When the Shit Hits the Fan

How to Prepare for Disasters

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When It Hits the Fan

What is 'it'? It applies to any disaster, large or small. From the strictly personal scale calamity to those of a more global nature, and everything in between. Regardless of the size of the problem, preparing beforehand will increase your chances of surviving.

Hopefully this book will will attempt to provide help for you to prepare, survive whatever disaster or emergency awaits and thrive when civilization breaks down. We will discuss skills and tools and strategies you can use in a negative situation to help yourself and others.

What kind of disasters are we talking about? Well, on a personal level, are you prepared to survive a blown engine or car crash in the middle of a desert? Or in the middle of a blizzard? What do you do if your house burns down? That's what this book is for.

Are you ready to deal with a global pandemic? It may be the bird flu, swine flu or something we haven't even heard of yet. Are you ready? You may be asking yourself "how do I even start answering that question?". That's what this book is for.

If a hurricane strikes; what will you do, where will you go, and how will you cope? If a tornado strikes your town or a rail road tank car releases a cloud of chlorine gas, now what? That's what this book is for.

How about economic meltdown, short and long term power disruptions, food riots and zombies? That's what this book is for. Okay, maybe not the zombies.

Especially in "modern" nations (economies based mostly in transformation and services), most citizens are utterly dependent on the steady availability of food, water, electricity, advanced medical care, and a million other goods and services and to the generally predictable state of things. Most of the time people can get away with that dependence, if things work in the expected parameters, but it is certain that there will be times that events be it natural disasters, political strife or any one of a multitude of possible and even unimaginable accidents that can and will interrupt the normal flow of life and leave people inconvenienced at best and at risk of dead at worst.

"*Any city is three days from starvation and one week from cannibalism.*"

Start reading and contributing to the book, above all start preparing. Because you do not want to be that guy, standing there with the dumbfounded look on his face, when 'it' hits the fan.

Part 1: Generalities

"Chance favors only the prepared mind" - Louis Pasteur

The quote above applies to scientific research as it does to dealing with 'it' - and when that 'it' hits the fan. There are so many things that can and probably will go wrong in your life. Being prepared for those situations will help you and your loved ones survive. The simple fact that you are aware of the potential problems means you are ahead of the curve compared to most people. And, no, we will not be recommending you to dig up a nuclear shelter or arm yourself to the teeth and shoot everything in sight; except the zombies, shoot as many of them as you find.

In this section we discuss small steps one can take, and common sense decisions to improve one's chances in case of trouble. All should be relatively cheap and easy.

Part 2: Personal Strategies and Know-how

This section will provide basic guides and approaches to problems, general needs and considerations to generalized procedures for surviving various personal emergencies. On how to take some steps that can help you in a survival situation, especially if you are low on material and must live from your environment.

These guides should only include information and strategies that will require only stone age materials or easily recyclable from today's environment and should focus on projects that ultimately are possible to be created and transported by a single person.

Part 3: Specific Calamities

Applying the generalities of the previous chapter to specific major events. Some of this events can be predicted or even expected, while others have a very low chance of happening. This section will only cover events that can be survivable and possible to happen in a given person life time. Things like the end of the universe, the Sun collapsing, alien invasions or a zombie apocalypse as well as religious or premonitory situations for the end of the world should be avoided.

Part 4: Rebuilding

When "it" does hit the fan, it can be so severe than there will be no rescuers coming for you and your companions. You should not give up hope easily, but being realistic will push you to deal with the inevitable conclusion (in this situation) that you must become self sufficient. This section is kind of a how-to for restoring civilization from scratch.

There are many literary works that cover the subject of survival in general, even after large catastrophes. From Lord of the Flies by William Golding, Tunnel in the Sky by Robert A. Heinlein, The Scarlet Plague by Jack London (in the public domain [1]) or even Lucifer's Hammer by Larry Niven and Jerry Pournelle for a broader view on how these situations may evolve.

This is also a subject that is covered in movies with some realism (or lack of it):
Deadly solar flare(s) - Where Have All The People Gone? (1974), Hell (2011).

References

[1] http://www.gutenberg.org/ebooks/21970

Generalities

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Step One: prepare for something small.

Survivability depends on what you know, how fit you are and available tools and resources. Fitness is the most important factor, if you are fit you can cope with mistakes and exert more effort to gather resources. The next important trait is having useful knowledge, this prevents making mistakes, reduces wasted energy and helps to keep moral up. It also serve to increase the chances of surviving without tools or resources. If you know how to improvise your own tools and locate water and food you have not only gained time but increased your value to others and you will have an advantage over any competition (including wildlife).

By having tools and resources you will be less dependent on others, reduce your movements/efforts and have something to bargain with if need arises, even for your life. Depending on the situation this can makes you also a bigger and slow target, especially if because of them you became static, for example not leaving your house amidst a flood or an epidemy because of excessive reliance/dependency on what you have stored. Balance is of the essence.

Knowledge

Be aware and informed. What could be an usual emergency? Some emergencies are indeed expected to occur. It might be a flood, a hurricane, a tornado, or an earthquake. All this things have a distinct and knowable risk factor, even if unpredictable, some events are dependent on specific geographic location. Do you live near a river bed ? A atomic power plant ?

Knowing your surroundings and local risk factors will always help you be prepared and safer and should be also a factor for you daily decisions. Be aware of emergency plans for the area where you live, work or visit and learn the general actions that increase survivability in expected emergencies, like how to act in an earthquake or a tsunami.

Know your blood type, allergies, the basics of first aid, use knots, learn how to swim and fish, to handle firearms and bows, to repair a car and drive it, ride a horse and bicycle. Get some camping experience, learn how to tie different utilitarian knots, create fire (especially using only wood), to meditate (or even hypnosis). This are all tools that will increase your survivability and you do not need to physically carry with you.

Experience

There is no better thing that first person experience, this is the best way to not only learn but understand your limits and find new ways to solve unexpected problems. It will help everyone survive dangerous situations (such as storms or earthquakes), or in dangerous places (such as the desert, the mountains, and the jungle). Useful skills like lighting a fire, finding shelter, making water safe to drink, finding and identifying food, treating injuries, and climbing, swimming, and using specific or makeshift tools.

The more experience one has the more self confidence and keeping the moral up it is. In order to overcome the effects difficulty it is important to study and understand how stress may affect your action in both good and bad

ways.

Backpacking

Having an understanding about your priorities, the needed supplies to address your requirements is extremely useful. Management of resources and deciding how and what to carry is a science in itself. There is a large quantity of books that deals exclusively with this subject directed to specific target audiences, in special to the habitual traveler but also for the wildlife experience. How and what to pack is a learning process that improves with experience.

Backpackers use lightweight equipment that can be carried long distances on foot, this may include a tent or shelter. Enabling a person to hike across the land, camping at remote spots. Backpacking equipment typically costs more that other type of equipment because of the materials used (resistance and weight) and the necessity of self reliability (like including their own power-supply).

Camping

Camping and other outdoor recreational activities are great to build self reliance and confidence. It can even provide the experience of being away from civilization. Camping may involve the use of a tent, a primitive structure, or no shelter at all.

Canoe camping is similar to backpacking, but uses canoes for transportation; much more weight and bulk can be carried in a canoe or kayak than in a backpack. Canoe camping is common in North America.

Anther form is the bicycle touring that combines camping with cycling. Where a bicycle is used to carry the gear and as the primary means of transportation, allowing greater distances to be covered than backpacking although less capacity for storage.

Motorcycle camping is more comparable to bicycle camping than car camping, due to the limited storage capacity of the motorbike. Motorcycle camping riders, as well as bicycle touring riders, often use some of the same equipment as backpackers, due to the lighter weights and compact dimensions associated with backpacking equipment.

"Winter Camping" refers to the experience of camping outside when there is sufficient snow on the ground. Some campers enjoy the challenge this form of recreation brings.

Wild Camping too, is a growing choice by people seeking the challenge of camping in the wilderness, without campsite amenities. It is a great way of enjoying the solitude and beauty of the wilderness in its most pure form. It falls into the survivalist experience.

Survivalists

Survivalist can be defined as experience campers that have learned the skills needed to survive out-of-doors in a situation of scarcity. It require skills in obtaining food from the wild, emergency medical treatments, orienteering, and pioneering. Skills used on a more permanent basis, or as a component of daily life are referred to as bushcraft.

Campers and outdoors people have adapted their forms of camping and survival to suit extremely cold nights and limited mobility or evacuation. Methods of survival when winter camping include building snow shelters (quinzhees), dressing in "layers," staying dry, using low-temperature sleeping bags, and fueling the body with appropriate food.

Practicers of this type of wilderness challenge face a different range of dangers. An environment may be dry, wet, hot, cold, high altitude, low altitude, desert, rural, urban, wilderness, subterranean, or an island. There are four basic necessities of life which apply in all of these cases: shelter, water, fire, and food. A fifth is oxygen for high altitudes and subterranean environments, and also specific survival situations such as drowning and landslide/avalanche.

Developments in outdoor equipment and pruning of survival techniques have skewed the scale towards man- if one is prepared, but there is nothing to replace experience in a survival situation.

Bushcraft

Bushcraft is a long-term extension of survival skills. A popular term for wilderness skills in Australia, New Zealand and South Africa, the term was popularized in the northern hemisphere by Mors Kochanski and recently gained considerable currency in the United Kingdom due to the popularity of Ray Mears and his bushcraft and survival television programs.

Bushcraft is about surviving and thriving in the natural environment, and the acquisition of skills and knowledge to do so. Bushcraft all the survivalists skills but will also include more complex knowledge; firecraft, tracking, hunting, shelter building, the use of tools such as knives and axes, foraging, hand-carving wood, container construction from natural materials, rope and twine-making, and many others.

Things you should carry with you at any time

Strive to at all times carry simple items that in a SHTF situation may make you life easier.

One type of object that should normally be carried is small or dividable item of tradable value. For instance a bracelet or necklace of gold or silver can be easily hidden and designed so links can be loosen to permit smaller trades in case of need or be used as bait for fishing. Depending on the situation most other other items you carry can be used for trade, like a watch or even your shoes.

A good resistant belt, preferably longer than required. The belt buckler can also be a good tool beyond its primary function. Note that a belt can be a rapid way to create a tourniquet, to increase your reach or even to use as support in a zip line.

A time keeper, pressure resistant, non digital wrist-watch (or even better a chain-watch), that does not depend on batteries will be extremely helpfully and as seen above be an easily tradable item, it can also serve as a compass with the help of the sun, and will permit you to keep to a time table so to improve survivability.

For instance in a forest you may not be able to see the sun and in a survival situation you should keep night movement to a minimum, depending on the available light (moon, possibility to make and the duration of a torch) and expertize in night navigation, even in a desert environment where nights will be cooler, and movement easy, it may not be advisable. It may also help avoid the hours of the day that temperatures are higher.

A small and reliable knife, is extremely useful in any situation even in for day-to-day life, for instance in your key-chain. Not only useful as cutting tool or a possible weapon, the metal of the knife may also serve to create fire and serve as a crude mirror for signaling.

Things to plan at home

Your home should be your base in an emergency. Ownership of the property should be a priority so you have full legal control over it and in dire circumstances no one will be able to claim if from you.

Select a property that is not in a flood basin or too near a river (or any water course), if it is, check historic records for the area and see if you can build it (or if it already is) well above the flood line. Having at least one inflatable boat will also be optimal. Note that this type of location it will prevent you to rely on a well for fresh water since there is a high degree of contaminants that can already be present of the the natural water system or will be carried by any flood, as also make any food planting very susceptible to damage. Near the coast line you will have aggravated problems due to humidity and the presence of salt.

In a location with a high probability of heavy snow, at least one of the doors should open inward and preferably be in the 2-split format, this will prevent you becoming snowed in. Same is valid in areas prone to dense sandstorms.

Assume 2-3 days without power and plan for that. This implies having three days of food that does not need cooking or refrigeration. Keep extra water put aside, flashlights, radio.

Step Two: supplies add more

Planing for supplies is extremely important and constitutes an economical investment. Any item should be considered on the basis of its longevity, hardiness and usefulness.

Human survival priorities are found in the "Rule of Three":

- Humans cannot survive more than three minutes without air (O_2)
- Humans cannot survive more than three hours exposed to extreme low temperature
- Humans cannot survive more than three days without water (H_2O)
- Humans cannot survive more than three weeks without food

There are also optimal times and locations to get your provisions for that special emergency or specialized material, consider that prices fluctuate with seasons for instance in the end of summer and winter season you can get good prices in sporting goods for the season that is ending.

Beans, Bullets and Bandages

Supplies are the stable base that all successful plans are build upon. Things are not build and run from thin air, this works for armies, for a family unit or for the individual.

Conventional wisdom states that the best thing to stock up are beans, bullets and bandages. I will discuss the bullets and bandages later, but for now lkeI will focus on the beans.

Beans

Beans refers to human consumable resources, food and water. The food selection for your pantry should be selected so to be non-perishable, easy to parcel and transport, this means that that should have provide a high level of nutrition and energy per weight. Comfort and taste should be the last priority, these should be seen as your last resource being unappealing will promote slow consumption and the active search for alternatives. Of course you can put some threats aside but this should be small (good for trade) and in a very limited proportion.

- **Canned food**, should be a staple item in any emergency supplies, cans beans, tuna fish and chicken.
- **Pasta**, pasta can be brought in bulk and is also long lasting the only downside is that it requires water.

Bullets

Bullets signify all not directly consumable resources. This can be candles, matches, batteries, light-bulbs and other. Of less importance than the first but will ultimately permit you to become more mobile and independent. As with food and water you should keep in easy to transport kits. Do not keep the items separated by type, this will reduce the chance of a catastrophic fail, separate them in parcels that have a bit of everything, better yet if they are all equal as it will permit you to have a better idea of what you are spending and remember were and what you have available

Bandages

Bandages are all consumables directed for specific health emergencies or for general repairs. From duct-tape to first aid kits, alcohol all these items can be categorized as bandages, keep at least two items of each, the more the better but keeping two of each will permit a non conflictual division. Avoid to trade off any of these items unless you have an ample supply or can be easily replaced.

Extras

Skill enhancers

- Lantern (with filters blue and red).
- Infrared goggles (night).
- Thermal vision.

Enhancement drugs or compounds, caffeine tablets...

Redundancy

Redundancy is having at least two items that have the same function. Redundancy can be extended if the same function is guaranteed by tow items that depend in different resources and/or have multiple function.

For example you can use a electric lanterns and a kerosene lamps, both will provide light and depend in distinct resources. Also note that the resources have them-selfs multiple function, the lantern batteries should work for instance on the portable radio and kerosene will also enable one to if not power a generator to start a fire.

Step Three: protection

Now you have something worth defend, something that others less prepared my be willing to fight you for. Huddling in the your "cave" fearing the unknown is an unsettling feeling. How does one combat this? Depending on your frame of mind, this is either the most frightening or most exciting part of preparedness steps, you will, in most events be dealing with the most dangerous animal on Earth, man.

In most locations and if not when involved in a catastrophic situations one may rely in the Police (or other state forces) since the event will not be disruptive enough to make it impractical or place your personal security at a low priority, making you dire situation not particularly relevant in the general context of things.

Protection is a defensive stance, the tool-set may serve other purposes but consider this factor when you plan, since it is linked to what you have a need to protect.

It is always best to be self reliant, by having a self sufficient strategy for active protection of your self, yours and your resources should be part of your survival strategy, this will help you fight off any intruder or scavenger be it human or beast.

Weapons

The best weapon to use is your body. Relying in your body will make you more fit, increase your awareness of surroundings and become aware of your body capabilities. This will also contribute to avoid even accidental damage to you most vulnerable areas. Learn to fight (or at least self-defense), you will become more self-confident and if you learn a martial art you can also expand mental capabilities as to face dangerous situations.

You will not have to carry the weapon, hide it or risk being disarmed. There will be no need for ammo or reload. Being "unarmed" forces you to carefully consider your choices and make less risky decisions, and you will be seen as a lesser threat by others. In a situation of survival every injury and energy spent can make the difference between life and death.

Your mind as part of your body can also be put to good use, most objects can be turned into weapons. A weapon is defined by its function for instance a staff can serve to increase reach but will hardly serve for hunting prey, but will be a good weapon for defense.

Improvisable weapons:

- **rock**
- **sling**
- **stone/bone/metal blade**

- **boomerang**
- **staff** - hard wood, can be improved with fire (hardened) and metal (hardened tips).
- **lance** - a lance is simply a trow-able light staff with a piercing tip, the tip of the lance can vary for different uses, for instance fishing and hunting require different constructs. It will need a longer and lighter staff and fire. With sap and/or fibers a stone, bone or metal tip can be attached to make it more effective in piercing.
- **axe** - a short staff with a weight in one end, that can be uses as a trow-able weapon (impact) or as an edge weapon (cutting) as with the lance the type of weight and its shape will not only determine durability but function, without metal forging one will need some sort of fiber and sap to keep the weight attached or it will require the carving wood in an axe like form, were a silex edge can be attached with sap.
- **bow** and **arrows** - a technological step above the lance, it consists in using tensile strength from fibers (a branch or animal tendons), a good bow requires expertise that is hard to improvise, any bow that is created only by improvisation will not outmatch a lance. It will also require several attempts before obtaining something the functions. Arrows can be seen as miniature lances one should also attach some type of airfoil to the back extremity as to increase accuracy again this is learned with experience and testing.
- **crossbow** - a crossbow is not very different that a bow, the advantage is that it permits to have less proficiency on use and a quicker reload time and is easier to find material as to increase the tensile strength because the structure is more stable. The consideration in opting for constructing a crossbow or a bow is based on time, material and experience for building, being the crossbow the one to select if all abound.
- **blow-pipe**
- other

In a urban setting, finding good materials is more difficult that one would think at first, most items are already set for a specific function and will not easily and durably adapt to any other, for instance one would probably look for some type of broom to serve as a basis of a lance, but if you examine most brooms handles you will quickly notice that if they are not hollow (will collapse on lateral impact and untrowable) they are made from a brittle material, this problem will be generalized in finding suitable wood. Also hunting in a urban involvement is out of the question so protection and attack capability will the objectives. There will be a good chance in finding pre-made weapons like knifes or building tools, sport material that permits to be use as a a blade or club or even a some find firearms.

Urban improvisable weapons:

- Molotov cocktail

A firearm will serve to protect you and and if game is available, to hunt but not all jurisdictions will permit to own a personal firearms, so that option will not be generally feasible (depending on local laws and availability of the weapons). Also worth considering is that an armed person is always a menace and a primary target in a conflict situation, there are times that openly demonstrate having a firearm will in fact put you in danger, even in "normal" day-life.

Consider that in most dire situations facing a stranger with visible firearm will probably result in getting shot on sight, a handgun will be easier to hide and most people will only perceive a knife as a weapon at very short range. A even better solution would be a bow or a crossbow, you will not advertise your presence as you use it (you can always use voice, fire, light or sun reflection for signaling) and you will not be dependent on ammo.

The real advantage of firearms is range and accuracy, unless you are competing with someone that also possesses them, old types of weaponry will be good enough to permit survivability, consider that we only had access to firearms very recently in human history. Note also that brought weaponry requires more technical maintenance and care and you will be more likely to fail to find replacement parts if something brakes.

Weapons:

- shotgun
- revolver
- pistol

- rifle
- bow (Long bows and compound bow)
- crossbow (recurved crossbow)
- knife, trowing knife and machete
- axe and trowing axe

Next... Reality Check

The most important factors for survival are shelter, water and food, by order of importance. In most situations if you are exposed you will be in danger from the involvement, be it hostile or not at the time you see yourself in dire straits. The sooner you find a safe place and establish the minimum to shelter you from the environment the better changes you will have.

The next priority is locating a water source, without water you will quickly become dehydrated and unable to function, water has also the property to reduce the sensation of hunger (especially if you can warm it).

The last step to become self sufficient is food. These are the three things that will have primal importance in any situation, being deprived of anyone of them will assuredly put your life in danger.

When It Hits the Fan/Teaming Going solo versus joining with family, a small team or a wider group.

When It Hits the Fan/Morals and law

Personal Strategies and Know-how

Going adventuring

The simplest and well proven strategy to get oneself out of trouble, is to announce to people that depend on you (coworkers, your boss, family, landlord, etc) where you are going and for how long. In the event that something happens, there will be a chance that someone will start questioning what happened to you as soon as the delay is detected, since they will not only have a vested interest on your wellbeing and safe return, but also in remembering the details of what you told them.

Leaving behind copy of any plans made for the trip and a list of people that will be participating in the event and their contacts will also increase the chances of a successful rescue. Even if one gets into trouble outside of where one had planed to be, there will be some benefit in the knowledge where any rescue efforts will first be deployed, this may help or not, but will permit to make better choices regarding the situation.

Keep in mind that the weather can change suddenly though. Just because it is warm when you begin your outing does not mean it will be warm the whole time. If there is a chance that the weather will turn cold, take along some cold weather gear as well. Check an almanac to see how cold it can get during the time you are planning to be out.

As we have covered planing what to pack and predicting what will need is a basic to ensure that you will be able to not only enjoy your projected outing but offers a greater chance of success in the face the unpredictable.

Clothing

Warm Weather Clothing

Here is a list of clothing appropriate for a warm-weather outing, with extra's included just in case the weather turn's nasty, which you should never underestimate the chance of happening, anytime!

- Thick socks
- Shorts
- Polypropylene long-johns/woolen trousers, NEVER JEANS, remember cotton kills
- Polypropylene long sleeve top
- Light Shirt (short sleeve)
- Wind Stopper
- Hat with a wide brim
- Woolen hat, just in case
- Sturdy boots
- Rain Jacket, just in case
- Sunscreen (not technically clothing but essential)

Cold Weather Clothing

Remember to dress in layers. This will allow you to control your temperature better. When dressing in layers put lightest layers closes to you. this will make them easier to remove without losing a lot of heat.

In cold weather, you do not want to sweat, because that will soak your clothing and chill you. If you find yourself working up a sweat, remove a layer of clothing, or open a zipper.

Rely on wool or polypropylene rather than on cotton as these stay warm even when wet. There is a popular saying among experienced outdoorsmen that "Cotton kills." This is because when cotton gets wet, it steals the body's heat which can lead to hypothermia and death. Your outer layer should be wind-proof, as this greatly increases the warmth of your clothing. This includes:

- Thermal Underwear
- Light shirts

- Heavy Shirts
- Wool Sweater
- Wind Breaker
- Fleece Pants
- Nylon Pants or snow pants
- Overcoat
- Wool Socks
- Boots
- Warm Hat

Sleepwear

For comfortable sleeping and for modesty on overnight trips, bring pajamas or a sweat suit. In many places where it is warm during the day it gets cold at night, so be prepared.

Miscellaneous Gear

Foil Blanket

Foil Blanket A emergency foil blanket (also known as a Space blanket, Mylar blanket, first aid blanket, thermal blanket or weather blanket) is a blanket used in emergencies to reduce heat losses in a person's body caused by thermal radiation, water evaporation and convection. This is a very low-cost, light-weight and compact addition to your kit. It has so many uses besides exposure prevention, in the rain it could be used to repel water or used for clean water collection. Also makes for a big signaling device.

Navigation skills

Survival situations are resolved by finding one's way to safety. This requires some navigation or movement:

Celestial navigation

using the sun and the night sky

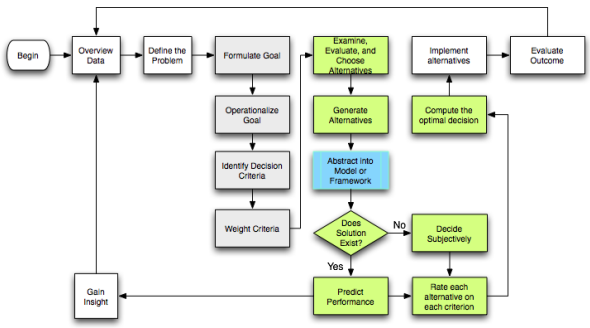
Reading a map

particularly a topographic map together with a compass

Magnetic compass considerations

Path Selection

Deciding how to go form point A to B is extremely important. It is part of the planing process of movement, most of the time we do not even realize this simple process but at times that significant effort and resources will be consumed on the task planning how to proceed should be the second step after deciding for a destination. Path selection is **a decision making process** by which one alternative is selected over another. Several procedures for making decisions have been outlined in effort to minimize inefficiencies or redundancies. These are idealized (or normative) processes, and describe how decisions might be made in an ideal world, and how they are described in official documents. Real-world processes are not as orderly.



Planning starts by selecting or deciding for a specific destination choice (this selection may in itself depend on many factors) fallowed by mode and route choices. The route selected my constrain or be depended on the modes of locomotion available.

It can be hard to decide if a path selection starts by establishing a destination, since all other components at some point have the same strength on the decision process. But undoubtedly if one is not required to go somewhere that there is no need to move, except if one is forced to move and then the destination may even be irrelevant. It all depends on the specificity of the situation that motivates the choice of a path.

In long trips, making a trip distribution (or intermediary destination choice or zonal interchange analysis). This step matches several origins and destinations to develop a “trip table” a matrix that displays the number of trips going

from each origin to each destination. Priorities and resources available as well as costs (even effort) must be taken in account. This is basically turning any complex voyage in a sequence of smaller steps as to reach the final objective.

Trip distribution's zonal interchange analysis yields a set of origin destination tables which tells where the trips will be made, mode choice analysis allows the modeler to determine what mode of transport will be used. Mode choice analysis follows destination choice and may affect route choice.

Route assignment, route choice, or traffic assignment concerns the selection of routes (alternative called paths) between origins and destinations in transportation networks. To determine facility needs and costs and benefits, we need to know the number of travelers on each route and link of the network (a route is simply a chain of links between an origin and destination).

The Fundamentals of Transportation wikibook is a good work to examine in detail the complexity and analysis behind planning transportation.

Dealing with extreme temperatures

Cold

Extreme cold snaps are hazardous to humans and their livestock. In a 2003 Mongolian cold snap, almost 30,000 livestock animals perished due to excessive snow and cold. When the temperature drops, caloric intake must increase to maintain body heat to for shivering [1]. Cold, especially in combination with other inclement weather is especially deadly [2].

Heat

A heat wave is a disaster characterized by heat which is considered extreme and unusual in the area in which it occurs. Heat waves are rare and require specific combinations of weather events to take place, and may include temperature inversions, katabatic winds, or other phenomena. The worst heat wave in recent history was the European Heat Wave of 2003.

Fire

Fire is probably humans' first technology. It is a cornerstone on our evolution as a species and how we manage to adapt to many distinct environments. It permits not only to warm ourselves, light the dark, serve as a weapon or communication device, but to make food more digestible, to clear fields, to break stone and work metals. Nothing has so much importance to mankind that this simple chemical reaction.

Light, Signaling and Security

Fire is also a easy to create source of light, in a dark environment and at night where it also permits safer movements. The light and smoke can serve also as a signaling device. It is very rare for small contained fires to occur naturally, so fire can also be an indication of human presence.

One can also use fire as a weapon or a dissuader for wild life, most wild animals will have an instinctual fear of fire. This fear is mostly due to learned experiences and is mostly based on smell, the negation of cover, the novelty and heat may also be a factor.

Natural occurrence

A fire is also a natural disaster that may destroy ecosystems like grasslands, forests causing great loss of life, property, livestock and wildlife. Bush and forest fires are generally started by lightning, but also by human negligence or arson.

Arson

Arson is the premeditated intent of setting a fire with intent to cause damage. The definition of arson was originally limited to setting fire to buildings, but was later expanded to include other objects, such as bridges, vehicles, and private property. Arson is the greatest cause of fires in data repositories. (See [3])

Campfire

A **campfire** is a fire lit at a campsite, usually in a fire ring. Campfires are a popular feature of camping, particularly among organized campers such as Scouts or Guides. Without proper precautions they are also potentially dangerous. A certain degree of skill is needed to properly build a campfire, to keep it going, and to see that it is properly extinguished.

A campifire have serves three primary objectives.

- Heat - For warmth and preparation of food and tool preparation.
- Security - Fire is a weapon and a dissuader, especially against wildlife. Most animals fear fire.
- Light source - Visibility and signalling. Light and smoke are extremely good for calling attention and mark a presence.

The dangers

A campfire may burn out of control in two basic ways: on the ground or in the trees. Dead leaves or pine needles on the ground may ignite from direct contact with burning wood, or from thermal radiation. Alternatively, airborne embers (or their smaller kin, sparks) may ignite dead material in overhanging branches. This latter threat is less likely, but a fire in a branch will be virtually impossible to put out without firefighting equipment, and may spread more quickly than a ground fire.

Embers may simply fall off of logs and be carried away by the air, or they may be ejected at high speed by exploding pockets of sap. With these dangers in mind, some places prohibit all open fires, particularly during times of the year that are prone to wildfires.

Campfires are prohibited in many public camping areas. Public areas with large tracts of woodland usually have signs indicating the level of fire danger, which usually depends on recent rain and the amount of deadfalls or dry debris; when the danger is highest, all open fires are prohibited. Even in safer times, it is common to require registration and permits to build a campfire. Such areas are often kept under observation by rangers, who will dispatch someone to investigate any unidentified plume of smoke.

Finding a site, and other safety measures

Ideally, every fire should be lit in a fire ring. If a fire ring is not available, a temporary fire site may be constructed. One way is to cover the ground with sand, or other soil mostly free of flammable organic material, to a depth of a few centimeters. The area of sand should be large enough to safely contain the fire and any pieces of burning wood that may fall out of it. Sand piles should be scattered after the fire has been put out. If the topsoil is moist, it may suffice to simply clear it of any dead plant matter.

Fire rings, however, do not fully protect material on the ground from catching fire. Flying embers are still a threat, and the fire ring may become hot enough to ignite material in contact with it.

No fire should be lit close to trees, tents or other fire hazards. This includes overhanging branches; some carry dead, dry material that can ignite from a single airborne ember. In addition, a fire may harm any roots under it, even if they are protected by a thin layer of soil. Conifers run a greater risk of root damage, because they lack taproots and their roots run close to the surface.

Fires also should not be lit on bare rocks. The ash will leave a black stain that cannot be easily removed, but the fire's heat can lead to more dramatic consequences. It will cause the outer layer of the rock to expand, possibly causing it to crack. It may also boil pockets of water contained in the rock.

An additional safety measure is to have sand and water on hand to smother and douse the fire if it does get out of the fire pit. It is wise to gather these materials before they are actually needed.

Types of fuel

There are, by conventional classification, three types of material involved in building a fire without manufactured fuels.

1. *Tinder* is anything that can be lit with a match. The best natural tinder is dead, dry pine needles or grass; a more comprehensive list is given in the article on tinder. A quantity of tinder sufficient to fill one's cupped hands to the top is the bare minimum needed.
2. *Kindling* is an arbitrary classification including anything bigger than tinder but smaller than fuelwood. In fact, there are gradations of kindling, from sticks thinner than a finger to those as thick as a wrist. A quantity of kindling sufficient to fill a hat may be enough, but more is better.
3. *Fuelwood* ranges from small logs two or three inches across to larger logs that can burn for hours. It is typically impossible to gather without a hatchet or other cutting tool, so fuelwood must usually be brought from home or purchased at a nearby store.

The gathering of fuel in natural areas is often restricted. Cutting of living trees is almost always forbidden - but neither is it very useful, because sap-filled wood does not burn well. *Squaw wood* (dead parts of standing trees) may also be prohibited. Wood lying on the ground is usually permitted.

Building the fire

Having found a suitable site and gathered materials, the fire-builder has a variety of designs to choose from. A good design is very important in the early stages of a fire. Most of them make no mention of fuelwood - in most designs, fuelwood is never placed on a fire until the kindling is burning strongly.

- The *tipi* fire-build is perhaps the best, but it is takes some patience to construct. First, the tinder is piled up in a compact heap. The smaller kindling is arranged around it, like the poles of a tipi. For added strength, it may be possible to lash some of the sticks together. A tripod lashing is quite difficult to execute with small sticks, so a clove hitch should suffice. (Synthetic rope should be avoided, since it produces pollutants when it burns.) Then the larger kindling is arranged above the smaller kindling, taking care not to collapse the tipi. A *separate* tipi as a shell around the first one may work better.
- A *lean-to* fire-build starts with the same pile of tinder as the tipi fire-build. Then, a long, thick piece of kindling is driven into the ground at an angle, so that it overhangs the tinder pile. The smaller pieces of kindling are leaned against the big stick so that the tinder is enclosed between them.
- A *log cabin* fire-build likewise begins with a tinder pile. The kindling is then stacked around it, as in the construction of a log cabin. The first two kindling sticks are laid parallel to each other, on opposite sides of the tinder pile. The second pair is laid on top of the first, at right angles to it, and also on opposite sides of the tinder. More kindling is added in the same manner. The smallest kindling is placed over the top of the assembly. Of all the fire-builds, the log cabin is the least vulnerable to premature collapse, but it is also inefficient, because it makes the worst use of convection to ignite progressively larger pieces of fuel.

- A variation on the log cabin starts with two pieces of fuelwood with a pile of tinder between them, and small kindling laid over the tops of the logs, above the tinder. The tinder is lit, and the kindling is allowed to catch fire. When it is burning briskly, it is broken and pushed down into the consumed tinder, and the larger kindling is placed over the top of the logs. When that is burning well, it is also pushed down. Eventually, a pile of kindling should be burning between two pieces of fuelwood. The logs will eventually catch fire from it.
- Another variation is called the funeral pyre method because it is used for building funeral pyres. Its main difference from the standard log cabin is that it starts with thin pieces and moves up to thick pieces. If built on a large scale, this type of fire-build collapses in a controlled manner without restricting the air flow.
- The traditional Finnish *rakovalkea* (literally "slit bonfire") is constructed by placing one long piece of fuelwood atop another, parallel and bolstering them in place with four sturdy posts driven into the ground. (Traditionally, whole unsplit tree trunks are used for the fuelwood.) Kindling and tinder are placed between the logs in sufficient quantity (while avoiding the very ends) to raise the upper log and allow ventilation. The tinder is always lit at the center so the bolstering posts do not burn prematurely. The rakovalkea has two excellent features. First, it burns slowly but steadily when lit; it does not require ardous maintenance, but burns for a *very* long time. A well constructed rakovalkea of two thick logs of two meters in length can warm two lean-to shelters for a whole sleeping shift. The construction means that the logs themselves act as wind-cover! Thus, exposure to smoke is unlikely for the sleepers; nevertheless someone should always watch in case of an emergency. Second, it can be easily scaled to larger sizes (for a feast) limited only by the length of available tree trunks.

Lighting the fire

A campfire

Once the fire is built, the next step is to light the tinder, using either a match or a lighter. A reasonably skillful fire-builder using reasonably good material will only need one match. The tinder will burn brightly, but be reduced to glowing embers within half a minute. If the kindling does not catch fire, the fire-builder must gather more tinder, determine what went wrong and try to fix it.

One of five problems can prevent a fire from lighting properly: wet wood, wet weather, too little tinder, too much wind, or a lack of oxygen. Rain will, of course, douse a fire, but a combination of wind and fog also has a stifling effect. Metal fire rings generally do a good job of keeping out wind, but some of them are so high as to impede the circulation of oxygen in a small fire. To make matters worse, these tall fire rings also make it very difficult to blow on the fire properly.

Steady, forceful blowing may be in order for a small fire in an enclosed space that has mysteriously slowed down, but blowing may extinguish a fire if it is done abruptly or when it is not needed. Most large fires easily create their own circulation, even in unfavorable conditions, but the variant log-cabin fire-build suffers from a chronic lack of air so long as the initial structure is maintained.

Once the large kindling is burning, all of the kindling should be put on the fire, save for one piece at least a foot long. This piece is useful later to push pieces of fuelwood where they are needed. Once all of the kindling is burning, the fuelwood should be placed on top of it (unless, as in the rakovalkea fire-build, it is already there). For best results, two or more pieces of fuelwood should be leaned against each other, as in the tipi fire-build.

Campfire activities

Australian "snags" cooking on a campfire

Campfires have been used for cooking since time immemorial. However, portable stoves have all but replaced campfires in this regard. For cooking information, see cooking on a campfire. Other practical, though not commonly needed, applications for campfires include drying wet clothing, alleviating hypothermia and use as a distress signal.

Most campfires, though, are lit exclusively for recreation. People tend to find something fascinating about flames and glowing coals, so a campfire is usually an agreeable way to pass the time from dusk to bedtime, particularly for those in a pensive mood. Campfires are also good venues for intimate conversation and storytelling; yarns and stories about poltergeists are particularly popular.

Having the control of fire is also a good moral booster, people fell safer by all the benefits that a fire provides.

Without matches

There are several ways to light a fire without any matches. All of them work with only the lightest and most flammable tinder, such as paper.

- On a sunny day, a lens may be used to focus the light onto the tinder. The most suitable lenses are magnifying glasses (included in some compasses), but eyeglasses may also suffice.
- The "bow and drill" method is also well-known, but it is a lot of work. The bow is similar to that used for archery. To make such a bow, find a thin rope or flexible but sturdy vine, and a sturdy stick about two feet long. Tie the rope to one end of the stick, and make another knot on the other end of the stick, with the rope between the ends not quite taut. The drill is another straight stick, thin but strong, preferably stripped of bark and with a sharpened end. The center of the bowstring (rope) is wrapped around the drill, with the two sticks at right angles to each other. The end of the drill is placed on a piece of bark in the middle of the tinder. The bow is moved rapidly back and forth to rotate the drill and create heat and friction on the bark. This method works best with an assistant feeding the tinder to the hot spot.
- The crudest method of igniting a fire is to strike two hard objects (at least one of them combustible) together to produce a spark, and ignite tinder from the spark. The substances traditionally used to produce sparks are flint and either steel or pyrite. Replacing the steel with ferrocerium (lighter "flint") produces more sparks with less effort. Rotting wood (punkwood) or charred fuel are sometimes used as tinder when using this method.

Charpaper

Charpaper is used in starting a fire with flint and steel. It is traditionally made from cotton that has been processed into charcoal. When a spark comes into contact with charpaper, it makes the charpaper glow, but the charpaper will not ignite. After the charpaper glows, you put it against your tender and blow.

To make charpaper, you need some cotton material. Cut it into approximately 2 inch squares. You then place 5-15 pieces of the cloth into a metal can that can be sealed. You will want to punch a small hole into the top and bottom of the can, in order to allow the gases to escape. You then place the can contain the cloth into a fire. you can have it in open flames or in hot coals, or even in the end stages of the fire. The hotter the fire, the faster the cloth will be transformed. you will want to roll the can in the fire to evenly cook the cloth, and continue to do so until you stop seeing gases coming from the holes in the can. When the gases stop coming out, you want to take the can out of the

fire, and place something on the can to block the holes. a rock or piece of wood will do fine. You then want to let the can cool down for at least 5 minutes. This ensures that when you open the can, the char paper doesn't get consumed from the sudden introduction of oxygen. Once the can has cooled, remove the lid, and remove the pieces of charcloth. You want to make sure that they are completely blackened, if any of the original color from the cloth is still evident, you will want to cook that cloth again. This is because the cloth has not been completely burnt, and will ignite instead of holding a spark. The flame resulting from such an ignition is very fast, and would be difficult to utilize in building a fire.

If you want to make some, you can use an altoids can, an old t-shirt, and a campfire.

Fire transportation

At times it may be unpractical to spend the efforts of restarting a fire from scratch. If fire is already available there are various methods of transporting fire, this will depend on materials available and time between the restarting the process.

Extinguishing fire

Leaving a fire unattended is dangerous! Any number of accidents might occur in the absence of people, leading to property damage, personal injury or possibly a wildfire. Ash is a very good insulator, so embers left overnight will only lose a fraction of their heat.

Large amounts of water are indispensable for extinguishing a fire. To properly cool a fire, water should be poured on all the embers, including places that are not glowing red. The water will boil violently and carry ash in the air with it, dirtying anything nearby but not posing a safety hazard. The water should be poured until the hissing noises stop. Then the ashes should be stirred with a stick to make sure that the water has penetrated all the layers; if the hissing continues, more water should be added. A fire is fully extinguished if the ashes are cool to the touch.

If water is scarce, sand may be used. The sand will deprive the fire of oxygen quite well, but it is much less effective than water at absorbing heat. Once the fire has been covered thoroughly with sand, all water that can be spared should be poured on it, and the sand stirred into the ash.

Finally, in lightly-used wilderness areas, it is best to replace anything that was moved while preparing the fire site, and scatter anything that was gathered, so that it looks as natural as possible.

Water

Flood

A flood is a natural disaster caused by too much rain or water in a location, and could be caused by many different sets of conditions. Floods can be caused by prolonged rainfall from a storm, including thunderstorms, rapid melting of large amounts of snow, or rivers which swell from excess precipitation upstream and cause widespread damage to areas downstream, or less frequently the bursting of man-made dams. A river which floods particularly often is the Huang He in China, and a particularly damaging flood was the Great Flood of 1993.

Drowning

Drowning is caused by suffocation when a liquid causes interruption of the body's absorption of oxygen from the air leading to asphyxia. The primary cause of death is hypoxia and acidosis leading to cardiac arrest.

Drowning is one of the major causes of death for children under 14 years old. Children have drowned in wading pools and even bath tubs. There is also a correlation of the rate of drowning in populations around the world and their access to water, the climate and the national swimming culture. For example, typically the United Kingdom suffers 450 drownings per annum or 1 per 150,000. Of population whereas the United States suffers 6,500 drownings or around 1 per 50,000 of population.

So the risk or drowning seems related to the situation and awareness of the danger allied to the capacity correctly ascertain one's capacity to extrude oneself from the danger of drowning.

Children have drowned in buckets and toilets

Prevention

The reduction of drowning through education has become a significant element of school curricula and is integrated into most water sports training. The elements incorporated into this training vary according to the particular context.

Most current training emphasizes the need to:

- Learn to swim
- Learn and practice water rescue.
- Know personal strengths and limitations in the water.
- Stay within one's depth unless a strong swimmer.
- Keep a watch out for others.
- Swim with company, finding a buddy, children to swim with a responsible adult.
- Ensure that children have competent supervision in or near water.
- Swim in areas supervised by lifeguards in preference to areas without.
- Be cautious and very conservative when swimming at night.
- Ensure that boats are reliable, properly loaded and that functional emergency equipment is onboard.
- Wear a properly fitting lifejacket while enjoying water sports such as sailing, surfing or canoeing.
- Pay attention to the weather, tides and water conditions, especially currents. Currents always look weaker from the outside!
- Have a fence around swimming pools.
- Consider cold-acclimatisation training for swimming in very cold water, by joining a winter swimming club.

Most current training emphasizes the need to avoid:

- Swimming while drunk or on drugs.
- Using hyperventilate to extend a breath-hold dive, see deep and shallow water blackout
- Relying on swimming aids as they may fail.
- Playing games that will put your life, or others', at risk.
- Pretending to be a drowning victim, unless **ALL** bystanders are informed that this is an exercise.
- Diving into water where the bottom cannot clearly be seen or depth determined.
- Walking on ice unless it is known absolutely that the ice is thick enough over the entire route.
- Handling electrical devices in or near the water.
- Exceeding personal limits.
- Swimming in cold water unless first, fully cold-acclimatised and experienced winter swimmer.

Drowning risk situations

Most drownings occur in water, freshwater (rivers and lakes, pools, etc) or in seawater, drownings in other fluids are rare and are often industrial accidents.

Common conditions that may lead to drowning include but are not limited to:

- Water conditions exceed the swimmer's ability; - turbulent or fast water, water out of depth, falling through ice, rip currents, undertows, currents, waves and eddies.
- Entrapment; - physically unable to get out of the situation because of a lack of an escape route, snagging or by being hampered by clothing or equipment.
- Impaired judgment and physical incapacitation arising from the use of drugs, principally alcohol.
- Incapacitation arising from the conditions; - cold (hypothermia), shock, injury or exhaustion.
- Incapacitation arising from acute illness while swimming; - heart attack, seizure or stroke.
- Forcible submersion by another person; - murder or misguided children's play.
- Blackout underwater after rapid breathing to extend a breath-hold dive; - shallow water blackout.
- Blackout on ascent from a deep breath-hold dive due to latent hypoxia; - deep water blackout.

A sign with 83 tally marks warns hikers on the trail to Hanakapiai Beach, Hawaii.

People have drowned in as little as 30mm of water lying face down, in one case in a wheel rut. Children have drowned in baths, buckets and toilets; inebriates or those under the influence of drugs have died in puddles. For a more detailed list of causes see swimming.

Rescue and treatment

Many pools and designated bathing areas either have lifeguards, a pool safety camera system for local or remote monitoring, or computer aided drowning detection. However, bystanders play an important role in drowning detection and either intervention or the notification of authorities by phone or alarm. No person should attempt a rescue that is beyond his or her ability or level of training.


(July 22, 2008) Seaman Apprentice Damien Bell uses his uniform as a flotation device during a training exercise in the combat training ...

If a drowning occurs or a swimmer becomes missing, bystanders should immediately call for help. The lifeguard should be called if present. If not, emergency medical services and paramedics should be contacted as soon as possible.

The first step in rescuing a drowning victim is to ensure your own safety. Then bring the victim's mouth and nose above the water surface. For further treatment it is advisable to remove the victim from the water. Conscious victims may panic and thus hinder rescue efforts. Often, a victim will cling to the rescuer and try to pull himself out of the water, submerging the rescuer in the process. To avoid this, it is recommended that the rescuer approach the panicking victim with a buoyant object, or from behind, twisting the

victim's arm on the back to restrict movement. If the victim pushes the rescuer under water, the rescuer should dive downwards to escape the victim.

Actively drowning victims do not usually call out for help simply because they lack the air to do so. It is necessary to breathe to yell. Human physiology does not allow the body to waste any air when starving for it. They rarely raise their hands out of the water. They use the surface of the water to push themselves up in an attempt to get their mouths out of the water. Lifting arms out of the water always pushes the head down. Head low in the water, occasionally bobbing up and down is another common sign of active drowning.

There can be splashing involved during drowning, usually a butterfly like stroke where the hands barely clear the waters surface, and sometimes victims can look like they are climbing an invisible ladder in the water.

Extenuating factors such as increased levels of stress, secondary injuries, and environmental factors can increase the likelihood of distress and/or drowning in persons who end up overboard. It is important that you recognize the behaviors associated with aquatic distress and drowning, so you can make informed decisions during emergencies.

Signs or behaviors associated with drowning or near-drowning:

- Head low in the water, mouth at water level
- Head tilted back with mouth open
- Eyes glassy and empty, unable to focus
- Eyes closed
- Hair over forehead or eyes
- Hyperventilating or gasping
- Trying to swim in a particular direction but not making headway
- Trying to roll over on the back to float
- Uncontrollable movement of arms and legs, rarely out of the water.

After successfully approaching the victim, negatively buoyant objects such as a weight belt are removed. The priority is then to transport the victim to the water's edge in preparation for removal from the water. The victim is turned on his or her back. A secure grip is used to tow panicking victims from behind, with both rescuer and victim laying on their back, and the rescuer swimming a breaststroke kick. A cooperative victim may be towed in a similar fashion held at the armpits, and the victim may assist with a breaststroke kick. An unconscious victim may be pulled in a similar fashion held at the chin and cheeks, ensuring that the mouth and nose is well above the water.

There is also the option of pushing a cooperative victim lying on his or her back with the rescuer swimming on his or her belly and pushing the feet of the victim, or both victim and rescuer lying on the belly, with the victim hanging from the shoulders of the rescuers. This has the advantage that the rescuer can use both arms and legs to swim breaststroke, but if the victim pushes his or her head above the water, the rescuer may get pushed down. This method is often used to retrieve tired swimmers. If the victim wears lifejacket, buoyancy compensator, or other flotation device that stabilizes his or her position with the face up, only one hand of the rescuer is needed to pull the victim, and the other hand may provide forward movement or may help in rescue breathing while swimming, using for example a snorkel.

Special care has to be taken for victims with suspected spinal injuries, and a back board (spinal board) may be needed for the rescue. In water, CPR is ineffective, and the goal should be to bring the victim to a stable ground quickly and then to start CPR.

If the approach to a stable ground includes the edge of a pool without steps or the edge of a boat, special techniques have been developed for moving the victim over the obstacle. For pools, the rescuer stands outside, holds the victim by his or her hands, with the victim's back to the edge. The rescuer then dips the victim into the water quickly to achieve an upward speed of the body, aiding with the lifting of the body over the edge. Lifting a victim over the side of a boat may require more than one person. Special techniques are also used by the coast guard and military for helicopter rescues.

After reaching dry ground, all victims should be referred to medical assistance, especially if unconscious or if even small amounts of water have entered the lungs. An unconscious victim may need artificial respiration or CPR.

The Heimlich maneuver is not recommended; the technique may have relevance in situations where airways are obstructed by solids but not fluids. Performing the maneuver on drowning victims not only delays ventilation but may induce vomiting, which if aspirated [4] will place the patient in a far worse situation. Moreover, the use of the Heimlich maneuver in any choking situation, involving solids or fluids, has become controversial and is generally no longer taught. For more information on this debate refer to the article Henry Heimlich.

100% oxygen is highly recommended, including intubation if necessary. Treatment for hypothermia may also be necessary. Water in the stomach need not be removed, except in the case of pediatric drownings as a gastric distension can limit movement of the lungs. Other injuries should also be treated (see **first aid**). Victims that are alert, awake, and intact have nearly a 100% survival rate.

Drowning victims should be treated even if they have been submerged for a long time. The rule "no patient should be pronounced dead until warm and dead" applies. Children in particular have a good chance of survival in water up to 3 minutes, or 10 minutes in cold water (10 to 15 °C or 50 to 60 °F). Submersion in cold water can slow the metabolism drastically. There are rare but documented cases of survivable submersion for extreme lengths of time. In one case a child named Michelle Funk survived drowning after being submerged in cold water for 70 minutes. In another, an 18 year old man survived 38 minutes under water. This is known as *cold water drowning*.

Water Purification

Water Desalination

Long-Term Water Storage

Avalanches, mudslides and landslides

Avalanche

An avalanche is a slippage of built-up snow down an incline, possibly mixed with ice, rock, soil or plant life in what is called a debris avalanche. Avalanches are categorized as either a slab or powder avalanche. Avalanches are a major danger in the mountains during the winter as a large one can run for miles, and can create massive destruction of the lower forest and anything else in its path. For example, in Montroc, France, in 1999 300,000 cubic meters of snow slid on a 30 degree slope, achieving a speed of 100 km/h. It killed 12 people in their chalets under 100,000 tons of snow, 5 meters deep. The Mayor of Chamonix was charged with manslaughter. (See http://www.pistehors.com/articles/avalanche/montroc.htm).

Mudslide

A mudslide is a slippage of mud because of poor drainage of rainfall through soil. An underlying cause is often deforestation or lack of vegetation. Some mudslides are massive and can decimate large areas. On January 10, 2005 at 1:20pm in La Conchita, a massive mudslide buried four blocks of the town in over 30 feet of earth. Ten people were killed by the slide and 14 were injured. Of the 166 homes in the community, fifteen were destroyed and 16 more were tagged by the county as uninhabitable.

Landslide

A landslide is a disaster closely related to an avalanche, but instead of occurring with snow, it occurs involving actual elements of the ground, including rocks, trees, parts of houses, and anything else which may happen to be swept up. Landslides can be caused by earthquakes, volcanic eruptions, or general instability in the surrounding land. Mudslides, or mud flows, are a special case of landslides, in which heavy rainfall causes loose soil on steep terrain to collapse and slide downwards (see also Lahar); these occur with some regularity in parts of California after periods of heavy rain.

Sink hole

A localized depression in the surface topography, usually caused by the collapse of a subterranean structure, such as a cave. Although rare, large sinkholes that develop suddenly in populated areas can lead to the collapse of buildings and other structures.

Civil disorder

Civil disorder is a broad term that is typically used by law enforcement to describe one or more forms of disturbance. Examples of disastrous civil disorder include, but are not necessarily limited to: riots; sabotage; and other forms of crime. Although civil disorder does not necessarily escalate to a disaster in all cases the event may escalate into general chaos.

Power outage

A power outage is not immediately a disaster, however, an extended power outage can strain a community and cause sufficient hardship to cause deaths in a community. A power outage may also jeopardize company's ability to stay solvent by preventing normal business activities. For this reason, business continuity planning normally addresses the possibility of an outage on the organizations core functions. A power outage at the same time as another disaster may exacerbate the severity of the incident by hampering disaster response teams.

Radiation Contamination

Related article: Chernobyl accident
Related article: Atomic bombings of Hiroshima and Nagasaki

When nuclear weapons are detonated or nuclear containment systems are otherwise compromised, airborne radioactive particles (fallout) can scatter and irradiate large areas. Ionizing radiation is hazardous to living things, and in such a case much of the affected area could be unsafe for human habitation. The former Soviet republic of Belarus was part of a scenario like this in 1986 after a reactor at the Chernobyl nuclear power plant suffered a meltdown.

Shipwreck

A shipwreck is what remains of a ship that has wrecked, either sunk or beached. Whatever the cause, a sunken ship or a wrecked ship is a physical example of the event: this explains why the two concepts are often overlapping in English

- 1904 General Slocum disaster

Related article: MV Wilhelm Gustloff (~9000 dead)
Related article: RMS Titanic (1,517 dead)
Related article: USS Indianapolis (CA-35) (~800 dead)

Telecommunication outage

A telecommunications outage is not immediately a disaster, however, an extended telecommunications outage can strain a company's ability to stay solvent by cutting them off from their clients, vendors and business partners. For this reason, business continuity planning normally addresses the possibility of an outage on the organization's core functions. A telecommunication outage at the same time as another disaster may exacerbate the severity of the incident by hampering disaster response teams.

Food

Food preservation

Food preservation in today's world is mostly a forgotten technology. Most of us have not only lost the capability to produce our own food but even the knowledge on how to preserve it. The household refrigerators (colloquially fridge) were introduced in 1915 , and soon after the practice of using a larder and even creating your own preserves become something of the past. The industrialization and the move from the agrarian culture to the city allied with industrial canning has also contributed to out general loss of knowledge regarding storing food.

When storing food it must be kept in mind that each item reacts to the chemical composition of the environment the other items. It is not only a matter of temperature.

Famine

What was previously a natural disaster, famine at a large scale today is a human created disaster, lack of planning and support to avoid a widespread lack of food in a region. It can be characterized as a lack of access or capacity to produce agriculture foodstuffs, a lack of livestock (by disease, weather or other factors. It is a generalized lack of all foodstuffs required for basic nutrition and survival.

Generalized famine is is a slow process, almost always caused by pre-existing conditions, such as drought, but its effects may be exacerbated by social factors, such as war. Particularly devastating examples include the Ethiopian famine and the Irish Potato Famine.

Cannibalism

Cannibalism is the consumption of members (or specific parts) of one's own species. Cannibalism is also practiced by humans, referred as **anthropophagy**, and is practiced even in the present days in human society, for survival or even by choice.

Cannibalism of human beings is nearly universally seen as taboo, however there are societies that condone cannibalizing deceased people and cultures that incorporate it into rituals where family members consume the flesh of their departed relatives. The practice of eating dead members of one's own culture, tribe or social group is called **Endocannibalism**. Cannibalism of healthy individuals is generally frowned upon due to the seemingly universal ethical belief in the sanctity of life, and is considered a punishable offense by most modern societies. Only in extreme cases do most modern societies condone taking the life of another human being.

Placentophagia, eating the placenta, is practiced in some parts of the world.

Exocannibalism is the practice of eating human corpses from people outside one's own community, tribe or social group.

In this book you will learn how cannibalism is practiced, what the potential risks and dangers of practicing cannibalism are, the moral and ethical issues involved in practicing cannibalism, and why people practice cannibalism.

Moral and ethical issues

History Mythology Religious practices

Supplies strategies

Managing your scarce resources, that are not limited to food or water, is a prioritizing task. What can you spare, what will last longer and what can be replaced, substituted or traded. All this will depend on the emergency situation you find yourself in, and what resources you got or can forage for.

What to eat first

If the electricity is gone, or you can't rely on it, your fridges and freezers aren't going to be working. It'll keep the food cold for a day or two though, depending on the outside temperature and how often you open the doors. So, eat this stuff, and any other soon-to-go-off food, like cream cakes or whatever, first. Leave tinned and dried food till as late as possible.

Food and water rationing

The requirement for water varies dramatically, depending on temperature, age and workload. 2 Litres per day is usually reccomended as the minimum amount, but this can be more in hot weather or with a high workload, and people have been known to survive on a lot less.

Likewise, you can probably survive three or more weeks without food, but after three days you'll feel sick and tired. People's calorific requirements vary, so some people can do a day's work fine on 1000 calories or less, but other people will find it impossible to live on less than 2000 calories even if they're not doing anything.

Caching

Be careful not to show off your vast stockpiles of food, warm clothing, toilet paper etc. Otherwise people will either begin congregating and asking to share your resources. Or they might come round in the night with guns and sticks and not be so polite in obtaining what they want.

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Specific Calamities

Calamity. From the Latin clāmāre (“to shout, proclaim, declare, cry out”); Latin calamitās (“loss, damage; disaster”). Most calamities resonate across time and are historic facts. But a calamity prediction is a shout to action as to avoid a future disaster. The root of the word disaster ("bad star" in Greek) comes from an astrological idea that when the stars are in a bad position a bad event will happen.

Any disaster is a tragedy born out of a natural occurrence or human-made activity. Increasingly they have in origin of a human-made hazard that negatively affects society or environment.

In contemporary academia, disasters are seen as the consequence of inappropriately managed risk. These risks are the product of hazards and vulnerability. Hazards that strike in areas with low vulnerability are not considered a disaster, as is the case in uninhabited regions.

Developing countries suffer the greatest costs when a disaster hits – more than 95 percent of all deaths caused by disasters occur in developing countries, and losses due to natural disasters are 20 times greater (as a percentage of GDP) in developing countries than in industrialized countries.

A disaster can be defined as any tragic event that involves at least one victim of circumstance, such as an accident, fire, terrorist attack, or explosion.

There are plenty of reasons to be worried, but chances are that you will never experience any of these calamities, the best way of avoiding such events (or survive them) is ultimately simple be aware of the possibility and informed. Things like our solar system being "eaten" by a black hole or galactic collisions (that will certainly happen), haven't been put on the list because probability that they will affect you is 0 or very near.

Natural events

A Natural phenomenon can easily turn into a natural disaster. Appearing to arise without direct human involvement, natural disasters are sometimes called an act of God as they defy logical explanation or scientific reason for their occurrence.

A natural disaster may become more severe because of human actions prior, during or after the disaster itself. A specific disaster may spawn different types of events and may reduce the survivability of the initial event. A classic example, is an earthquake that collapses homes, trapping people and breaking gas mains that then ignite, and burn people alive while trapped under debris. Human activity in risk areas may cause natural disasters. Volcanoes are particularly prone to causing other events like fires, lahars, mudflows, landslides, earthquakes, and tsunamis.

Man-made events

Disasters resulting form an element of human intent, negligence, error or involving a failure of a human controlled system are called man-made disasters. Man-made disasters like power or telecommunication outages, may be caused by natural causes, like thunderstorms, tornadoes or earthquakes and though the root cause is an act of God, they are considered a man-made disaster because they not only involve a failure of a human system but are mostly predictable and can be planed for. The power grid and telecommunication infrastructure could be made more resilient against outages however, probably due to cost and feasibility constraints, the systems were intentionally left vulnerable to outage. With an increase in complexity of the failed human system there is also an increase in the likelihood that it becomes systemic.

Severe weather

Climate change

Climate change is a trend that seems intrinsically connected to human activities even if humans are not the sole cause, they are undoubtedly a major factor. Climate change is not only characterized by a rise of medium level temperatures but also of quickly changing extremes and increased unpredictability. Another result is that the rise in medium temperatures has contributed to the melting of ice water consistently in existing glaciers (they have been retreating for some time) and on the poles. It also includes a rise on the carbon level on the atmosphere that lead to ocean water acidification and collaborates in the greenhouse effect.

Flood Maps (http://flood.firetree.net/) is a WEB tool that permits to visualize the results of sea water level rise, in relation to coastal areas, it does not take in consideration normal erosion not claims to be extremely exact its errors are on the optimistic side.

The study of climate change and its effect are looked in more depth on the wikibook Climate Change. Climate change my be a cause of specific whether related calamities because of the increased predictability, that may also effect food supplies and production. In 2011 unusual floods even impacted on the price of hard-disks since factories had been geographically concentrated, this type of disruptions will tend to occur more often and in faster cycles.

Winter storm

A snowstorm is a winter storm in which the primary form of precipitation is snow. When such a storm is accompanied by winds above 32 mph that severely reduce visibility, it becomes a blizzard. Hazards from snowstorms and blizzards include traffic-related accidents, hypothermia for those unable to find shelter, as well as major disruptions to transportation and fuel and power distribution systems.

Thunderstorm

A thunderstorm is a form of severe weather characterized by the presence of lightning and its attendant thunder, often accompanied by copious rainfall, hail and on occasion snowfall and tornadoes.

Hail Storm

A hailstorm is a natural disaster where a thunderstorm produces a numerous amount of hailstones which damage the location in which they fall. Hailstorms can be especially devastating to farm fields, ruining crops and damaging equipment. A particularly damaging hailstorm hit Munich, Germany on August 31, 1986, felling thousands of trees and causing millions of dollars in insurance claims. Skeleton Lake, a glacial lake in Uttarakhand state of India, was named so after 300-600 people were killed by a hailstorm.

Hurricane, Typhoon, or Tropical cyclone

A hurricane is a low-pressure cyclonic storm system which forms over the oceans. It is caused by evaporated water which comes off of the ocean and becomes a storm. The Coriolis Effect causes the storms to spin, and a hurricane is declared when this spinning mass of storms attains a wind speed greater than 74mph. In different parts of the world hurricanes are known as cyclones or typhoons. The former occur in the Indian Ocean, while the latter occur in the Eastern Pacific Ocean. The most damaging hurricane ever was Hurricane Andrew, which hit southern Florida in 1992.

Storm surge

A storm surge is an onshore rush of water associated with a low pressure weather system, typically a tropical cyclone. Storm surge is caused primarily by high winds pushing on the ocean's surface. The wind causes the water to pile up higher than the ordinary sea level. Storm surges are particularly damaging when they occur at the time of a high tide, combining the effects of the surge and the tide. The highest storm surge ever recorded was produced by the 1899 Bathurst Bay Hurricane, which caused a 13 m (43 feet) storm surge at Bathurst Bay, Australia. In the US, the greatest recorded storm surge was generated by Hurricane Camille, which produced a storm surge in excess of 25 feet (7.6 m).

Tornado

A tornado is a natural disaster resulting from a thunderstorm. Tornadoes are violent currents of wind which can blow at up to 318mph. Tornadoes can occur one at a time, or can occur in large tornado outbreaks along a squall line. The worst tornado ever recorded in terms of wind speed was the tornado which swept through Moore, Oklahoma on May 3, 1999. This tornado has wind speeds of 318mph and was the strongest ever recorded.

Waterspout

A waterspout is a tornadic weather phenomena normally occurring over tropical waters in light rain conditions. They form at the base of cumulus-type clouds, extend to the water surface where winds pick up water spray. Waterspouts are dangerous to boats, planes and land structures. Many waterspouts occur in the Bermuda Triangle and are suspected of being the a cause of the many missing ships and planes in that region.

Drought

A drought is a long-lasting weather pattern consisting of dry conditions with very little or no precipitation. during this period, food and water supplies can run low, and other conditions, such as famine, can result. Droughts can last for several years and are particularly damaging in areas in which the residents depend on agriculture for survival. The Dust Bowl is a famous example of a severe drought.

Droughts are slowly evolving calamities, they can be planed for and with enough resources have their impact demolished. Unless the drought affects a full continent (lets say Australia) a drought can hardly be seen as a calamity that one needs to prepare specifically.

Biological-Chemical Contamination

CBRNs

A catch-all initialism meaning Chemical Biological Radiological Nuclear. The term is used to describe a non-conventional terror threat that, if used by a nation, would be considered use of a weapon of mass destruction. This term is used primarily in the United Kingdom. Planning for a CBRN event may be appropriate for certain high-risk or high-value facilities and governments.

In this section we will not cover radiological threats, they will be covered in separate since are more distinct and rarer in occurrence by have higher and long lasting impacts.

Natural

Disease becomes a disaster when it spreads in a pandemic or epidemic as a massive outbreak off an infectious agent. Disease is historically the most dangerous of all natural disasters. Different epidemics are caused by different diseases, the Black Death, smallpox, and AIDS. The Spanish flu of 1918 was the deadliest ever epidemic, it killed 25-40 million people. The Black Death, which occurred in the 14th Century, killed over 20 million people, one third of Europe's population. Plant and animal life may also be affected by disease epidemics and pandemics.

Pandemic outbreak

A **pandemic** (from Greek παν *pan* all + δήμος *demos* people) is an epidemic that spreads through human populations across a large region (for example a continent), or even worldwide.

Definition

According to the World Health Organization (WHO), a pandemic can start when three conditions have been met:

- **the emergence of a disease new to the population.**
- the agent infects humans, causing serious illness.
- the agent spreading is sustainable and easy among humans**.**

A disease or condition is not a pandemic merely because it is widespread or kills many people; it must also be infectious. For example cancer is responsible for many deaths but is not considered a pandemic because the disease is not infectious or contagious (although certain causes of some types of cancer might be).

WHO pandemic influenza phases

The *World Health Organization global influenza preparedness plan* defines the stages of pandemic influenza, outlines the role of WHO and makes recommendations for national measures before and during a pandemic. The phases are:

Inter-pandemic period:

- **Phase 1:** No new influenza virus subtypes have been detected in humans.
- **Phase 2:** No new influenza virus subtypes have been detected in humans, but an animal variant threatens human disease.

Pandemic alert period:

- **Phase 3:** Human infection(s) with a new subtype but no human-to-human spread.
- **Phase 4:** Small cluster(s) with limited localized human-to-human transmission
- **Phase 5:** Larger cluster(s) but human-to-human spread still localized.

Pandemic period:

- **Phase 6:** Increased and sustained transmission in general population.

Pandemics and notable epidemics through history

There have been a number of significant pandemics recorded in human history, generally zoonoses that came about with domestication of animals — such as influenza and tuberculosis. There have been a number of particularly significant epidemics that deserve mention above the "mere" destruction of cities:

- Typhoid fever, during thePeloponnesian War, 430 BC, killed a quarter of the Athenian troops and a quarter of the population over four years. This disease fatally weakened the dominance of Athens, but the sheer virulence of the disease prevented its wider spread; i.e. it killed off its hosts at a rate faster than they could spread it. The exact cause of the plague was unknown for many years; in January 2006, researchers from the University of Athens analyzed teeth recovered from a mass grave underneath the city, and confirmed the presence of bacteria responsible for typhoid. [1]
- Antonine Plague, 165 – 180. Possibly smallpox brought back from the Near East; killed a quarter of those infected and up to five million in all. At the height of a second outbreak (251–266) 5,000 people a day were said to be dying in Rome.
- Bubonic plague also named in the first recorded outbreak as the Plague of Justinian, from 541 to 750. It started in Egypt and reached Constantinople the following spring, killing (according to the Byzantine chronicler Procopius) 10,000 a day at its height and perhaps 40% of the city's inhabitants. Plague went on to eliminate a quarter to a half of the human population that it struck throughout the known world. [2] It caused the Europe's population to drop by around 50% between 550 and 700.[3]

- The Black Death, started 1300s. Eight hundred years after the last outbreak, the bubonic plague returned to Europe. Starting in Asia, the disease reached Mediterranean and western Europe in 1348 (possibly from Italian merchants fleeing fighting in the Crimea), and killed 20 to 30 million Europeans in six years,[4] a third of the total population and up to a half in the worst-affected urban areas.[5]
- The English Sweat, that struck England, and later continental Europe, in a series of epidemics beginning in 1485. The last outbreak occurred in 1551, after which the disease apparently vanished. The onset of symptoms was dramatic and sudden, with death often occurring within hours making it even more feared than the bubonic plague. Its cause is still unknown.
- Typhus, sometimes called "camp fever" because of its pattern of flaring up in times of strife. (It is also known as "gaol fever" and "ship fever", for its habits of spreading wildly in cramped quarters, such as jails and ships.) Emerging during the Crusades, it had its first impact in Europe in 1489 in Spain. During fighting between the Christian Spaniards and the Muslims in Granada, the Spanish lost 3,000 to war casualties and 20,000 to typhus. In 1528 the French lost 18,000 troops in Italy and lost supremacy in Italy to the Spanish. In 1542, 30,000 people died of typhus while fighting the Ottomans in the Balkans. The disease also played a major role in the destruction of Napoleon's *Grande Armée* in Russia in 1812. Typhus also killed numerous prisoners in the Nazi concentration camps during World War II.
- Influenza
  - The "first" pandemic of 1510 traveled from Africa and spread across Europe.[6][7]
  - The "Asiatic Flu", 1889–1890. Was first reported in May of 1889 in Bukhara, Russia. By October, it had reached Tomsk and the Caucasus. It rapidly spread west and hit North America in December 1889, South America in February – April 1890, India in February-March 1890, and Australia in March – April 1890. It was purportedly caused by the H2N8 type of flu virus and had a very high attack and mortality rate.
  - The "Spanish flu", 1918–1919. First identified early March 1918 in US troops training at Camp Funston, Kansas, by October 1918 it had spread to become a world-wide pandemic on all continents. Unusually deadly and virulent, it ended nearly as quickly as it began, vanishing completely within 18 months. In six months, 25 million were dead; some estimates put the total of those killed worldwide at over twice that number. An estimated 17 million died in India, 500,000 in the United States and 200,000 in the UK. The virus was recently reconstructed by scientists at the CDC studying remains preserved by the Alaskan permafrost. They identified it as a type of H1N1 virus[*citation needed*].
  - The "Asian Flu", 1957–58. An H2N2 caused about 70,000 deaths in the United States. First identified in China in late February 1957, the Asian flu spread to the United States by June 1957.
  - The "Hong Kong Flu", 1968–69. An H3N2 caused about 34,000 deaths in the United States. This virus was first detected in Hong Kong in early 1968 and spread to the United States later that year. Influenza A (H3N2) viruses still circulate today.
- Cholera
  - first pandemic 1816 – 1826. Previously restricted to the Indian subcontinent, the pandemic began in Bengal, then spread across India by 1820. It extended as far as China and the Caspian Sea before receding.
  - The second pandemic (1829–1851) reached Europe, London in 1832, Ontario Canada and New York in the same year, and the Pacific coast of North America by 1834.
  - The third pandemic (1852–1860) mainly affected Russia, with over a million deaths.
  - The fourth pandemic (1863–1875) spread mostly in Europe and Africa.
  - In 1866 there was an outbreak in North America.
  - In 1892 cholera contaminated the water supply of Hamburg, Germany, and caused 8,606 deaths.[8]
  - The seventh pandemic (1899–1923) had little effect in Europe because of advances in public health, but Russia was badly affected again.

- The eighth pandemic began in Indonesia in 1961, called El Tor after the strain, and reached Bangladesh in 1963, India in 1964, and the USSR in 1966.

Effects of Colonization. Encounters between European explorers and populations in the rest of the world often introduced local epidemics of extraordinary virulence. Disease killed the entire native (Guanches) population of the Canary Islands in the 16th century. Half the native population of Hispaniola in 1518 was killed by smallpox. Smallpox also ravaged Mexico in the 1520s, killing 150,000 in Tenochtitlán alone, including the emperor, and Peru in the 1530s, aiding the European conquerors. Measles killed a further two million Mexican natives in the 1600s. Some believe that the death of 90 to 95 percent of the Native American population of the New World was caused by Old World diseases. As late as 1848–49, as many as 40,000 out of 150,000 Hawaiians are estimated to have died of measles, whooping cough and influenza.[9][10]

Dengue. Spread of Dengue disease in South Asia by a mosquito.

There are also a number of unknown diseases that were extremely serious but have now vanished, so the etiology of these diseases cannot be established.

Concern about possible future pandemics

Ebola virus and other quickly lethal diseases

Lassa fever, Rift Valley fever, Marburg virus, Ebola virus and Bolivian hemorrhagic fever are highly contagious and deadly diseases with the theoretical potential to become pandemics. Their ability to spread efficiently enough to cause a pandemic is limited, however, as transmission of these viruses requires close contact with the infected vector. Furthermore, the short time between a vector becoming infectious and the onset of symptoms allows medical professionals to quickly quarantine vectors and prevent them from carrying the pathogen elsewhere. Genetic mutations could occur which could elevate their potential for causing widespread harm, thus close observation by contagious disease specialists is merited.

Antibiotic resistance

Antibiotic-resistant microorganisms, sometimes referred to as "superbugs", may contribute to the re-emergence of diseases which are currently well-controlled. For example, cases of tuberculosis that are resistant to traditionally effective treatments remain a cause of great concern to health professionals. The World Health Organization (WHO) reports that approximately 50 million people worldwide are infected with multiple-drug resistant tuberculosis (MDR TB), with 79 percent of those cases resistant to three or more antibiotics. In 2005, 124 cases of MDR TB were reported in the United States. Extensively drug-resistant tuberculosis (XDR TB) was identified in Africa in 2006, and subsequently discovered to exist in 17 countries including the United States.

In the past 20 years, common bacteria including *Staphylococcus aureus*, *Serratia marcescens* and Enterococcus, have developed resistance to various antibiotics such as vancomycin, as well as whole classes of antibiotics, such as the aminoglycosides and cephalosporins. Antibiotic-resistant organisms have become an important cause of health care-associated (nosocomial) infections (HAI). In addition, infections caused by community-acquired strains of methicillin-resistant *Staphylococcus aureus* (MRSA) in otherwise healthy individuals, have become more frequent in recent years.

HIV infection

HIV — the virus that causes AIDS — is of pandemic proportions with infection rates as high as 25% in southern and eastern Africa. Effective education about safer sexual practices and bloodborne infection precautions training have helped to slow down infection rates in several African countries sponsoring national education programs. Infection rates are rising again in Asia and the Americas. See AIDS pandemic.

SARS

In 2003, there were concerns that SARS, a new, highly contagious form of atypical pneumonia caused by a coronavirus dubbed SARS-CoV, might become pandemic. Rapid action by national and international health authorities such as the World Health Organization helped slow transmission and eventually broke the chain of transmission, ending the localized epidemics before they could become a pandemic. The disease has not been eradicated, however, and could re-emerge unexpectedly, warranting monitoring and case reporting of suspicious cases of atypical pneumonia.

Influenza

Wild aquatic birds are the natural hosts for a range of influenza A viruses. Occasionally viruses are transmitted from these species to other species and may then cause outbreaks in domestic poultry or (rarely) give rise to a human pandemic. [] []

H5N1

In February 2004, avian influenza virus was detected in birds in Vietnam, increasing fears of the emergence of new variant strains. It is feared that if the avian influenza virus combines with a human influenza virus (in a bird or a human), the new subtype created could be both highly contagious and highly lethal in humans. Such a subtype could cause a global influenza pandemic, similar to the Spanish Flu, or the lower mortality pandemics such as the Asian Flu and the Hong Kong Flu.

From October 2004 to February 2005, some 3,700 test kits of the 1957 Asian Flu virus were accidentally spread around the world from a lab in the US[11].

In May 2005, scientists urgently call nations to prepare for a global influenza pandemic that could strike as much as 20% of the world's population.[*citation needed*]

In October 2005, cases of the avian flu (the deadly strain H5N1) were identified in Turkey. EU Health Commissioner Markos Kyprianou said: "We have received now confirmation that the virus found in Turkey is an avian flu H5N1 virus. There is a direct relationship with viruses found in Russia, Mongolia and China." Cases of bird flu were also identified shortly thereafter in Romania, and then Greece. Possible cases of the virus have also been found in Croatia, Bulgaria and in the United Kingdom [12].

By November 2007 numerous confirmed cases of the H5N1 strain had been identified across Europe [13]. However, by the end of October only 59 people had died as a result of H5N1 which was atypical of previous influenza pandemics.

Despite sensational media reporting, avian flu cannot yet be categorized as a "pandemic" because the virus cannot yet cause sustained and efficient human-to-human transmission. Cases so far are recognized to have been transmitted from bird to human, but as of December 2006 there have been very few (if any) cases of proven human-to-human transmission. Regular influenza viruses establish infection by attaching to receptors in the throat and lungs, but the avian influenza virus can only attach to receptors located deep in the lungs of humans, requiring close, prolonged contact with infected patients and thus limiting person-to-person transmission. The current WHO phase of pandemic alert is level 3, described as "no or very limited human-to-human transmission."[*citation needed*]

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Accident

The definition of accident is at times very murky, an accident strictly speaking results from an unplanned failure, but the categorization of accidents depends on the observer of the event. Some "accidents" may be even intentionally created or at least considered as a possible result for the causer.

Biological

We live in an ecosphere where a multitude of biological agents compete amongst themselves for resources and survival, our planet is a semi-closed system making all the biology therein highly dependent on each-other directly, like in a hunter-pray or symbiotic relation or simply dependent on the actions that other agents perform in the system.

An accident can be categorized of a biological nature if the cause is a biological process but most often the classification is also used to include any accident that affects the normal biological functions in a system and this makes if very difficult to distinguish for example a toxic accident from a biological one. Take for instance the recent issue regarding the decline of the population of domesticated bees, a 50% decline in the U.S and the E.U. at the start of 2013. It is at the same time a problem of toxic poisoning due to pesticide use and a biological one due to the genetic manipulation of crops both affecting the immune system of the bees and promoting the spread and lethality of natural occurring diseases, allied with the already depressed quality of the environment due to pollution and the rapidly altering weather patterns resulting from climate change. A problem so grave that there are concerns that it may even lead to the extinction of the species if not corrected.

> "If the bee disappears from the surface of the earth, man would have no more than four years to live." — Albert Einstein.

Attack

Volcanic eruption

This natural disaster is caused by the eruption of a volcano, and eruptions come in many forms. They range from daily small eruptions which occur in places; like Kilauea, in Hawaii, or extremely infrequent supervolcano eruptions in places like Lake Toba. Recent large volcanic eruptions include that of Mount St. Helens and Krakatoa, occurring in 1980 and 1883, respectively.

Lahar

A Lahar is a water, mud, rock and debris slide along rivers, caused by the sudden melting of a snow-capped volcano during, or as a consequence, of an eruption.

The eruption of the Volcán del Ruiz in Colombia produced massive lahars which ran down the rivers and creeks. One of these lahars jumped on a valley with a wave of 60 mt. (200 ft.)in height and struck the town of Armero in the

night of November 13, 1985, causing the leveling of 80% of the town's buildings and houses. The death toll was estimated at 25,000 deaths, but recent estimates put the figure in 21,000 deaths. In a touch of irony, the graveyard of Armero was spared of destruction. Armero tragedy (http:/ / volcanoes. usgs. gov/ Hazards/ What/ Lahars/ RuizLahars.html)

Limnic eruption

A sudden release of asphyxiating or inflammable gas from a lake. Three lakes are at risk of limnic eruptions, Lake Nyos, Lake Monoun, and Lake Kivu. A 1986 limnic eruption of 1.6 million tonnes of CO_2 from Lake Nyos suffocated 1,800 people in a 20 mile radius. In 1984, a sudden out-gassing of CO_2 had occurred at Lake Monoun, killing 37 local residents. Lake Kivu, with concentrations of methane and CO_2, has not experienced a limnic eruption during recorded history, but is suspected of having periodic eruptions every 1,000 years.

Earth-quake

An earthquake is a sudden shift or movement in the tectonic plate in the Earth's crust. On the surface, this is manifested by a moving and shaking of the ground, and can be massively damaging to poorly built structures. The most powerful earthquakes can destroy even the best built of structures. In addition, they can trigger secondary disasters, such as tsunamis and volcanic eruptions. Earthquakes occur along fault line, and are unpredictable. They are capable of killing hundreds of thousands of people, such as in the 1976 Tangshan and 2004 Indian Ocean earthquakes.

Tsunami

A tsunami ("harbor wave" in Japanese) is caused by seismic disturbances in the ocean. A common misconception is that tsunamis are simply very large waves, but this is incorrect. Instead, when one has reached land, it gives the appearance that the sea level has risen very rapidly. Tsunamis can flood areas and cause widespread devastation, often killing thousands of people. Tsunamis are commonly called tidal waves, a title discouraged by professional oceanographers because tsunamis are not related to ocean tides in any way.

Major solar flare

A solar flare is a violent explosion in the Sun's atmosphere with an energy equivalent to tens of millions of hydrogen bombs. Solar flares take place in the solar corona and chromosphere, heating the gas to tens of millions of kelvins and accelerating electrons, protons and heavier ions to near the speed of light. They produce electromagnetic radiation across the spectrum at all wavelengths from long-wave radio signals to the shortest wavelength gamma rays. Solar flare emissions are a danger to orbiting satellites, manned space missions, communications systems, and power grid systems.

Solar flares are common and there are no record of an event that would put life on earth in any considerate danger, that is not to say that they are innocuous. Human societies dependence on electricity, electronic devices and satellites have also made us more vulnerable to a social order collapse due to the disabling effect a strong solar flare would have in the infrastructure we now depend for day-to-day life.

One of the best know effect of solar flares is on the power supply networks, for instance Canada and Finland have added protective devices to their high voltage transformers just for that eventuality. It should be something that a national government should act upon since a nations energy infrastructure is of national security importance, even if in most nations energy is a private enterprise.

There is also a early warning system in place due to the effect solar flares have on satellites, so a major event should be public knowledge before it hits. In personal terms having taken the general steps discussed on Part 1 will suffice, unless the even is so great that the recovery time will erode the fabric of society.

EMP event

EMP events can occur only result of a EMP weapon discharge.

As with many other catastrophic events, an EMP attack or incident has been also the subject of books and other media, even video games. The computer-animated American science fiction television TV series from 2007 Afterworld covers Russell Shoemaker, the lead character, history across a devastated land, in the portrayed EMP event has not only cause all alternative current utilities to ceased function but has "disintegrated" a large part of the population. It covers interesting subjects like how humanity uses myths to explain away the unknown and permit to build order over a chaotic reality.

Nuclear event

The word today seems to be evolving beyond nuclear power and nuclear weapons, due to some hard realizations based on experiencing extreme destruction, pollution and the unreliability of the systems especially facing unexpected realities. Something has been learned and we have gone far beyond the bad propaganda from the pre-cold war age into the 21 century.

Nuclear radiation evokes fear and uncertainty, probably the more worrying characteristic is that it is unseen, carried by air and more damaging than virus since the effects can take extremely long time to dissipate and the effects to be noticed, if not in the immediate form of a radiation burn or severe poisoning.

This section will try to cover this subject by providing a short introduction to this important topic and address some of the confusion and even misinformation regarding radiation and radiation poisoning.

Radiation is a physical property of some natural occurring elements. Since matter is, simply put, made up of protons, electrons and neutrons.

The type of element is determined by the number of protons as the number of protons in for any element is fixed, electrons and neutrons vary within some limits. The number neutrons affects the stability of the atom, there is an optimal range of numbers of neutrons needed to keep the atom stable. When you have 2 atoms of the same element but with different number of neutrons they constitute an isotope of that element. If one of the atoms is unstable it then leads to alpha, beta-, beta+ or gamma decay.

One of the more problematic aspects of the lack of public information about radiation effects is the establishing of safety limits and of full disclosure of the dangers. This includes being transparent about contaminated sites, professions and the nuclear economy.

The rem is the most common unit of measure used to gauge radiation damage to human tissue. For instance the International Commission on Radiological Protection recommends evacuation from locations were radiation dose exceeds .1 rem per year. With an exposure of 100 rem or more one will get radiation illness (with similar effects to cancer patients that get radiation treatment, loss of hair, nausea and weakness). A dose of 250 to 350 rem will become life-threatening, if untreated chances of dying are approximately 50%.

Fission is a reaction commonly created in nuclear power stations where unstable isotopes of an element are created from splitting of atoms. Creating unstable isotopes will eventually decay the various decay processes.

Radioactive decay As we have seen there are several types of radioactive decay, each decay will emit:

- alpha decay, means that the unstable atom emits a helium nuclei (composed of 2 neutrons and 2 protons) as it decays.
- beta- decay, occurs for isotopes with an excess of neutrons, in seeking stability neutrons are converted into protons (thereby changing the element) this generates a releasing of electrons and other elementary particles, like neutrinos.
- beta+ decay, may occur, if the atom has enough energy to overcome the mass difference between an proton and a neutron and when the atom nucleus has too few neutrons to remain stable, forcing a conversion of a proton into a

neutron and a positron (negative charged electron) that will emit a neutrino.
- gamma decay, is generally a result of a alpha or a beta decay. If the resulting atom is in an excited state, it can radiate a high energy photon to lose some of the excess energy.

Except from a massive solar flare or a pulsar ejection hitting the Earth most other natural ways of getting irradiated beyond normal ranges can only occur due to human action or some controlled activity or repeated exposure. The most probable deadly nuclear events are a nuclear war, terrorist attack, a nuclear facility accident or exposure to nuclear waste.

War

War is conflict, between relatively large groups of people, which involves physical force inflicted by the use of weapons. Warfare has destroyed entire cultures, countries, economies and inflicted great suffering on humanity. Other terms for war can include armed conflict, hostilities, and police action. Acts of war are normally excluded from insurance contracts and disaster planning. Most wars are caused when two political leaders have conflicts with each other's views. Civilians normally have no input on whether a war should be started.

Movies

Books

Terrorism

Terrorism is a controversial term with multiple definitions. One definition means a violent action targeting civilians exclusively. Another definition is the use or threatened use of violence for the purpose of creating fear in order to achieve a political, religious, or ideological goal. Under the second definition, the targets of terrorist acts can be anyone, including civilians, government officials, military personnel, or people serving the interests of governments.

Impact event

Impact events are caused by the collision of large meteoroids, asteroids or comets (generically: bolides) with Earth and may sometimes be followed by mass extinctions of life. The magnitude of the disaster is inversely proportional to its rate of occurrence, because small impactors are much more numerous than large ones.

This type of event is portrayed in many movies, TV shows and literary works. The TV series of 1999, from the UK, The Last Train, follows the survival of a mixed group of train passengers who have accidentally been cryogenically frozen. It covers items like famine due to ash cover (drop of temperature) and acid rain.

Gamma-ray burst

A gama-ray burst is a blast of gama radiation, the best known and common generators of such events are pulsars but any passing star cluster within a few thousand light years of Earth could generate a strong enough burst that would result in mass extinction of life on Earth. In fact it is theorized by a team from the University of Kansas in Lawrence led by Adrian Melott in 2003, that such an event may indeed have occurred 440 million years ago, even if so far no proof has been found, but little would be left to identify such event.

In star clusters, gama-ray bursts are generated when a single star explodes or two or more stellar corpses merge. In 2003, a team led by Adrian Melott of the suggested that a gamma-ray burst within a few thousand light years of Earth triggered a mass extinction 440 million years ago. But proof has been elusive. Because these bursts occur when , there is little left to identify the culprit.

A **galactic gama-ray superwave** can also be a possibility from a massive supernova. Recent discoveries made by Fermi Gamma Ray telescope increases the chance of Earth being hit in what is a recurrent phenomena.

According to Wilfried Domainko of the Max Planck Institute for Nuclear Physics in Heidelberg, Germany (arxiv.org/abs/1112.1792), in globular clusters, massive swarm of active and dead start, the probability based on the number of star clusters in the Milky Way and the rate of gamma-ray bursts in them, that an deadly game-ray busts event will strike Earth is at least once in the past billion years.

The chance that a pulsar will cause damage to the earth is very remote but not inexistent, in fact it is almost a certainty that some pulsars will be targeting the earth from time to time, but because they are so distant little or no impact is felt.

Rebuilding

Basic Assumptions

This section was created as to permit the analysis of hypothetical situations that one, and possibly an indeterminate number of people, may face when faced with general survival situation, in a somewhat insulated set-up. Stranded in a what may be an uninhabited remote place (e.g. an island, new unexplored landmass, specific will covered to provided for any plausible alternative) that has may have edible vegetation and possibly animal life.

Do not automatically assume that access exist to any man-made objects other than (perhaps) the clothes on ones back, a common objects most people carry around in daily life. As we covered in previous sections, it may make note of small advantages given by items and knowledge that you may and should have on your person (such as pens, paper, keys, the contents of your wallet and so on), but will not require these elements. When standing next to a wreck (plane, car, ship or bus), consider it a major bonus and a source of useful material.

Immediate Survival

Your safety first

Before anything else, make sure you are safe and well. That means making sure the ground is stable and that nothing is about to fall on you, that you are physically well and that any situation-specific hazards have been taken care of (e.g. the boat is not about to capsize, the plane that you may have crashed in is not on fire or that you are not in it).

Others

If you were injured, assess the gravity of the situation and call for help, don't move unless you are forced to, don't make demands of others but don't be hysteric, if it hurts scream, consider that others will only help you if you are indeed in need of help. As others can be useful to you, you are also useful to others.

For those who are conscious, obtain name, current physical/emotional state and any important information (medical conditions, allergies, etc.). Keep track of this information for future reference. Write it down if you can, this information will be useful for future relations and decision making. Avoid adding in writing any personal remarks or negative observations, if you need to do it in a short-form code that you understand by that others reading it will not take offense or use it against you at a later date. Keeping a log of events is extremely useful not only to keep one's sanity but for future rescuers, at times it can even serve as a distraction from an asher reality. It can even be the basis for a best selling book, plenty of examples abound.

Other survivors are a resource, sharing the same goal, but also rely on the few resources available. So after you attend to your personal safety you should determine how many people are with you (naturally, if you are still doing triage you may want to hold off on the headcount, as you may have less people later if adequate medical attention cannot be provided), and if they need immediate help. Don't put yourself at risk of injuries, at this point you are on your own, no social structure exists, be as helpful as you can without entering in conflicts and becoming emotional,

the other survivors are strangers to you, assess priorities according to how useful others will be to you later on. Don't give orders, but request help and work in tandem by joining efforts with other fit survivors to bring safety to all.

Shelter

Finding or making shelter is important because it allows a person to stay protected from the elements, and even wildlife. Depending on the environment shelter may be the number one priority.

There are however two major possibilities where the threat of the environment may not be readily apparent:

1. Warm or arid environment.
2. Cyclic environment (day/night or winter/summer).
3. Contaminated or radiated environment.

A warm climate may feel relatively comfortable, but it may also cause you to lose a lot of body fluid - if water is not nearby this could be dangerous and shade would be a good idea.

Cyclic environments may surprise you with storms or vastly different conditions during day and night or summer and winter. However you may find warning hints to this in the environment itself - if dead leaves cover the ground its because cold winter comes around every year or if the air is not very moist it can mean rapid changes in temperature come nightfall or dawn etc..

If the environment is partially dangerous be careful with the food and water you take in even if it means going hungry and watch the wildlife for signs something is wrong. If a place makes you feel even slightly bad leave it for a vastly different kind of place, for instance you might go from low grounds to higher grounds or the other side of a mountain.

The next priority after finding shelter is water.

Water

It is your most critical resource as a human may potentially survive only hours without water, but easily days or a month without food. The length of survival mostly depends upon climate conditions and physical exertion.

Water may usually be obtained from places of condensation like mountain tops and glaciers, vegetation or deep from the ground through wells.

Procuring resources may also help elevate you to a position of leadership through your obvious contribution and the trust it creates or through the raw power the resources give you. From this position you can then continue to help the group.

If the weather is harsh for instance because of arid conditions consider sleeping in the shadow in the day and working and traveling only at night.

If the water may be contaminated fresh but potentially poisonous fluid may be obtained from plants and animals, water may be filtered through old and flayed clothes or water may be boiled for 10 minutes.

Food

Food is also essential for survival. This is especially important during winter, as one has higher calorie-burning needs.

After a while food begins to claim your attention. You want to be ready before that if possible since it may take time to grow crops or find the non-poisonous fruits. Remember that finding one nut is not the same as feeding the entire group for an extended period of time. You need to find and secure a large area for foraging or a slightly smaller area for growing foods.

For longterm survival you will need to get to know the area and environment, in the short-term you may be able to hunt or gather plants for feeding. Plants may be poisonous, to test this use the look, rub, taste and eat procedure:

1. Look at the plant - does it look fresh and are other animals willing to eat it? If not do not eat it.

    1. a Bright warning colors may also indicate a poisonous plant.
2. Rub a small amount of sample on your skin.
    1. a Observe the patch for minimum 3 hours, if there is any discomfort or rash do not eat it.
3. Now you may taste a small piece of the plant, do not eat or swallow.
    1. If the plant tastes foul, bitter or just a little strongly - do not eat it.
4. You may now eat a small bit of the plant.
    1. Wait 8 hours minimum and if there is no discomfort you may try larger portions.

Do not let the group eat the same unknown plants, if you must get yourselves poisoned by your ignorance there is still no reason to kill or discomfort everybody at the same time - although it surely would seem hilarious in those last flower induced death.

Other resources

Moral

It should not be overlooked what the will to live means in a life and death situation. Stories of heroic feats of survival by regular people with little or no training are not uncommon. Even with a strong understanding of the way we may be mentally affected, even a trained survival expert may feel the crushing effects of psychological strain during duress.

Understanding the effects of stress will reveal that while it may not always seem like it, stress is a necessary evil and belongs not only for malice but for good as well. It serves as a measuring stick for our success, it presents one with challenges, and it is a good way to show us how far we can bend and not break.

Reality sometimes has a nice way of pointing out that things could indeed be much worse. On the flip side of the coin too much stress can be a awful thing. The carnage that stress can breed within a human being is almost without limits. Too much stress can lead to forgetfulness, increased propensity to making mistakes, lessened energy, outbursts of rage, and carelessness.

Emotions are hard wired into our brains. Survival situations are bound to invoke strong emotional reactions from anyone involved. There are a few emotions that most often accompany this type of event. They drastically lessen our ability to combat the situation. It is not something that initially comes to mind when thinking of surviving but they are as important as any other survival skill.

There are 6 emotions that must be overcome to allow a chance at survival and have a good time, in general.

Fear

> Once placed into a survival situation one of the initial reactions for anyone is fear. It is a perfectly normal reaction, however fear is the enemy. It drastically lessens our ability to make clear decisions, which ultimately will lessen the chance for survival. In an effort to minimize our fears, we can train in realistic situations to condition ourselves to have the mentality needed to increase our confidence and more effectively manage fear.

Anxiety

> Typically anxiety and fear run hand in hand with one another. It may start as a uneasy feeling in the pit of our stomach but by the time the mind is added into the situation it may quickly spiral out of control. Anxiety will oftentimes take over the mind and quickly make it difficult to make decisions with any clarity. Anxiety must be fought through in order to focus on the tasks at hand. Typically once some of the critical survival needs have been met, anxiety will be easier to keep at bay.

Anger

> It is inevitable that in a survival situation there are going to be problems. With the endless possibilities of things that can go wrong and probably will, to imagine that tempers may flair should not come as a surprise. Anger can sap one's drive necessary to want to survive. Finding other ways to channel this emotion will prove

more useful than losing ones temper.

Depression

An overall sense of malaise is not uncommon in wilderness. Being alone in the wilderness trying to survive is almost certainly bound to bring about a depressed state. Overwhelming depression can lead to the body shutting down and not unlike anxiety can also cause a human being to give up hope. Staying positive can allow one to combat this.

Guilt

Often accompanying a survival situation is loss of life. The guilt may not even come from someone taking responsibility for the person's death, rather a sense of guilt as they are alive and the other person is dead.

Boredom (and Loneliness)

An often unanticipated side effect of being in a survival situation. Boredom and loneliness can both contribute to lowering morale. It is important to be able to keep your mind busy and your spirits up. It may be one of the most critical skills to survive.

The first steps of building a social structure

The Roster

For future reference, and in case of an emergency, you need to find out who your "go-to" guys/girls are. You will need to figure out who are your fighters, who your nature boys and girls are, and the smart guys/girls. Considering your position you may be one of the above mentioned three.

A fighter would be a person who is skilled in some kind of combat, any kind of weapon (if you have any such weapons) or is just a relatively strong/able person. You'll need him/her to help keep watch over the camp at night, scout the island, and just handle any kind of danger to the rest of the population.

A nature boy/girl is a person who understands nature and is used to working in the wild. The nature boy/girl should have knowledge of animal behavior, plants, and wilderness survival. You'll need him/her to find food, help organize the camp site and in many cases the nature people can be just as useful for the camp's defense as the fighter.

The smart boy/girl is necessary to the group just as the mind is necessary to the body. The smart person or persons should have a vast knowledge in engineering and technology, and can design and build just about anything the group needs. You'll need the smart people to help build the camp as well as to eventually find a way to get back home (if that appears to be possible - this manual does not guarantee such an occurrence).

Although less important, it may be helpful for future reference to know who does not have any any of the above three traits.

The unskilled laborer is anyone with no specialized survival skills for this situation, at least in the early days of rebuilding civilization, such as an accountant, lawyer, or nuclear physicist (at least until complicated finances, complex law, and nuclear power plants are rebuilt). These are common, and you are likely to have a couple in your group of survivors. To keep them busy and to free up time for those with more important skills, these laborers should be used in tasks which are easy to teach but time consuming. Primarily, they should be used for gathering firewood, gathering building materials, and testing edible plants (as explained in the Food section), after given specific instructions on how to acomplish these tasks, by those with knowledge regarding those subjects.

Scouting the Area

After the incident is over (the plane crash, shipwreck, etc...) and all the injured are being taken care of, the first thing you need to do as leader is to put together scout team(s) to gather knowledge of the area, to find ways to gather things in the area such as food (fruit, vegetables, edible animals, etc.), water, possible building materials for the future and to look for any nearby dangers. If you have a useful skill or trait (like being able to identify plants or being relatively strong), you may want to join the scout team. The scout team may also find something important that may or may not be beneficial to the group: like an aggressive tribe or a hidden hatch, either way it is important to mark all things of that nature.

It may be useful to mark the path you take (trailblazing), so that the scouting party can find the base camp again (rather than getting lost further and further away from base camp, or getting stuck going around and around a big circle). Also, if you find something useful that cannot immediately be carried back to camp by the scout team, the trail marks can help you find it again.

Reminder: Always use the buddy system when leaving the camp, and tell others where you are going and (if possible) roughly when you plan to return.

Setting Up the Base Camp

While the scouts are looking for food and materials, those left at the camp should start by trying to create a camp fire. The fire is needed: to keep the camp illuminated at night, (depending on where one is) to keep warm when it gets cold, also to ward away aggressive animals. As an added bonus it will create a large amount of smoke that could get the attention of nearby ships and planes. If you are fortunate the ship/plane you came in on may have some dry matches left behind. If the wreck you came in on is extremely serious you may want to use the broken parts as fire burning material however you may want to leave the plane/ship alone on the off chance you can repair it later (Note: this assumes that you have access to a ship/plane wreck. This manual does not guarantee that.). If your skill sets involve building or cooking then you may want to stay to set up camp.

Rather than have the one person who knows how to tie knots do all the knot-tying from now on, encourage that person to teach everyone the more useful knots.

Another idea, once the camp is established and the immediate necessities taken care of. A base perimeter should be made. Think of this as a safe zone from animals, who may try to steal your food, or other predators (man or animal).

Find the highest ground available, and set-up a signal fire, ready to be set a blaze at the first sign of rescue. You may also use that mirror from the make-up compact now to reflect light at the cockpit of the vessel you see.

Organizing Supplies

That is, stockpiling weapons and ammunition you may have, storing spare parts and such (canteens, backpacks, paper, books, writing utensils, eating utensils, etc.), and so on. Part of this may include requisitioning supplies. DON'T FORCIBLY TAKE POSSESSIONS. People should contribute for the good of the group. Doing otherwise will not help you make friends and influence people. And having friends in this situation could save your life.

A better way to put this is to take a an inventory. Your wife's mirror in her make-up compact has now just become a signal mirror and 1/2 of a periscope. Nothing is insignificant, and when there is no WalMart nearby, nothing should be wasted.

This may be better served being done immediately after taking a health assessment of the group. As stated before, all contributions should be voluntary, while explaining that there is power in numbers and sharing resources, rather than "strking out" on one's own to fend as an individual. Those who choose to remain independent and not share are simply nailing their own coffins shut. Their choice is their own, remind them.

Lighters, pocket knives, keys, leather belts, strong prescription vision glasses, all now have alternate uses for survival.

Later Days and Secondary Projects

After having a basic campsite built with roofed shelters, a campfire going (with the necessary fuel to maintain it), water security (even storage) and there is an organized method of collecting or hunting for food, you may notice that there is a large increase in down time. Although it is good for your fellow castaways to get their rest, too much downtime can lead to depression, boredom, hopelessness and possibly a dangerous amount of unrest. It may sound mean but the leader must keep the castaways busy to reduce the problems mentioned above. A wise man once said “if you can give a man one thing give him something to love, if you can't do that give him something to hope for, and if you can't even give him that, give him something to do” this saying can mean a lot in this kind of situation.

The effort and planing may depend on the situation, specific project and resources, consider the urgency and expenditures before selecting a new task.

Extended Exploration

After things have settled down, you may wish to conduct extended exploratory trips to gain information about your surroundings. This could mean, but does not necessary implies a travel by sea, week-long hiking trips, and so forth.

Suggested Projects

Multipurpose Center

If you are going to set up a village-type camp, it may prove beneficial to construct (or designate, in the case of a cave or natural open area) a large multipurpose center. This can be used for "camp" meetings, spirituality and organized sports and recreation activities (such as soccer or dancing).

Government

Even if you have a fairly small group of people (say, less than 10), you may need a form of official government. This goes especially if the group is anything but close friends.

The "leader" doesn't have to have dictatorial powers though, but he may be the guy who is told to think on a plan while the rest scouts. If you try not to put too much status in it you may have a better shot at achieving this.

Leadership is absolutely essential for survival short-term and longterm and without it there won't be any rebuilding of civilization as much as there will be back to scratch. Leadership, mind you, does not mean that a guy is in command; if you end up putting the emotionally charged but charismatic/strong fool in the seat you might as well have anarchy.

Indeed more importantly the system you begin now may stand for the next hundred years, think of your responsibility to the future and the precedence you set for it.

Most people know only two kinds of system, the one where the strongest are in command or the one with the more popular guy (democracy) - considering your situation the prevalent system structure may have proved to be catastrophically flawed, maybe you want to invent a new one.

Keep in mind that once people settle into a habit they develop a certain resistance to any change so while getting that water may seem really important right now, this issue is no less immediate.

If you want to invent a new system and have nothing to go on use science, when the group has time to spare organize two equal teams with each their command structure/command rules and see who wins at at a friendly game - work from there.

Fire

Fire

Fire is probably humans' first technology. It is a cornerstone on our evolution as a species and how we manage to adapt to many distinct environments. It permits not only to warm ourselves, light the dark, serve as a weapon or communication device, but to make food more digestible, to clear fields, to break stone and work metals. Nothing has so much importance to mankind that this simple chemical reaction.

Light, Signaling and Security

Fire is also a easy to create source of light, in a dark environment and at night where it also permits safer movements. The light and smoke can serve also as a signaling device. It is very rare for small contained fires to occur naturally, so fire can also be an indication of human presence.

One can also use fire as a weapon or a dissuader for wild life, most wild animals will have an instinctual fear of fire. This fear is mostly due to learned experiences and is mostly based on smell, the negation of cover, the novelty and heat may also be a factor.

Natural occurrence

A fire is also a natural disaster that may destroy ecosystems like grasslands, forests causing great loss of life, property, livestock and wildlife. Bush and forest fires are generally started by lightning, but also by human negligence or arson.

Arson

Arson is the premeditated intent of setting a fire with intent to cause damage. The definition of arson was originally limited to setting fire to buildings, but was later expanded to include other objects, such as bridges, vehicles, and private property. Arson is the greatest cause of fires in data repositories. (See [3])

Campfire

A **campfire** is a fire lit at a campsite, usually in a fire ring. Campfires are a popular feature of camping, particularly among organized campers such as Scouts or Guides. Without proper precautions they are also potentially dangerous. A certain degree of skill is needed to properly build a campfire, to keep it going, and to see that it is properly extinguished.

A campifire have serves three primary objectives.

- Heat - For warmth and preparation of food and tool preparation.
- Security - Fire is a weapon and a dissuader, especially against wildlife. Most animals fear fire.
- Light source - Visibility and signalling. Light and smoke are extremely good for calling attention and mark a presence.

The dangers

A campfire may burn out of control in two basic ways: on the ground or in the trees. Dead leaves or pine needles on the ground may ignite from direct contact with burning wood, or from thermal radiation. Alternatively, airborne embers (or their smaller kin, sparks) may ignite dead material in overhanging branches. This latter threat is less likely, but a fire in a branch will be virtually impossible to put out without firefighting equipment, and may spread more quickly than a ground fire.

Embers may simply fall off of logs and be carried away by the air, or they may be ejected at high speed by exploding pockets of sap. With these dangers in mind, some places prohibit all open fires, particularly during times of the year that are prone to wildfires.

Campfires are prohibited in many public camping areas. Public areas with large tracts of woodland usually have signs indicating the level of fire danger, which usually depends on recent rain and the amount of deadfalls or dry debris; when the danger is highest, all open fires are prohibited. Even in safer times, it is common to require registration and permits to build a campfire. Such areas are often kept under observation by rangers, who will dispatch someone to investigate any unidentified plume of smoke.

Finding a site, and other safety measures

Ideally, every fire should be lit in a fire ring. If a fire ring is not available, a temporary fire site may be constructed. One way is to cover the ground with sand, or other soil mostly free of flammable organic material, to a depth of a few centimeters. The area of sand should be large enough to safely contain the fire and any pieces of burning wood that may fall out of it. Sand piles should be scattered after the fire has been put out. If the topsoil is moist, it may suffice to simply clear it of any dead plant matter.

Fire rings, however, do not fully protect material on the ground from catching fire. Flying embers are still a threat, and the fire ring may become hot enough to ignite material in contact with it.

No fire should be lit close to trees, tents or other fire hazards. This includes overhanging branches; some carry dead, dry material that can ignite from a single airborne ember. In addition, a fire may harm any roots under it, even if they are protected by a thin layer of soil. Conifers run a greater risk of root damage, because they lack taproots and their roots run close to the surface.

Fires also should not be lit on bare rocks. The ash will leave a black stain that cannot be easily removed, but the fire's heat can lead to more dramatic consequences. It will cause the outer layer of the rock to expand, possibly causing it to crack. It may also boil pockets of water contained in the rock.

An additional safety measure is to have sand and water on hand to smother and douse the fire if it does get out of the fire pit. It is wise to gather these materials before they are actually needed.

Types of fuel

There are, by conventional classification, three types of material involved in building a fire without manufactured fuels.

1. *Tinder* is anything that can be lit with a match. The best natural tinder is dead, dry pine needles or grass; a more comprehensive list is given in the article on tinder. A quantity of tinder sufficient to fill one's cupped hands to the top is the bare minimum needed.
2. *Kindling* is an arbitrary classification including anything bigger than tinder but smaller than fuelwood. In fact, there are gradations of kindling, from sticks thinner than a finger to those as thick as a wrist. A quantity of kindling sufficient to fill a hat may be enough, but more is better.
3. *Fuelwood* ranges from small logs two or three inches across to larger logs that can burn for hours. It is typically impossible to gather without a hatchet or other cutting tool, so fuelwood must usually be brought from home or purchased at a nearby store.

The gathering of fuel in natural areas is often restricted. Cutting of living trees is almost always forbidden - but neither is it very useful, because sap-filled wood does not burn well. *Squaw wood* (dead parts of standing trees) may also be prohibited. Wood lying on the ground is usually permitted.

Building the fire

Having found a suitable site and gathered materials, the fire-builder has a variety of designs to choose from. A good design is very important in the early stages of a fire. Most of them make no mention of fuelwood - in most designs, fuelwood is never placed on a fire until the kindling is burning strongly.

- The *tipi* fire-build is perhaps the best, but it is takes some patience to construct. First, the tinder is piled up in a compact heap. The smaller kindling is arranged around it, like the poles of a tipi. For added strength, it may be possible to lash some of the sticks together. A tripod lashing is quite difficult to execute with small sticks, so a clove hitch should suffice. (Synthetic rope should be avoided, since it produces pollutants when it burns.) Then the larger kindling is arranged above the smaller kindling, taking care not to collapse the tipi. A *separate* tipi as a shell around the first one may work better.
- A *lean-to* fire-build starts with the same pile of tinder as the tipi fire-build. Then, a long, thick piece of kindling is driven into the ground at an angle, so that it overhangs the tinder pile. The smaller pieces of kindling are leaned against the big stick so that the tinder is enclosed between them.
- A *log cabin* fire-build likewise begins with a tinder pile. The kindling is then stacked around it, as in the construction of a log cabin. The first two kindling sticks are laid parallel to each other, on opposite sides of the tinder pile. The second pair is laid on top of the first, at right angles to it, and also on opposite sides of the tinder. More kindling is added in the same manner. The smallest kindling is placed over the top of the assembly. Of all the fire-builds, the log cabin is the least vulnerable to premature collapse, but it is also inefficient, because it makes the worst use of convection to ignite progressively larger pieces of fuel.
- A variation on the log cabin starts with two pieces of fuelwood with a pile of tinder between them, and small kindling laid over the tops of the logs, above the tinder. The tinder is lit, and the kindling is allowed to catch fire. When it is burning briskly, it is broken and pushed down into the consumed tinder, and the larger kindling is placed over the top of the logs. When that is burning well, it is also pushed down. Eventually, a pile of kindling should be burning between two pieces of fuelwood. The logs will eventually catch fire from it.
- Another variation is called the funeral pyre method because it is used for building funeral pyres. Its main difference from the standard log cabin is that it starts with thin pieces and moves up to thick pieces. If built on a large scale, this type of fire-build collapses in a controlled manner without restricting the air flow.
- The traditional Finnish *rakovalkea* (literally "slit bonfire") is constructed by placing one long piece of fuelwood atop another, parallel and bolstering them in place with four sturdy posts driven into the ground. (Traditionally, whole unsplit tree trunks are used for the fuelwood.) Kindling and tinder are placed between the logs in sufficient quantity (while avoiding the very ends) to raise the upper log and allow ventilation. The tinder is always lit at the center so the bolstering posts do not burn prematurely. The rakovalkea has two excellent features. First, it burns slowly but steadily when lit; it does not require ardous maintenance, but burns for a *very* long time. A well constructed rakovalkea of two thick logs of two meters in length can warm two lean-to shelters for a whole sleeping shift. The construction means that the logs themselves act as wind-cover! Thus, exposure to smoke is unlikely for the sleepers; nevertheless someone should always watch in case of an emergency. Second, it can be easily scaled to larger sizes (for a feast) limited only by the length of available tree trunks.

Lighting the fire

A campfire

Once the fire is built, the next step is to light the tinder, using either a match or a lighter. A reasonably skillful fire-builder using reasonably good material will only need one match. The tinder will burn brightly, but be reduced to glowing embers within half a minute. If the kindling does not catch fire, the fire-builder must gather more tinder, determine what went wrong and try to fix it.

One of five problems can prevent a fire from lighting properly: wet wood, wet weather, too little tinder, too much wind, or a lack of oxygen. Rain will, of course, douse a fire, but a combination of wind and fog also has a stifling effect. Metal fire rings generally do a good job of keeping out wind, but some of them are so high as to impede the circulation of oxygen in a small fire. To make matters worse, these tall fire rings also make it very difficult to blow on the fire properly.

Steady, forceful blowing may be in order for a small fire in an enclosed space that has mysteriously slowed down, but blowing may extinguish a fire if it is done abruptly or when it is not needed. Most large fires easily create their own circulation, even in unfavorable conditions, but the variant log-cabin fire-build suffers from a chronic lack of air so long as the initial structure is maintained.

Once the large kindling is burning, all of the kindling should be put on the fire, save for one piece at least a foot long. This piece is useful later to push pieces of fuelwood where they are needed. Once all of the kindling is burning, the fuelwood should be placed on top of it (unless, as in the rakovalkea fire-build, it is already there). For best results, two or more pieces of fuelwood should be leaned against each other, as in the tipi fire-build.

Campfire activities

Campfires have been used for cooking since time immemorial. However, portable stoves have all but replaced campfires in this regard. For cooking information, see cooking on a campfire. Other practical, though not commonly needed, applications for campfires include drying wet clothing, alleviating hypothermia and use as a distress signal.

Australian "snags" cooking on a campfire

Most campfires, though, are lit exclusively for recreation. People tend to find something fascinating about flames and glowing coals, so a campfire is usually an agreeable way to pass the time from dusk to bedtime, particularly for those in a pensive mood. Campfires are also good venues for intimate conversation and storytelling; yarns and stories about poltergeists are particularly popular.

Having the control of fire is also a good moral booster, people fell safer by all the benefits that a fire provides.

Without matches

There are several ways to light a fire without any matches. All of them work with only the lightest and most flammable tinder, such as paper.

- On a sunny day, a lens may be used to focus the light onto the tinder. The most suitable lenses are magnifying glasses (included in some compasses), but eyeglasses may also suffice.
- The "bow and drill" method is also well-known, but it is a lot of work. The bow is similar to that used for archery. To make such a bow, find a thin rope or flexible but sturdy vine, and a sturdy stick about two feet long. Tie the rope to one end of the stick, and make another knot on the other end of the stick, with the rope between the ends not quite taut. The drill is another straight stick, thin but strong, preferably stripped of bark and with a sharpened end. The center of the bowstring (rope) is wrapped around the drill, with the two sticks at right angles to each other. The end of the drill is placed on a piece of bark in the middle of the tinder. The bow is moved rapidly back and forth to rotate the drill and create heat and friction on the bark. This method works best with an assistant feeding the tinder to the hot spot.
- The crudest method of igniting a fire is to strike two hard objects (at least one of them combustible) together to produce a spark, and ignite tinder from the spark. The substances traditionally used to produce sparks are flint and either steel or pyrite. Replacing the steel with ferrocerium (lighter "flint") produces more sparks with less effort. Rotting wood (punkwood) or charred fuel are sometimes used as tinder when using this method.

Charpaper

Charpaper is used in starting a fire with flint and steel. It is traditionally made from cotton that has been processed into charcoal. When a spark comes into contact with charpaper, it makes the charpaper glow, but the charpaper will not ignite. After the charpaper glows, you put it against your tender and blow.

To make charpaper, you need some cotton material. Cut it into approximately 2 inch squares. You then place 5-15 pieces of the cloth into a metal can that can be sealed. You will want to punch a small hole into the top and bottom of the can, in order to allow the gases to escape. You then place the can contain the cloth into a fire. you can have it in open flames or in hot coals, or even in the end stages of the fire. The hotter the fire, the faster the cloth will be transformed. you will want to roll the can in the fire to evenly cook the cloth, and continue to do so until you stop seeing gases coming from the holes in the can. When the gases stop coming out, you want to take the can out of the fire, and place something on the can to block the holes. a rock or piece of wood will do fine. You then want to let the can cool down for at least 5 minutes. This ensures that when you open the can, the char paper doesn't get consumed from the sudden introduction of oxygen. Once the can has cooled, remove the lid, and remove the pieces of charcloth. You want to make sure that they are completely blackened, if any of the original color from the cloth is still evident, you will want to cook that cloth again. This is because the cloth has not been completely burnt, and will ignite instead of holding a spark. The flame resulting from such an ignition is very fast, and would be difficult to utilize in building a fire.

If you want to make some, you can use an altoids can, an old t-shirt, and a campfire.

Fire transportation

At times it may be unpractical to spend the efforts of restarting a fire from scratch. If fire is already available there are various methods of transporting fire, this will depend on materials available and time between the restarting the process.

Extinguishing fire

Leaving a fire unattended is dangerous! Any number of accidents might occur in the absence of people, leading to property damage, personal injury or possibly a wildfire. Ash is a very good insulator, so embers left overnight will only lose a fraction of their heat.

Large amounts of water are indispensable for extinguishing a fire. To properly cool a fire, water should be poured on all the embers, including places that are not glowing red. The water will boil violently and carry ash in the air with it, dirtying anything nearby but not posing a safety hazard. The water should be poured until the hissing noises stop. Then the ashes should be stirred with a stick to make sure that the water has penetrated all the layers; if the hissing continues, more water should be added. A fire is fully extinguished if the ashes are cool to the touch.

If water is scarce, sand may be used. The sand will deprive the fire of oxygen quite well, but it is much less effective than water at absorbing heat. Once the fire has been covered thoroughly with sand, all water that can be spared should be poured on it, and the sand stirred into the ash.

Finally, in lightly-used wilderness areas, it is best to replace anything that was moved while preparing the fire site, and scatter anything that was gathered, so that it looks as natural as possible.

Pandemy

Pandemic outbreak

A **pandemic** (from Greek παν *pan* all + δήμος *demos* people) is an epidemic that spreads through human populations across a large region (for example a continent), or even worldwide.

Definition

According to the World Health Organization (WHO), a pandemic can start when three conditions have been met:

- **the emergence of a disease new to the population.**
- the agent infects humans, causing serious illness.
- the agent spreading is sustainable and easy among humans**.**

A disease or condition is not a pandemic merely because it is widespread or kills many people; it must also be infectious. For example cancer is responsible for many deaths but is not considered a pandemic because the disease is not infectious or contagious (although certain causes of some types of cancer might be).

WHO pandemic influenza phases

The *World Health Organization global influenza preparedness plan* defines the stages of pandemic influenza, outlines the role of WHO and makes recommendations for national measures before and during a pandemic. The phases are:

Inter-pandemic period:

- **Phase 1:** No new influenza virus subtypes have been detected in humans.
- **Phase 2:** No new influenza virus subtypes have been detected in humans, but an animal variant threatens human disease.

Pandemic alert period:

- **Phase 3:** Human infection(s) with a new subtype but no human-to-human spread.
- **Phase 4:** Small cluster(s) with limited localized human-to-human transmission
- **Phase 5:** Larger cluster(s) but human-to-human spread still localized.

Pandemic period:

- **Phase 6:** Increased and sustained transmission in general population.

Pandemics and notable epidemics through history

There have been a number of significant pandemics recorded in human history, generally zoonoses that came about with domestication of animals — such as influenza and tuberculosis. There have been a number of particularly significant epidemics that deserve mention above the "mere" destruction of cities:

- Typhoid fever, during thePeloponnesian War, 430 BC, killed a quarter of the Athenian troops and a quarter of the population over four years. This disease fatally weakened the dominance of Athens, but the sheer virulence of the disease prevented its wider spread; i.e. it killed off its hosts at a rate faster than they could spread it. The exact cause of the plague was unknown for many years; in January 2006, researchers from the University of Athens analyzed teeth recovered from a mass grave underneath the city, and confirmed the presence of bacteria responsible for typhoid. [1]
- Antonine Plague, 165 – 180. Possibly smallpox brought back from the Near East; killed a quarter of those infected and up to five million in all. At the height of a second outbreak (251–266) 5,000 people a day were said to be dying in Rome.
- Bubonic plague also named in the first recorded outbreak as the Plague of Justinian, from 541 to 750. It started in Egypt and reached Constantinople the following spring, killing (according to the Byzantine chronicler Procopius) 10,000 a day at its height and perhaps 40% of the city's inhabitants. Plague went on to eliminate a quarter to a half of the human population that it struck throughout the known world. [1] It caused the Europe's population to drop by around 50% between 550 and 700.[2]
- The Black Death, started 1300s. Eight hundred years after the last outbreak, the bubonic plague returned to Europe. Starting in Asia, the disease reached Mediterranean and western Europe in 1348 (possibly from Italian merchants fleeing fighting in the Crimea), and killed 20 to 30 million Europeans in six years,[3] a third of the total population and up to a half in the worst-affected urban areas.[4]
- The English Sweat, that struck England, and later continental Europe, in a series of epidemics beginning in 1485. The last outbreak occurred in 1551, after which the disease apparently vanished. The onset of symptoms was dramatic and sudden, with death often occurring within hours making it even more feared than the bubonic plague. Its cause is still unknown.
- Typhus, sometimes called "camp fever" because of its pattern of flaring up in times of strife. (It is also known as "gaol fever" and "ship fever", for its habits of spreading wildly in cramped quarters, such as jails and ships.) Emerging during the Crusades, it had its first impact in Europe in 1489 in Spain. During fighting between the Christian Spaniards and the Muslims in Granada, the Spanish lost 3,000 to war casualties and 20,000 to typhus. In

1528 the French lost 18,000 troops in Italy and lost supremacy in Italy to the Spanish. In 1542, 30,000 people died of typhus while fighting the Ottomans in the Balkans. The disease also played a major role in the destruction of Napoleon's *Grande Armée* in Russia in 1812. Typhus also killed numerous prisoners in the Nazi concentration camps during World War II.

- Influenza
  - The "first" pandemic of 1510 traveled from Africa and spread across Europe.[5][6]
  - The "Asiatic Flu", 1889–1890. Was first reported in May of 1889 in Bukhara, Russia. By October, it had reached Tomsk and the Caucasus. It rapidly spread west and hit North America in December 1889, South America in February – April 1890, India in February-March 1890, and Australia in March – April 1890. It was purportedly caused by the H2N8 type of flu virus and had a very high attack and mortality rate.
  - The "Spanish flu", 1918–1919. First identified early March 1918 in US troops training at Camp Funston, Kansas, by October 1918 it had spread to become a world-wide pandemic on all continents. Unusually deadly and virulent, it ended nearly as quickly as it began, vanishing completely within 18 months. In six months, 25 million were dead; some estimates put the total of those killed worldwide at over twice that number. An estimated 17 million died in India, 500,000 in the United States and 200,000 in the UK. The virus was recently reconstructed by scientists at the CDC studying remains preserved by the Alaskan permafrost. They identified it as a type of H1N1 virus[*citation needed*].
  - The "Asian Flu", 1957–58. An H2N2 caused about 70,000 deaths in the United States. First identified in China in late February 1957, the Asian flu spread to the United States by June 1957.
  - The "Hong Kong Flu", 1968–69. An H3N2 caused about 34,000 deaths in the United States. This virus was first detected in Hong Kong in early 1968 and spread to the United States later that year. Influenza A (H3N2) viruses still circulate today.
- Cholera
  - first pandemic 1816 – 1826. Previously restricted to the Indian subcontinent, the pandemic began in Bengal, then spread across India by 1820. It extended as far as China and the Caspian Sea before receding.
  - The second pandemic (1829–1851) reached Europe, London in 1832, Ontario Canada and New York in the same year, and the Pacific coast of North America by 1834.
  - The third pandemic (1852–1860) mainly affected Russia, with over a million deaths.
  - The fourth pandemic (1863–1875) spread mostly in Europe and Africa.
  - In 1866 there was an outbreak in North America.
  - In 1892 cholera contaminated the water supply of Hamburg, Germany, and caused 8,606 deaths.[7]
  - The seventh pandemic (1899–1923) had little effect in Europe because of advances in public health, but Russia was badly affected again.
  - The eighth pandemic began in Indonesia in 1961, called El Tor after the strain, and reached Bangladesh in 1963, India in 1964, and the USSR in 1966.

Effects of Colonization. Encounters between European explorers and populations in the rest of the world often introduced local epidemics of extraordinary virulence. Disease killed the entire native (Guanches) population of the Canary Islands in the 16th century. Half the native population of Hispaniola in 1518 was killed by smallpox. Smallpox also ravaged Mexico in the 1520s, killing 150,000 in Tenochtitlán alone, including the emperor, and Peru in the 1530s, aiding the European conquerors. Measles killed a further two million Mexican natives in the 1600s. Some believe that the death of 90 to 95 percent of the Native American population of the New World was caused by Old World diseases. As late as 1848–49, as many as 40,000 out of 150,000 Hawaiians are estimated to have died of measles, whooping cough and influenza.[8][9]

Dengue. Spread of Dengue disease in South Asia by a mosquito.

There are also a number of unknown diseases that were extremely serious but have now vanished, so the etiology of these diseases cannot be established.

Concern about possible future pandemics

Ebola virus and other quickly lethal diseases

Lassa fever, Rift Valley fever, Marburg virus, Ebola virus and Bolivian hemorrhagic fever are highly contagious and deadly diseases with the theoretical potential to become pandemics. Their ability to spread efficiently enough to cause a pandemic is limited, however, as transmission of these viruses requires close contact with the infected vector. Furthermore, the short time between a vector becoming infectious and the onset of symptoms allows medical professionals to quickly quarantine vectors and prevent them from carrying the pathogen elsewhere. Genetic mutations could occur which could elevate their potential for causing widespread harm, thus close observation by contagious disease specialists is merited.

Antibiotic resistance

Antibiotic-resistant microorganisms, sometimes referred to as "superbugs", may contribute to the re-emergence of diseases which are currently well-controlled. For example, cases of tuberculosis that are resistant to traditionally effective treatments remain a cause of great concern to health professionals. The World Health Organization (WHO) reports that approximately 50 million people worldwide are infected with multiple-drug resistant tuberculosis (MDR TB), with 79 percent of those cases resistant to three or more antibiotics. In 2005, 124 cases of MDR TB were reported in the United States. Extensively drug-resistant tuberculosis (XDR TB) was identified in Africa in 2006, and subsequently discovered to exist in 17 countries including the United States.

In the past 20 years, common bacteria including *Staphylococcus aureus*, *Serratia marcescens* and Enterococcus, have developed resistance to various antibiotics such as vancomycin, as well as whole classes of antibiotics, such as the aminoglycosides and cephalosporins. Antibiotic-resistant organisms have become an important cause of health care-associated (nosocomial) infections (HAI). In addition, infections caused by community-acquired strains of methicillin-resistant *Staphylococcus aureus* (MRSA) in otherwise healthy individuals, have become more frequent in recent years.

HIV infection

HIV — the virus that causes AIDS — is of pandemic proportions with infection rates as high as 25% in southern and eastern Africa. Effective education about safer sexual practices and bloodborne infection precautions training have helped to slow down infection rates in several African countries sponsoring national education programs. Infection rates are rising again in Asia and the Americas. See AIDS pandemic.

SARS

In 2003, there were concerns that SARS, a new, highly contagious form of atypical pneumonia caused by a coronavirus dubbed SARS-CoV, might become pandemic. Rapid action by national and international health authorities such as the World Health Organization helped slow transmission and eventually broke the chain of transmission, ending the localized epidemics before they could become a pandemic. The disease has not been eradicated, however, and could re-emerge unexpectedly, warranting monitoring and case reporting of suspicious cases of atypical pneumonia.

Influenza

Wild aquatic birds are the natural hosts for a range of influenza A viruses. Occasionally viruses are transmitted from these species to other species and may then cause outbreaks in domestic poultry or (rarely) give rise to a human pandemic. [] []

H5N1

In February 2004, avian influenza virus was detected in birds in Vietnam, increasing fears of the emergence of new variant strains. It is feared that if the avian influenza virus combines with a human influenza virus (in a bird or a human), the new subtype created could be both highly contagious and highly lethal in humans. Such a subtype could cause a global influenza pandemic, similar to the Spanish Flu, or the lower mortality pandemics such as the Asian Flu and the Hong Kong Flu.

From October 2004 to February 2005, some 3,700 test kits of the 1957 Asian Flu virus were accidentally spread around the world from a lab in the US[11].

In May 2005, scientists urgently call nations to prepare for a global influenza pandemic that could strike as much as 20% of the world's population.[*citation needed*]

In October 2005, cases of the avian flu (the deadly strain H5N1) were identified in Turkey. EU Health Commissioner Markos Kyprianou said: "We have received now confirmation that the virus found in Turkey is an avian flu H5N1 virus. There is a direct relationship with viruses found in Russia, Mongolia and China." Cases of bird flu were also identified shortly thereafter in Romania, and then Greece. Possible cases of the virus have also been found in Croatia, Bulgaria and in the United Kingdom [12].

By November 2007 numerous confirmed cases of the H5N1 strain had been identified across Europe [13]. However, by the end of October only 59 people had died as a result of H5N1 which was atypical of previous influenza pandemics.

Despite sensational media reporting, avian flu cannot yet be categorized as a "pandemic" because the virus cannot yet cause sustained and efficient human-to-human transmission. Cases so far are recognized to have been transmitted from bird to human, but as of December 2006 there have been very few (if any) cases of proven human-to-human transmission. Regular influenza viruses establish infection by attaching to receptors in the throat and lungs, but the avian influenza virus can only attach to receptors located deep in the lungs of humans, requiring close, prolonged contact with infected patients and thus limiting person-to-person transmission. The current WHO phase of pandemic alert is level 3, described as "no or very limited human-to-human transmission."[*citation needed*]

[1] Cambridge Catalog page "Plague and the End of Antiquity" (http://www.cambridge.org/us/catalogue/catalogue.asp?isbn=0521846390&ss=from) Quotes from book "Plague and the End of Antiquity" (http://www.speakeasy-forum.com/lofiversion/index.php/t18579.html) Lester K. Little, ed., *Plague and the End of Antiquity: The Pandemic of 541-750*, Cambridge, 2006. ISBN 0-521-84639-0

[2] The History of the Bubonic Plague (http://dpalm.med.uth.tmc.edu/courses/BT2003/BTstudents2003_files\Plague2003.htm)

[3] Death on a Grand Scale (http://www.medhunters.com/articles/deathOnAGrandScale.html)

[4] Plague - LoveToKnow 1911 (http://www.1911encyclopedia.org/Plague)

[5] Beveridge, W.I.B. (1977) *Influenza: The Last Great Plague: An Unfinished Story of Discovery*, New York: Prodist. ISBN 0-88202-118-4.

[7] John M. Barry, (2004). *The Great Influenza: The Epic Story of the Greatest Plague in History*. Viking Penguin. ISBN 0-670-89473-7.

[8] The Story Of... Smallpox (http://www.pbs.org/gunsgermssteel/variables/smallpox.html)

[9] Smallpox: Eradicating the Scourge (http://www.bbc.co.uk/history/british/empire_seapower/smallpox_01.shtml)

Survival Kit

There are many debates about what makes a survival kit. Below is a list of useful items to have with you. Remember to there is more to being prepared than a survival kit. Each person has their own personal needs, which can drastically change the following suggestions.

Items in bold can easily be carried in a small back pack whenever you go into the outdoors even for just part of a day. The other items should be brought on any trips longer than a day.

- **Water** is an absolute must! Your body can not survive without fresh, clean water!!!
- **cell phone** with a charged battery (charge it once a month to make sure that it does not lose its charge over a few months. Also note that you may not be able to get a signal if you are in the wild.) or
- Portable CB radio (handheld CB radios have very limited range)
- A container that should be something in which you can boil water and cook. Stainless steel is best. If you have to, remember you can boil water in almost anything, even straight in the water bottle.
- **Knife** with a solid blade and a tang that goes down into the handle (a good knife is very important). A knife that has the blade and handle made of one solid piece of metal (like a dive knife) is even better. There are many uses for a knife, such as carving, safety, marking, etc.
- Knife sharpener (a dull knife is dangerous)
- **Flint and steel striker** (in case matches fail)
- **Waterproof / Windproof matches** (get good ones)
- **Disposable lighter**, such as a Bic™
- **Water purification** tablets or pump (Tablets may be more practical, as pumps can be expensive, and take up a lot of space.)
- **Water tight container** (a heavy duty zip lock freezer bag will do)
- **High calorie food** light and non perishable. (Nuts, energy bars, and peanut butter work well). When out in the wild, you will need a larger calorie intake.
- **sighting mirror** to use for signaling or fire starting
- **Whistle**
- **Beanie** to keep you warm you lose lots of heat from your head in hot environments a wide brimmed hat.
- sunscreen and lip balm
- Bug repellent
- Bright plastic marking tape (to leave a trail for others to follow)
- waterproof nylon tarp
- **Poncho**, big plastic bag will do
- **Emergency "space bag, blanket"** sleeping bag made of mylar (it's only about a 2" cube and works by reflecting your body heat). If you have room in your kit for two, that's even better. Put one on the ground then put a layer of leaves then the second blanket and then wrap yourself up in the layers. Or use one as a tent and the other as a blanket.
- Parachute cord (at least 20 feet)
- Folding portable cooking stove and solid fuel tablets (it is also small and inexpensive)
- **Map of the area**, the best one being a topographic
- **Compass** Remember you can tell direction using the sun to some degree of accuracy: Sun rises in the East sets in the West.
- **Money and Spare change for phone calls**
- **Anti-diarrheal medicine** (as drinking from a potentially unsafe water source carries the risk of sometimes-fatal dehydration)

- **Aspirin or similar medicine** with anti-inflammatory, fever-reducing and pain-relieving qualities. (Acetaminophen, brand name Tylenol™, Ibuprofen, brand name Advil™)
- **Self-adhesive bandages & Cotton balls** (such as Band-Aids™ brand) Cotton balls work well for swabs as well as tinder for starting a fire.
- **Watch** to keep track of the time
- **Survival or First Aid Book** provides fire starting materials(paper), helps relax by reading may tell you what you need to survive.
- **Flash Light** The led kind are very light and last a long time. Make sure to have extra batteries or a shake recharge flash light.
- **Collapsible camp-cup and 4-foot square of clear, flexible, thin-gauge plastic sheeting like the kind used as paint drop-clothes** The plastic sheeting is used to ***make water***. This is done by digging a small hole about two feet in diameter and six inches deep. The dimensions are not critical. Once the hole is ready, place any water-bearing organic matter such as grass or leaves in the hole in a thin layer along the bottom. Place the cup in the center of the hole. Place the plastic sheet over the hole and weight it down around the edges with dirt and/or rocks. Take a small rock and place it above the cup, so that the plastic dimples down *directly over the cup*. As the sun begins to heat the contents of the hole, the water vapor steams out of the organic matter, condenses on the plastic, and drips down the dimple and into the cup. This works, but it takes time. Remember, **any** organic, water-bearing matter will work - including waste products. The water produced will be pure since it is distilled.
- And finally, **Confidence**

The important thing here is that you make your survival kit small and light enough that you bring it with you if you travel in rural areas leave it in your car.

Another important aspect of the survival kit is the container in which it is carried. The kit above in bold should not have to be that big or heavy but a good backpack of some sort is important for ease of carrying, energy savings, and for the comfort of the survivalist.

The other items you should have on longer trips may be heavier and need to be carried in a pack meant for back packing or kept in your car.

You can also keep a survival kit where you live for general emergencies.

Shelter

Helpful Hints

Shelter will keep you out of the elements and help prevent hypothermia. It will provide shade in the heat. It also has an important positive psychological effect.

- Bring a cheap, lightweight tent with you whenever you go hiking, even if you are not staying the night. Consider a "tube tent," for example...such a tube can be constructed by gluing (with waterproof glue) the long edge of a thin tarp or plastic drop cloth to the matching edge, creating a tube of-sorts. To use, simply string the string from one end of the tube through the other end, and tie the ends between two trees. If you are injured in the wilderness, such a shelter can be easy to erect quickly. When injured (particularly in cold weather) proper shelter can be essential for your survival.
- A lean-to can be made by lashing a stick between two trees, then leaning more sticks on it to form a triangular structure. It can be improved by insulating it with evergreen boughs, branches and leaves, or snow. Alternatively just lay sticks against a log and fill with an cover with insulation. Remember add as much insulation as possible.
- Get your body off the ground. Build an insulating pad between your body and the earth using sticks, pine boughs, leaves, etc. You should have twice as much insulation below you as above you.
- Make the inside of your shelter as small as you can in cold conditions with lots of insulation
- Building a fire reflector (a wall of sticks, rocks, etc.) will improve a lean-to by reflecting the fire's warmth back into the open side of the lean-to.
- Bring one or two metallic rescue blankets wherever you go. They are useful for building shelters, reflectors, and water collectors, and you can even cook with them.
- In snowy conditions, build a quinzhee.
- One shelter that has worked very well in the past, is a lean-to shelter, it is fairly easy to construct, and is very effective.

Shelter for Survival

In the average consideration of survival it often seems shelter is overlooked, or at least taken for granted and misplaced on the scale of priorities.

It is always good to remember the "rule of threes":
"A person can survive for three minutes without air,
three hours without shelter,
three days without water,
three weeks without food."

While not absolute these guidelines are reasonable and appropriately stress the need for shelter. Protection from the elements comes second only to breathing.

Quick thoughts about the conditions under which three hours of exposure is a generous life-expectancy should immediately clarify that when shelter is most needed it may be most difficult to find or create.

Levels of shelter:
Clothing and basic tools
Minimal short-term protection
Long-term protection
A recent engineer by the name of Howard "Chubby" Fultz has developed an idea that could revolutionize outdoor survival. It is commonly refered to as "The Chubby Dome." The official name is "CD320." Although still in the

developing stages, The Chubby Dome offers a fresh water supply, food storage, power, shelter, and a small bathroom.

Clothing:

Dress in Layers!

The first level of shelter to consider is that of clothing. Simply put, you have to be able to "walk home" in the clothing you have on or at hand. Take a hard look at the difference between what you want to wear and what you should have for all possible conditions.

Waypoints where additional resources are available (camp, basecamp, your car) can certainly be the initial target of any self-extraction. Such caches then cover situations of different scope ~what's on your person will get you back to camp, what's at camp will get you to your car, etc.

The concept of walking home may sound out of place, but there is a distinction between being lost and/or injured, and simply being in a difficult spot for an indefinite period of time. As a rule, if you are lost or injured do not wander -get yourself found-.

A minimal set of equipment should be incorporated into one's wardrobe. Without the ability to make fire and cut things -right now- you're not even trying to be prepared and will be hard-pressed to spend anything but a summer night outdoors safely.

Other Wikibooks

- Debris Hut Construction from the Self-Reliance Handbook

Water

Humans can survive 3 days on average without water—less when it is very hot or one is very active (as opposed to weeks without food). A single day without water significantly reduces bodily and mental performance.

Water is an essential item on any camping or hiking trip. Some campgrounds have tap water, drawn from wells and purified. This water is of reliable quality under normal circumstances and should be used whenever practical. When tap water is not available, it is usually best to bring all necessary water from home. However, it is impossible to bring more than a couple of days' worth of water on a backpacking trip, and survival situations may create an unforeseen demand for water. If this demand is not met, dehydration will result, leading to heat exhaustion, heatstroke and death within days.

Please avoid the thought of rationing water. The best storage container in a survival situation is your own body. Even experienced soldiers have been found dead of dehydration with a full canteen.

Finding Water

- You should have a map that shows water sources in the area where you plan to operate.
- Water is most likely found where it is carried by natural terrain features such as ravines, gullies and washes.
- Game trails leading down-slope may lead to water, but it may be miles away.
- Water is more likely found in green areas with a good amount of vegetation.
- Collect falling rainwater with a tarp, tent, or even clothing. It is safe. Funnel or wring it into containers (bottles, canteen, pots, you).
- Quickly running water is more likely to be safe than large slow moving rivers or water in ponds and lakes.
- Dew can be a water source when it condenses on any surface. Sop it up with a sponge or cloth.
- You can get water by distillation from common leaves, grasses, and other green plants. Place an armload in a plastic bag/container, then leave it out in an area where it will get a lot of warmth and sunlight. Make sure that

you don't use any poisonous plants, and that the container is sealed, so no water vapor escapes. Several such containers will be needed for a single person.
- DO NOT drink seawater unless it is distilled! It takes twice as much water for your body to process seawater as you get from it.
- NEVER drink urine, even if it is filtered.
- Avoid eating snow in cold weather; doing so can significantly lower body temperature (as can becoming dehydrated) and even lead to shock.
- Try to avoid stagnant water. It is more difficult to make safe.
- Try to avoid brackish water. Purification or disinfection will not remove salt from brackish water.
- Of the methods discussed above, only distillation and charcoal reduce risks from chemicals dissolved in water. Try to be aware of the risk of chemically-contaminated water in your area of operation.

Making Water Safer

- You should always presume that water found in the outdoors contains disease-causing organisms. They are present far from any signs of human habitation. These organisms may have no effect on you if you drink the water without treatment OR they make cause debilitating illness or even death (See, for example, giardia, cryptosporidium, cholera, typhoid.). Therefore, you should do what you can to make the water safer.
- Boiling is the most reliable method to kill all organisms in water. Bring the water to a rolling boil. Boil several minutes if at high altitude since water boils at a lower temperature at altitude. Even bringing water to temperature uncomfortably hot to the touch kills most organisms, but boil if you can.
- Commercial filters in working condition and used correctly remove all organisms except viruses.
- Chlorine dioxide (NOT "bleach" which is chlorine hydroxide) used according to directions will kill all organisms in water. Wait times may be four hours.
- Water in a closed, clear container (Think 2 ltr. softdrink bottle.) if exposed to a day of strong sunlight is usually safe (See SODIS).
- Water obtained by distillation (See above.) is usually safe.
- A well dug ten feet/3 meters or more from a body of water and dug to a depth below the water level in that body of water, will gradually fill with water that is safer than the source body of water.
- A filter of layers of grass, sand, and charcoal (from a fire site) inside a cone or cylinder of bark, plastic, aluminum foil or the like, will make water safer.
- A filter of 6-8 layers of tightly-woven cloth will make water safer.
- Allowing particles in water to settle to the bottom of a container and then treating the clearer water towards the top improves the resutls of treatment. Such "settling" of water, alone, makes water safer.
- Any method that makes water safer, such as use of "bleach" (Chlorine hydroxide) or iodine, is better than not treating the water at all. Putting it another way, killing or otherwise eliminating some of the wee nasties is better than leaving them all for your body to fight.

AND

- Bring "enough" safe water with you where ever you go OR have a method to render safe water from known sources. Be prepared.
- If you have no water, avoid eating fats and proteins because your body uses water to process them. Juicy vegetable foods may sources of water.
- Always try to keep the sun off of you, regardless of how much clothing or sunblock you are wearing. It heats your body up over time, so you lose a LOT more water from your body from the extra sweating.
- When melting snow in the winter, first melt a small amount in the bottom of a pot and then add more snow slowly. If you fill a pot with snow and put it over a fire, the snow at the bottom may sublimate directly into a gas, leaving the bottom of the pot dry and vulnerable to melting.

- Pouring boiled water back and forth between pots after boiling will remove the flat taste. If you are very thirsty, you will not notice a flat taste.
- If in the desert, do not remove your clothing as your sweat will evaporate more quickly and you will dehydrate faster. Ideally you want light colored, lightweight, loose clothing that covers as much skin as possible.
- Do your work in the early mornings and at dusk to avoid the hottest part of the day. Get extra sleep during that time.
- Your stomach is the best water container. People have been found dead of dehydration with water still in their canteens. Don't drink more than you need to, but don't be stingy with it either.
- Always try to protect yourself as much as possible from the wind, it can dehydrate you in mere hours of exposure in areas with little cover, particularly mountains and plains.

If a natural water source is available

It is not difficult to obtain water from a natural body of fresh water such as a river or lake, but this water should not be used untreated. Natural water often contains organisms that cause infectious disease, most notably *Giardia lamblia*. There are four ways to remove this threat and make natural water potable.

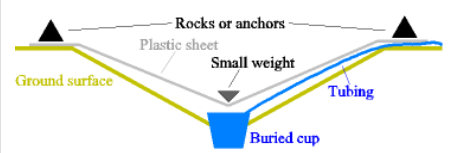
- Water may be boiled over a campfire or portable stove. At high altitudes, water boils at a lower temperature, so the boil must be maintained for several minutes to kill the microorganisms.
- Water may be filtered with a portable water purification device. Water purifiers differ widely, so if you own one, familiarize yourself with the instruction manual. If the water is visibly dirty, pour it through a clean cloth to remove large particles and avoid prematurely clogging the purifier.
- Certain chemicals, such as dilute chlorine solution, are commercially sold as antimicrobial additives. Some leave an unpleasant flavor that may be masked with powdered drink mix.
- Water may be added to an evaporation still or solar still to purify the water through the natural evaporative process. Questionable water is added then when it evaporates it rises and condenses on a cooler surface. It then drips into your collection container where it can be collected using tubing to maintain the efficiency of your still. The warmer the still becomes the faster you will be able to collect pure water. Only a few chemicals will evaporate with the water one of which is benzene. This is usually only a concern when trying to purify flood waters.

This method can also be used to purify salt water. As long as the salt water is not allowed to get on your collection surface or in your collection container the water will be potable.

If a natural water source is not available

The evaporation still

Water may also be obtained from the soil or from plant matter.



Cross-section diagram of an evaporation still

Probably the best way to get water from the ground is the evaporation still, shown in cross-section in the diagram at right. To build an evaporation still, you need only four items: a shovel, a sturdy sheet of transparent plastic, a cup, and a piece of flexible plastic tubing long enough to reach from the middle of the plastic sheet to the side with some excess length.

Begin by digging a hole with sloping sides in the shape of the sheet of plastic, but slightly smaller. Avoid digging in hot weather, as you will lose considerable amounts of water through sweat. Sink the cup in the middle of the hole so that the rim is almost flush with the sides of the hole. Place one end of the tube in the cup, run the other end to the outside of the hole, and place the sheet of plastic over the whole assembly. Weigh down the sides of the plastic sheet,

or anchor them with stakes, and place a small weight directly over the cup.

The evaporation still will produce water continuously. The plastic sheet will create a greenhouse effect in the still, accelerating the natural evaporation of water from the soil. When the water vapor hits the plastic sheet, it will condense and drip down into the cup. The tubing may be used to drink from the cup without disturbing the still. For added effectiveness, use a second cup to pour any available water-based fluids, such as urine or water collected from roofing or tent surfaces into the pit. A second tube would also work for this same purpose.

The vegetation still

An easier method uses just a plastic bag. Gather enough succulent vegetation (big leaves, cacti stripped of their thorns, etc.) to mostly fill the bag. Mash it to break through the leaves' outer water-resistant cuticle. As in the evaporation still, a greenhouse effect will cause water to evaporate from the leaves. It will then condense on the plastic and run down into the bottom of the bag.

The water in the bag will pick up chemicals from the leaves. These will give it a strong leafy flavor, and may include toxins, so make sure not to gather any poisonous plants.

Vegetation may also be added to an evaporative still to avoid the unpleasant taste but the used vegetation will have to be cleared out after the water has been collected from it. Preferably at night when the still is less effective.

Fire

Start the fire first with tinder, then add small twigs (wire size), then pencil size twigs, then thumb size twigs. Keep the fire small so that you aren't wasting valuable energy gathering firewood all the time. However if gathering wood is easy big fires attract attention. Burn whole logs without cutting them by just sliding them into the fire as they burn (the whole log will not catch fire).

Don't fear rain. Rainwater is just on the outside, and this does not mean that wood is sodden through. Green wood and young branches are "wet," and won't ignite readily, but any kind of wood will eventually burn on a hot enough fire. If it looks like a heavy downpour is coming, build a roof over your fire using one or two big logs about a foot (30cm) above the coals.

- Paper, cardboard, or unneeded cloth can be easy to start on fire
- Use small twigs from under the main canopy of the tree as tinder. (If they don't break off easily, they are still green.)
- Dry pine needles work great to start fires and give off lots of smoke.
- Rubbing bark between your hands until it is fluffy also makes excellent tinder
- Cattails easily catch on fire.
- If stranded in a vehicle, siphon out some gas or oil.

If you don't have matches:

- The old "fire-bow" trick is very hard work even under the best circumstances
- Fire can be started with a glass lens from a magnifying glass, mirror, binoculars, and the polished bottom of a soda can. (Most eyeglasses will not work.)
- The reflector of a (broken) car headlight can be used to concentrate sunlight and start a fire. Place tinder where the filament is and point the lamp at the sun. Same with a flashlight reflector.
- Flint and steel works but you must practice with it first.

Lately many new products have become available:

- Two-part chemical fire starters work fairly well and work even in the rain
- Magnesium fire starters work well but practice with them first

Some other ideas

- a tealight candle works wonders.
- If you have a 9 volt battery and a bit of steel wool, hold the steel wool against the battery's terminals and it will spark and start the steel wool burning.
- Just for fun (be careful with frost bite for this one) but you can actually start a fire by melting a piece of ice with your hands into a lens and using it to start a fire. However Mythbusters showed this does not work.
- Be creative

To coax a struggling fire into a healthy blaze, fan it or blow on the coals. A flap of cardboard makes an ideal fan. Be careful not to blow it out.

Food

I feel that food can be divided into two categories: That which crawls; That which sprouts. First, I'll cover plants, then I'll say some about ways to get meat.

Growing, Catching, and Preparing Food - An Overview

If you are facing the prospect of gathering and / or catching food in the wild, you are facing one of two circumstances: this is a lifestyle choice, or you're in a long-term survival situation, where chances of rescue within weeks are slim.

The time frame of weeks may surprise some, but the reality is that in most survival situations, food is the least important factor, i.e., if you make it your number one survival priority, you'll probably get killed by something more important like not having sought adequate shelter while you were chasing badgers with a pointy stick. But getting down to brass tacks...

Chances are, you're not going to develop the skills necessary to hunt wild animals without firearms in any immediate timeframe, so the next option available to us is to prepare snares and traps. Snares and traps have the distinct advantage that they are hunting for you night and day, rain or shine. A simple circuit of your traps once a day is all that is required. The most important, and hopefully obvious consideration with traps is site selection: place traps where animals will be. Bait is fine, but to have bait, you have to have already caught something, haven't you? If you haven't, consider that animals invariably seek water, so a simple snare along a well worn path to the creek is perfect.

Types of Traps:

- Deadfalls
- Snares
- Cage Traps
- Nets
- Fishing Lines

Edible & Poisonous Wild Plants

Here are some guideline for eating wild plantlife. In most situations, if you don't know what a plant is, don't eat it. You can live 3 weeks or more without food. You can live a lot less long with poison in your system. Only eat wild plants if you have devoted a good deal of time to studying them.

- Do not eat mushrooms or fungi unless you know for certain that it is edible. Most are poisonous, and there is no way of determining which ones are edible without properly identifying the species.
- Plants with umbrella-shaped flowers should not be eaten.
- Avoid legumes (beans and peas).
- Bulbs should generally be avoided. Wild garlic and onions are edible but have poisonous look-a-likes. However, garlic and onions smell distinctively like garlic and onions.
- Lichen
- Avoid white and yellow berries, as most of them are poisonous. Blue and black berries are usually safe to eat.
- The "berry rule" is that 10% of white and yellow berries are edible; 50% of red berries are edible; 90% of blue, black, or purple berries are edible, and 99% of aggregated berries are edible. This is only a guideline, and unknown berries shouldn't be eaten.
- Aggregated fruits and berries are almost always edible (blackberry, raspberry, salmonberry, and thimbleberry).
- Single fruits on a stem are usually considered safe to eat.
- Plants with shiny leaves or a milky sap are considered to be poisonous. The two that don't follow this rule are Dandelion and Fig. (Both have milky sap.)
- It is a myth that if an animal eats something, then it is safe. For instance, deer will eat poison ivy.
- Wild nuts that taste or smell like almonds are EXTREMELY dangerous. They contain hydrogen cyanide.
- Wild fruits and berries can be checked for edibility in the following way:

1. Put a small amount of juice on your forearm and wait until it dries. If there is no burning, swelling or redness go to the next step.
2. Put a small amount of juice on the corner of your mouth and wait until it dries. If there is no burning or stinging go to the next step.
3. Put a small amount of juice on your tongue. If there is no burning or stinging go to the next step.
4. Eat a very small amount. (If you immediately feel sick or vomit, stop eating!) If no symptoms occur in 24 hours, the item MOST LIKELY is not poisonous.
5. Eat sparingly at first, and if symptoms still do not occur, proceed to eat as much as you like.

NOTE: This technique can be very dangerous. Many plants (Agave, to name one example) contain compounds that won't burn or tingle, but can be powerful emetics and/or laxatives. Others may be safe in small quantities, but can be dangerous when large amounts are eaten. Your best bet is to familiarize yourself with a few common plants for your area that can be eaten, and not rely on potentially dangerous methods such as the one listed above.

Animals

There are three main types of meat you can get in a survival situation: Insects, fish, and game. Here they are covered in that order; easiest to hardest.

All mammals and birds are edible. Some must be boiled or roasted until tender, though.

Do not eat dog/wolf liver, it contains high levels of vitamin A which can lead to hypervitaminosis and death.

Eating a long term diet of only rabbits can lead to "rabbit starvation" and death. Rabbits have no fat which your body needs.

Insects

In many places, insects are a staple of local diets. Some basic guidelines for insect eating:

- Avoid brightly colored insects.
- Avoid insects that bite or sting.
- Avoid fuzzy or hairy insects.
- Most worms and grub are good to eat. It helps to toast grub until they are dried.
- Some ants are good food. Dip a stick in water after letting it be coated by ants; repeat until you have enough.
- Before eating grasshoppers and crickets, remove their wings and legs. (They scratch on the way down.)
- Only eat fresh, healthy insects.
- Grasshoppers can contain tape worms, grab them behind the head and hold their body and pull out the stomach and intestines, and it is a good idea to line them up on a small stick and roast them on a rock by a fire.

Fish

Fish are easier to catch than wild game. It's best to go fishing in the morning and at dusk; just after sunrise and before sunset. In streams, look for deep still pools, undercut banks, and the areas around and behind sandbars. In lakes, bass gather around cover. Try areas around plantlife, sunken logs and boulders, docks, and areas around dropoffs and ledges. In the ocean, try reefs, points, deltas, and channels. Here I have listed some ways of catching fish, along with how to use these ways to catch various types of fish:

Common Types of Fish

Bass

: live in lakes and ponds. They like warm, clear, slow-moving water. They gather around cover (as mentioned above). A predatory fish, they like large worms, frogs, liver and other organs, crickets and grasshoppers, any meat, and crayfish. They average about 2-5 pounds. Bass weighing 8 pounds or more are uncommon, but not unheard of.

Catfish

: are bottom feeders living in lakes, ponds, channels, and slow-moving rivers. There are also saltwater species. They like deep water, and will eat anything strong and smelly, such as meat, organs, and cheese. They have even been caught using things such as bubblegum and cottonballs soaked in meat juices. They are also one of the only fishes that can caught by noodling [1]. For using a rod & reel, put bait and a heavy weight on the end of you line. Then, throw it out into the deep water at the middle of a lake. Let it sit there until a catfish comes across it. As for weight, they are usually around 2-5 pounds, though the biggest on record was 646 pounds!

Bluegill

: are small fish sometimes called panfish and bream. They are caught on either flies or live bait. They gather around underwater vegetation. The average weight is a pound or two.

Techniques

Rod & Reel

Using a rod & reel is one of the best ways to catch fish. You can use it in the normal fashion, or use the line and hooks to make "set lines." (See below.)

Nets

Nets, when properly placed, can provide a wealth of food. Lay one down in a creek with a line tied to each corner. Wait till fish swim over it, then lift it up. Also, try tying one under a waterfall. As fish pass over the falls, they get caught in the net. Also a "gill net" consists of thin strands of material making a "curtain". When fish take water in through their gills, they draw in the strands and suffocate.

Set Lines

Your time can be used more efficiently by setting many fixed lines from things such as tree branches overhanging water. This is the same technique used by trappers; rather than hunt one animal at a time, they set dozens of traps, increasing their odds of catching something.

Spearfishing

Fish can be harvested with a spear. To make an improvised fishspear: Find a long, strait pole or piece of bamboo. Wrap a piece of cord (tightly) around one end, about a foot from the end. Split the end of the pole evenly in half. The split will stop at your cord wrap. Sharpen the two points. You may also fire harden them.

To use it, stand perfectly still in waist deep water. If you have bait to spare, you may scatter some around you if you wish. Keep the spear-point in the water and move it VERY slowly towards a fish. When your point is a foot or so away from it, jab it sharply, pinning it to the bottom. Try to make the fish slip between the two points, wedging it. Wedging it is better than piercing it; stabbing it can mess up the meat. Now, reach down and grab it firmly; as long as it's still in the water, it can fight with amazing power. Throw it on the bank and continue fishing.

Fishtraps

You can construct fishtraps out of vines, bamboo, wire, or plastic jugs. As a rule, the time it would take you to construct a fish trap (if you could at all) is best spent on other things. However, I'll still include directions for their construction. To make a simple fishtrap from a large narrow-mouthed plastic jug: Cut the top few inches off of the jug, widening the hole just enough allow comfortable access for a fish. Then, cut the top third off of the jug. Invert the removed section, and stick it in the rest of the jug, creating a funnel. Secure it in this position. Put bait in the jug. Fish will be "funnelled" in towards the bait, but will be unable to exit. You are actually more likely to catch crawfish and lobsters than fish with this! The same design is used to make woven and wire traps. (If someone knows the exact way to weave traps, put it here!) Also, on a beach, you can build a fishtrap from logs and stones: When the tide is low, create an inland-facing halfcircle of logs and stones. The tide comes in, and the trap is submerged. When the tide goes out, fish a trapped in the halfcircle as the water level drops. They may then be picked up.

Fishing Poisons

There are some plants that deoxidise water (remove oxygen). When added to a small pool of still water, they cause fish to suffocate and float to the surface. Because you did not actually poison them, there is no danger when eating fish caught this way. (List of plants has yet to be added.)

Handfishing

With practice, you can actually catch fish by hand. When you catch catfish in this way, it is called noodling. (Catching catfish uses a special technique, not covered here.) To catch fish by hand: Find an undercut bank over still water. Laydown on your belly on the ground next to the water. Stick your hand in the water. Move very slowly and gingerly until you feel a fish. Work your hand under his belly. Grip firmly and lift him out.

This is kind of like spearfishing with your hand. It takes a lot of practice.

Older people have mentioned tickling the fish, then jamming your thumb into the gills for extra grip.

Next Step

Now that you have a fish (or several fish) you should scale and clean them. (Instructions for scaling and cleaning to be added.) You can eat the heart and liver. Save the other organs for bait. Cut open the stomach to see what the fish has been eating, so you can get an idea of what bait to use. If the stomach is empty, it means that the fish are very hungry, and will bite almost anything. You can put the head on a large hook and drop in the water to catch a snapping turtle. Scatter whatever is left in the water to attract other fish.

References

[1] http://en.wikipedia.org/wiki/Noodling

First Aid

Wilderness first aid is the provision of first aid under conditions where the arrival of emergency responders or the patient evacuation may be delayed due to constraints of terrain, weather, and available persons or equipment. It may be necessary to care for an injured person for several hours or days.

In the United States and United Kingdom, **Wilderness First Aid** (WFA) is the name of a certification in wilderness medicine that covers wilderness first aid; depending on the laws applicable where it is practiced, it may impose specific responsibilities and confer specific immunities on duly-diligent practitioners. For instance, the practicing of certain rules of WFA, by someone certified in the usual "street" First Aid discipline but not in WFA (or a higher Wilderness Medicine qualification), could result in civil liability or perhaps even criminal prosecution.

A classic problem is whether to leave an injured person or stay if only one person is ambulatory. Barring special circumstances, the injured one should be stabilized, placed in shelter, and marked in a way visible from the air (usually a single, long line of cut brush or trampled snow). Then the injured one should be left alone, while the other goes for help.

If there are three or more, the healthy group should be split into halves by speed, with the fastest going for help, and the others remaining to make the preparations. (In a party of four, it would be a rare hiker who would be better sent for help alone, rather than sent in a sub-party of two.)

Ensuring the rescuers can find the injured person is crucial. If a Emergency Position-Indicating Radio Beacon is available, it should be triggered and placed with the injured person. If enough help is available, air-visible markings may be worthwhile. Where surveyor's tape is available within the party (and assuming clear trails are available), it should be used by the sub-party going for help, to back up memory and notes with tape-flagging of the toward-the-injury-location choices of trail at intersections. (When an injury location is off clear trails, by distances that make it impractical to keep blazes of tape within sight of each other, forks in watercourses should be treated as substitutes for trail intersections.)

Training in wilderness first aid is available in the the US and UK. Any group of persons traveling in wilderness should have at least one person trained in wilderness first aid and carry a first aid kit designed for the area they are traveling in.

Nursing care is not part of normal first aid but is part of wilderness first aid.

Specific conditions

Exposure

Exposure, sometimes called *hypothermia*, is a normal hazard of temperate wilderness. It occurs when a person's core body temperature falls below 33.7C (92.6F). If a person is wet, in a mild wind, it can occur in less than an hour at temperatures as high as 15°C (59°F).

The basic early symptoms are uncontrollable shivering, stiffness and confusion. The conclusive evidence is a cool or cold stomach. If the hypothermia has not yet advanced to a critical stage, basic treatment is to warm the person in a sleeping bag. People with hypothermia may have such depressed metabolisms that they can no longer heat themselves. However, if the hypothermia has become severe - the victim is confused or unconscious - it is critical not to warm them suddenly. Evacuation would be the preferred option, with warming undertaken in a controlled medical environment. Sudden warming of a severely hypothermic person can send the heart into a fatal, irregular beating pattern or arrhythmia.

Heat syncope: heat exhaustion or sunstroke

Both maladies tend to occur during heavy exercise in high humidity, or with inadequate water. Some chronically ill persons enter these state normally.

The basic symptom of heat syncope is a body temperature above 40°C (104°F) with fainting, or weakness but **without mental confusion.** If unconsciousness, confusion or convulsions are present, it is **sunstroke** which is rarer, but far more severe condition, a true medical emergency.

Note that some authorities do not distinguish heat syncope from sunstroke, and treat heat syncope as sunstroke in order to be safe. All authorities recognize that these are stages in the same process.

Heat syncope is caused by mild overheating with inadequate water or salt. In young persons, it is far more common than true sunstroke. Blood pressure is lowered when the body dilates (widens) capillaries (small blood vessels) in the skin to radiate heat. Also, water is evaporated from the blood, reducing the blood's volume and therefore lowering blood pressure further. The result is less blood to the brain, causing light-headedness and fainting.

The basic treatment for heat syncope is to treat it like fainting: Have the victim sit, if sitting lay down, if laying down, raise legs. Then, administer water, and oral rehydration salt, slowly, and move the victim to a cooler area.

With sunstroke, cool the victim. Remove their clothing, shade them, fan them and sponge with cool water. Massage limbs vigorously to move cooled blood into the body cavity. Ice or alcohol can cause damage. Get help immediately. Sunstroke, especially when the victim has been unconscious, often causes major damage to body systems such as brain, kidney, liver, gastric tract. Unconsciousness for more than two hours usually leads to permanent disability.

Cramps

There are two basic causes of cramping. One is inadequate oxygenation of muscle, and the other is lack of water or salt. Cramps from poor oxygenation can be improved by rapid deep breathing, and stretching the muscle. Cramps from lack of salt and water can be treated by stretching the muscle, drinking water and eating salt. Pounding on the muscle can increase soreness.

What happens in a cramp is that lactic acid builds up because of normal anaerobic muscle metabolism. When the muscle burns sugar without enough oxygen, it makes lactic acid. The lactic acid finally becomes concentrated enough to trigger the contraction of the muscle. When the muscle lacks salt, the nerves firing the muscle are unable to recharge properly, causing a similar effect.

Insect and animal bite

Most animal bites should be considered as possible sources of infection, including rabies. Wash the wound, ideally with povidone iodine soap. Loosely bandage it, and do not suture it. Know the venomous animals in your area.

Animal bites by carnivores other than rodents should be considered possible cases of Rabies. If you are bitten, try to capture alive or kill the animal and preserve its head. Look for signs of Rabies (foaming mouth, self-mutilation, growling, jerky behavior, red eyes). If the animal lives for ten days and does not develop rabies, then no infection has probably occurred. The head can later be analyzed to detect the disease.

If the animal is gone, prophylactic Rabies treatment is recommended in most places. Certain places, such as Hawaii, are known not to have native Rabies. Treatment is generally available in North America, Britain and the Northern European states. Away from these areas, try to get to the nearest embassy of one of these states and indicate an acute medical emergency. The embassy doctor is usually willing and able to help.

Many snakebites, even by venomous snakes, are not envenomed, and these can be treated as animal bites. Croatilid (rattlesnake and pit-viper) venoms cause the bitten area to turn green or purple. Elapsid (coral and monay other non-U.S. snakes) venoms cause swollen lymph nodes. If symptoms appear, they should be treated by compressing and cooling the bite(many say the bite should not be cooled, http://www.fda.gov/fdac/features/995_snakes.html) and evacuating the victim, on a litter if possible. If a victim is unable to reach medical care within 30 minutes, a bandage, wrapped two to four inches above the bite, may help slow venom. The bandage should not cut off blood flow from a vein or artery. A good rule of thumb is to make the band loose enough that a finger can slip under it(American Red Cross, FDA/Office of Public Affairs:http://www.fda.gov/fdac/features/995_snakes.html). If available, antivenim should be administered. See below for phone numbers to locate antivenims.

The black widow spider, and some scorpions are dangerous mostly to small children and elderly adults. Only the Sydney funnel-web spider of Australia is frequently dangerous to adults, and it resides only within 100 miles of Sydney Australia. Treat as snake-bite. Antivenins are available in the U.S. for black widow spiders and the dangerous scorpions native to the U.S.

To locate antivenims, the Anti-venim index in Oklahoma City, Oklahoma, United States (1-405-271-5454) maintains a 24-hour hotline to help locate rare antivenims. Another possible number is the Poisondex central office in Denver, Colorado, USA (1-800-332-3073). In Australia, contact Commonwealth Serum Laboratories, Parkville, Victoria, Australia. In Asia try Haffkine Biopharmaceutical Corporation, Parel, Bombay, India. In Africa try the South African Institute for Medical Research, Johannesburg, Republic of South Africa. In most moderately developed countries, the national hospital can treat local venomous bites.

Anaphylactic shock

Insect bites as well as exposure to allergens can trigger anaphylaxis in some people. Anaphylaxis is a life-threatening medical emergency because of rapid constriction of the airway, often within minutes of onset. Call for help immediately. First aid for anaphylaxis consists of obtaining advanced medical care at once; rescue breathing (a skill that is part of Cardiopulmonary resuscitation, or CPR) is likely to be ineffective but should be attempted if the victim stops breathing. Look to see if a device such as an Epi-pen is available for administration of epinephrine by a layperson.

Altitude sickness

Altitude sickness can begin in susceptible people as low as 8,000ft. The early symptoms are drowsiness, feeling unwell, and weakness, especially during exercise. More severe symptoms are headache, poor sleep, persistent rapid pulse, nausea and sometimes vomiting, especially in children. More severe symptoms include pulmonary edema (fluid in the lungs- persistent coughing), confusion, psychosis, hallucination and death.

Victims can sometimes control mild altitude sickness by consciously taking ten to twelve rapid large breaths every five minutes. If overdone, this can blowoff too much carbon dioxide and cause tingling in the extremities of the body. The quickest cure is to reduce the victim's altitude if possible. Some mountain rescue groups carry acetazolamide (a prescription drug) to treat mountain sickness, injectable steroids to reduce pulmonary edema, and inflatable pressure vessels to relieve and evacuate severe mountain-sick persons.

Altitude acclimatization has two stages. Overnight, the body can adjust its carbonic acid balance, and substantially improve its performance. Over four to six weeks, the body can grow more blood cells, strengthen the heart and make other tissue changes. Above 18,000ft, further altitude exposure weakens one, rather than strengthening one's acclimation.

Wounds

Wounds with spurting, bright red blood require immediate pressure to stop the bleeding. If necessary, you may need to use your finger to push on the bleeding artery.

Follow this with a pressure bandage so you can rest, but make sure the wound is not continuing to bleed into the bandage. Oozing, slower wounds can be treated the same way, but it's reasonable to clean them first.

Antibiotic ointment, if available, is helpful if medical care is many hours away. It should be spread freely on wounds. Some authorities even advocate gently packing it into deep, dirty, slowly-bleeding wounds.

Some authorities believe that it is better not to change dressings, if the dressing change does not include good quality cleaning and debridement. Otherwise, dressings should be changed at least daily.

If sterile normal saline is available, it is useful for rinsing most dirt out of wounds.

Regardless of the severity of the wound, proper cleaning and disinfection is essential on longer stays in the wilderness where an evacuation is not deemed necessary or is not possible. Relatively harmless local infections at the wound site can quickly escalate into life-threatening systemic infections if proper care is not taken. Some WFA courses provide instruction on the proper administering of antibiotic drugs to help treat serious infections.

Sucking chest wounds

See open pneumothorax. A person with a penetrating chest wound is experiencing a life-threatening medical emergency and needs immediate access to advanced medical care and equipment to save their life. One standard first-aid treatment is to cover the wound with a pressure bandage made air-tight with petroleum jelly or clean plastic sheeting. It is important not to completely close off the opening. Leave a flap or corner open so that air does not build up in the lungs yet the patient can still breathe.

Fractures

Stabilize the break with splints, and move the injured party as little as possible unless they are certain to die from lack of shelter or care. The object is to prevent the bone from causing more injuries. If the skin is broken, treat it as a major wound.

Broken ribs are stabilized with tape. A person with a broken arm, collarbone or ribs can often be stabilized enough to walk out, however large amounts of pain indicate this is a bad idea. Waxed cardboard splints are inexpensive, very lightweight, quite waterproof and quite strong.

Toothache

The basic treatment is oil of cloves on packing in the sore tooth to reduce the pain. Systemic antibiotics and analgesic such as acetaminophen (paracetamol) or NSAIDs may also help if available. Although teeth may hurt terribly, most severe tooth infections simply result either in a dead tooth, or a tooth that falls out and are rarely life-threatening.

CPR (Cardio-Pulmonary Resuscitation)

CPR is often portrayed in movies and television as being highly effective in rususcitating a person who is not breathing and has no circulation. A 1996 study by the New England Journal of Medicine showed that CPR success rates in television shows was 75%. The reality is that CPR administered outside hospitals has a 2-15% success rate on its own, and is most importantly used to sustain oxygen supply to the brain *until specialized medical equipment and personel can reach the scene* (see defibrillator).

If you are performing CPR in the wilderness, you may want to stop:

1. when a competent health professional takes responsibility for the patient; or
2. when the rescuers are in danger.

External links

- Wilderness manuals: First aid [1] - U.S. Army manual.

Category:First aid

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[1] http://www.wildernessmanuals.com/manual_4/index.html

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