Health problems from unsafe water

PACE Action Sheet 11

What is this Action Sheet about?
This sheet is about the types of health problems that can come from drinking unsafe water, and what people can do about them. It can be difficult to know if water is safe or not. Some of the things that cause health problems are easily noticed by looking at, smelling or tasting the water. Others can only be found by testing the water with a special kit. Understanding what makes water unsafe and taking steps to protect water from contamination can prevent many problems from unsafe water.

What types of health problems come from drinking unsafe water?
- Diarrhoea diseases, like dysentery, cholera and typhoid
- Worm infections, like guinea worm and blood flukes (Schistomiasis, bilharzia)
- Poisoning by toxic chemicals

Diarrhea diseases
Diarrhoea, dysentery, cholera, and typhoid are caused by many kinds of germs carried by human waste, unsafe water, flies and insects, and on food. Diarrhoea can be a sign of some kinds of worm and parasite infections. These illnesses may also be caused by poor sanitation and a lack of enough water for personal cleanliness.

Signs of diarrhoea diseases
The most common sign of a diarrhoea disease is frequent, watery stools. It may be accompanied by fever, headache, trembling, chills, weakness, and vomiting. Because there are many causes of diarrhoea and dysentery, knowing what treatment to give depends on the kind of diarrhoea.

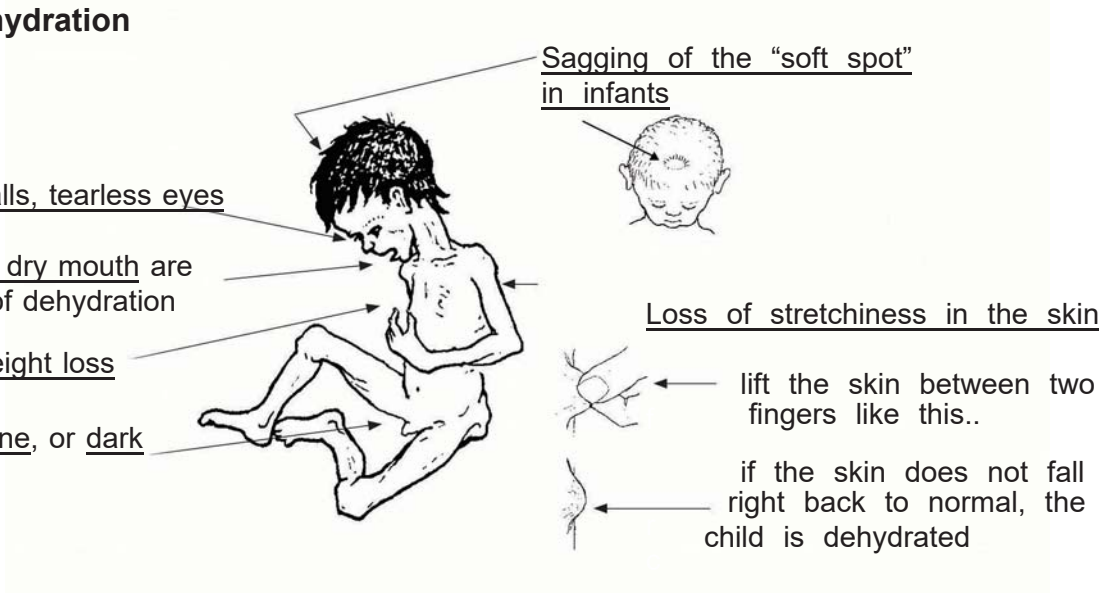
These signs can help you know which diarrhea disease a person has:
- **Cholera**: diarrhoea like rice water, severe intestinal pain and cramping, vomiting.
- **Typhoid**: fever, severe intestinal pain and cramping, headache, constipation or diarrhoea.
- **Giardia**: diarrhea looks greasy, floats and smells bad, gas and burps that smell like rotten eggs.
- **Bacterial dysentery (Shigella)**: bloody diarrhea, fever, severe intestinal pain and cramping.
- **Amebic dysentery**: bloody diarrhea, fever, severe intestinal pain and cramping.

Many people die from diarrhoea diseases, especially children.

Most children who die from diarrhoea die because they do not have enough water left in their bodies. This lack of water is called dehydration
People of any age can become dehydrated, but dehydration can happen very quickly to small children and is most dangerous for them.

Any child with watery diarrhoea is in danger of dehydration

Signs of dehydration



To stop dehydration

When a child has watery diarrhea or diarrhea and vomiting, do not wait for signs of dehydration. Act quickly. Give lots of liquids to drink, such as a thin cereal porridge or gruel, soup, water, or rehydration drink (see below). Keep giving food. As soon as the sick child (or adult) can eat food, give frequent feedings of foods she likes. To babies, keep giving breast milk often – and before other drinks.

Rehydration drink helps to prevent or to treat dehydration. It does not cure diarrhea, but may give enough time for the diarrhea to cure itself.

Below are two ways of making rehydration drink. If you can, add half a cup of fruit juice, coconut water, or mashed ripe banana to either drink. These contain potassium, a mineral which helps a sick person accept more food and drink. Give the child sips of this drink every 5 minutes, day and night, until he begins to urinate normally. A large person needs 3 or more litres a day. A small child usually needs at least 1 litre a day, or 1 glass for each watery stool. Keep giving the drink often, and in small sips. Even if the person vomits, not all of the drink will be vomited.

Method 1, made with powdered cereal and salt. Powdered rice is best but you can use finely ground maize, wheat flour, sorghum, or cooked and mashed potatoes. In 1 litre of clean WATER, put 8 heaped teaspoons of powdered CEREAL and 1/2 a level teaspoon of SALT. Boil for 5 - 7 minutes to form a liquid gruel, pap or watery porridge. Cool the drink quickly and begin to give it to the sick person. Caution. Taste the drink each time before you give it to make sure that it has not spoiled. Cereal drinks can spoil within a few hours in hot weather.

Method 2, made with sugar and salt. You can use raw, brown sugar or molasses instead of white sugar. In 1 litre of clean WATER, put 8 level teaspoons of sugar and 1/2 a level teaspoon of SALT. MIX well. Before adding the sugar, taste the drink and be sure it is less salty than tears.

WARNING: Take children to the health worker if they do not get better in 3 days OR show signs of: marked thirst, many watery stools, blood in the stools, fever, eating or drinking poorly, repeated vomiting.

What are the best treatments for diarrhea diseases?

Diarrhoea is best treated by giving plenty of liquids and food. In most cases, no medicine is needed.

These diarrhoea diseases need special treatment:

- Amebic dysentery may be best treated with antibiotics. To know which antibiotics to use, see a health worker or a general health book like Where There is No Doctor.
- Typhoid is best treated by antibiotics because it can last for weeks or months and cause death.
- Cholera is best treated with rehydration drink, lots of fluids, and easy-to-digest foods to replace nutrients lost through diarrhoea and vomiting. Antibiotics should only be used in the most severe cases.

If a person has bloody diarrhoea, or a high fever, or is very sick, they need to go to a health centre.

How can we prevent diarrhoea and dysentery in the first place?

Because most diarrhoea diseases are related to poor sanitation and hygiene, and contaminated water and food, they are best prevented by protecting water sources and improving sanitation.

- Do not use water from unprotected sources. (See Action Sheet 11)
- Make water safe to drink by filtering or treating it (see Action Sheets 24 to 25)
- Use clean toilets and wash hands after use. (See Action Sheet 27)
- Wash hands with soap and water before handling food. (See Action Sheet 28)
- Cook food well and protect food from germs
- Clean baby bottles and eating utensils with boiling water to kill germs
- Feed only breastmilk to babies for the first four to six months of life, when possible, and continue to breast feed for at least two years

A way to wash hands close to toilets can prevent many cases of diarrhea.

Worm infections

Some worms and other parasites (tiny animals) that live in surface water can get into people's intestines and cause diseases. The larger ones can be seen, but most cannot. Stepping into or washing with contaminated water, drinking this water, or eating uncooked shellfish or plants can pass these worms and parasites to people.

To prevent worm infections

- Reduce contact with contaminated water
- Keep animal waste out of water
- Use toilets and wash hands after use
- Cook food well and protect food from germs
- Trim fingernails and wash hands often
- Wear shoes to prevent worms from entering through the feet
- Settle, filter, and disinfect drinking water.

Guinea Worm

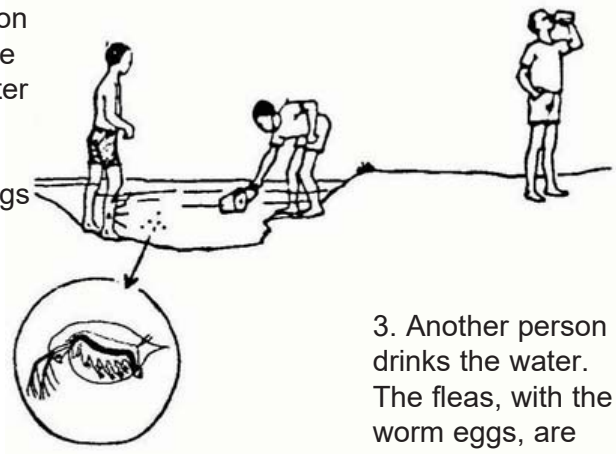
Guinea worm is a long, thin worm that lives under the skin and makes a painful sore on the body. The worm, which looks like a white thread, can be over a meter long. Guinea worm is found in parts of Africa, India, and the Middle East.

Signs of guinea worm:

- A painful swelling develops on the ankle, leg, or elsewhere on the body
- After a few days to a week a blister forms which soon bursts open and forms a sore. This often happens when standing in water or bathing. The end of a white thread-like guinea worm can be seen poking out of the sore. The worm works its way out of the body over the next week
- If the sore gets dirty and infected or if the worm is broken by trying to pull it out, the pain and swelling spread and walking becomes impossible

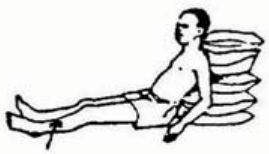
Guinea worm is spread from person to person like this -

1. An infected person with an open sore wades into a water hole. The worm pokes out of the sore and lays eggs in the water.



2. Tiny water-fleas eat the worm eggs.

3. Another person drinks the water. The fleas, with the worm eggs, are swallowed.



4. Some of the eggs develop slowly into worms under the person's skin. After a year, a sore forms when a worm breaks through the skin to lay eggs.

To treat guinea worms see a health worker or a general health book like *Where There is No Doctor.* In addition, measures should be taken to prevent new contact with worms.

To prevent guinea worms see Action Sheet 23: Making water safe for drinking and cooking.

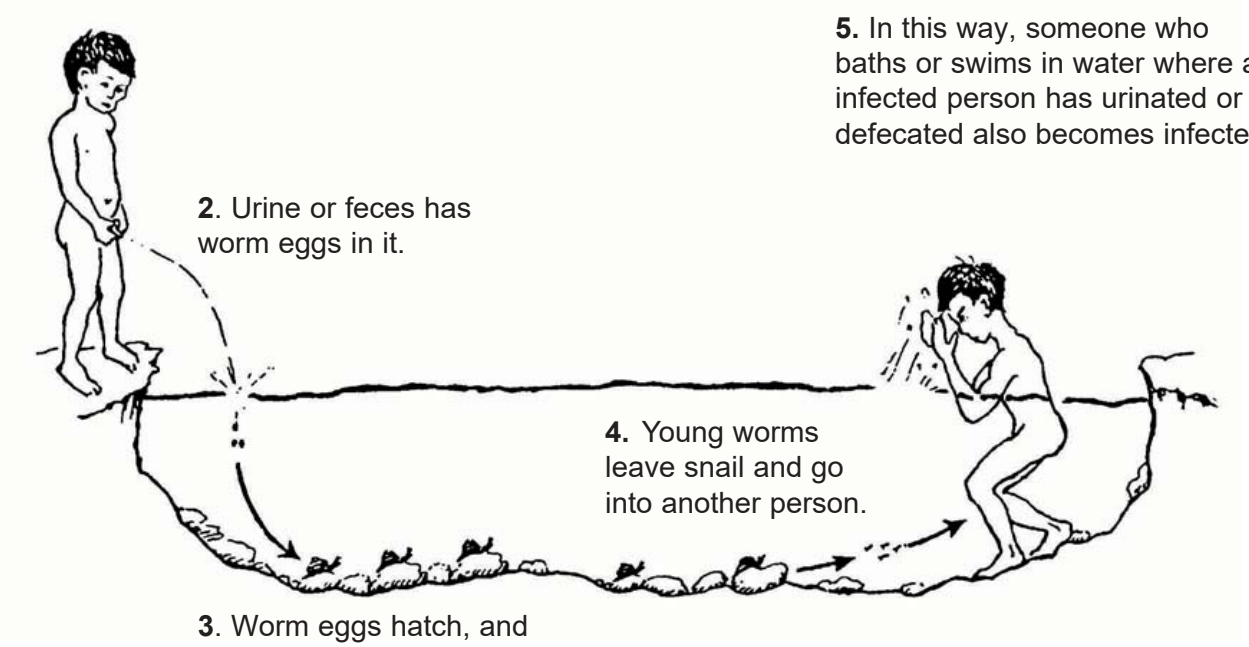
Blood flukes (Schistosomiasis, bilharzia)

This infection is caused by a kind of worm that gets into the bloodstream after washing or swimming in contaminated water. The illness can cause serious damage to the liver and kidneys, and may lead to death after months or years.

Sometimes there are no early signs. A common sign in some areas is blood in the urine or bloody stools. In areas where this illness is very common, people with only mild signs or belly pain should be tested.

Blood flukes spread like this:

1. Infected person urinates or defecates in water.



2. Urine or feces has worm eggs in it.

3. Worm eggs hatch, and the worms go into snails.

4. Young worms leave snail and go into another person.

5. In this way, someone who baths or swims in water where an infected person has urinated or defecated also becomes infected.

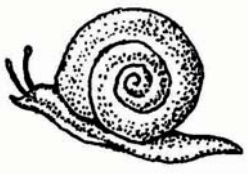
To treat blood flukes

Blood flukes are best treated with medicines. To know which medicines to use, see a health worker or a general health book like Where There is No Doctor.

To prevent blood flukes

Blood flukes do not spread directly from person to person. Part of their life they must live inside a certain kind of small water snail. To prevent schistosomiasis, programs can be established to kill these snails. These programs can only work if people follow the most basic preventive step -

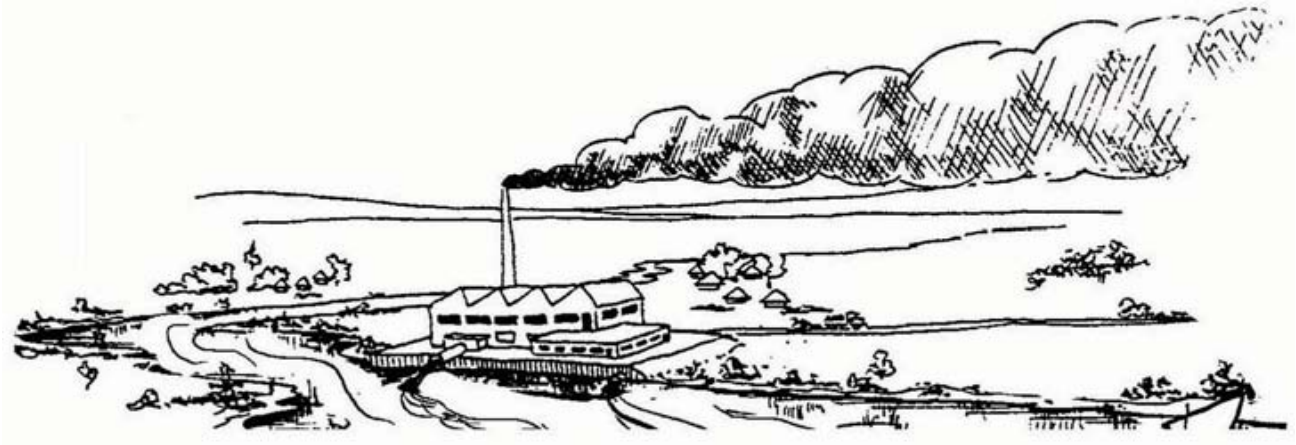
NEVER URINATE OR DEFECATE IN OR NEAR WATER.



Snail

Toxic chemicals in water

Factories that produce food products, textiles, plastics, pharmaceuticals, cosmetics, and pesticides all release chemical waste into water sources. This makes the water unsafe to drink or to use for bathing or irrigation. These chemicals are usually invisible and very difficult to detect.



Toxic chemicals can enter the water in many ways. The only way to know what chemicals are in the water is to test it at a laboratory. The only way to ensure that water is free of toxic chemicals is to prevent chemical contamination at the source. To prevent contamination from toxic chemicals:

- Factories should take responsibility for treating their wastes
- Industries like mining and oil drilling should not be done in places where water is at risk
- Governments should set standards to prevent industrial pollution of water sources and ensure that these standards are enforced
- Farmers who use pesticides and fertilizers should use them in limited amounts and ensure that these chemicals do not enter water sources
- People aware of chemicals entering waterways must report it and ensure action is taken.

How can we share this knowledge with the rest of the community? The sad story below and activity on the next page mayhelp raise awareness in your community -

Timothy's story

Njoki lived in the village of Luido in northern Inhambane province, Mozambique, with her young son Timothy. He was a happy and healthy child until recently.

In their village, water was pumped up from a deep tubewell. The well and pump had been built many years before by a development group. Once in a while a part of the pump would break, but one of the development workers always knew how to repair it or could buy a new part. But now the development workers are gone from the region. There is no one left who knows how to repair the pump, and there is no money for new parts.

When the pump broke again, Njoki's village had to rely on a water hole far from the village. The water hole, also used by many animals, was contaminated with worms, germs, and parasites. Timothy soon became very sick with severe, watery diarrhea. He became very weak and dehydrated. Njoki had no money to take her son to the health center many hours away. Within a few days, Timothy died.

But why? Building a chain of causes

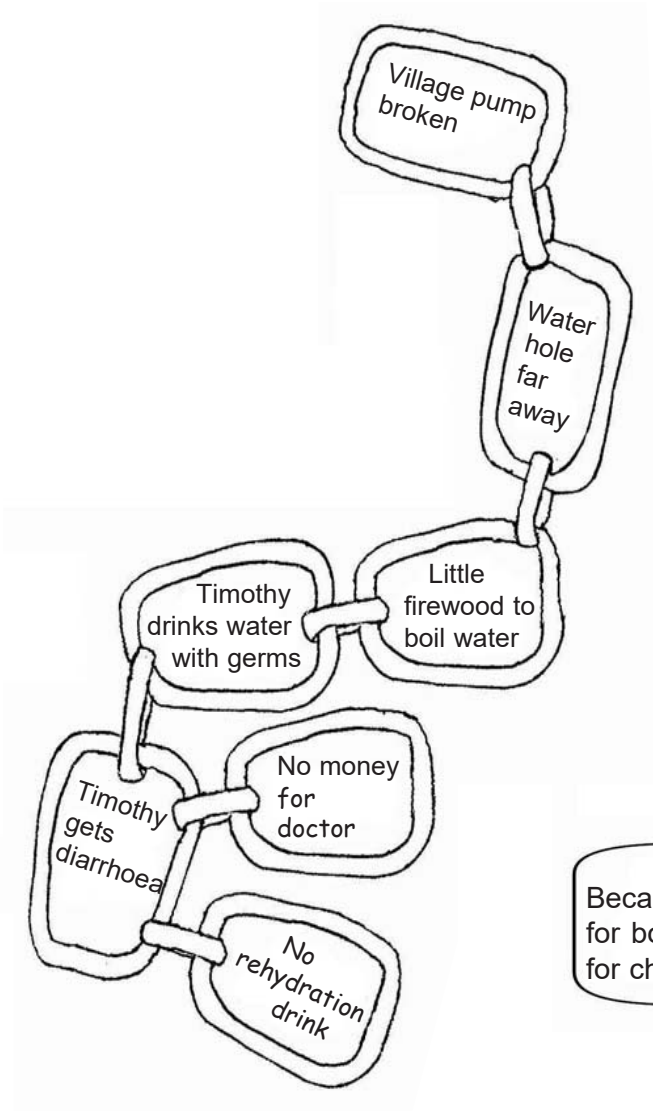
Why did Timothy die?

"But why?" is a question game that helps people recognize and build a chain of causes that lead to illness and death. In this activity, ask the group for ideas about what led to Timothy's death. Each time an answer is given, ask, "But why?", helping the group to explore as many causes as possible. For example:

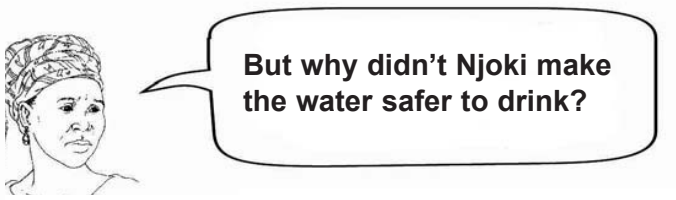
What caused Timothy's death? He died from diarrhea and dehydration.

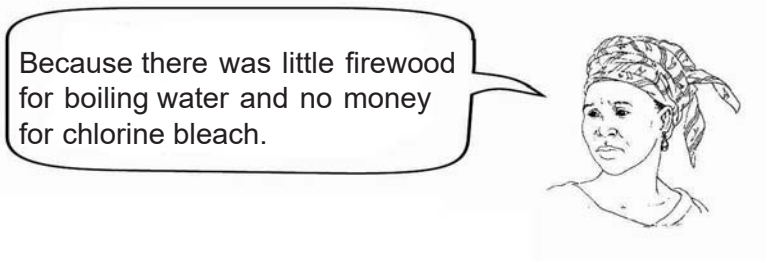
But why did he have diarrhoea? Because he did not have enough safe water to drink.

But why didn't Timothy's family have enough safe water? The village pump wasn't repaired.



Continue the "chain" until you run out of questions. You can also return to an earlier link and ask for more underlying causes. For example -



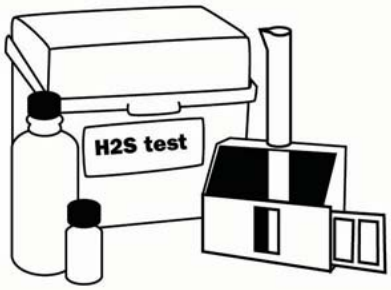


The "But why?" game continues as people contribute reasons for Timothy's death. A chain of causes drawn on paper or on a chalkboard, or made of cardboard or flannel, can be used to show the causes for Timothy's illness and death. For each reason given, another link is added to the chain. In this way, people can analyze the different causes of water insecurity.

How can water be tested for safety?

Testing water in a laboratory or with a water quality test kit can show the type and amount of contamination. Water testing may be done by professionals, who take samples of local water to a laboratory to test it. Laboratory testing is usually necessary to find chemical contamination. These tests are helpful, but can be costly.

Testing water for germs may be done locally using a test kit. One kind of test kit, called the H2S test, is widely used to test for germs in water. It is not costly (5 tests cost about 1 US dollar) and it gives quick results. But this test sometimes mistakes harmless living things for germs, and it does not show if chemicals or harmful parasite eggs are present. Another problem with this and other water quality tests is that they only show if the water is contaminated at the time and place the water sample is taken.



Water quality testing has many advantages and can be used successfully under some conditions. But it is not a replacement for a community water assessment plan, careful protection of water sources, and common sense.

What's the next step?

Once people in the community are aware of health problems from drinking unsafe water, the next step is to join together to assess the water supply where you live and develop a plan for community water security (See Action Sheet 12).

Acknowledgements

This Action Sheet was based closely on three publications - "Sanitation and Cleanliness for a Healthy Environment" and "Water for Life: Community Water Security", both created by the Hesperian Foundation for the UNDP, in cooperation with the Community Water Initiative partners, and part of a larger book by the Hesperian Foundation, A Community Guide to Environmental Health. Thirdly, Food, Water and Family Health: A Manual for Community Educators, 1994, World Health Organisation.

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Hesperian Foundation www.hesperian.org

WaterAid https://washmatters.wateraid.org/publications
World Health Organization (WHO) - Water, Sanitation and Health: www.who.int/water_sanitation_health/en

Sanitation and Cleanliness for a Healthy Environment, created by the Hesperian Foundation for the UNDP, in cooperation with the Community Water Initiative partners, part of a larger book by the Hesperian Foundation, A Community Guide to Environmental Health

Water for Life: Community Water Security, created by the Hesperian Foundation for the UNDP, in cooperation with the Community Water Initiative partners, part of a larger book by the Hesperian Foundation

A Community Guide to Environmental Health; Food, Water and Family Health A Manual for Community Educators, 1994, World Health Organisation

Where There Is No Doctor: A Village Healthcare Handbook, by David Werner, Carol Thuman and Jane Maxwell, Hesperian Foundation, Updated 2003

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