garnet): The name given to the darkest green of garnets (also sometimes called uvarovite), uvarite exhibits all of the properties common to garnets.

Ornate

Australian Opal: Opals are vitreous to pearly in luster. Australian opals are mostly white and yellow in color.

Balas Ruby (Spinel): The red variety of spinel, balas ruby is the most common variety of spinel. It is usually transparent, though occasionally can be translucent or opaque, and has a vitreous luster. Its coloration runs from deep red to pink.

Black Opal (Opal): Among the most precious forms of opal, black opal has a dark black background color, though the play of reflected light consists of all colors of the rainbow.

Blue Opal (Opal): Blue opal, as might be expected, has a rich blue background color. Like other opals, however, reflected light can appear to sparkle with all colors.

Boulder Opal (Opal): Boulder opal is closely related to blue opal, but boulder opal is a combination of light cyan to dark blue (almost black) background as opposed to a single solid color. Like other opals, reflected light from a boulder opal appears to sparkle with all colors.

Cachalong Opal (Opal): "Cachalong" is simply the name given to opals with a pale yellow or white translucent background; like other opals, light playing off the opal is reflected in all colors.

Cherry Opal (Opal): Simply the name given to a the form of opal with a rich red background color, cherry opal, like other opals, tends to play all colors of the rainbow when light is reflected off it.

Emery (Corundum): Corundum mixed with magnetite, emery is usually white. It is translucent and has an adamantine luster. It is usually rough and is an excellent abrasive material.

Fire Opal (Opal): An opal with a brilliant orange to red background is called a fire opal. The surface of the opal, of course, plays reflected light into all colors of the rainbow.

Girasol (Opal): The variety of opal with a translucent gray to tan background, the surface of girasol, like other opals, plays reflected light into all colors of the rainbow.

Goshenite (Beryl): The colorless variety of beryl is referred to as goshenite; it is transparent with a vitreous luster.

Honduran Opal (Opal): The background color of honduran opal is a light blue to light gray color, almost like a cloudy sky on a hot day. Light reflects and plays off the surface of the opal in all colors (as is the norm for opals), and it is the background color that allows one to determine the particular variety of opal.

Hyalite (Opal): Hyalite opal has a yellow to blue mixed background color that seems to glow to darkvision (it fluoresces bright green in ultraviolet light). Like other opals, reflected light from a hyalite opal appears to sparkle with all colors.

Imperial Topaz (Topaz): Topaz comes in many colors; blue is the most famous, but the golden variety (an orange-red color), is known as "Imperial Topaz". Like other types of topaz, it has an adamantine to vitreous luster and is translucent to transparent and forms in either crystals or masses.

Moss Opal (Opal): Moss opal is so named because it contains impurities that look like dark, branching moss spread along the background of the opal; like other opals, moss opal plays light across its surface in all colors.

Mountain Opal (Opal): "Mountain opal" is a variety of opal with an opaque orange to tan background, the surface of mountain opal, like other opals, plays reflected light into all colors of the rainbow.

Sapphire (Corundum): Probably the second-most famous variety of corundum, sapphire is usually thought of as a rich blue stone; however, any variety of corundum that is not red (a ruby) is called a sapphire. Hence, there are green and yellow and even black sapphires. Sapphires are vitreous in luster and transparent to translucent.

Spinel: Often substituted for the most costly of gems (such as rubies or sapphires), spinel comes in a variety of colors, from greens to purples to blues to browns to black. The most common variety, however, is red. Spinel has a vitreous luster and runs the gamut of transparency, from transparent all the way to opaque. This makes it perhaps one of the most varied in appearance among precious gems. It is exceptionally hard and wears well.

Tomb Jade: A term that refers to jade that has seen much or heavy use and has been weathered to an opaque reddish, yellowish, or brownish tinge, the base form of tomb jade is jade. It derives its name because it is most commonly found in ancient tombs, having long been exposed to the air without cleaning.

Topaz: In natural form, topaz tends to be golden yellow to pale yellow in color, with transparent crystals that have a vitreous to adamantine luster. Topaz is one of the more versatile gemstones, forming in large crystals, small granules, and even in massive, amorphous forms. They are extremely sturdy crystals and some can be as large as several hundred pounds. Topaz' color is sometimes clear, orange, or red in natural form. It has the curious property of changing color (permanently) to blues and greens when heated.

Water Opal (Opal): The "background" color of a water opal is clear, colorless, translucent stone, though the surface, like other opals, splays reflected light into all colors of the rainbow and creates an opalescent pattern

White Opal (Opal): White opal is the form of opal with a "background" color milky white, translucent stone. The surface of water opal, like other opals, reflects light into all colors of the rainbow due to tiny crystals and water pockets included just below the surface of the opal.

Wood Opal (Opal): Opal with a background color that is orange to brown in color (and thus reminiscent of wood) is called wood opal. The background is translucent and the surface plays light into all colors as other opals do.

Exquisite

Corundum: Corundum comes in a variety of colors, though the term "corundum" usually refers only to colorless and white varieties. Red corundum is commonly known as ruby, while all other colors of corundum (not just blue) are usually referred to as sapphires. It is transparent to translucent, with a vitreous luster.

Diamond: Diamond comes in nearly every color imaginable, though it tends to be pale to colorless. It has a waxy to adamantine luster and is transparent to translucent.

Emerald (Beryl): The most famous of the beryls, emerald is most easily recognized for its signature deep green coloration. It is transparent to translucent and has a vitreous luster. It typically forms in long, six-sided crystals.

Harlequin Opal (Opal): Harlequin opal is a special term for opals that refers not to the background color (as is often the case), but rather the regularity of the "patches" when light is played off the surface of the opal. In most opals, the "patches" are uneven and irregular; in harlequin opal, the patches are roughly square and of about equal size.

Jacinth (Zircon): A reddish-blue to deep purple stone sometimes known as "hyacinth," jacinth is the name given to zircon (q.v.) of this color. It has an adamantine luster and is transparent to translucent. It tends to form in long, four-sided crystals with "pyramids" at each end.

Jelly Opal (Opal): Jelly opal ranges from orangish yellow to dark red in color, and while it is more translucent than most varieties of opal, it is also the least opalescent of the opals (i.e., light does not play and reflect in many colors along the surface of jelly opal well).

Morganite (Beryl): Morganite is the pink form of beryl; it has a vitreous luster and forms in large transparent to translucent crystals.

Ruby (Corundum): The most well-known variety of corundum, pink or red in color, rubies are among the most precious of gemstones. They are usually transparent or translucent, with a vitreous luster.

Glass

Aeroglass: Aeroglass is a light, strong glass containing small amounts of adamantine and numerous minute air bubbles. It is sometimes found as slag floating on top of lava in active volcanoes.

Glass: A compound made of heated sand and silica, glass may be tinted by adding various impurities but is generally completely transparent and somewhat fragile.

Leaded Crystal: Not truly a crystal, but rather glass mixed with small quantities of lead, leaded crystal looks like glass with a brilliant sparkle (due to light reflecting off the lead). It can be tinted different colors, but in its natural form appears as clear as normal glass; the difference comes in the increase in sparkle.

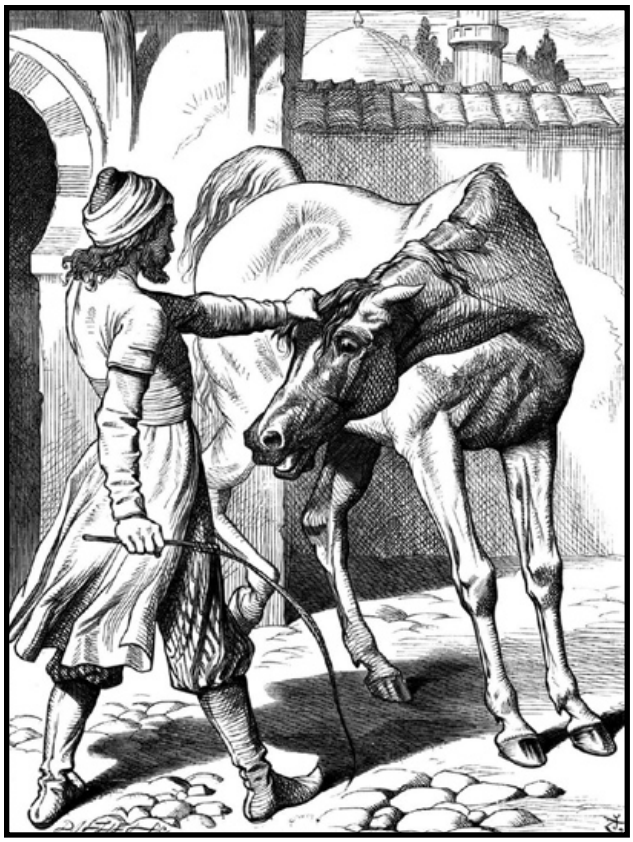
Livestock

Cattle, Bull: A sexually mature male. One bull can service up to 30 cows.

Cattle, Cow: An adult female.

Cattle, Heifer: A cow less than three years old that has not had a calf.

Cattle, Steer / Ox: A castrated male, usually used for draft.



Chicken, Capon: Castrated male chicken.

Chicken, Cockerel: Male chicken less than one year old.

Chicken, Hen: Female chicken one year old or more.

Chicken, Pullet: Female chicken less than one year old.

Chicken, Rooster: Male chicken one year old or more.

Chick: A newly hatched or immature bird.

Geese, Gander: Adult male goose.

Geese, Goose: Adult female goose.

Geese, Gosling: Young goose.

Goat, Nanny: A female goat

Goat, Kid: A young goat that has not been weaned.

Goat, Billy: A sexually mature male goat. One billy can service up to 50 goats.

Horse, Foal: Newborn or juvenile horse.

Horse, Gelding: Castrated male horse.

Horse, Mare: Adult female horse.

Horse, Stallion: Adult male horse.

Mastiff: This dog is very massive, powerful and muscular. The mastiff is one of the heaviest breeds; a male can exceed 200 pounds. The mastiff is very brave and can be vicious in combat. The breed has been used as an arena gladiator for bull, bear and dog fighting, and as a solid military dog. The short coat of the mastiff is golden, light gold, silver and apricot. There is a black mask around the eyes and nose no matter what the general coat color.

Pigeon, Squab: A young pigeon still in the nest.

Sheep, Ewe: Adult female sheep.

Sheep, Ram: A sexually mature male sheep. One ram can service up to 50 ewes.

Sheep, Whether: A castrated male.

Swan, Cob: A male swan.

Swan, Cygnet: An immature swan.

Swan, Pen: Female swan.

Swine, Barrow Pig: Castrated male pig

Swine, Boar: Adult male pig.

Swine, Hog: A castrated boar.

Swine, Shoat Pig: Young pigs between 100-180 pounds.

Swine, Sow: Adult female pig.

Livestock Tools

Bit, Bridle, & Reins: A collection of head gear necessary to control a mount. If this equipment is lacking, Handle Animal checks made for the mount suffer a -2 penalty.

Breast Band Harness: A flat strap goes around the front of the chest and is joined to one or two straps that go over the withers, usually by a metal ring. The traces, flat leather or chains covered with a soft pipe, go from the ring to a swingle tree. This is in turn attached to the implement or cart.

Collar Harness. This is a good harness for large cart horses; the pull is from the shoulders rather than the chest. The traces are connected to the collar and to a swingle tree. Unfortunately a collar needs to be specifically adjusted for use by a specific animal and cannot be used for another animal. Poorly fitted collars can result in injury and an animal will not pull well if it is painful to pull. +2 to animal Str checks.

Falconer Equipment: A set of falconer equipment has everything a character needs to train and use a raptor to hunt small prey. Each set contains jesses, talon guards, a leash, a perch block, a gauntlet, and a hood. Trying to train a raptor without this equipment incurs a -6 penalty to Handle Animal skill checks.

Saddle Harness: This is a inexpensive harness favored by farmers. A wooden saddle is attached onto the back of the animal and secured by a belly strap and a strap around the chest. This saddle is attached directly to a plow or simple carts.

Halter: A strap with a bitless headstall that is set on the head or neck of the animal to restrain and guide it. +2 to Handle Animal checks.

Hobbles: These are tethers used to restrain an animal but still allow it to move. +1 to Handle Animal checks.

Horseshoes: Metal bars shaped to fit a horse's hoof and attached to the hoof by nailing it to the inner edge of the horny wall of the hoof.

Howdah: A seat equipped with a railing and canopy designed for riding on the back of an elephant, camel, or other large animal or monster.

Saddle, Military: A military saddle braces the rider, adding a +2 circumstance bonus to Ride checks related to staying in the saddle. If a character is knocked unconscious while in a military saddle, he or she has a 75% chance to stay in the saddle (compared to 50% for a riding saddle).

Saddle, Pack: A pack saddle holds gear and supplies, not a rider. A pack saddle holds as much gear as the mount can carry.

Saddle, Riding: The standard riding saddle supports a rider.

Saddle Cloth: This is a soft woolen cloth with a leather patch that serves as a inexpensive saddle.

Yoke: A simple crossbar harness with two U-shaped pieces that encircle the necks of draft animals for simple draft work.

Exotic Mount/Monster Equipment: Sometimes a customer requires gear for a special mount or rare animal, such as a Camel, Unicorn, Griffin, Elephant, Spider Eater, etc. This equipment must be custom made for the particular creature, making it expensive. The highly customized piece also adds an additional 1d4 days to the normal crafting time. Example: A typical war-saddle for a Unicorn costs 240gp [(4HD*2)*30gp=240gp].

Metal

Dense, ductile, reflective, and good conductors of heat, metal should be familiar to most readers. This category is broken into two sub-categories, pure metals and metal alloys. Metal alloys are rarely, if ever, found in nature; a metal alloy is a metal made by the mixture of two or more metals and/or trace elements (to help the bonding process).

By contrast, pure metals can be found in nature, though often they will be mixed with rock in "ore" form. They are the "basic" metals and cannot be derived by mixing other metals (as alloys can).

Pure Metal

Adamantium: Almost always found in ore deposits (the ore itself is usually called adamantite), adamantium is one of the two pure metals from which adamantine is derived. Adamantium is a dull, dark gray (almost to the point of being black) and is exceedingly light. It is not as durable as adamantine, and is only occasionally used for creating items; its greater value is as a constituent material of

adamantine. Because of its rarity, and because of the value of adamantine, nearly all adamantium is quickly alloyed into adamantine when found.

Aluminum: An exceedingly versatile metal with a wide range of attractive properties, aluminum is resistant to corrosion, is malleable, conducts electricity and heat well, and when properly alloyed, can be extremely strong. In a more historical middle age setting, aluminum is extremely rare, as acid baths and electricity are required to separate it from bauxite (the ore in which it is found); however, the price given (see the asterisk) assumes a high fantasy world where (magical) electricity is easy to come by. Its value should increase one hundred-fold in worlds where little to no electricity exists. Aluminum is a silvery-white metallic color and reflects light exceptionally well. It is often used in masterwork components that add strength and/or lower the weight of an item.

Copper: Copper is a reddish brown metal that is an excellent conductor of heat and electricity. It is fairly malleable and is among the most common metals (iron being another) used by most denizens of a fantasy world.

Gold: This well-known metal with a distinctive yellowish color is somewhat soft when pure; it is frequently alloyed to increase its durability and hardness. It is an excellent conductor of heat and electricity. Gold is probably familiar to most adventurers in a fantasy world.

Iron: Probably the most familiar material to common folk of fantasy worlds, iron is a gray-colored metal that is fairly easily worked and comprises the vast majority of the tools found in the typical fantasy world.

Nickel: Along with iron, nickel is known for its ability to become magnetized. It is heavy and relatively stiff and firm, making it a popular choice in alloys (as it lends its strength to the alloy).

Platinum: Among the most valuable and rare metals in the world, platinum is a light silvery, almost white color, with a high reflective sheen. It does not tarnish and is exceptionally durable.

Silver: In common use among the commoners of fantasy worlds, silver is the metal most frequently available for jewelry and the like for the "everyday" folk (and even then, it's expensive). Silver is something most people in a fantasy culture will be very well acquainted with, having seen it and having it pass through their hands, even if they do not own much of it.

Tin: Surprisingly heavy and strong, tin appears to be somewhat dull (it does not reflect light too well) and grayish-white in color. Tin is slightly softer than most metals. It is fairly easy to work, which makes it popular for small-scale items (such as cups).

Titanium: Metallic in color, though not quite as shiny as silver nor as dull as tin, titanium is among the strongest metals (especially for its weight) known. It is also among the rarest.

Metal Alloy

Adamantine: Adamantine is an alloy known to be made of a mixture of one part adamantium and two parts iron, with traces of a few other elements mixed in. The trace elements – both the proportions needed and precisely what they are – are without exception a closely guarded secret among smiths. Knowledge of the trace elements is vital as they are required to hold the alloy together; adamantium and iron normally are immiscible, quickly separating in the same fashion as oil and water. Adamantine is a deep gray color, similar to graphite, but it has the sheen of burnished silver (though its much deeper color ensures that it is seldom mistaken for silver). Light playing off of adamantine usually has the peculiar property of appearing blue (this is usually referred to as "blue adamantine"), though a few samples have been found where the light play is red ("red adamantine); it is speculated that there are two sets of trace elements that can bind adamantine and that the combination that produces blue reflections is simply the more common of the two.

Brass: Brass comes in many hues, from a light red to a deep yellow to a pale, almost white yellow. It is a mixture of zinc and copper. Usually it is 2 parts copper to 1 part zinc; the color is determined by the other trace metals added to the mixture.

Bronze: An alloy consisting of copper and tin, bronze tends to be a dark yellow to orange-brown color. It reverberates well and is popular for making bells.

Electrum: An alloy of silver and gold (usually considered to be about 45% gold and 55% silver), electrum is somewhat shiny (like silver) with a pale yellow color. The first recorded reference to the metal electrum was in Homer's epic poem The Odyssey.

Mithral: Mithral is a very rare silvery, glistening metal that is lighter than iron but just as hard. When worked like steel, it becomes a wonderful material from which to create armor and is occasionally used for other items as well.

Steel: The metal most frequently used in the forging of weapons, steel is simply iron with trace amounts of carbon (and other materials) added to make it much harder and durable than is iron. It is in common use for tools, armor, and other metal items among the common folk in most fantasy worlds.

Organic

Amber: A resin that hardens into a translucent stone with a yellow-brown tone, often used in decoration and jewelry.

Coral: Coral is a rocklike deposit consisting of the skeletons and shells of sea life. Coral deposits often accumulate to form reefs or islands in warm seas.

Horn Coral: Horn coral is usually green (sometimes even fluorescent green) to brown (with a strong reddish tint), though when formed where there is little light (such as at great depths), it is yellow. In addition, the green or brown coloration tends to fade to yellow with age.

Hornbill Ivory: Taken from the helmeted hornbill bird, hornbill ivory is distinguished from other ivories by being quite hard and closely-textured. It is used to make small objects such as buckles and brooches (as the bird is not that large, large specimens are rare). The outside is a red to brown color, though when cut through, it is found to have a red rim with a bright yellow interior; hence, working and sanding can result in hornbill ivory of oranges and yellows.

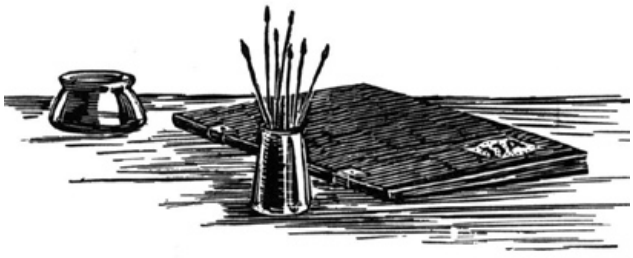
Ivory: Usually harvested from elephants (though walrus ivory is also fairly common), ivory is simply the cream- to white-colored tusks of animals. Ivory is often used as a material for carving and holds etchings reasonably well. It is relatively easy to obtain in areas where elephants and walruses live but is comparatively rare elsewhere.

Jet: A mineraloid produced from decaying wood under extreme pressure that is polished and used in ornamentation and jewelry.

Nacre: Also known as "mother-of-pearl," nacre is the name given to the iridescent interior of mollusk shells. It is usually white, cream, or blue in hue, though the light play across the surface runs the gamut of colors.

Pearl: Formed inside in the shell of mollusks, pearls are round hard objects. Mollusks are irritated by a substance and coat the irritant with calcium carbonate, thus making a pearl.

Petrified Wood: Fossilized wood where the organic material is replaced with minerals in the original structure of the wood, turning the wood into stone. Often used in decoration and jewelry.



Pen and Paper

Black Carbon Ink: This ink is sold as sticks that can be liquefied in water as needed. Very useful for travelers who don't want to carry messy liquid ink or fragile containers. A single stick of black carbon ink will produce 1 pint of liquid ink.

Fixative: This liquid is brushed over drawings in dry media, especially charcoal or chalk, which are easily rubbed or erased. It protects the drawing from smudges and other mishaps.

Gesso: A preparation of plaster and glue used as a surface for painting.

Glair: Glue made from egg whites

Ink-Pot: This is a small clay pot designed to keep ink moist and to hold a quill when not in use. A standard inkpot hold up to 4 ounces of ink.

Inkhorn: A portable ink-pot, designed to prevent spilling or breaking. A inkhorn hold 8oz of ink.

Journal: This book is designed with large pages and a loose spine, primarily to serve as a record for personal events. A standard journal uses 8"x10" sheets of paper. A journal has a minimum of 30 sheets of paper.

Ledger: This large book is similar to a journal, primarily used to record all of the financial transactions of an individual or business. A standard ledger uses 12"x15" sheets of paper. A ledger has a minimum of 40 sheets of paper

Paper: Although a fairly new material, paper's popularity continues to soar, ensuring its future position as the most popular writing material. Slightly more expensive than parchment, but with more abundant source materials, paper is the most popular medium among young spellcasters. Formed from any number of fibrous materials such as straw, leaves or rags, paper is produced in a manner very similar to papyrus in that it is moistened, pressed and then dried. Paper enjoys the most popularity in large, cosmopolitan cities.

Papyrus: In many cultures, papyrus replaced cuneiform as the primary writing medium. Despite its ancient origins, papyrus remains a popular but rather expensive material. Formed from the pith of the papyrus plant, the entire process of moistening, pressing and drying the plant material lasts about one week. Unlike cuneiform, writing on papyrus' coarse surface requires some type of ink. Because

of its lack of durability, papyrus is used largely for scrolls. Papyrus is extremely vulnerable to water. Any saving throws it must make against water based attacks receive a -2 circumstance penalty.

Parchment: In many cultures, parchment replaced papyrus and remains the most popular choice for scrolls and spellbooks. Parchment is created from the specially treated and untanned skins of sheep, calves and goats. The parchment maker thoroughly cleans the skin, removing all hair and other debris before rubbing it with powdered pumice.

Quill: The best feathers prove to be the five or so outer wing pinions of a water fowl. Feathers freshly removed from the bird, or found, are too flexible and need hardening. They can either be left to dry out for some months or can be hardened artificially by soaking them in water and then plunging them for a few minutes into a tray of heated sand. The feathers of crows and other birds are fine, and are used for tiny script.

Scroll Case: A scroll case stores up to 40 rolled scrolls.

Tome: Tomes are massive codices, holding vast amounts of script. The long-lived dwarves often use ruled tomes as ledgers, meticulously cataloging thousands of business transactions dating back for a century or more. A standard tome uses 20"x25" sheets of paper. A tome has a minimum of 100 sheets of paper.

Vellum: Vellum is a more expensive form of parchment; is crafted from the skins of younger animals, producing a smoother and finer finished product than does parchment.

Skins

Bear: Bearskin is (naturally) the skin of a bear. The skin itself tends to have a somewhat coarse texture and is slightly on the thick side. Bearskin (with fur intact) is a popular hunting trophy (and not an unpopular choice for rugs, either).

Beaver: Beavers have a natural layer of insulation and waterproofing, courtesy of their double coating of brown fur. The outer layers of the beaver's fur consists of coarse, prickly hair, and the inner layer is made of dense, fine hairs. This outer layer is almost always removed when making beaver skin furs, as it is uncomfortable to wear.

Bobcat: Found in nearly all habitats save for densely populated areas. Most commonly, though they live in mountains and desert areas where some water is available, favoring rocky, brushy hillsides on which to live and hunt. "Bobcat" may have come from its short (just a few inches long) tail, which is always black tipped with white. It has long legs and large paws, but is fairly small in size (only about thirty pounds). Geographic variations have some effect on their color. Those found in timber and heavy brush fields are darker with rust-colored tones, while those found in the desert generally are a paler tawny-gray, often with a complete absence of spots on the back and less distinct markings.

Ermine: A close relative of the mink, ermines have dark brown coats of fur that they shed in the winter in favor of white coats (to blend in with snow) - but the tip of the tail is always black. It feeds on rabbits and small rodents.

Dragon Hide: Perhaps the most legendary of all materials, dragon hide is simply the skin, usually with scales, harvested from a dragon. The scales are left on in most cases save when the hide is to be cured for use as a material to be written upon. Scales vary in color according to dragon, though the underskin itself is usually slightly more reddish or grayish (depending on the age of the dragon) than the scales themselves.

Fox: A small animal that tends to hunt rabbits and other small game, foxes are generally thought of as pests. They are quite clever at avoiding traps and pursuit, and are characterized by bright red fur with white streaks on the face and on the end of their tails. Their fur is rather soft and is prized for making clothing.

Giraffe: Skin of the tallest (non-fantastic) land animal is valued for the beautiful spotted pattern and for the length of the skins and furs which may be extracted from it (due to the long neck).

Leather: A material known to the common folk of most fantasy worlds, leather is simply cow hide that has been tanned, toughening it for every day use. Leather can be boiled and cured to harden it further (for uses such as armor) and is fairly easy to dye. In its natural form, it is a light to dark brown color.

Lynx: Sometimes mistaken for a bobcat, a lynx is larger than a bobcat and has rear legs longer than its front legs. The color fur of a lynx can vary from sandy to rusty red with black spots on the back; the underbelly is white. The lynx's fur is layers; the long layer is soft and thin while the inner layer is very thick and provides a great deal of warmth. Both layers are usually left intact when making a fur from a lynx, though in hotter climates, the inner layer is occasionally (painstakingly) removed.

Mink: An aquatic member of the weasel family, the mink has short and dense fur. Most mink fur is chocolate to almost black in color. Mink tend to have small, irregular patches of white fur on their chins, throats, chests and stomachs.

Nilgai: Part of the antelope family, nilgai males are gray to brown in fur color, while females are brown to orange. They have patches of white on their face and on the throat, with a white band stretching along their bellies from neck to tail. Below the throat hangs a long tuft of white hair. Nilgai pelts are usually prized if they are of females for the rich orange color. The fur is reasonably soft, but not particularly warm.

Otter: With dusky brown fur that is somewhat coarse and a naturally waterproof skin, otters are prized more for their skins than as furs (though the soft underfur of an otter is valuable). The skin is excellent for use in protecting things from moisture and water, and so otter skin "wraps" for spellbooks are in high demand among adventuring wizards. Otterskins are considerably more expensive away from rivers (their natural habitat).

Owlbear: Covered with a combination of rough, shaggy, long white fur and white to gray feathers, owlbear skin is heavy and not particularly comfortable unless plucked. Sometimes, the skin is instead carefully shaved of fur while leaving the feathers intact (for a soft and warm garment), but plucking provides a warm (if not so soft) garment and is much easier. Just as often, the fur and feathers are sheared away altogether and the slightly yellowish gray skin of the owlbear is worn.

Panther: The all-black form of a leopard, a panther has soft, velvety black fur. Its dark skin is sometimes shaved of fur, though as with most great cats, the fur tends to be left alone, as it commands a considerably higher price than the skin alone.

Sable: A small, four-legged animal related to the weasel, mink, and ermine, the sable is highly prized for its fur. Though the word "sable" is often used as a synonym for black, the fur of the animal is in fact a dark brown. It lives in colder regions, so its soft fur is quite warm (another reason for its popularity). The skin of a sable is almost never seen, so highly prized is the fur.

Seal: Usually gray to brown in color, sealskin is remarkably resistant to water and warm. It must be kept oiled (usually with oil or blubber) or it becomes hard and stiff. When it becomes so, soaking it in saltwater usually works to make it pliable again.

Snake: A relatively familiar sight to those in desert climes, snakeskin is comprised of many small scales on the skin of a snake. The scales often have intricate patterns in greens, browns, and yellows, though more exotic species of snake yield whites, reds, and even blues. The value of the snakeskin is mostly determined by pattern and color, though size is also important; it is hard to find large squares of snakeskin; due to the snake's body structure, most snake skins are long and not (comparatively) very wide. Snakeskin is never found in with fur (at least, not from real-world snakes; fantasy snakes may be a different story).

Snow Leopard: An arctic creature, a snow leopard has white fur with black patches (very similar to leopards, with their yellowish fur with black patches). Because of the beauty of the soft fur, and its ability to keep the wearer warm, snow leopard pelts are almost always furs rather than skins.

Tiger: Best known for its unique orange coloration with black and white stripes, tigerskins are among the most prized of furs and skins. The fur is relatively soft and the coloration on the fur means that skins are rare; furs are worth far more.

Winter Wolf: The fur of these enormous white wolves is white and somewhat coarse, but their skin is naturally a soft shade of icy blue, making it prized for its beauty as well as for the danger that must be braved to acquire it.

Wolverine: Also known as the "skunk bear," wolverines have dark fur and a bushy tail. Their short legs and their hefty bodies, make for pelts that are rather large and round. The fur is dense and short and slightly prickly to the touch. Often, the fur is trimmed down a bit when making furs out of the pelts.

Yeti: Simply put, this is the skin of a yeti (or "abominable snowman"); the fur is light gray to white and the skin is thick and warm. The fur is somewhat coarse but not entirely uncomfortable.

Zebra: A horse-like animal with natural white and black striped fur (and striped skin underneath the fur), zebra skin (and fur) is valued for its rarity and beautiful patterns. No two zebras have the same pattern, so no two zebra skins will be exactly alike.

Stone

Alabaster: Alabaster is a dense, translucent, white or slightly tinted fine-grained gypsum. It is easily worked with a knife or woodworking tools, and can be sanded to a high gloss. When polished, it is usually covered with a thin layer of wax to protect it from the elements.

Anorthite: White to light gray and with darker banded streaks included, anorthite is a derivation of feldspar with a vitreous luster (though opaque). It has the peculiar property of melting when heated (at about the same temperature as steel) and when cooled, does not recrystallize, allowing it to be formed into nearly any shape desired.

Arkose: A brownish-gray to pink color, arkose is a mixture of sandstone and feldspar (primarily sandstone but at least 25% feldspar).

Basalt: Basalt is a relatively dense rock that is usually dark in color, with a fine-grained appearance. Sometimes, small holes are found in basalt; these are artifacts of gas bubbles trapped during its formation.

Biotite: Possessed of a light tan to almost black coloration, biotite tends to have a slightly metallic sheen to it. It tends to change color to yellow when weathered.

Catlinite: Catlinite (or pipestone) is a deep reddish color when polished and finished. It is soft enough to be worked with standard woodworking tools, including knives and files.

Chert: Chert is a semi-translucent to opaque massive form of chalcedony. Chert colors include green, gray, white, cream, and black. Dark forms of chert, such as black and gray are called Flint. Chert historically finds uses in making arrowheads, points, knives, spearheads, axe heads, etc. Chert is sometimes called "Hornstone."

Chondrodite: Chondrodite appears to be a series of reddish-brown to yellow opaque rocks bound together in a translucent white limestone. It is sometimes referred to as "nature's brick and mortar."

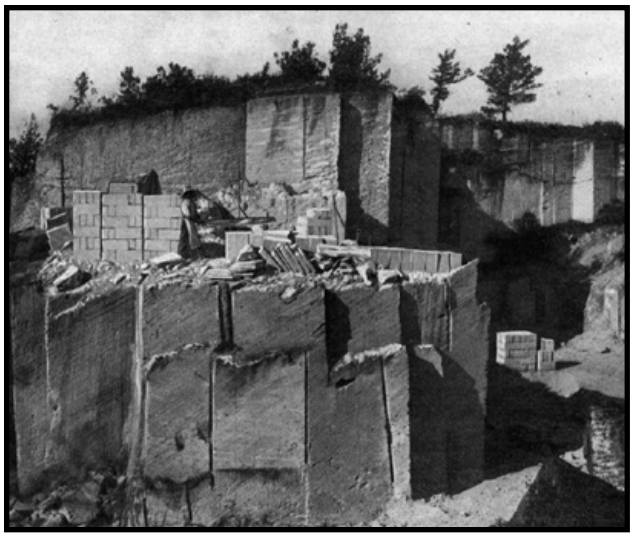
Chrysocolla: With the appearance of small flower petals of an opaque aqua to blue color spread about the face of a dark rock, chrysocolla is often used in elvish architecture due to its beauty.

Diorite: With a salt-and-pepper coloration, diorite is a mixture of feldspar, quartz, and hornblende. It is somewhat granular and can be mistaken for granite.

Dolomitic Marble: Less common than "normal" marble, dolomitic marble is simply marble composed primarily of dolomite (a white or light-colored mineral). It is usually white with swirls of pale color mixed throughout. It is distinguished from "ordinary" marble by being somewhat less durable.

Dripstone: Dripstone is stone built up from falling drops, or water running down stone walls, depositing minerals. It is the constituent of stalactites and stalagmites. It is distinguished from flowstone in that it is formed from isolated drops or dribbles of water, and therefore tends to form single columns, whereas flowstone is formed by larger quantities of water and tends to form massive, more rounded structures.

Feldspar: Feldspar has a white, slightly chalky or grainy appearance. It has an earthy smell when wet. Feldspar means "easily cleaved material" and indeed,



can easily be split into sheets in one direction (usually when feldspar is used to make walls, this direction is oriented so as to be the "top-to-bottom" direction.

Flowstone: Flowstone is formed as water flows over dirt and rock, and often leaves the appearance of a waterfall. It is distinguished from dripstone in that dripstone is composed of small drops of water, while flowstone is formed by considerable quantities of water, meaning that flowstone masses tend to be much smoother and larger.

Gabbro: Gabbro is a dark gray to green to black stone that, though coarse and grainy in its natural state, smooths well and takes a high polish, making it suitable for monuments and other enduring structures.

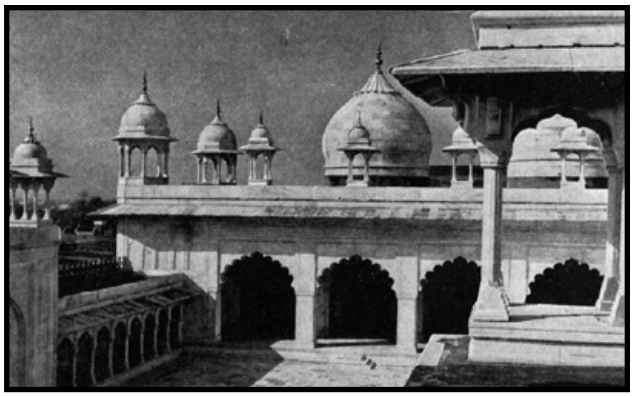
Geyserite: Also known as "sinter," geyserite is a gray stone usually found near hot springs or other mineral-rich deposits of water. It has the peculiar property of being opalescent; i.e., light reflecting off the surface is splayed into all sorts of colors due to tiny bubbles or crystal enclosed near the surface of the stone.

Gneiss: Gneiss is usually a gray or pink color with dark streaks and layers. It has a medium- to coarse-grained texture. It is characterized by discontinuous, altering light (coarser) and dark (less coarse) layers.

Granite: A hard, light gray stone that appears to have a "salt-and-pepper" sprinkling of white and black in it, granite is one of the preferred building materials for buildings and walls that will endure almost anything.

Graywacke: Graywacke is the archaic name for schist; it has the appearance of being a clay that holds together course-grained sandstone, grains of quartz and feldspar, and a variety of dark rock and mineral fragments. The clay is hardened and fired to the point of being almost as hard as the other rocks.

Greensand: Greensand is a form of shale taken from oceans that contains a large amount of green silica (sand). It contains considerable amounts of dead organic matter as well.



Hornblende: Hornblende is black, brown and green in color. It forms in long, smooth cubes, sheets, or crystalline structures and has a somewhat dull, metallic appearance.

Hornfels: Hard, compact rock that breaks into splintery fragments, hornfels has a fine-grained texture and sometimes contains small crystals within it, giving it a vaguely "glittery" appearance in these instances.

Kaolin: An off-white colored hard clay, kaolin is usually hardened by heat when used as a building material (the statistics above reflect the hardened version of kaolin). The clay has a high feldspar content, lending its coloration to it.

Limestone: Limestone refers to rough, unpolished stone made largely of calcium deposits. It is usually bone-white in color, though it is quite absorbent and may be dyed other colors. This ability to absorb liquid comes from limestone's "airiness" - there are many tiny pockets of air within the stone, and indeed, sometimes large pockets of air can form cavities. Limestone is very vulnerable to acid; attacks from acid bypass the limestone's hardness and deal double damage. This makes it somewhat unsuited for use as part of a fortification.

Marble: Marble is a common enough stone, a mildly compressed form of limestone. It is a fine- to coarse-grained stone that is banded with colors (most commonly white, cream, or grey banded with red, green, or blue, though nearly every combination of colors is possible). It "fizzes" (effervesces) slightly when exposed to acid. It is the fine-grained texture and density that distinguishes it from common limestone.

Mica: Mica is found in two varieties; "muscovite" is a red- and green-straked stone, while "phlogopite" is a yellow color. They are otherwise similar in makeup, and are found in different geographic regions. Mica is a somewhat soft stone with a fairly coarse texture.

Phylitte: Phylitte is a clay-like metamorphic rock somewhere between slate and schist. It is usually formed from heated and melted shale or tuff, with some inclusions of mica. The mica imparts a pronounced sheen to phylitte's surface when the rock is broken or cut; the exposed interior of phylitte is often quite highly reflective. The word phyllite is from scientific Latin and means "leaf-stone."

Pumice: Pumice is a light, porous volcanic rock that forms during explosive eruptions. It resembles a sponge because it consists of a network of gas bubbles frozen amidst fragile volcanic glass and minerals. All types of magma will form pumice. It is similar to the liquid foam generated when a bottle of pressurized soda is opened - the opening depressurizes the soda and enables dissolved carbon dioxide gas to escape or erupt through the opening. During an explosive eruption, volcanic gases dissolved in the liquid portion of magma also expand rapidly to create a foam or froth; in the case of pumice, the liquid part of the froth quickly solidifies to glass around the glass bubbles. This makes pumice somewhat brittle and coarse to the touch, though it absorbs blows well (by cracking in tiny bits around the air bubbles and absorbing the energy by chipping and crumbling). It may be found in all colors, but gray to black is the most common by far.

Quartz Sandstone: Sandstone is formed from small grains of quartz and feldspar. It forms in layers, so a single "piece" of sandstone may have a number of different color patterns on its surface. Quite common, it is commonly used as building material. Quartz sandstone is sandstone made up of at least 75% quartz; it tends to sparkle more and is somewhat "grainier" than ordinary sandstone.

Sandstone: Sandstone is formed from small grains of quartz and feldspar. It forms in layers, so a single "piece" of sandstone may have a number of different color patterns on its surface. Quite common, it is commonly used as building material.

Scoria: Scoria is a vesicular (bubbly) glassy lava rock ejected during volcanic eruptions. The bubbly nature of scoria is due to the escape of volcanic gases during eruption. Scoria is typically dark gray to black in color, mostly due to its high iron content. The surface of some scoria may have a blue iridescent color; though oxidation (rusting) of the iron may lead to a deep reddish-brown color.

Shale: Shale is a type of stone made of densely packed layers of fine-grained particles of rock (usually sediments) that has been compressed into rock by pressure. It is quite porous and absorbs water and dyes very well; unfortunately, it is also somewhat prone to wear. It is as adroit at soaking up oils as it as at soaking up water.

Slate: A dark-colored, fine-grained rock that is formed in extremely hot temperatures, slate splits easily into thin, smooth layers (but only when broken in the right direction). It is often used (in conjunction with chalk) as a writing material. Its fine-grained makeup allows it to absorb water on its surface slightly, though water rarely permeates the interior of the rock.

Soapstone: Soapstone is a grey stone, which when polished and oiled becomes a lovely soft black. It is soft enough to be worked with standard woodworking tools, including knives and files.

Tufa: Soft and sandy, tufa is not the most stable of rocks. It is usually formed from compressed ash in volcanoes or other areas of great geographic stress.

Unakite: A stone with grains of epidote included, unakite is usually pink or green in color (with swirls or streaks - green streaks in pink stone and pink streaks in green stone). It is an agglomeration of sandstone and feldspar, though the epidote lends to it the color.

Tobacco

Burley: Burley tobacco is the second most popular type of tobacco, especially for pipe blending. Containing almost no sugar, it gives a drier and fuller aroma more akin to the taste of cigars, and it easily absorbs flavors. Burley burns slowly and comparatively cool. Its air-cured leaves are a light brown to mahogany.

Cavendish: Cavendish is a method of tobacco-processing. Tobacco leaves are flue or fired cured and stored under pressure for curing and fermentation over several weeks. This creates a very dark, black tobacco. Some people heavily flavor cavendish tobacco until the natural taste of the tobacco is almost gone, termed "casting." Typically, tobacco is soaked in a liquid mixture of sugar, licorice, and aromas/ essences, producing a sweet, smooth aroma.

Kentucky: Kentucky tobacco is fire-cured burley tobacco. Its taste is aromatic without being as heavy as other fire-cured spice tobaccos; however the nicotine content is significantly higher and often blended with other tobacco.

Latakia: Latakia tobacco is a spice tobacco produced from fire-cured tobacco leaves. Small smoldering fires of aromatic woods and fragrant herbs impart a smoky flavor on the leaves while also drying the tobacco. They have a heavy, rich taste, and they are often blended with other tobaccos (typically at 40-50%) due to the intense flavors and harsh nature of smoking this tobacco.

Oriental: Oriental tobacco is the smallest and hardiest type of tobacco, grown in Turkey, the Balkans, West Asia, and Russia. It is dusty, dry, and sometimes bear a slightly sour aroma. Typically sun-cured, Oriental tobacco is most familiar to western pallets through the traditional Turkish cigarette.

Perique: Perique tobacco is a rare, slow-burning spice tobacco with a strong taste. It is red burley that first undergoes a shortened air-curing and then an additional step of fermentation. After air-curing, the leaves are placed in oak barrels or in Cypress logs, undergoing pressure that squeezes the juice from leaves and causing fermentation. The leaves are removed and then repacked and re-fermented, a production process that takes at least a year. The nicotine content is extremely high and perique only ever constitutes 5% of a blend, although the aroma is full-bodied.

Spice: Spice tobaccos are processed tobaccos that are used in blends. They are rarely smoked pure.

Virginia: Virginia tobacco is named after its location of first cultivation. It is the most popular tobacco, and its flue-cured (fire-cured) leaves are yellow to orange in color. It is the mildest of blending tobaccos, it is a good burner, and it has the highest level of natural sugars, giving the tobacco a light, sweet taste.

Transportation

Carriage: This is a fancy enclosed cart equipped with padded seats, brass fixtures, curtains, and the like. It requires a beast of burden to pull the carriage.

Cart: A two-wheeled vehicle drawn by a single beast of burden. Comes with a standard harness for horses or cattle.

Cart, light: A smaller cart designed for hauling goods inside city limits.

Wagon: This is a four-wheeled, open or covered vehicle for transporting heavy loads. In general, two beasts of burden draw it. Comes with a standard harness for horses or cattle.

Wood

Alder: When newly felled, alder wood is a warm light brown color, though that changes rapidly to a bright deep orange as the wood is exposed to air. The wood has a fine texture. It decays easily but takes stains very well, making it suitable for short-term use in such things as toys, musical instruments, or tools (especially tools that see heavy use and thus have a short lifespan), but is ill-suited for long-term, high-wear use such as in building structures.

Apple: Apple wood is a pinkish-tan to cinnamon brown color and has a fine, close grain and has a very high luster when polished. It is difficult to dry properly, as it has a tendency to warp, but once dried, it is very

stable. It is rare to find large, straight pieces of apple wood, as the tree knots and turns frequently, hence its use is usually confined to smaller items, though gnarled staves of apple wood are not uncommon.

Ash, Black: Black ash is a dark, grayish brown in color with a coarse, even texture. It also goes by the names swamp ash, brown ash, and water ash.

Ash, White: White ash saplings are white in color, though this color darkens to a light brown within a year or two of the tree sprouting. It bends well, especially when soaked in water, and is more durable than most woods. Its lightness, durability, and widespread availability (and corresponding low price) make it a popular wood for items that see heavy use.

Aspen: Aspen is a soft and light wood, which makes it popular for sculpting, but of little use in building. It is creamy white to gray in color and has a fine, even texture that almost seems like cloth when sanded. It does not burn well (the wood gains a +1 bonus to all saving throws vs. fire), nor does it take stains well, with a tendency to stain unevenly.

Balsa: Soft in texture and exceedingly light, balsa ranges in color from almost a white to a yellowish brown. It has a straight grain and is very absorbent. Its light weight makes it popular for theatrical use.

Bamboo: Almost green in color when living, bamboo eventually turns to yellow-brown after being cut. It is quite fibrous and is made up of hollow, reed-like sections.

Basswood: A creamy white to brown color, basswood has a straight grain and a fine texture, but does not bend particularly well. Its tight-grained texture and ability to hold a carved shape make it a popular wood for carving toys and utensils.

Beech: When beech wood is taken from saplings, it is usually almost white; this color eventually darkens to a deep red to brown as the beech tree ages. It has a close, straight grain, and a slightly coarse texture. It has a bit of a tendency to split when nails are driven into it.

Birch: A tough, heavy wood, birch starts as a light cream color that slowly darkens to a medium brown as the tree ages. It tends to splinter when cut and stains unevenly; multiple stains are usually required to obtain an even finish. It is used for making inexpensive furniture and sometimes canoes.

Black Cherry: Young black cherry wood is light brown, changing to a deep red as the wood ages. It has a fine grain and a smooth texture, and is frequently used for higher-end furniture.

Black Walnut: Dark brown to purplish-black in color, black walnut is a tough wood with a straight grain that accepts finishes very well. It is sometimes used for very fine furniture and carvings.

Blackthorn: The most notable features of blackthorn wood are the deep reddish-black bark and the numerous knots. Blackthorn is also known as the European spiny plum. The wood itself is only slightly lighter than the bark. Blackthorn is looked upon by some as the best wood for the shaft of a cane. A rod of blackthorn feels more like a metal bar than a wooden stick.

Boxwood: Dense and hard, boxwood finishes to a polished surface. It can hold a clean sharp edge. It is an even straw yellow color, with a uniformly fine texture and a straight grain. Working boxwood with hand tools or carving tools is slow going because of the hardness of the wood.

Brazilwood: Brazilwood has a straight to irregular grain with fine, even texture and a natural luster. It has nearly white sapwood and bright orange heartwood that matures to a deep red. It is very popular for making violin bows.

Bubinga: A rich salmon color with occasional streaks of brown, bubinga has a fairly smooth texture and a straight grain.

Butternut: Medium to light brown in color, butternut has a coarse texture and tends to take on a "fuzzy," velvetine feel when sanded. It does not bend well. Its most common use is as trim on other items.

Cedar: Cedar has a straight grain and a fine texture. It tends to mix cream and dark red coloring and is very prone to having knots in it. The scent of cedar is thought to repel moths; because of this, it is commonly used for closets and chests.

Cherry: Cherry, when first cut, is a tan/salmon color w/black striping which turns a rich deep red color over time. In direct sunlight, the color change will occur within a few days. Out of sunlight, it will occur slowly over about six months.

Chestnut: The outer growth rings (sapwood) of chestnut can be very light. However, when the sapwood is penetrated, chestnut takes on a deep chocolate brown color that graduates to a golden honey the deeper you move into the core. It has a straight grain and is sometimes used in furniture making.

Cocobolo: Cocobolo is a rich brown wood with a somewhat fine texture and straight grains. It often includes knots, however, and is somewhat difficult to work.

Cypress: Cypress is a light yellow to light brown color and has a straight, tight grain and an oily texture. It is very resistant to rot and decay and is usually found in and around swamps. Because of this resistance, it is often used for boats, bridges, docks, and other items that are often in contact with water, as well as outdoor furniture.

Ebony: Known for its dark black coloration with a dark interlocking grain, ebony is a very dense wood with a coarse texture. Ebony is very dense and difficult to cut. Because of its rarity and value, it is often used in inlays and other projects that do not require large amounts of wood.

Elm: Elm is a light yellow to brown color. It is very easy to bend and quite prone to warping, qualities which limit its usefulness in carpentry. It is sometimes used in boat-building because it is somewhat water-resistant.

Fir: Fir has a very pronounced hard, straight grain. It is orange to reddish-brown in color and the hard grain makes it somewhat difficult to carve and shape. It is very strong for its weight and quite stiff, however, and often finds use as a support/load-bearing material for homes and other woodworking projects.

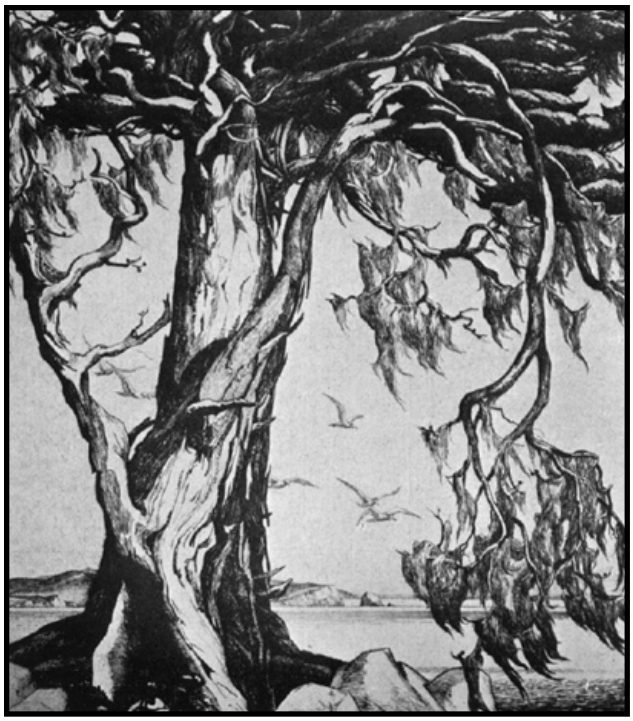
Goncalo Alves: Light to reddish-brown to deep redbrown in color, goncalo alves has a fine, uniform texture. It is easily carved, finishes very smoothly, and takes an excellent natural polish. The wood is highly durable and is often used for carving work. It is sometimes referred to as "tigerwood."

Hard Maple: Recognized for its creamy, even white coloration, hard maple is very durable and resists stains and markings. For this reason it is often used for flooring and other high-wear uses.

Hickory: HIckory is generally straight-grained and coarse textured. The color ranges from white sapwood (the portion of the tree nearest the bark) to to reddish brown heartwood. It is a hard, heavy, strong wood that bends fairly easily when steamed; however, it is rather susceptible to decay. Because of its strength and toughness but relatively short lifespan, it is often used for tool handles, wheels, and agricultural tools (things which need to be tough to survive heavy and often abusive use, but are expected to have a limited lifetime).

Ipé: A hard, durable, medium brown wood, ipé is favored for its density and durability. It wears well and is usually used for high-use areas such as floors.

Jelutong: Jelutong is creamy-white to pale yellow in color and has a fine, even texture. It is light and soft but is brittle, does not bend well, and decays fairly easily. It does accept stains well, however. This combination makes it ill-suited for project that are



meant to withstand use, but popular for carving and sculpture due to its softness.

Juniper: Juniper varies from milky white to deep reddish-brown and bends exceptionally well; after being soaked in hot water, thin slices of juniper wood can be tied into knots without splitting.

Kingwood: Dark brown to almost violet in color with a light brown grain, kingwood is used in fine furniture and for decorative purposes. The light grain against a dark wood is very unusual and makes kingwood popular among the social élite, who use it to show their individuality.

Larch: Popularly known as "tamarack," larch is a yellow-brown to reddish-brown color with a slightly oily appearance and a coarse texture. It is a common material for construction of homes, boxes, crates, and casks.

Lignum Vitae: The hardest wood known, Lignum vitae has a highly interlocked grain; this combined with its hardness makes it extremely difficult to work. The wood has an unusual resistance to acid (treat the wood as though it had Acid Resistance: 3) and is extremely resistant to decay and rotting. It has a warm brown color and a relatively smooth texture; this, combined with its heavy weight, has earned it the nickname "Ironwood."

Linden: The wood of the lime tree, linden is a soft, straight-grained wood with fine texture. White to pale yellow in color, it is used mostly for carvings.

Magnolia: Magnolia wood is light to dark brown with a slight yellow or green tint. It is straight grained with a close uniform texture. It bends fairly well when steamed, and is both hard and strong, but is somewhat susceptible to rot. Its smoothness means that it

requires little sanding. Because it is strong but not very weather-resistant, it is mostly used for interior furniture, bowls, and food containers (as it does not pass a taste or odor to food contained therein).

Mahogany: Other names for mahogany included "bandoro" and "lagos wood." It is possessed of creamy-white sapwood (the "new wood" near the exterior of the tree) and reddish brown heartwood, though frequently these have something of a purplish tinge. It has a moderately coarse texture. It does not bend well when steamed, and is not terrible stiff. Its coarse grain makes it difficult to work, but it takes stains very well. It finds uses in cabinetry, high-class joinery, boat building, and paneling.

Oak: Light reddish tan in color, oak is straight-grained with a coarse texture. It is strong, stiff, and strong but has a tendency to splinter and chip when cut against the grain. It bends well when steamed, and finishes well with most stains and finishes. It is used for cabinets, furniture, boxes, caskets, and pallets.

Olivewood: With varying layers of white and brown dark streaks, olivewood cannot be said to have a characteristic color. It has a fine texture and a straight grain. It is used in carvings and inlay work.

Ósanwëtaurë: Harvested from the roots of the ósanwëtaurë bush, this wood is also known as "thoughtwood" or "mindwood." Weapons or armor constructed from ósanwëtaurë provide their wielders or wearers (as appropriate) with a +1 bonus to Will saves due to the calming and balancing nature of the ósanwëtaurë wood (a magical property). However, ordinary ósanwëtaurë cannot be permanently enchanted without causing the calming effect to fade. The wood is a reddish color and is thin and somewhat stringy.

Ovankol: The heartwood of ovankol (also called ovangkol) is yellow brown to green brown with gray to almost black stripes. The grain is straight to interlocked.

Pecan: Pecan wood is a subtype of hickory wood; pecan wood comes from fruit-bearing trees and is slightly softer but more durable than "normal" hickory wood. It has a white to reddish-brown coloration, and is frequently used for baskets and wooden musical instruments (such as recorders)

Pine: Pine ranges from a light yellow to a reddish brown in color and has a soft surface, prone to being scratche and cut. It does not bend well, often splintering when attempts are made to bend it. Its light weight and relatively weak nature make it common in use for cheaper furniture and as plywood.

Poplar: Sometimes called "whitewood," poplar wood is usually white to light brown in color and possessed of green or brown streaks that run randomly through the wood. It is finely grained with an even texture. Because of its color, texture, and durability, it often finds use in musical instruments, furniture, and carvings.

Purplewood: Also known as "amaranth," purplewood is a deep, rich purple color that fades to a dark brown with age. Because of its deep natural color, it does not take stains particularly well, and because of its rarity and color, it is usually reserved for special projects; it is almost never used for "common" materials.

Red Alder: In contrast to "regular" alder wood, red alder wood is a pinkish color when first cut, fading to a deep brick-red color as it dries. It decays quickly though it takes stains well, making it popular for short-term projects (such as props for stage acting.

Red Cedar: Possessed of a golden brown color, red cedar has a coarse texture but is straight-grained and durable. Like "ordinary" cedar, it is often used to make chests because its aroma helps ward off insects, though it is also popular for use making outdoor furniture.

Red Oak: With a pink to red color, coarse texture, and good ability to accept polishes, red oak truly does appear somewhat red when finished. It is durable and is often used in flooring and other high-use applications, though it takes a lot of sanding to smooth it.

Redwood: The redwood is a reddish-brown color with an even texture. It accepts stains extremely well, and may be shaped by bending fairly easily. It has excellent resistance to the weather and its toughness and weather resistance means that it is frequently used for outdoor flooring, lamp posts, and other high-wear outdoor applications.

Rosewood: Black-grained wood with a deep brown to purplish color, rosewood does not bend well and is difficult to work with. The wood usually has oils in it, making it difficult to stain, but also imparting some water resistance to it. Its most common use is in smaller musical instruments.

Rowan: Some of the more colorful nicknames for rowan include "witchwood," "quickbane," "wiggin," and "sorb apple." Rowan has an unusual dark brown color with green streaks, though the sapwood (the

newly grown wood near the outside of the trunk) is white or creamy. It has a fine grain but emits a distinctive odor when cut.

Shittim: The archaic name for "acacia," shittim wood is hard and has a somewhat sweet odor (especially when burned). Acacia has a rich, deep brown color and prominent contrasting grain.

Soft Maple: Similar in appearance to hard maple, soft maple is slightly lighter in color than its cousin and has a pinkish, almost skin-toned coloration. It resists bending and warping and is usually used for furniture.

Spruce: A somewhat soft wood, spruce is sought after for its excellent symmetry; the rings in spruce are almost always perfect concentric circles. Spruce is often used in window frames, as it accepts stains well and when buffed to a finish, has a very smooth finish.

Steelwood: Steelwood is a very rare type of wood that, through a complex curing process, can be hardened to an almost iron-like rigidity. They are difficult to discern from iron or steel weapons, as the curing changes its composition. Anyone looking at a steelwood weapon must make a Spot check against DC 12 to notice that it is not made of iron. Due to its composition, it is not affected by heat metal or other metal-based spells. It neither rusts, nor conducts electricity.

Sycamore: The grain of the sycamore has a wide range of figures; it can appear in unusual flaky or lace patterns or fine thin lines, depending on the direction in which it is cut. It is a pale whitish yellow to light honey color, with a slight brown or pink tint. It bends (when steamed) very well and resists splitting. It is often used for ships due to both its large size and resistance to weathering.

Teak: Teak is a rich brown color with small, fine grains and a smooth texture. It does not take stains well at all, which limits its utility in works of art somewhat. It is rather resistant to weathering and is often used in making outdoor furniture.

Tulipwood: Sometimes called "pinkwood," tulipwood is a pinkish to yellowish color with rings of red, purple, and dark pink. It is most often used for jewelry boxes, fancy wood carvings, and other "artistic" uses.

Walnut: A deep, lustrous surface (when finished), a fine texture, and a dark brown color with "crisscross" grains all characterize walnut. It is popular for making high-quality furniture.

White Elm: With white layers of wood interlaced with brown grains, white elm is a soft, slightly waxy-feeling wood. It is resistant to splitting and is often used basketry and flooring. The bark of the tree is somewhat sinewy and can be used to make rope.

White Oak: With exceptional strength, hardness, and water resistance, white oak is among the more popular woods for use in creating objects that will

see a high degree of use. It has orange to yellow coloration with deep brown grains.

Willow: Soft, light, and easily bent, willow does not splinter or split easily. The wood is light tan to grayish or reddish in color (depending on the tree). It is used for crates.

Yellow Birch: Yellow birch is possessed of white to light reddish brown wood. It is generally straight-grained with a fine uniform texture and bends well. It wears fairly well and finds use in cabinetry and doors.

Yellow Cedar: With a fine texture, straight grain, and excellent durability, yellow cedar finds use in high-use projects such as ramps, walkways, tables, and chairs. It has a light yellow color and is very resistant to weather and decay (another reason for its popularity in outdoor applications).

Yellow Poplar: The color of yellow poplar is based on the age of the tree; the wood of younger trees is light yellow, but as the tree ages, the wood takes on a greenish hue. It is somewhat resistant to rot and decay, and is used for furniture, boxes, and crates.

Yew: Yew, when fresh cut, is orange, red, or purplish-brown but turns to a rich golden brown over time with exposure to air and sunlight. It is usually straight-grained with an even, medium texture. It is feels somewhat oily, and bends excellently; because of its bending properties, it is valued for making bows and parts of items designed to bend.

Zebrawood: Found near riverbanks, zebrawood possesses a moderately coarse texture and has a yellow-brown wood with dark, thick grains (lending it its zebra-like appearance). When freshly cut, it emits a pungent odor, though the odor fades over time as the wood dries. Because it shrinks noticeably when it dries, it is not usually used for furniture.

Other

Barrels: Also called casks, barrels are a cylindrical container made of wood bound with metal hoops.

Beeswax: A natural product from bee hives that comprises their honey combs. The wax can be refined and applied to other uses, such as making candles.

Camphor: A transparent waxy substance with a pungent aromatic quality. It is used as a scent and an

agent in topical unguents. Camphor is easily absorbed through the skin and has a cooling sensation as well as slight anesthetic and antimicrobial qualities.

Candles (Tallow): Candles made from rendered animal fat (typically beef or mutton).

Candles (Wax): Candles made from wax, which burn cleaner and more efficiently than tallow candles.

Ceramic: Ceramic is hard, brittle, heat-resistant and corrosion-resistant material made by shaping and then firing a nonmetallic mineral, such as clay, at a high temperature. It is a "catch-all" term that also includes earthenware and porcelain.

Chalk: A white porous form of limestone, often used in building materials and for alchemical purposes.

Charcoal: Impure carbon that remains after removing water and other volatile substances from organic material. Charcoal is typically made from burning wood, and it is used in gunpowder production and metallurgical and alchemical purposes.

Clay: Clay is a fine-grained, firm earthy material that is malleable when wet and hardens when heated. It is used in making bricks, tiles, and pottery. Materials made of clay may assumed to be dried but not yet heated and hardened (that would be classified as ceramic).

Coal: Composed mostly of carbon, coal is usually obtained by burning wood or other combustible substance. In this sense, coal refers to the cooled form (obviously, there are "hot coals" but those are usually impractical for humans to carry and use).

Cork: Made from the tissue of the cork oak tree, it is an elastic and low-density material used in sealing bottles and boating materials (for its buoyancy).

Dung: Solid animal waste that can be dried out and burned.

Fire Starters: A favorite of travelers. These are thick disks made with an amalgam of surplus waxes, sawdust and sometimes a bit of lamp oil. These make starting a campfire quick and simple, and can even start wood that is damp or hardwoods with little or no kindling. If the GM requires a check to start a fire, this item grants a +5 bonus to that check.

Flint: A type of quartz that splits into thin sharp splinters and flakes used in stone tools. Also creates a spark with struck on another hard object.

Graphite: A form of carbon used for drawing and writing in solid form and a lubricant in powder form. Also conducts electricity.

Gum Arabic: A gum produced from certain species of the acacia tree when the bark is damage. Used in foods (it is edible!), cosmetics, inks, and other liquids, gum arabic helps control viscosity. It also has many other alchemical uses, such as a binder in pyrotechnic compounds.

Ice: Frozen water; it's cold. Naturally, ice can be harvested from frozen bodies of water or brought down from high altitudes.

Lamp Oil: Oil used in lamps and lanterns.

Meerschaum: German for "seafoam," meerschaum has also been called "pierre de savon Maroc" (rock of Moroccan soap) - because of it was sometimes used as a soap. White to cream to tan or gray, meerschaum is a very light stone (some of it is so light that it floats) but is very porous; because of this it absorbs both water and dyes easily and seems to stick slightly to moist surfaces (such as the tongue; meerschaum is often identified by noting that it seems to stick to the tongue). It has a dull to pearly luster and is translucent.

Peat: A combustible accumulation of partially decayed vegetation, typically cut from the earth in wetlands, bogs, moors, mires, etc.

Pitch: A viscous liquid that appears solid, derived from petroleum (tar or bitumen) and plant resins. Pitch flows at room temperture, albeit very slow. Traditionally, pitch is used to caulk seams of wooden ships.

Porcelain: A ceramic made from refining kaolinite clay, producing a fine white shiny ceramic with high strength.

Rocksalt: Salt found in mineral deposits, used in preservation, food preparation, and manufacturing.

Saltpeter: Used in manufacturing gunpowder and glass, as well as metallurgical and alchemical preparations. Typically mined from limestone caves where there is ample decaying organic material, an alkaline base, and sufficient moisture with exposure to oxygen but shelter from sun and rain.

Sand: Sand is naturally occurring granules of rock with a gritty quality when rubbed on skin. Sand is used in manufacturing, as an abrasive, and as a water filter.

Sawdust: Fine particles of wood, often used as mulch or fuel.

Sealing Wax: Wax used to seal envelops and documents, typically in stick form or as granules that required a crucible for melting.

Talc: A soft mineral that powered easily with many uses, from cosmetics to lubricants. Talc is also used as an astringent to prevent rashes and absorb moisture. It is also added to pharmaceutical products and foods, and is used in metalworking.

Water: Potable water is water fit for human consumption. Less clean water has its uses as well, such as watering crops, manufacturing, and generating power.

Chapter 6: The Historic Silk Road

As stated in the Introduction, we are not codifying the Silk Road in a specific time. Our mission is to create the Silk Road as a roleplaying environment, capturing the spirit of Silk Road: desolate terrain, refreshing oases, high mountain passes, violent conflicts, cultural abstractions, and a feel for the exotic.

Although we have scratched the surface of Central Asian geography in Chapter 1, there is more to Central Asia than a couple of mountains and deserts. Central Asia is the heart of a large landmass, producing extreme weather and climate in and of itself. When you combine that factor with the weather patterns and the series of mountains that create rain shadows, the proliferation of deserts in Central Asia is hardly surprising.

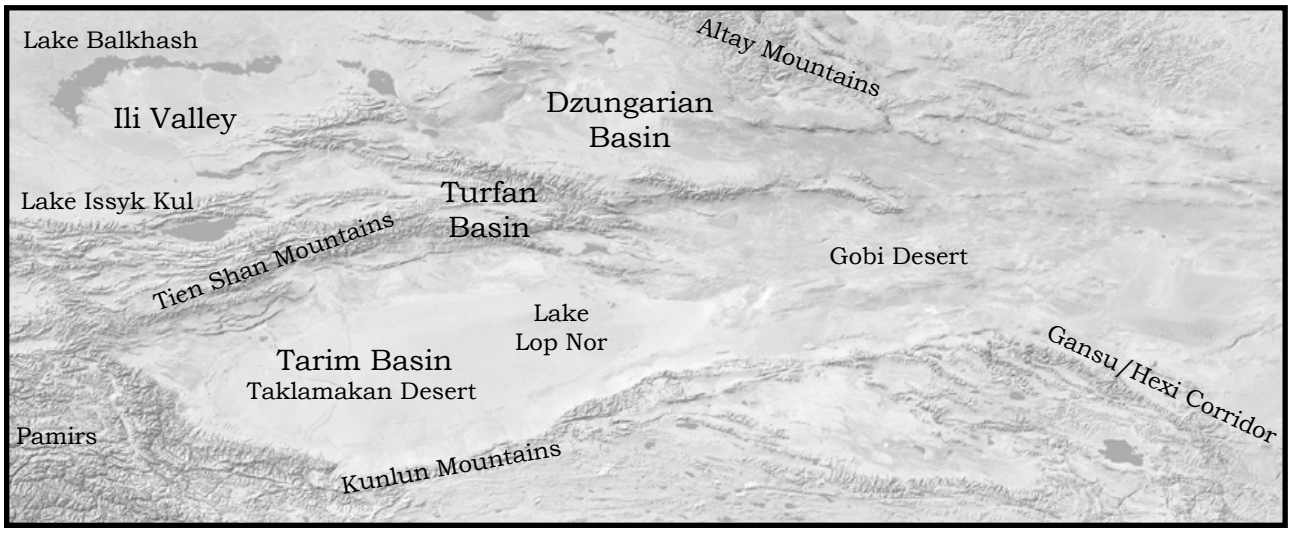
Tarim Basin

The Tarim Basin is the traditional boundary of the Silk Road. The bulk of this oval-shaped depression is the Taklamakan Desert, surrounded by foreboding mountain ranges on all sides. Due to the lay of the land, the majority of oases follow the foot of mountains along the northern edge of the Taklamakan Desert. Snowmelt from the Tien Shan Mountains makes life more bearable along the northern edge of the Tarim Basin, creating a string of oases for travelers and settlers. The eastern side of the Tarim Basin was once wet, the most pronounced body of water being Lake Lop Nor to the southeast. Over time, changes in terrain elevation and increased usage upstream transformed Lake Lop Nor and the surrounding fishing villages into the dry salt flats. It is rumored that Lake Lop Nor temporarily reappears, collecting water when the climatic conditions are just right. Serendipitously, there is an oasis at the western end of the Tarim Basin, which will become the widely accepted western entrance to the Tarim Basin.

Radial Landscape

Now that the physical barrier zone and some of its unique characteristics are in place, consider the surrounding terrain and how it affects the development of the Silk Road. Beyond the mountain chains bordering the physical barrier zone, there are numerous geological features that make the Tarim Basin more difficult to access. From the northeast, the Altai Mountains limit access while the Gobi Desert isolates the basin from the east. South of the Kunlun Mountains is the Tibetan Plateau, one of the highest plateaus with the average elevation exceeding 16,400 feet. Further south of the Tibetan Plateau are the rough peaks of the Himalayas. The Kunlun Mountains continue to hug the southern curve of the Tarim Basin, only to be reinforced by the Karakorum Mountains to the southwest. There both mountains meet with the Tien Shan Mountains (from the north), the Pamirs, and the Hindu Kush. Crossing these rocky giants from any pass is a daunting task with average altitudes of 9,800 ft. and some peaks as high as 23,000 ft. A branch of the Tien Shan Mountains continues to the northwest in the direction of transoxiana, while a series of deserts in the west further isolate the Tarim Basin. But before you think this land is completely abandoned by God, let me say two words: the steppe.

Tarim Basin and Surrounding Environs



In the case of the historic Silk Road, the most influential feature outside of the physical barrier zone is the steppe. The steppe is a band of grassland that girdles the width of the Eurasian continent from coast to coast. The grassland is typically not suitable for agriculture, but it is ideal land for nomadic pastoralists. The combination of mobile populations and a "highway" stretching from coast to coast ensures a constant supply of people, be they settlers, refugees, raiders, invaders, allies, or trade partners. The steppe is an ideal staging post for raids or invasions into the Tarim Basin. It is also an ideal place for would-be invaders, injecting waves of displaced people into the Tarim Basin for lack of better land.

Other geographic formations also facilitate the movement of people from the steppe into the Tarim Basin. Between these ominous mountains are comparatively lush, verdant valleys. The Dzungarian Basin and the Ili Valley are grassland havens between the Altai Mountains and the Tien Shan Mountains. The Ferghana Valley is west of the Tarim Basin tucked between the Tien Shan Mountains and the mess of mountains to the south. The Ferghana Valley is 8,500 square miles surrounded by mountains on all sides with rich and fertile lands for growing fruit and crops and raising sheep and goats. Its high altitude makes for cold and windy climate, and the valley is home of the "celestial horses," the animals prized in China since the Han Dynasty. Bodies of water also facilitate movement in the steppe, such as Lake Issyk Kul (north of the Tien Shan Mountains, towards the western end of the Tarim Basin).

Cultures of the Silk Road

Defining cultural norms in the historic Silk Road is nigh impossible without discussing the major cultural groups neighboring the physical barrier zone. To the east is China, to the south are Tibet and India, to the north are the various nomadic steppe groups, and to the west are varying Iranian, Greek, Roman, and Arabian influences. Each culture has borrowed from, contributed to, and traveled through Central Asia. Untangling the web of influence is not a simple task, but here is the quick history on social and cultural influences on Central Asia throughout history.

People of the Steppe

The first groups to impact Central Asia are the nomadic steppe people, which can vary greatly in and of itself. There is archeological evidence of early blue-eyed, fair skinned Europeans, as well as traditional Turk nomads to the eastern-featured peoples, akin to Siberians and Mongols. These are the first explorers, settlers, and inhabitants of Central Asia, changing territory and influence with waves of invasions and displacements. The mobility inherent in their lifestyle also makes the people of the steppe as a whole the most enduring cultural group on the Silk Road.

Although the people of the steppe are diverse from group to group, there are a few cultural trends shared by the majority of steppe people. First and foremost, they are nomadic and rely on their herds for survival. Nomadic groups tend to be smaller in size with a more decentralized social organization. Personal, socially reinforced connections are often what keep nomadic groups together. Once a group reaches over 700 people, the group is too large to personally know each other and have those connections, resulting in internecine fighting or splintering of the group.

This trend does not exclude larger endeavors. In the case of the steppe people, larger military endeavors were accomplished when a strong leader with clear vision managed to band the smaller chiefdoms together, and in working together, used their mobility and martial prowess to conquer. The Uighurs are actually a conglomeration of smaller steppe groups, and the Mongols and Tamerlane are fine examples of what is possible when the fierce people of the steppe work together.

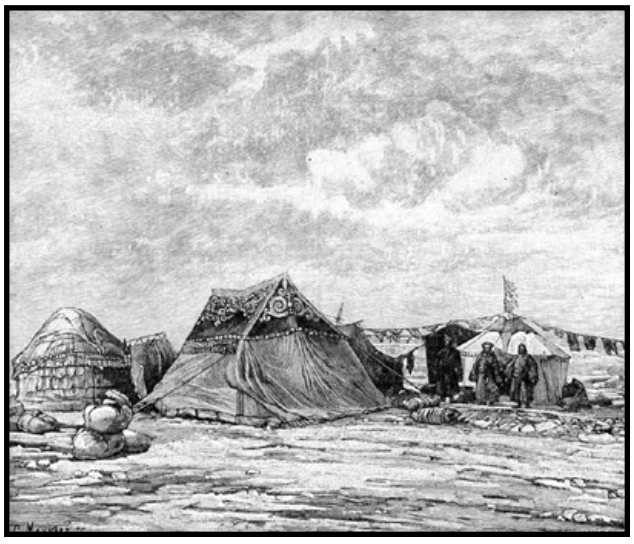
Many steppe groups are semi-nomadic, alternating from a handful of sites depending on the season or climatic conditions. Being nomadic also means they have the ability to pack up and move at a moments notice. This mobility results in fewer utilitarian goods and mobile shelter. Steppe people typically live in tents covered in felt canvas. The Mongol style tents are called yurts, with circular bases 5m. in diameter and 3m. high, large enough for an entire household. The circular base is made of woven rods or a collapsible wooden frame converging on top with an open duct for releasing smoke. Tibetan-style tents have a square base and rely on series of poles to shape and support the tent. Large pieces of felt are sewn together and stretched over the frame. The cluster of tents gleam in the sun for white felt is often coated with lime, white earth, or powered bone for brightness, although some people of the steppe also use black felt. Inside of the yurt, the ground and

walls are covered with carpets, and inflated animal bladders adorn the walls alongside bags, pots, water skins, and other household accoutrements.

Animals are the bases of their livelihood. The animals vary depending on their environment. For example, yaks are excellent in cold climates and high altitude. They provide milk, fur, and fuel from their dung. They are also good pack animals in environments unfavorable to horses. Goats and sheep provide wool for weaving and pressing felt, milk during parts of the year, and meat at slaughter. Camels are another useful animal for travel, providing milk, wool, meat and the ability to carry more weight than most pack animals. But by far, the horse is the animal most associated with the steppe.

Most all of their finished goods and food comes from their herds. Milk, blood, meat, jerky, cheese and butter are the staple of the diet, supplemented by rudimentary agriculture or trade with agricultural societies. They even make alcohol from mare's milk, often used in celebrations, religious occasions, and sealing trade agreements. Their clothing is often woven from wool or pressed felt, sewn with bone needles and sinew thread. With trade, other materials are introduced into the clothing scheme, but the roots of steppe clothing come from the animals they raise. Animal motifs decorate their clothing and cloth, as well as spirals and curls, whose stitches reinforce each other rather than perforate the fabric. Make-up is also made from herd products. One people boil whey until it blackens and thickens, applying it with wool tufts on the cheeks, temples, and brow ridges.

Games are centered around animals and herding, often challenging the prowess of riding, and bow and sword skills on horseback. One popular game in the Turkistan/steppe area is Bozkashi, translated as "catch goat." The game played on horseback with a goat or calf whose head and feet are cut off and sewn shut while the carcass is stuffed with sand. Riders equipped with whips vie for control of the "ball" across a vast playing field with a circle drawn in quicklime as a goal. For less-hands-on entertainment that does not include whips, bones and teeth are carved into dice and throwing sticks for gambling.



Some steppe people have valuable resources other than their herds. Living in the mountains also makes metal available to some steppe communities. For example, the Altai Mountains provided much of the gold crafted by the Scythians. The Sakas are nomadic people renown for making exquisite jewelry and their skill with working gold, silver, copper, and iron. Using coals and blow tubes to stoke and control the fire, Central Asians honed the art of metal artisanship.

But life on the road is a hard; cyclical droughts, aggressive neighbors, and marching on an empty stomach is a difficult way of life. We have the best record of nomadic people who chose to settle down at one point of their existence. Some become soft and accustom to city life, while others never give up their nomadic ways. One nomadic ruler who conquered an oasis set up his yurts inside the city gates. Other groups return to nomadic life after a time of settled living, either by choice, circumstance, or physical displacement.

China

Throughout China's history, these steppe riders have helped themselves to China's bounty, invading Chinese farms. China sought many methods of quieting these barbarous people: diplomacy, force, marriages with Chinese princesses, and bribery with silk. Eventually, China sent a diplomat/solider through Central Asia to seek an alliance against a particularly persistence tribe, the Xiongnu. Central Asia and the Tarim Basin have never been the same.

The most influential Chinese impact on the Tarim Basin and Central Asia is undoubtedly silk. Although Chinese Silk was in circulation before their initial exploration (through the bribes paid to barbarian raiders), China's presence greatly increased the amount of trade throughout the Tarim Basin. Like India, Bactria, and Persia, China was a distinct cultural center offering different kinds of goods to pre-existing customers while creating more demand for products from other places within and across the Tarim Basin. Silk is the most famous of China's trade goods, but the Chinese also traded gun power, paper, chrysanthemums, compasses, bamboo, spices, furs, tea, rhubarb, lacquered goods, ceramics, bronze sculptures, and iron and steel goods and technology. From the west, China sought gold, ivory, precious metals and stones (jade, lapis lazuli, coral, pearl), glass, rugs, tapestries, cotton, herbal medicines, jasmine flowers, incense, exotic foodstuffs (nuts, grapes, pomegranates, peaches, pepper, onions, incense, kohlrabi, cucumbers), and animals (yaks, camels, horses, peacocks, and elephants).

The second Chinese contribution is the presence of imperial control throughout the Silk Road. Throughout its own border conflicts, internal politics, and rebellions, China is one of the most active participants on the Silk Road. Strong dynasties brought city-states under their protection, created forts and trading posts, and injected military presence to protect merchants from banditry and riders of the steppes. Weak rule of China was quickly reflected in the Tarim Basin. City-states and forts reverted to self-rule or fell to stronger outside forces. Remote posts and forts were abandoned, and the desert quickly reclaimed them. China's favored status with regional trade partners flipped, and China found itself shelling out more bribes and receiving less diplomatic gifts. Merchants began to take different routes to minimize the dangers of bandits and raiders, and an aura of instability rippled through Central Asia. Fortunately, Central Asian natives are use to these sorts of things.

China considered itself the center of all things, culturally, physically, and metaphysically. It drew a clear line where China ended and barbarism began. The last Chinese city to the west was Chang'an, and only merchants with proper papers or adequate diplomatic gifts were allowed to enter. Once the capital of China, Chang'an was divided into two parts: the eastern half for emperors and ministers, and the western half for everyone else (including merchants). The western half had taverns, inns, religious places, and markets catering to the diversity of people along the Silk Road. But once you pass through the gate out of Chang'an, you are no longer in China. Instead you are facing the Gobi Desert crossing into barbarian territory. Chinese emperors and officials sometimes used assignments to Central Asia as punishment or sent exiles through the gate, banishing them from the center of the world that is China. Ironically, China lustily sought after all that was exotic. They embraced style of dress, music, dance, foods, spices, and fashion from Central Asia. Much of what is modernly thought of as traditionally Chinese is borrowed and adapted from Central Asia.

From Chang'an, travelers heading west could not avoid the Gansu Corridor, a narrow passageway prime for attack from Tibetan warriors or steppe riders. The Gansu Corridor was a slim passage with Qilian Mountains to the south and the Gobi Desert to the north. Along this corridor, China founded four commanderies—garrisoned cities with built up ramparts—as a line of defense to ensure safe passage. Each of the four cities (Wuwei, Zhangye, Jiuquan, and Dunhuang) was staging post of merchants, Wuwei being closest to Chang'an and Dunhuang being the closest to the Tarim Basin. Traders from China had two paths heading west: west to Dunhuang, across the Gobi Desert, and into the Tarim Basin or northwest to Hami and west across the northern rim of Tien Shan Mountains into Transoxiana and Bactria, although some travelers entered Dunhuang before heading to Hami.

India

India had a large influence on Central Asia and specifically the Tarim Basin before the spread of Islam on the Silk Road. They did not vie for military control over the Tarim Basin, like the Chinese, Tibetans, Persians, and various steppe people. Instead, they expanded their influence through their traders, trade goods, and religions. Indian spices (sought for curative powers), perfumes, incense, and textiles were consistent favorites in Central Asian markets, while Indian mysticism and philosophy seeped into the Tarim Basin consciousness. The spread of Buddhism made a huge impact on the Tarim Basin, becoming the dominant religion of most of Central Asia through the height of the Silk Road (200BCE-1000CE) and taking root in East Asia. As always, people of Central Asia found ways to continue their cultural mores while integrating and absorbing Indian influences. Some cultures of the Tarim Basin used a modified Indian script for their written language. Copies of religious text came out of India and were translated into various vernacular languages. The tradition of solitude in remote places was a perfect fit in the Tarim Basin—there are hundreds of caves and religious complexes carved into the mountains of Central Asia, mimicking the Indian Buddhist and Jain caves found in the heart of the Indian Subcontinent.

Like China, India's presence on the Silk Road created movement through trade forces: high demand for Indian goods and Indian customers seeking Chinese silk and Red Sea pearls. India was also responsible for creating movement as a response to Buddhism. Buddhism gave impetus to many travelers: religious pilgrims, proselytizing monks, "foreign" monks seeking the roots of the adopted religion, people bearing translations of Buddhist scriptures, and religious tourists (pilgrims concerned with acquiring experiences by visiting places linked with Buddha)

There are two general paths from India to the Tarim Basin, although the cities and stops along the way vary. From India, travelers can cut through the Pamirs, then through the Hindu Kush (Khyber Pass), traveling through modern-day Afghanistan and Pakistan. Once they are clear of the mountains, travelers can enter the Tarim Basin from Kashgar, head north to Transoxiana, or west into Persian/Iranian lands. The other route into the Tarim Basin from India is through Tibet, passing through the Karakoram Mountains into Leh and cutting through more mountains to enter the southern Tarim Basin route.

Tibet

Tibet is located south of the Tarim Basin, the "roof of the world" surrounded by some of the highest, roughest mountains in the world. They are one of the intermediaries between India and the Tarim Basin and continually plagued Chinese forces at the Gansu Corridor and Chinese protectorates and forts along the southern route of the Tarim Basin. Tibet also popularized their own brand of Buddhism, rooted in tantric thinking mixed with elements from their local religion Bon. Tibetan Buddhism focused on the powerful acts of the body, speech, and mind while incorporating the home-grown Bon deities and magical elements. The use of spoken mantras, mandalas, prayer flags and wheels, and mani stones marking pilgrimages all appealed to people because of the tangible nature of such a metaphysically-complex religion. Tibetan chortens (stupas) and piles of mani stones dot the Central Asian landscape, testifying to Tibet's influence over the region.

Another uniquely Tibetan contribution to the Tarim Basin is the yak. Nomadic pastoral communities play a large role in the Tibet, economically and culturally. While they may raise horses, sheep, goats, and cattle, their most valuable animal is the yak, which makes travel across soaring heights possible.

Persia

Through the history of the Tarim Basin, Persian influences permeated all layers from technology, culture, and religions. It is likely that Persian people along with people of the steppe seeded Central Asia early in its history. Persia's own long and rich history, complete with more than a few barbaric usurpers, further re-enforces its ties with Central Asia as a whole. From the beginning of metallurgy in the 3rd millennium BCE (copper and tin ore from the Anatolian and Iranian highlands) to the domestication of horses and use of chariots, Persians have been spreading their influence across Central Asia.

Persian construction was used throughout the Tarim Basin. Most buildings were made of earth with pieces of earth and clay solid enough to cut through like turf. The walls are layers of such earth, often 3-feet thick, with 2-3 rows of sun-dried brick facing. Buildings were built thick on the bottom, which each layer narrower than the lower layer, and second layers were not placed until after the first layer dried. After the entire building was finished, the whole thing was covered with mortar by masons. This style of construction was well adapted to Central Asian inhabitants due to the paucity of wood and the scale of production required for quarrying stone. Some of the Tarim Basin oases are products of Persian/Iranian technology, bearing their distinct irrigation systems. Iran has exported its religious and philosophical ideas into Central Asia, including the basic fire gods, astronomy, and the practice of exposing bodies to vultures, sun-bleaching the bones, and placing them in ossuaries. More than one Iranian-based religion has swept through the Tarim Basin, such as Nestorianism, Zoroastrianism and Manichaeism, which became

the official religion among the Uighurs in 763 CE. Merchants played a large role in disseminating Persian dress, customs, and technology as well as Persian communities that settled in Central Asia, India (Farsi) and China. Persians, throughout their changes in political leadership, have a deep rooted tradition in trade, embarking from trade centers like Kirman, Ispahan, Tabriz, Baghdad, and Mosul.

Barrier Cultures

The people found in the Tarim Basin are a true melting pot both culturally and ethnically. The inhabitants of the eastern Tarim Basin have the most interaction with the Chinese and bear the most oriental physical features. The inhabitants of the Tarim Basin bear more occidental features the further west, often a fusion of Persian and Turkish stock with Hellenistic strands. Although density in the Tarim Basin is comparatively less than the surrounding landscape, it experiences a high turnover of peoples due in large part to the influence of the Steppe people. Every time riders from the Steppe invade (and sometimes settle in) the Tarim Basin, a series of displacements ripples through Central Asia with consequences reaching as far as Western Europe. From the Scythians and Huns to the Mongols and Tamerlane, the Tarim Basin is the often the first area hit by ambitious Steppe people, and its history is a prime example of cyclical displacement and replacement.

There are three kinds of barrier cultures in the Silk Road, defined by what role they currently fill in the Silk Road story: producers, traders/facilitators, and raiders. Producing cultures are generally sedentary, although cultures raising herds may be semi-nomadic, seasonally moving between established community sites. Trading cultures are people who make a living acting as a liaison between parties, moving goods, or facilitating those who move goods. Raiders pluck other cultures' bounty and sometimes succeed in conquering areas and establishing their own kingdoms.

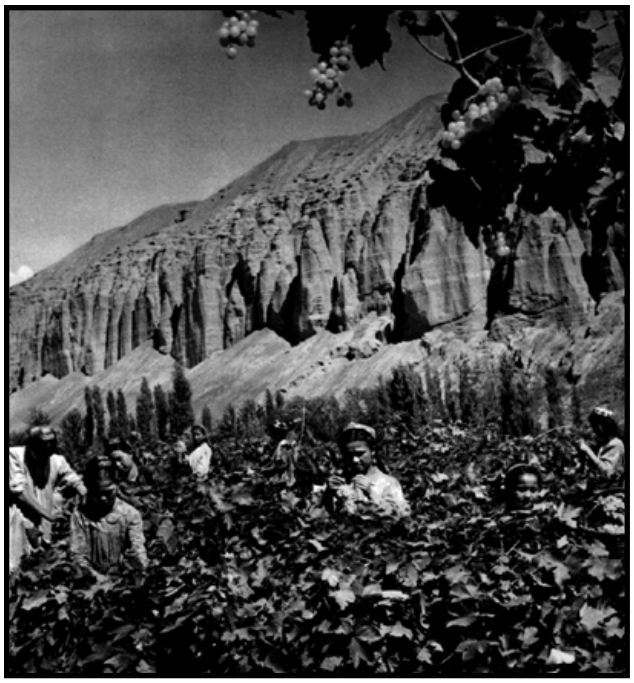
Producing Cultures

The key to producing cultures in the Tarim Basin is water. Due to the terrain, there are limited places for producing cultures: oases, fertile valleys, and irrigated areas. Oases in the Tarim Basin are typically dedicated to agriculture, while irrigation maximizes the utility of their precious water supply. The Tarim River is the only river in the Tarim Basin, fed by three tributaries: Kaxgar Daria from the Pamirs, Hotan Daria from the Kunlun Mountains, and Yarkant Daria from the Karakorum Mountains. Over time, the Himalayas have pushed the mountains south of the Tarim Basin higher and higher, turning the Tarim Basin into a desert. However, glaciers and snowmelt become rivers with rich mountain soil washing down and turning areas into oases. Conversely, the oases of the northern Tarim Basin are fed by snowmelt from the Tien Shan Mountains and are more numerous than the oases of the southern and eastern Tarim Basin, some of which have dried up and turned into salt lakes.

The premiere oasis in the Tarim Basin is Kashgar, where the mountains meet the desert. Watered by the Pamirs (which joins no fewer than four mountain chains) and the western entrance of the basin, Kashgar is undoubtedly the most cosmopolitan crossroad city in the Tarim Basin. Kashgar is the Uighur name, meaning "to have water," and it sits at a focal point where all the trade routes meet: where the northern and southern routes of the Tarim Basin converge, China to Bactria, China to Transoxiana, India to China, India to Transoxiana, and Arabia to China to name a few. Kashgar is one of the largest oases in the Tarim Basin and grows wheat, vegetables, and fruits (melons, apricots, grapes, pomegranates, and figs to name a few delicacies). Kashgar is deeply rooted in Arabic and Persian influences with mudbrick architecture, using wood for supports, doors, and affluent or religious buildings due to the scarcity of wood.

Khotan is the second most influential oasis in the Tarim Basin, located on the southern Tarim Basin route and entrance/exit point from the Tarim Basin into India. Khotan has always been an important oasis, both for its precious source of water and its production of jade and silk. Seat of the Yutian Kingdom during the years of Chinese influence, Khotan (like Kashgar and other important oases) collected high taxes from western traders under Teng control. Fed by the Hotan Daria (Hotan is the Chinese name for Khotan), Khotan is home of the jade rivers: Baiyu He east of town produces white jade, Lüyu He west of town produces green jade, and Heiyu He also west of town produces black jade. Harvesting jade was a simple matter of collecting the stones from the riverbeds. Besides this highly-sought stone, Khotan grows fruit trees, mulberry trees, and wheat, using the mulberry for raising silk worms and paper making. Khotan is also the fabled location where the Chinese princess introduced the first silk worm, smuggled through her headdress so she would not have to live without the luxurious cloth. Legend aside, Khotan is one of the first producers of Central Asian silk as well as the first Central Asian site of a Buddhist monastery, built in 211 CE and disseminating Buddhism throughout the area.

Another important oasis is Turfan, fed by the snowmelt of the Tien Shan Mountains. The Turfan Basin is a gravel plain laying below sea level, the deepest, waterless depression on earth. In the winter it is the coldest region of China, but in summer one can boil an egg by burying it in the sand. However,



agriculture flourishes in Turfan due to the snowmelt from the Flaming Mountains (a portion of the Tien Shan) and the 400+ subterranean water courses that help irrigated the area (using a Persian irrigation system of horizontal wells). Such conditions make it possible to grow grains, vegetables, fruits, and cotton, while planting cannabis on the periphery shielding crops from wind and sand. Under the Gaoche Kingdom (early 1st C CE), Turpan had the largest vineyards and cultivated raw silk and cotton. Turfan and the neighboring Gaoche capital of Jiaohe were important oases and trading cities along the route that traveled north of the Tien Shan Mountains.

Halfway between Turfan and Kashgar along the northern Tarim Basin route is the oasis of Kucha, home of Mongolesque people that have more cultural influence from Persian and Mediterranean people. Like other oases, Kucha grew fields of grains (red millet and wheat), fruit in orchards (grapes, pomegranates, pears, plums, peaches, almonds), as well as a tradition for metallurgy (both blacksmithing and jewelry) and music. Kucha is watered by a chain of mountains called locally the Southern Mountains (south of Urumchi). This oasis is a fine example of the rare Asian city state, once home to the Kingdom of Quzhi who fortified the city with walls.

Another type of producing culture comes not from agriculture, but from animal husbandry and the products made from animals, such as milk, butter, cheese, meat, lard, leather, clothing and textiles made of wool and skins, and tools and ornamentation made of bone. There was even a demand for mare's milk wine, made from fermented milk. Although the examples of fertile valleys technically lie outside of the Tarim Basin, they are central to the animal husbandry culture and animal trade so prevalent along the Silk Road. The most famous is the Ferghana Valley, located in Transoxiana and home of the celestial horses, although other animal husbandry and agriculture took place in the verdant valley surrounded by mountains. The Ili Valley, domain of the Kazakhs, Mongols and other pastoralists, raise animals in the lush grasslands between the Altai and the Tien Shan Mountains. Modern day Kazakhs now inhabit the region and raise their herds (including camels) in the Ili Valley. Another haven for animal production as well as agricultural is Tashkurgen, an area in Turkistan near the Pamirs called the "land of 1,000 springs". In modern day, Tadzhiks (Persian people of Caucasian stock, some of which intermarried with Turks and Mongols) live in the area, engaging in agriculture and husbandry. All three sites border the Tarim Basin and play a large role in the Silk Road.

Although there is a wide variation from culture to culture, producing cultures of the barrier zone share some common traits. First, these locations are preferred stops along travel routes. Second, these locations are prime real estate in the barrier zone, not only because of their potential for agriculture, but because travelers and traders stop at these locations for food, water, and supplies. Depending on where and how they are located, these locations are more likely to develop into staging posts and crossroad cities, or conversely, protectorates are more likely to choose such locations to create staging posts and crossroad cities. Third, producing cultures are settled, which does not seem like much of a feat to their "civilized" neighbors like China and India, but it speaks volumes to the nomadic people of the Steppe. These settled people of the oases and valleys have much more material culture than their nomadic neighbors, as well as the wealth brought from traders and travelers. All these factors create a unique evolution: the Asian city-state. Unlike Europe, city-states are almost unheard of in Oriental architecture and organization. Generally, there are capital cities with a scattering of influential cities, but the idea of have a sovereign state consisting of an independent city and its surrounding territory is completely foreign to the development of Asian empires, except for the oases of Central Asia.

Trading Cultures

The central theme of trading cultures is the continuous movement of people and goods. Trading cultures attain much of the stature and wealth through travel and trade, and their cultural mores and attributes follow the same vein. That does not exclude endeavors in agriculture or husbandry, nor does it exclude having a home base or kingdom. In the historic Silk Road, the best example of trading

cultures is the Sogdians, an ancient Iranian people settled in transoxiana, the area between the two rivers Amu Darya and the Syr Darya, south of the Aral Sea, and north of Bactria. Although Sogdiana contained fertile areas, such as the Ferghana Valley, where agriculture and husbandry took place, they were also masters of trade, projecting mercantile endeavors from Samarkand, Bukhara, and smaller trading cities. Sogdians trained in the skills of merchants and learned the languages (spoken and written) of their trade partners. They also ran businesses aimed toward merchants and travelers, such as caravanserais, inns, restaurants, and tea houses.

People of trading cultures are first and foremost merchants and travelers. Even when they have a home base, they establish small communities all over the barrier zone and neighboring lands. Their mercantile ties led them to explore many places, and their culture reflects all those influences. They are often tolerant societies, due to their exposure to numerous people and different mores. They are practical people, adapting as political lines shift and new conquerors claim them as their subjects; in some sense, trading cultures like the Sogdians predate political boundaries because the culture of mercantile endeavors persists despite who is technically the ruler.

Trading cultures are often transmitters of technology, religions, and fashion as they move from place to place. Sogdians were the people who brought glass-making technology to the Chinese, who were consummate consumers of Roman glass. Sogdians were one of the first (and most persistent) Central Asian contacts China found when it sent its initial expedition across the Gobi desert to battle the Xiongnu. In subsequent years, the Chinese used Sogdians as emissaries and allowed Sogdian merchants (in limited numbers) into Chinese cities like Dunhuang and Chang'an. Sogdians also played a vital role early on in the dissemination of Buddhism in the Tarim Basin. Although they have adopted many religions over time, they still bear cultural marks of their Persian roots, known for exposing the bodies of their dead and placing the bones in ossuaries.

Raiding Culture

Raiding cultures are nomadic people who attain much of their wealth through raiding caravans. There are few examples of raiding cultures residing in the Tarim Basin; due to the unique geography, raiding cultures often resided in the steppe outside of the barrier zone. Successful raiding cultures eventually become usurpers, taking over territory and establishing their own kingdom as the Scythians and Uighurs did. A separate but related example of raiding culture are the Arab tribes west of the Tarim Basin, who made a living trading and raiding each other's caravans. During the rise of Islam, a

series of strong political figures united the various tribes, and Arabs could no longer raid each others' caravans under tribal code. The Arab tribes became a mobilized force specialized in raiding and in search of new caravans to raid. They expanded their sphere of mercantile and military control through parts of Persia, Bactria, Transoxiana, and into the Tarim Basin, thus confirming that successful raiding cultures tend to become usurpers and rulers.

History and Politics

Early history of Central Asia is based largely on the nomadic warrior tribes that came to control much of Europe and Asia from the third millennium BCE on, such as the Celts, Huns, Slavs, Germans, Hittites, and Scythians. With the domestication of the horse and invention of the chariot, the warriors that poured through Central Asia were fierce opponents. Herodotus gives us one of the first written records on Central Asians, writing of the Scythians in 5th C. BCE. Although the early history is vague at best, historians are certain that Central Asia had established trade routes, large urban settlements, agriculture, metallurgy, mining, manufacturing, and commerce as early as the second millennium BCE.

The height of the Silk Road occurs between 2nd C BCE to 11th C. CE, after the Chinese are united under the Han Dynasty and enter the Tarim Basin in search of allies against the Xiongnu but before the rise of maritime routes shifted goods from traveling through Central Asia. In this time period, there are major changes in leadership in the Tarim Basin and the lands neighboring the region. The Xiongnu lost control of the Gansu Corridor to the Chinese, and further internecine fighting split the tribe into two factions, one of which controlled present-day Mongolia, the other fled westward to Afghanistan, India, and into the Roman Empire. The Chinese empire extended its control into the Tarim Basin as far west as the Ferghana Valley in Sogdiana, but it eventually fell into chaos until the Sui Dynasty regained control in the 6th C. CE, followed by the Teng Dynasty. The Kushans overtook Bactria and

extended their control into the Hindu Kush, only to be taken over by Sassanians, who also usurped the Parthian kingdom as well. By mid 8th C. CE, the Arab Caliphate was in Transoxiana and pushing its western borders, the Tibetans were vying for control of the Tarim Basin, the Pamir Kingdoms, and the Ordos Plateau, Turkic kingdoms controlled Mongolia and the steppe north of the Tarim Basin, and China was staving off invasions, rebellions, and civil war.

"May you live in interesting times."

After the end of the first millennium, a rise in maritime routes diminished the amount of wares moved across Central Asia. The melting pot of religions became solidly Islamic through a series of invasions. People often converted for practical reasons, since mercantile sectors were controlled by those of Islamic faith and the leadership gave initial taxation breaks to Islamic worshippers. Overtime, generation after generation accepted Islam and the remaining enclaves of other religions lost contact with outside sources of their faith. There was a renewal in overland trade during the period known as the Pax Mongolia in the 14th C. CE, when a steppe culture held the sphere of China and maintained an empire through efficiency, swift communication between clans and cities, and decisive action against troublemakers.

Routes across Central Asia

If has been emphasized that silk roads are a network of many smaller routes which as a whole move goods across a physical barrier zone. There are also a limited number of ways through the barrier zone, siphoning traffic through certain thoroughfares. The need for water, fuel, supplies, and unloading/ buying goods while traveling through a barrier zone necessitate hitting these cities and staging posts, regardless of the specific route a caravan takes.

There were three ways to cross the Taklamakan Desert: avoiding it altogether and passing north of the Tien Shan Mountains, hugging the southern edge of the Tien Shan Mountains (often referred to as the "northern Tarim Basin route"), and hugging the northern edge of the Kunlun Mountains (often referred to as the "southern Tarim Basin route"). Besides traveling east/west from China, caravans also traveled from the north, coming from the steppe, and from the south, coming from Tibet or India.

The route passing north of the Tien Shan Mountains (from China) pass through (sometimes Dunhuang) Hami, Barkol, (sometimes Turfan and Urumchi), across the Dzungaria plain to Yining, Frunze, Tashkent, and Samarkand. This route is sited by Chinese text as a more direct route to Transoxiana and Bactra, especially for the animal markets of Samarkand and Bukhara. The northern Tarim Basin route passed through Dunhuang, Turfan, Kucha, Aksu, and Kashgar. This route is relatively well watered along the entire route and preferable for caravans in politically stable times. The southern route passed through Dunhuang, Miran, Cherchen, Endere, Minfeng, Khotan, Karghalik, Yarkend, and Kashgar. Not all of these stops exist at the same time, as kingdoms rise and fall and cities become abandoned when the remaining population cannot sustain the irrigation works. In general, this route is more remote and has less water and stops between trading cities and staging posts. In times of raiding, the southern route was often taken due to the relative ease for raiders of the steppe to attack the northern Tarim Basin route. That does not mean that the southern route was free of raiders, especially from the fierce Tibetan horsemen, but that there were significantly less along the southern Tarim Basin route.

Places with natural resources bloom into urbanized trade centers, such as Dunhuang, Turfan, Kashgar and all the major stops along both Tarim Basin routes. The places with the most diverse traffic become more cosmopolitan through increased interaction with different cultures, increased markets for caravans, and increased diversity of goods for consumers. For example, the main artery and largest city in the Tarim Basin is Kashgar, largely due to its position for both north/south and east/west movement. If a caravan travels through the Tarim Basin, more than likely it makes a stop at Kashgar. Both northern and southern Tarim Basin routes met at Kashgar, and travel to and from Bactria, Sogdiana, and the Pamirs also stop in Kashgar. Dunhuang is a major oases for travel in and out of China, especially for religious-minded travel with hundreds of Buddhists caves carved out of the mountains in that region. Those traveling in the Tarim Basin or north of the Tien Shan Mountains stop at Dunhuang for respite of the desert, crucial supplies, trading, and entertainment. Turfan is an oasis that receives caravans and travelers traveling across the Tarim Basin as well as a branching point for people who travel north of the Tien Shan Mountains. It also acts as an entrance point into the Tarim Basin from the steppes, or more precisely the Dzungaria Plain.

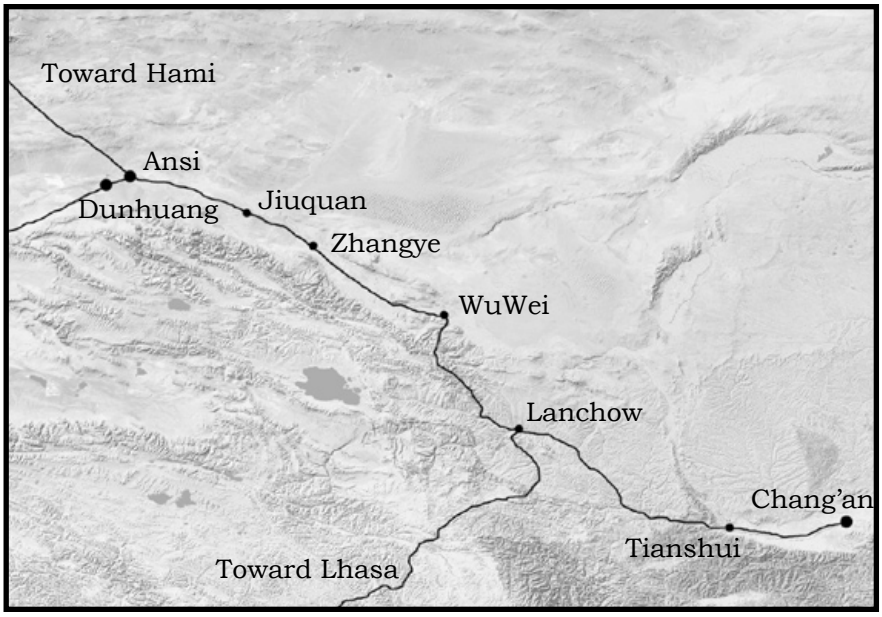
Visit the appendix for maps detailing these different paths.

Maps, Maps, and More Maps!

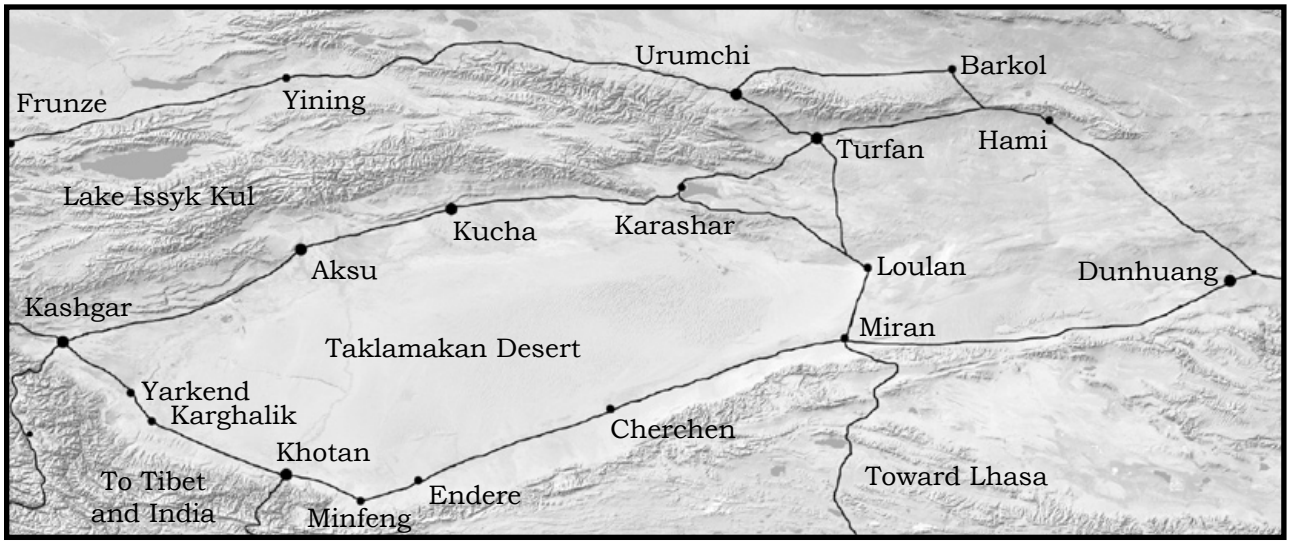
Here are the labeled maps from the front and back cover. They are broken down into regional sections with geographical formations labeled for reference. Although common routes between stops are marked, remember that not all cities were in use at the same time, and often time necessity dictated alternate routes.

Also remember of scale and scope of the map. Only major stops are listed; for every dot on the map, there are dozens of smaller stops around which adventure lingers. While linear lines connect these major cities, remember they represent a network of routes that are generally leading in similar directions. When you zoom into a particular area, there is much more complexity and movement taking place.

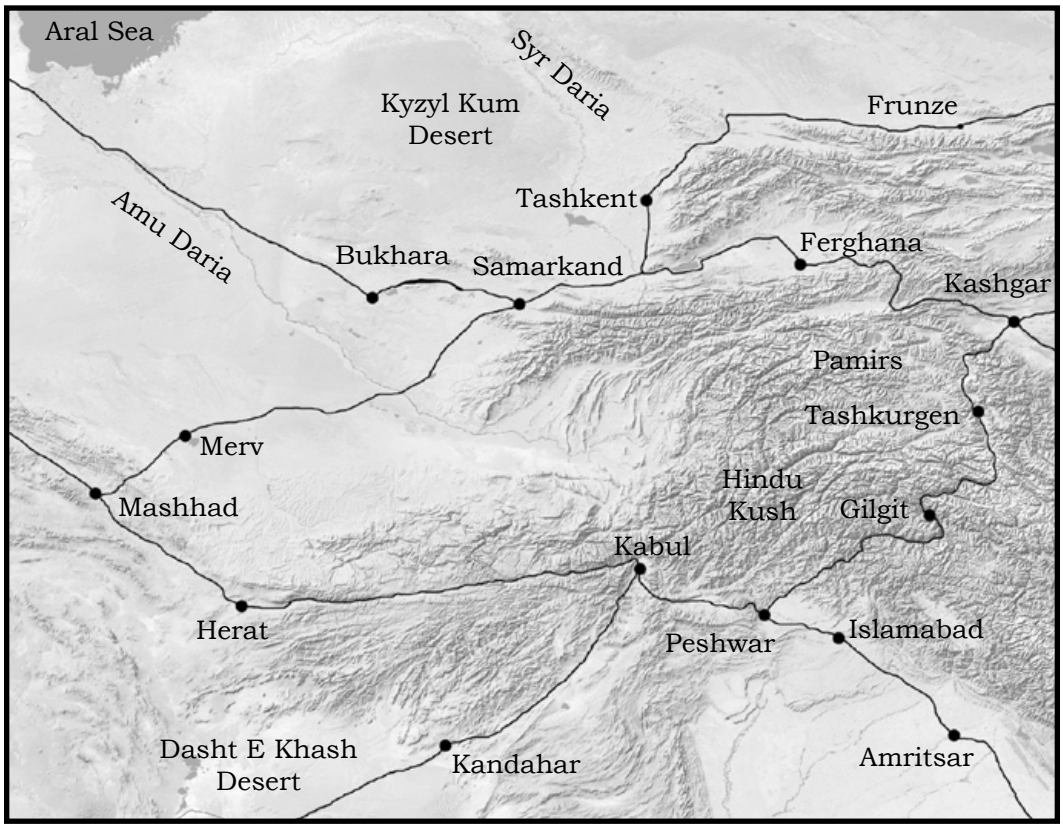
Map of China, Gansu/Hexi Corridor, and entering the Tarim Basin



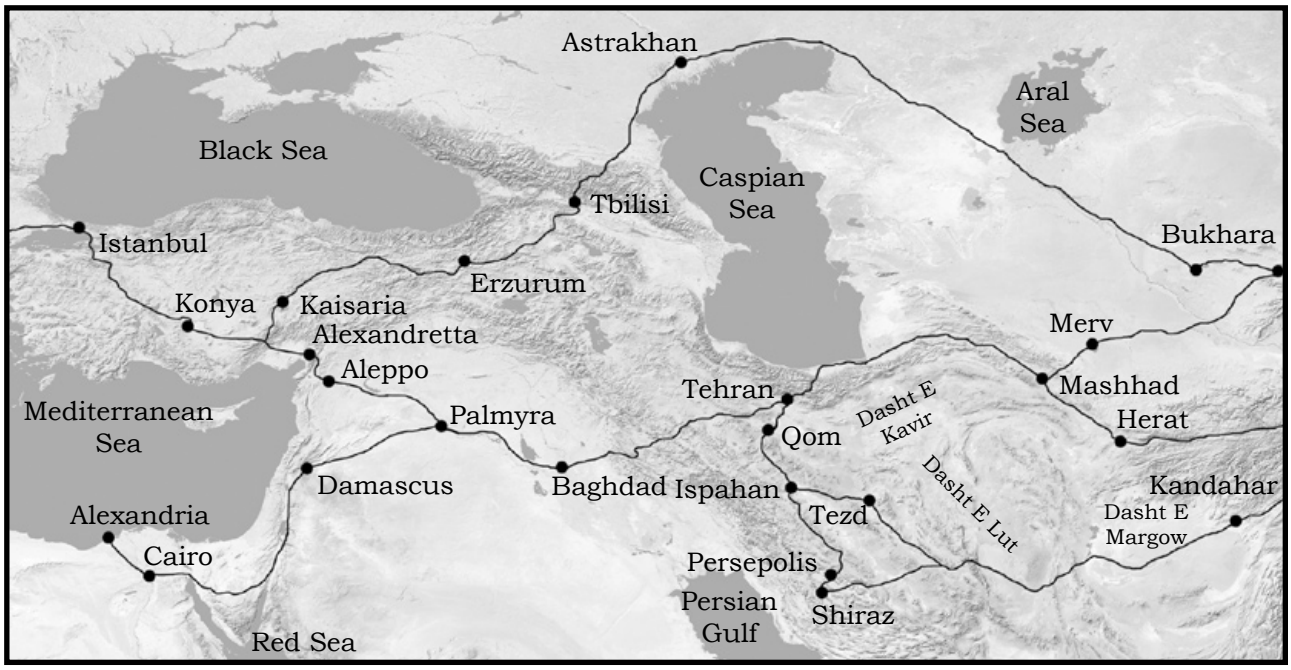
Map of the Northern Route, Northern Tarim Basin Route, and Southern Tarim Basin Route



Map of Pamirs, Hindu Kush, and Afghanistan



Map of West Asia



Adornment and Craft

People have created numerous ways to decorate themselves, their belongings, and their surroundings. Below are descriptions of just a few methods, as well as descriptions of crafts. While this list is limited in scope, it should give interested readers enough information for further independent inquiry.

Appliqué

Appliqué is a technique of attaching one material to another, often for decoration or trimming, but also for patching. Typically, appliqué fastens a piece of decoration onto a larger piece of fabric in either planned designs for free form embellishment. Appliqué is found in many cultures, applied to clothing, door and wall hangings, canopies, cushions, blankets, saddles, rugs, bags, purses, hats, headdresses, gloves, boots, and other personal items as a means of embellishment.

The most common use of appliqué is on textiles, using sewing to attach decoration to foundation piece. Appliqué is not limited to fabric-on-fabric decoration; applying other objects to a foundation textile is also possible. Such items like beads, fish scales, animal bones, shells, leaves, coins, pieces of metals, precious stones, ribbons, and braids are all examples of historic uses of appliqué in addition to appliquéing fabric. The foundation piece is not limited to fabric; hides, vellum, beaten bark, and any other stitchable material are all candidates for appliqué.

Brocade

Brocade is a decorative weaving technique where an extra, decorative (non structural) thread is laid in weft-wise during the weaving process. The thread can span the entire width of the fabric or remain in an isolated area. Brocade raises a design from the structural woven fabric, creating three dimensional embellishments to woven fabrics. Brocades can follow a plain weave, highlighting the nature of the weave, brocades can follow a sequence or pattern, like a twill or floating weave, or brocades can be placed at will, looking much like embroidery.

Emboss

Embossing impresses some design into a surface to create a three-dimensional image on an otherwise two-dimensional surface. Embossed surfaces have to be ductile, making a relief when the design is pressed into it. Paper, metal, leather, and cloth are all common vessels for embossing. Embossing is used to add more decoration to a piece, used in legal documentation, stamps, invitations, wallpaper, jewelry, book-making, textile production, and metal smithing. Embossed surfaces can be left uncolored (called blind stamping or embossing), but some artists add colors or gold leaf to highlight embossing. Embossing metals is also called repoussé, listed under jewelry techniques.

Embroidery

Embroidery is decorating fabric or other stitchable materials with needle and thread, yarn, or ribbon. Thread and yarn can come from numerous sources: cotton, silk, wool (sheep, yaks, llamas, camels, goats), and metal (gold, copper, silver) to name a few. Embroidery may also incorporate other materials in the needlework, like precious stones, beads, sequins, glass, or metal.

Embroidery can either be free forming, where designs are stitched without regard to the weave of fabric, or counted-thread, where the weave creates a grid which dictates the orientation and size of the design according to a pattern.

Felt Making

Unlike woven fabrics, felt is a pressed fabric produced from wool's natural tendency to mat together. Raw wool is sheared from sheep, beaten to rid the wool of dirt and dust as well as soften the course wool, and washed before it is ready for felting. Clean raw wool is laid in a mat, the mat is rolled and continually pressed, undergoing a process of friction and water (or another lubricant). This sort of agitation causes the fibers to knit or tack together, forming a sheet of cloth.

Felt is used for clothing, rugs, saddle cloths, and yurt covers. It is highly prized for its insulation, and often decorated in spirals and curved patterns, which decorate without perforating the matted cloth.

Designs can also be pressed into the felt or sewed on (appliqué) with wool thread is spun by hand with a spindle or with a modern spinning wheel (by foot petal). Spinning thread from wool also creates woven woolen cloth.

Inlay

Inlay is a form of decoration used in woods and metals where part of the base piece is removed and another piece is put in its place, typically in geometric patterns or to create a scene. The most common inlay pieces are furniture where pieces of colored wood, metal, precious stone, or bone are inserted into a piece of wood and then veneered.

Like many types of decoration, there are specific names for different styles of inlay. Making patterns through inlaying metallic threads into other metals is called damascening, used in swords, gun barrels, and various metal objects. Intarsia is a form of wood inlay that fits varied shapes, sizes, and types of wood together to create a three dimensional mosaic-like picture. Not unlike fitting a jigsaw puzzle, pieces are cut and joined with a finish or veneer over the entire piece. Besides wood, intarsia also uses bone and ivory, and marble intarsia uses the same principles except with different colors of stone inlaid in marble, often used in floors of grand buildings. Niello is a black metallic alloy (sulphur, copper, silver, and lead) often used in metal inlay on engraved metal. For example, an artisan may carve a pattern or figure into silver and raise the figure by carving out the background. The niello inlay goes into the background and the piece is baked until the alloy hardens. Then the piece is sanded and buffed creating a two-toned inlay on which the artisan can add minute details by hand. Niello can also be used to fill in designs cut into metal.

There are other types of adornment that look like inlay, but are not. For example, marquetry is often confused with inlay work and in England people who practiced marquetry were often called inlayers even though marquetry added decorative panels of veneers onto sections of wood, not into wood as in inlay.

Incense

Incense is an aromatic substance that is burned to produce fragrant smoke. Incense is often made from aromatic woods, herbs, resins, essential oils, and sometimes from animals. The following substances are often burned whole or pulverized before burning (or further processing): agarwood, gum benzoin, clove, camphor, cedar, copal, cypress, frankincense, juniper, labdanum or ladanum, myrrh, nutmeg, patchouli, sage, sandalwood, star anise, and storax. Common essential oils are often extracted from the following plants: patchouli, cedar, sandalwood, ferula or galbanum, jasmine, rose, and ylang-ylang. When such materials are not available, incense can be made of a combustible material that has added oils and perfumes in place of aromatic ingredients, although this is consider the cheapest type of incenses.

Combustible Incense

There are two forms of incense. The first is direct burn or combustible incense where the incense is lit and the fire is fanned out. The glowing ember continues to smolder without an outside source of heat. This type of incense is more difficult to make because it requires finer grinding of materials, a more precise balance of materials to ensure a smoldering ember, and a combustible binder.

The combustible binder both binds the fragrant materials and gives the incense a self-sustaining ember. While combustible binders fuel direct burn incense, they should not give a perceivable smell in and of themselves. Makko powder is a natural plant-based combustible binder, taken from the bark of the tabu-no-ki tree of Asia, and there are other plants with similar properties to act as natural combustible binders. Another common combustible binder is a mixture not unlike gunpowder: a charcoal of wood base with a gum and an oxidizer. Careful attention must also be paid to the ratio of binder to fragrant materials based on the natural qualities of the materials. For example, oily resinous materials (like frankincense and myrrh) cannot exceed the amount of dry material or else the incense will not smolder, and incense made with natural combustible binders cannot be mixed with too much water or pack too tightly in formation, lest the incense burn unevenly or too slowly/quickly.

Combustible incense come in different shapes, the most common being the cored stick. A supporting rod of bamboo, sandalwood, or another fragrant wood is soaked in water or a thin glue mixture and dipped in damp incense powder three of four times. A solid stick of incense has no supporting rod and formed when incense powder mixed with a little water forms a hard dough is extrusion through a die. Solid sticks are easily broken into pieces to determine the amount of incense burned at one time. Combustible incense also comes in cones and coils, which are formed in moulds after incense powder and a little water are kneaded into a hard dough. Whenever water is added to incense for formation, the incense have to undergo a drying process. Incense formed in this way are subject to warping or misshapen drying (in the case of coils and cones), so constant rotation and climate control are important in drying incense.

Incombustible Incense

The second type of incense is non-combustible, also called indirect burn. The incense is separate from the heat source and requires a heat source since it

does not burn itself out. Non-combustible incense are applied to a heat source as a whole in its raw, unprocessed form, as a powder (burning quickly releasing intense fragrance for a short duration), or as a paste, where powdered incense is mixed with an incombustible binder (honey, resin, dried fruit) and formed into pellets or cakes.

Incombustible incense requires more accoutrements for burning, namely a burning vessel and fuel. Place non-combustible incense directly on charcoal is the most common method, but there is also makko and mica. Makko is a natural combustible from a particular tree found in Asia. When powdered and lit, it burns slowly with high heat, also known as hot ash. Mica uses a hotplate which is placed on charcoal or placed on a vent hole of charcoal stacked in a cone shape under ash. The incense is placed on the plate, and as it heats up, it releases fragrance with very little smoke.

Jewelry Making

Jewelry is a type of personal adornment often (but not necessarily) made with gems or precious metals. Styles and materials vary throughout time and place, but there are a few techniques that generally appear in jewelry making. These techniques are not unique to making jewelry; they are used to create other types of ornamentation and goods.

Casting

Casting is an economic method for creating metal findings and pieces, especially is uniformity in size and shape is desired for a piece of jewelry. Metal is heated into a liquid state and poured into a mold, cooling and solidifying to the shape of the mold. In Central Asia, there is a history of metallurgy and gold/silver craft dating back to the Scythians of the Altai Mountains, eventually sweeping through the Eurasian continent. Precious metals are melted in crucibles sitting in small fires, stoked and superheated by blowing air directly into the coals with blowpipes (like a mini bellows). Using tongs, the liquid metal is poured in molds, and after it cools, artisans smooth the edges and seams of excess or jagged metal.

Filigree

While metal makes for fine settings and supporting structures, metal can also be fashioned into jewelry in and of itself. Filigree is a technique where fine pliable threads of metal are twisted, curled, or plated to create jewelry and other decorative embellishments. Often times, smaller pieces are soldered to create a larger, fuller piece of ornamentation, rather than chiseling or engraving a piece of metal for the desired effect.

Many cultures employed filigree, including the Phoenicians, Etruscans, Greeks, Indians, Europeans, and of course, Central Asians. Using charcoal, blowpipes, and pieces of gold or silver, artisans of Central Asia create very fine grains, beads, or spines of gold, similar to a strand of course hair. These strands are united and grounded until the desired piece of decoration is complete.

Repoussé and Chasing

Another method of creating metal jewelry is repoussé and chasing. They both create a raise image or shape from a single sheet of metal, but they approach it from different methods. Repoussé is embossing metal, or shaping a malleable piece of metal by hammering the reverse side of the metal. Chasing defines the image by hammering the front of the metal, effectively raising the design by sinking the background.

These methods rely on the plasticity of the metal, stretching it locally while maintaining a continuous surface. Gold and silver are generally reserved for fine detail work while copper, tin, and bronze are used for larger works. Repoussé and chasing are also used to make large sculptures and items, such as water vessels of copper and silver made in India. Some cultures used dies and punches to mass create repoussé pieces and followed up with chasing to sharpen the detail.

Cloisonné

Another technique used in jewelry making is cloisonné, a mixture of metallurgy and ceramic skills. It begins with a shaped metal object, often copper or brass due to its ductile nature, to which a pattern is applied. Adhering to the pattern, artisans add partitions, soldering filigree to the piece and making a complicated but complete pattern. The areas between the filigree partitions are painted, either with glass frit or enamel filling. Glass frit is a method used in glass making where a batch material is melted with other materials and then ground into powder before being added to another batch. For example, lead oxide, which can produce a harmful dust, may be melted with silica, and then ground down as a lead silicate. The enamel filling is similar to a glaze on ceramics. The basic elements are boric acid, saltpeter and alkaline, and added minerals produce different colors (refer to the chart below). The enamel filling is ground to a fine powder and applied to the cells between the filigree.

After applying the first layer of frit of enamel, the piece is fired. However, artisans must repeat this process many times because firing the piece forms enamel, causing some sinking in the cells between the filigree. Once they have enameled compartments equal to the height of the filigree, the piece is polished until the enamel and filigree are at the level. A final firing and polish add luster to the surface. Gilding (dipping in fluid gold or silver) or electroplating prevents corrosion and is the final process in cloisonné.

Cloisonné have a long and varied history. Egyptians used cloisonné for many of their decorations as well as molding. Cloisonné developed in the Near East and spread to the Byzantine Empire and along the Silk Road to China, where is took off with a flare. There are many examples of cloisonné in Chinese art and decoration from vases to headdresses, but one of the most common uses are for making decorative beads.

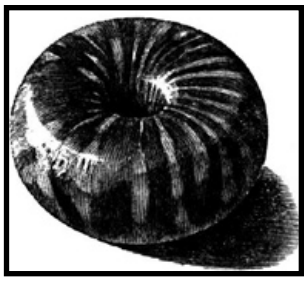
Mineral	Color
Iron	Gray
Uranium	Yellow
Chromium	Green
Zinc	White
Bronze	Blue
Gold	Red
Iodine	Red

Lapidary

Another important component of jewelry is gems and stones. While precious stones are the most prestigious in this category, there are many other elements which cultures use in their jewelry: stone, minerals, amber, shell, pearl, coral, horn, bone, glass, jet, and copal.

Tumbling (also called tumble polishing) smoothes and polishes stones and other hard substances. The material to be polished is placed in a barrel with rocks of same hardness, abrasive grit, and water and slowly rotated continuously. The amount of polish is determined by the coarseness of the abrasion and the duration of the tumble. Tumbling often takes multiple steps, using coarse grit in initial tumbles and finer grit in subsequent tumbles for a finer polish, although the length of time each batch is tumbled largely depends on the hardness of the material to be polished and the degree of smoothness desired.

When it comes to gems, a lapidary can shape and polish a gem or facet a gem. Opaque gems and softer gemstones (lower than 7 on Mohs hardness scale) are usually cut (cabochon) while transparent stones are facetted. Cabochon are typically cut convex on top and flat on the back, which makes for the easiest setting of the stone in jewelry. Transparent and translucent gems are often cut to maximize the sparkle of the gem, a process called faceting. Cut at precise angles at exact orientations, the goal of faceting is to produce as much internally reflected light in the stone. Each type of stone has a unique refractive index which dictates the type of angles during faceting. For example, cubic zirconium, rock crystal, and diamonds can all be cut in a round brilliant cut, but the angles must be different to produce the same optical effect; however, diamonds have the highest refractive index of all three stones and can have a greater sparkle than the other two when cut properly.



Beads

Beads are some of the oldest and most persistent pieces used in personal ornamentation in human history. Archeology and the natural distribution of certain materials tell us that throughout history people went far and wide to acquire bead material. For example, one of the earliest beads in Asia, around 20,000 years old, is a Oliva shell ground at the apex and gouged through the final whorl, found at a site in India over 400 miles away (by foot) from its nearest natural source. One of the oldest beads in the Americas is roughly 11,500 years old and comes over 800 air miles from its nearest source. Lapis lazuli's only known natural source is a desolate valley in Badakhshan, Afghanistan where no one lives; however for at least 6,500 years people extract the stone every summer. Along the cliff faces, people built fires to heat the stone, then they threw cold water on the hot rock, shattering the rock and exposing the highly sought after blue stone, exported to Mesopotamia as early as 4,500 BCE.

Even language exposes the importance of beads, not only as decoration but in the development of technologies related to bead extraction and production. Although not the same word, the word for "pearl" is the same word for "bead" in Greek, Latin, French, Italian, German, Swedish, Serbo-Croatian, Hindi, Tamil and languages of insular Southeast Asia. In Russian, Czech, Polish, Dutch and Yiddish the word for "bead" is the same word for "coral." If you can drill a hole through it, string it and wear it, then it can be a bead. There is no limit to what people made into beads: from stones to shells, from bones to metal, from glass to wood.

Lacquer

Lacquer is a clear or colored coating that creates a hard, durable finish on the original object, often polished to create depth and shine. Anything can be lacquered: natural fruits (gourds), wood, metal, ceramics, and bone to name a few. Although the first examples of lacquering are from China and India (over 7,000 years ago), there are numerous cultures that use lacquering for decoration and durability.

Raw lacquer comes from insects and tree resins. The most commonly associated insect is the Laccifer lacca, which secrete a red viscous goo called "lac," which people harvest by cutting coated tree branches

of these voracious plant eaters. Crushed, sieved, and repeatedly washed, the lac is purified. This type of raw lacquer is produced in Northern India, Bangladesh, Myanmar, Thailand, Laos, Vietnam, and parts of China.

Certain tree resins are also used in lacquering. Central Asia is home to the original lacquer tree, a deciduous plant belonging to the cashew family with a grayish white trunk growing up to 30 feet tall. The trunk is slashed with a knife, and a grayish yellow milk-like liquid oozes from between the bark and the wood, called "crude lacquer."

Lacquering involves a series of dipping, the first typically in crude lacquer with subsequent coatings in finer lacquer solutions. Each coating is dried with precise heat and humidity unique to the type of lacquer and the style of lacquering. Pigments are typically added to the lacquer of the final coating. Some lacquers set by evaporation, while others use oxidation in addition to evaporation. In general, the quality of a lacquered piece depends on the quality of the lacquer (purity) and the method of drying the lacquer (heat, humidity, and time). For example, slow-drying lacquer uses lower temperatures (10 to 25 °C) with a relatively high humidity (70 to 80 percent), allowing the lacquer to harden gradually. Quick-drying uses much higher temperatures (100-150 °C), but the lacquer sets within an hour. While the slow-drying method is preferred with wood, the fast-drying method is preferred with metals and ceramics.

There are many styles of lacquer. Carved lacquer takes an intricately carved piece and then lacquers the entire sculpture, polishing it to a shine at the end. Sometimes objects had pieces inlaid and then the entire work is lacquered. Sometimes lacquer fills in engraved designs, only to be rubbed flat to capture the scene in fine polish. Sometimes two different colored layers of lacquer are applied to an object. Then, with fine care, designs are engraved on the object, removing the second layer of lacquer without disturbing the first layer of lacquer. After the two tones are expressed in the design, a final coat of clear lacquer is polished to a fine shine. Last, there is painted lacquer, where objects receive a base coat of lacquer, they are painted with fine brushes (sometimes a process over many layers of lacquering), and then receive a final coat and polish.

Mosaic

Mosaic is decoration comprised of smaller pieces of colored glass, stone, pottery fragments, clear glass backed with metal foils, or other material that as a whole makes a larger design or scene. These smaller pieces are called tesserae, after the Latin meaning "small square." Mosaics are often used to create larger intricate geometric patterns or depict scenes. Mosaics are a favorite internal decoration for walls and ceilings as well as decoration on portable items like vases, boxes, and other containers.

There are three general methods of mosaic work: direct, indirect, and double indirect. The direct method secures tesserae directly on the supporting surface, popular with portable items and items with distinct three-dimensional qualities like vases, although this method is not suitable for large scale projects or for smooth surfaces like floors and tables. The indirect method places tesserae upside down on an adhesive backing and later transferred into the supporting surface. This method is used in larger projects with simple patterns or solid blocks of color. They produce a smoother, more even surface as well as manage projects of greater scope. The last method, double indirect, places tesserae face up on an adhesive backing, so the artist can see what the finish picture will look like as he creates it. When the mosaic is complete, an adhesive backing is placed on top of the mosaic and the entire piece is turned over. The original adhesive material is removed, and the mosaic is affixed to the supporting surface (wall, floor, etc.) This method is used with extremely large projects (like murals), where sections are completed off-site and moved on-site.

Paper Making

The Chinese invented paper in the 2nd C BCE. From interaction with their neighbors, the skill of papermaking spread both east and west. The Chinese used paper in a multitude of ways, including wall paper, toilet paper, kites, paper money, paper umbrellas, clothing, blankets, and armor. They used a variety of fibers in their paper, depending on its purpose: bamboo, straw (from rice and wheat), sandalwood, hibiscus, seaweed, floss silk, rattan, jute, flax, and ramie. The first paper made in China was probably hemp, followed by mulberry fibers, then rattan, bamboo, and straw. To the west, the Arabs learned the art of papermaking from the Chinese (prisoners of war from battling over Transoxiana),

and added linen to their paper. Arabs in turn sold paper to the Europeans, who were predominantly using vellum, and managed to keep the secret to themselves until the 12th C. CE, when the first signs of papermaking in Europe occur.

At its root, papermaking comes down to fibers, water, and energy. Paper can be made from any fibrous material joined together into a cohesive whole. The first step in making paper is making a pulp, which consists of the fibrous material and water. The raw materials that go into the pulp affect the character of the paper. Hardwood trees (oaks, maple) have very short fibers, making the paper relatively weak, but its surface is smoother, ideal for writing and printing. Softwood trees (pine, spruce) have long fibers in the wood, making stronger paper ideal for containers but the finish is rougher, making it less useful for printing or writing. Some use cottons, linen, and hemp in papermaking, making a finer paper that is durable and springy. Of course, part of the art of papermaking is creating blends of different materials to create paper suited for different purposes.

Making pulp is exactly like it sounds-agitating, pounding, or otherwise working the raw materials to make separate fibers in a watery soup. Pulp made from recycled materials does not require vigorous agitation to separate the fibers since they have already been processed once and the lignin from the original organic material is already removed. However, pulp made from natural materials still has lignin in the cell walls. Pulp made from physically breaking down fibers (opposed to chemical pulp) still retains the lignen in the fibers, which yields more paper but the paper will yellow when exposed to air and light. Chemically-treated pulps break down the lignin and turn it into a water soluble compound that is washed away from the remaining fibers.

Now that the fibers are exacted from the raw materials, papermakers can use additives to alter the characteristics, such as bleaching, dying, or adding chemicals/minerals to give paper gloss or sheen. Once the raw material is a soupy pulp, more water is added to dilute the fibers into a slurry. This slurry is poured into a screened frame (or some other device that forms sheets) which allows the water to run through but traps the fibers. At this point, a watermark or stamp can be placed on wet paper. By removing the bulk of the water, the fibers bond into a thin mat, sometimes with the help of bonding agents. Pressure and heat are often used to extract more water from the paper and seal the fibers closer together. From there, paper is couched (transferred from the frame to an absorbent material), blotted, rung, or sun dried to remove the last of the water from the paper.

Sericulture

Sericulture is the process of making silk, a natural protein fiber obtained from the cocoon of silkworm larvae that can be woven into textiles. Silk has a shimmering appearance due to the triangular, prism-like structure of the fibers, causing woven silk cloth to refract incoming light at different angles.

Most silk is made from the mulberry silkworm (Bombyx mori). Silk moth lay eggs, and when they hatch, the larvae are fed cut-up mulberry leaves. For roughly 35 days (or after the fourth molt), the larvae feed, fattening up to 100,000 times heavier than their weight at hatching. The engorged worms climb on provided twigs and spin their cocoons. Their silk is a liquid protein secreted from two salivary glands in their head, which solidifies with contact to air. The two threads are cemented together with a gummy substance called sericin. In two or three days, a silkworm encapsulated itself in silk roughly 1 mile in length. With these domesticated moths, the silkworms are killed before they damage the cocoon, allowing cultivators to harvest longer, continuous threads of silk that make for stronger woven cloth. Immersion in boiling water both kills the larvae and dissolves the sericin. The cocoons are brushed to find the outside ends of the filament, and the silk filaments are wound in a reel. A single mulberry silkworm cocoon contains 1,000 yards of silk filament. The raw silk is then combined to form a yarn and undergo further refinement, dying, and weaving.

Wild silks are produced by caterpillars other than the mulberry silkworm (Bombyx mori). The term "wild" implies that these silkworms are not capable of being domesticated and artificially cultivated like the mulberry worms. Because they are not domesticated, the types of wild silk are largely regional. These silks vary in color and texture, and they generally are considered lower grade silk because the pupa have a chance to chewed through or damage the cocoon, causing shorter threads of silk in comparison to the domesticated mulberry silk worm. However, there are wildly prized wild silks, such as muga silk, a strong comfortable silk produced only in the Brahmaputra Valley whose natural golden sheen improves with age and washing.

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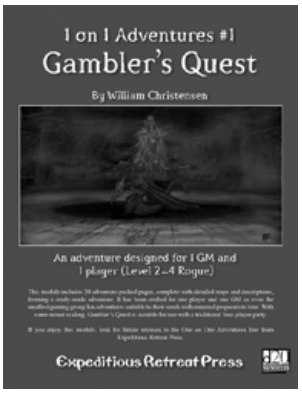

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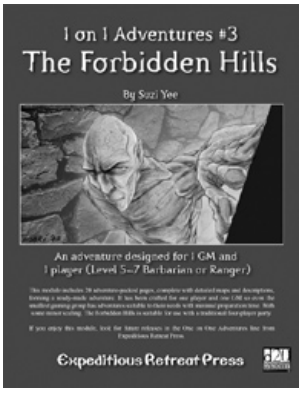

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Starvation looms for the people of the Wolf tribe! The elk have all but disappeared and the risky move of the tribe near the Bear clan territory has proved fruitless. An emergency council of the elders has declared that a single hearty warrior must make the dangerous journey deeper into Bear territory to find a source of food. The council has chosen you for this mission of great importance. It is your task to find out where the elk have gone and bring back food for the winter or at least enact Wolf people retribution against the source of the oncoming famine! Into The Forbidden Hills you must travel, heart full of hope and anger…

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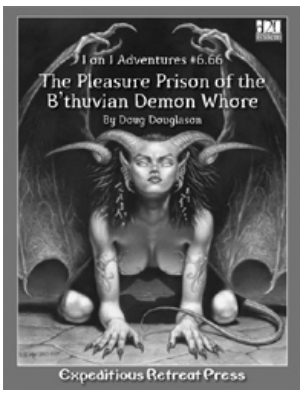
Hubrimort is a small, respectable town whose only claim to fame is a local governmental position bestowed by five of the king's chosen officials, known as the Cavaliers. The position is given to the head of one of four noble families once each decade. While competition for the mysterious position is always fierce, this year there are rumors of underhanded deals with criminals, rigged tournaments, and a nasty case of blackmail.Which of the ancient families deserves ten years of power and privilege? Only the Sixth Cavalier can help the five officials make the right choice!



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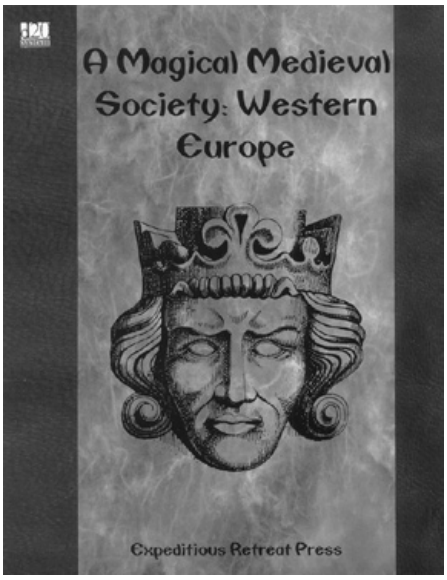

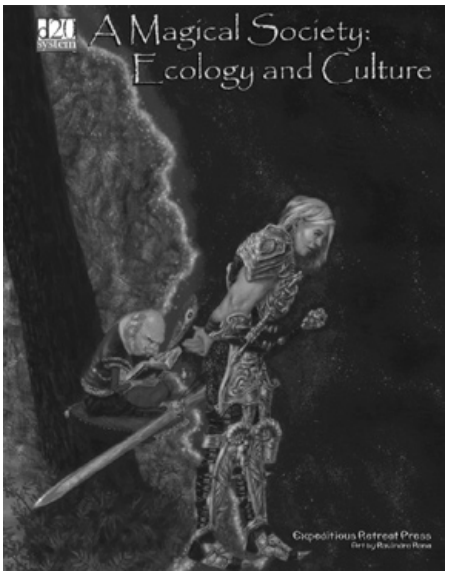

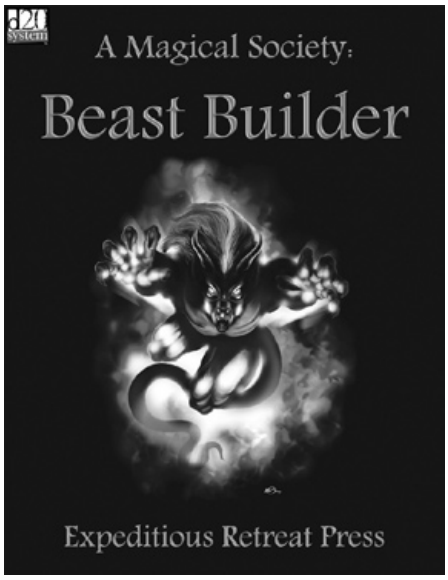

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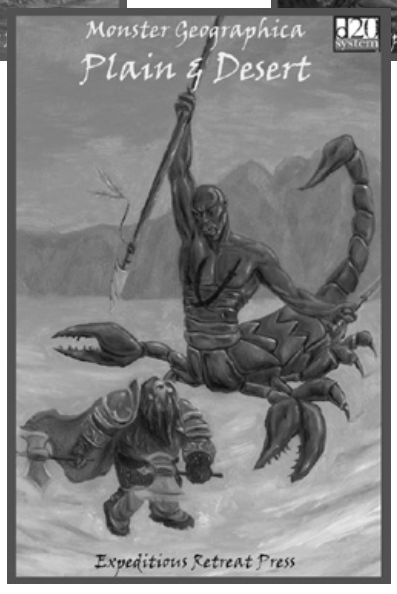

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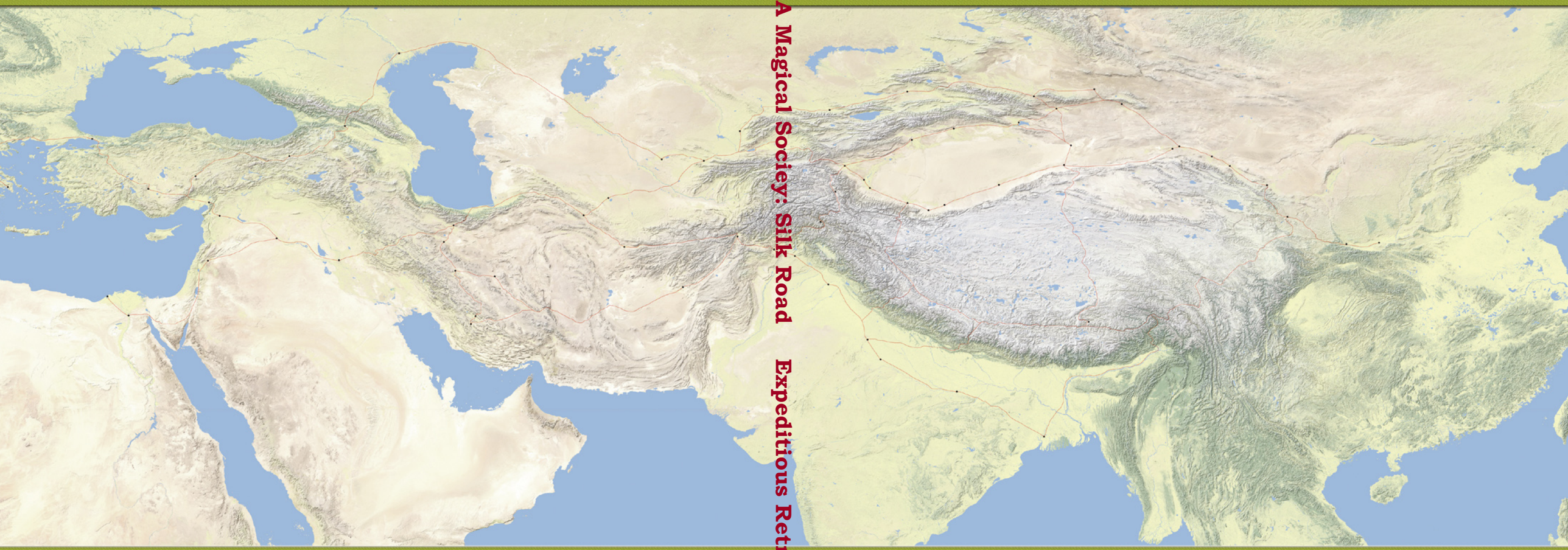

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