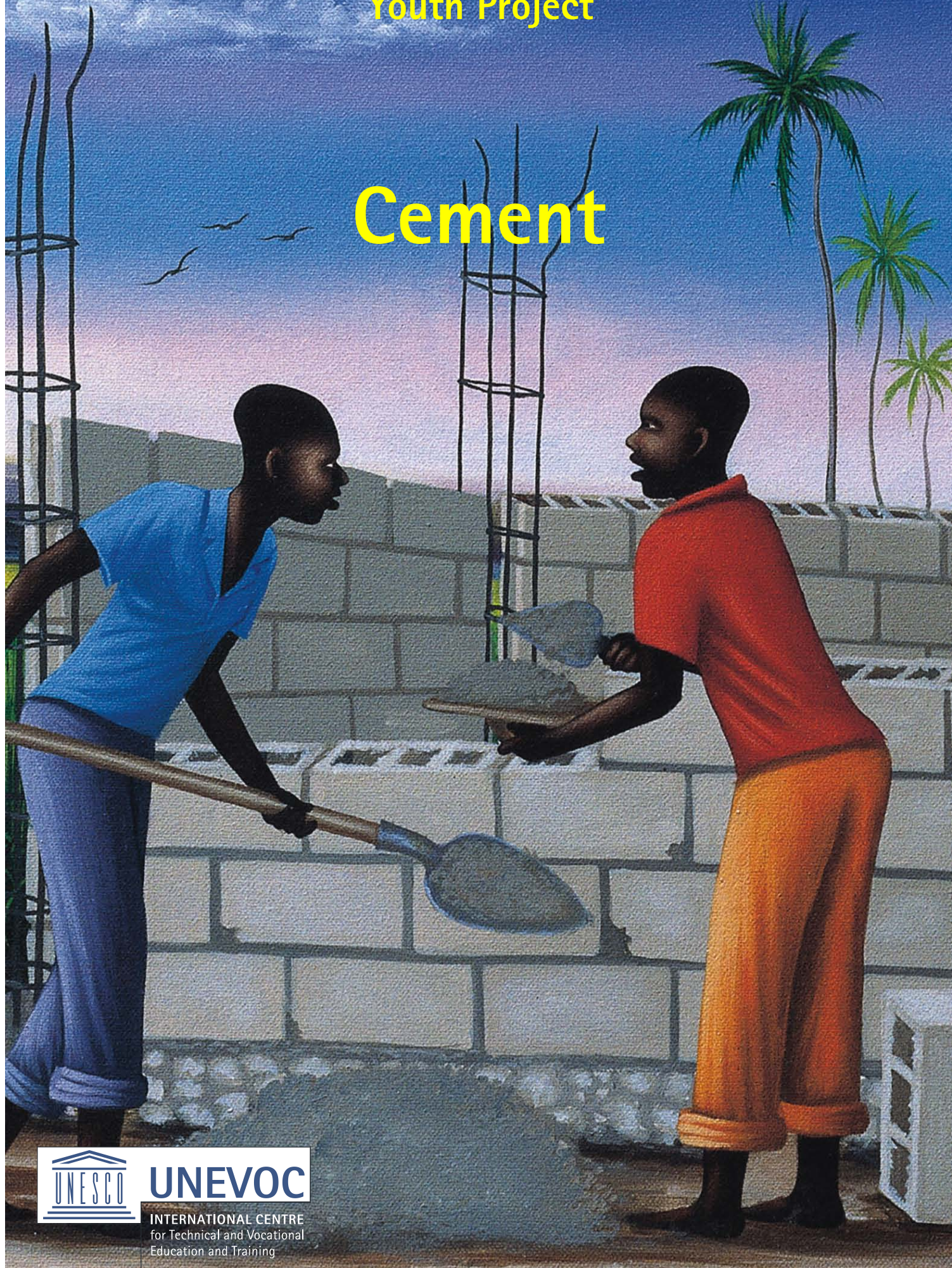


Global Action Programme on Education for All Youth Project

Cement



UNEVOC

INTERNATIONAL CENTRE
for Technical and Vocational
Education and Training

Learning and Working

Motivating for Skills Development: A Campaign Package

Version February 2006

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Booklet 7.04 – CEMENT

This booklet complements the video clip on “Cement” on DVD 1. It gives a short summary of the content of the video and contains illustrations followed by technical texts, which will make it easier to understand and recall the activities shown in the video. The booklet can be copied and handed out to participants, so that they can make notes on them or use them as a reference for later.

A transcript of the soundtrack of the video is included at the back of the booklet. Whenever the locally spoken language is different from the language used in the video, the facilitator may wish to use this text transcript as a basis for comments and explanations in the local language.

Comments and Observations

This video shows different techniques of construction work. Construction work is important for improving the living conditions in the countryside and high density areas. Learning these skills and techniques does not only provide the individual with income-earning skills, but is also an opportunity for small communities to help themselves to improve their living conditions without much money.

Video CEMENT: Summary

This video summarizes recommendations on how to use cement to build a house.

For the roof, it is better to use tiles of vibrated cement than corrugated metal sheet. Vibrated cement insulates better and does not rust.

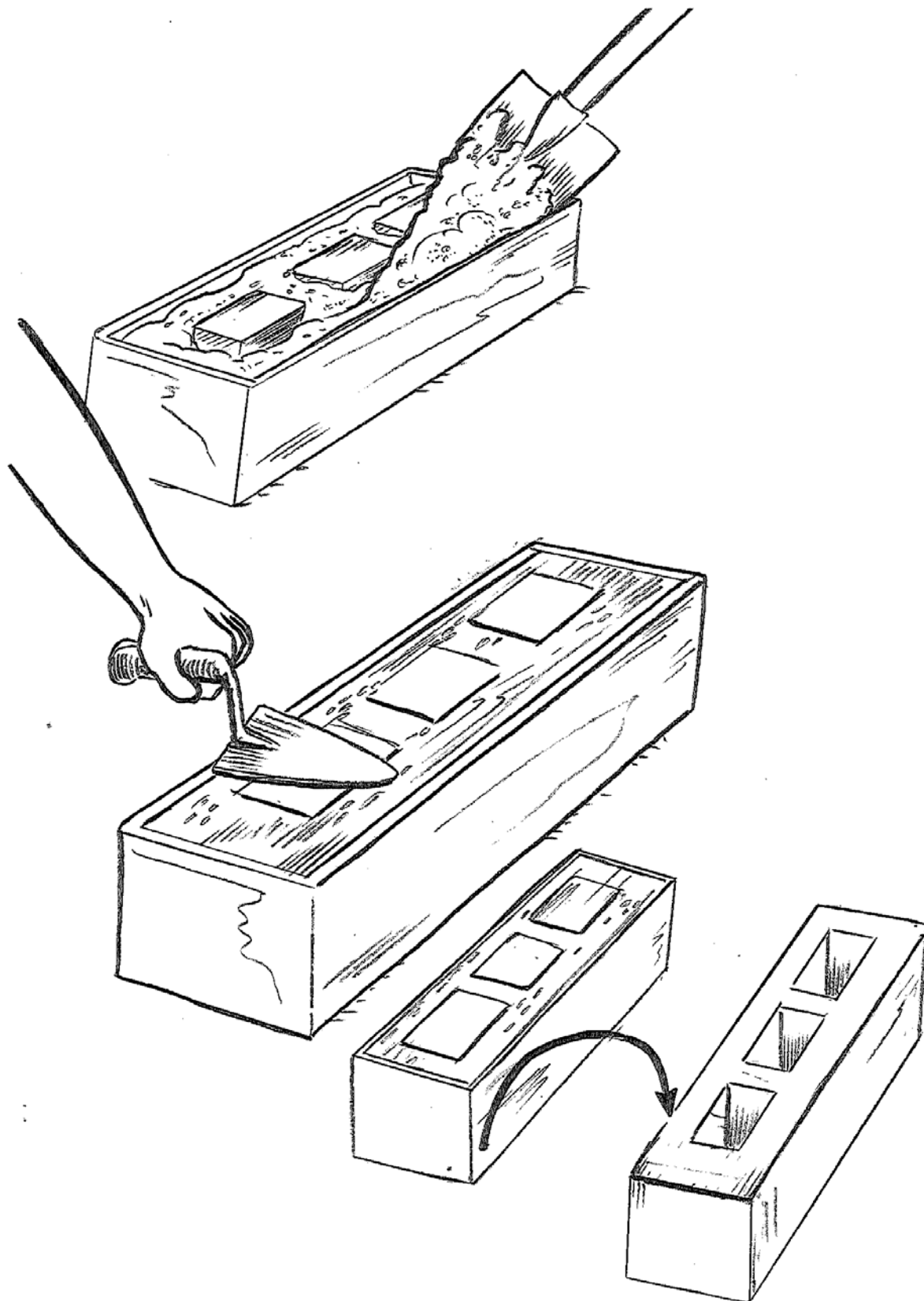
For the walls of houses, perforated concrete blocks are used.



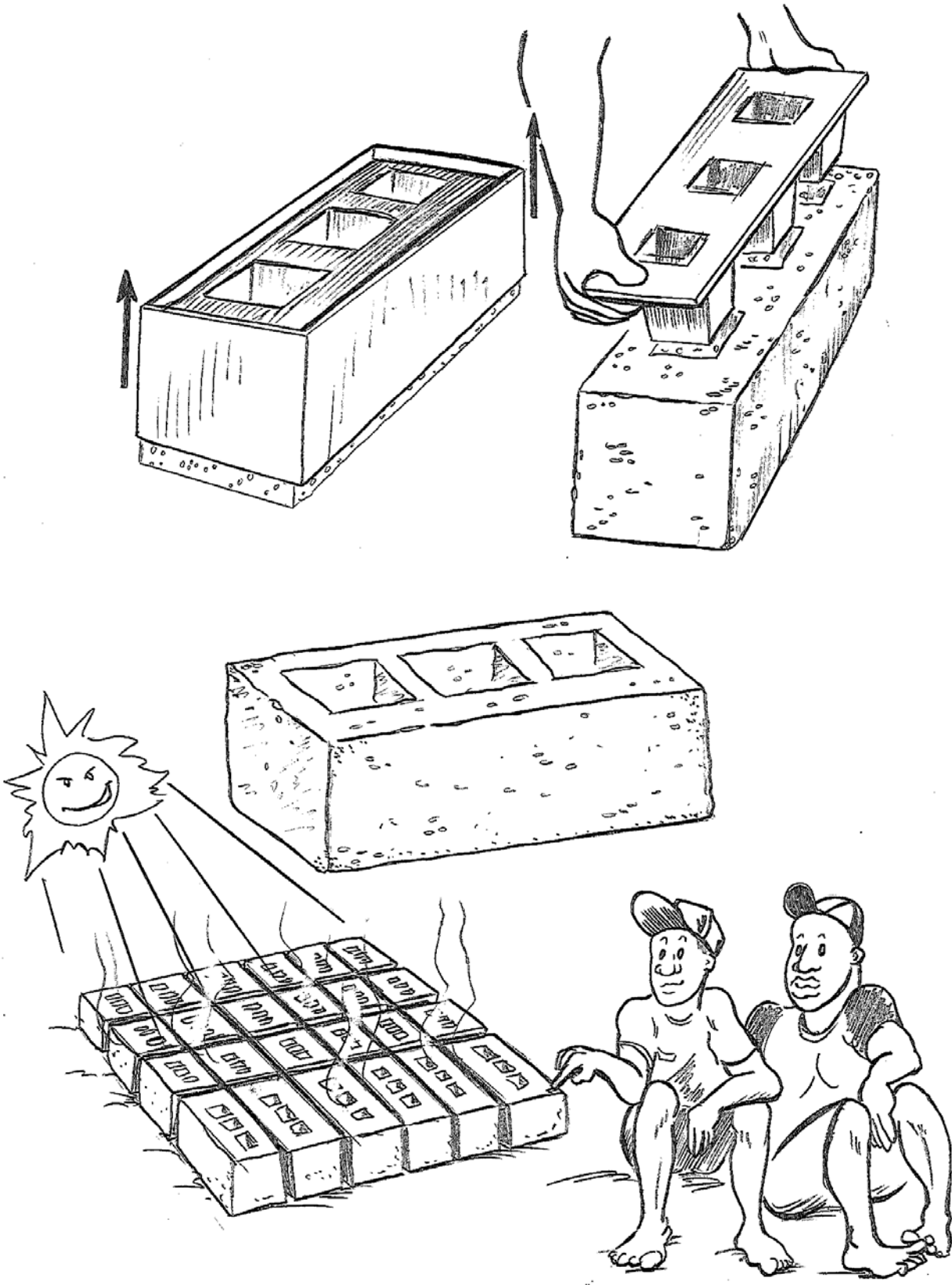
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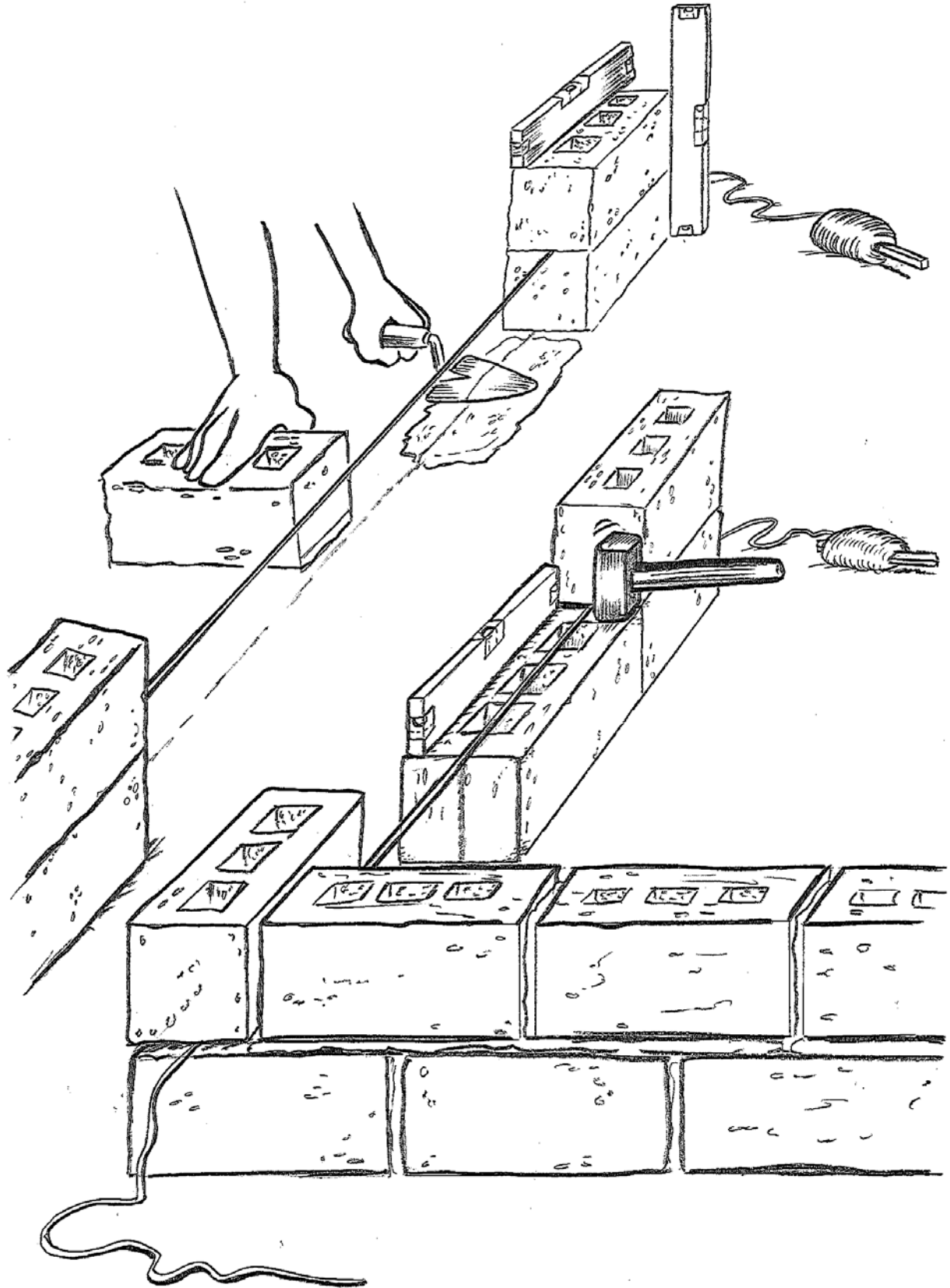
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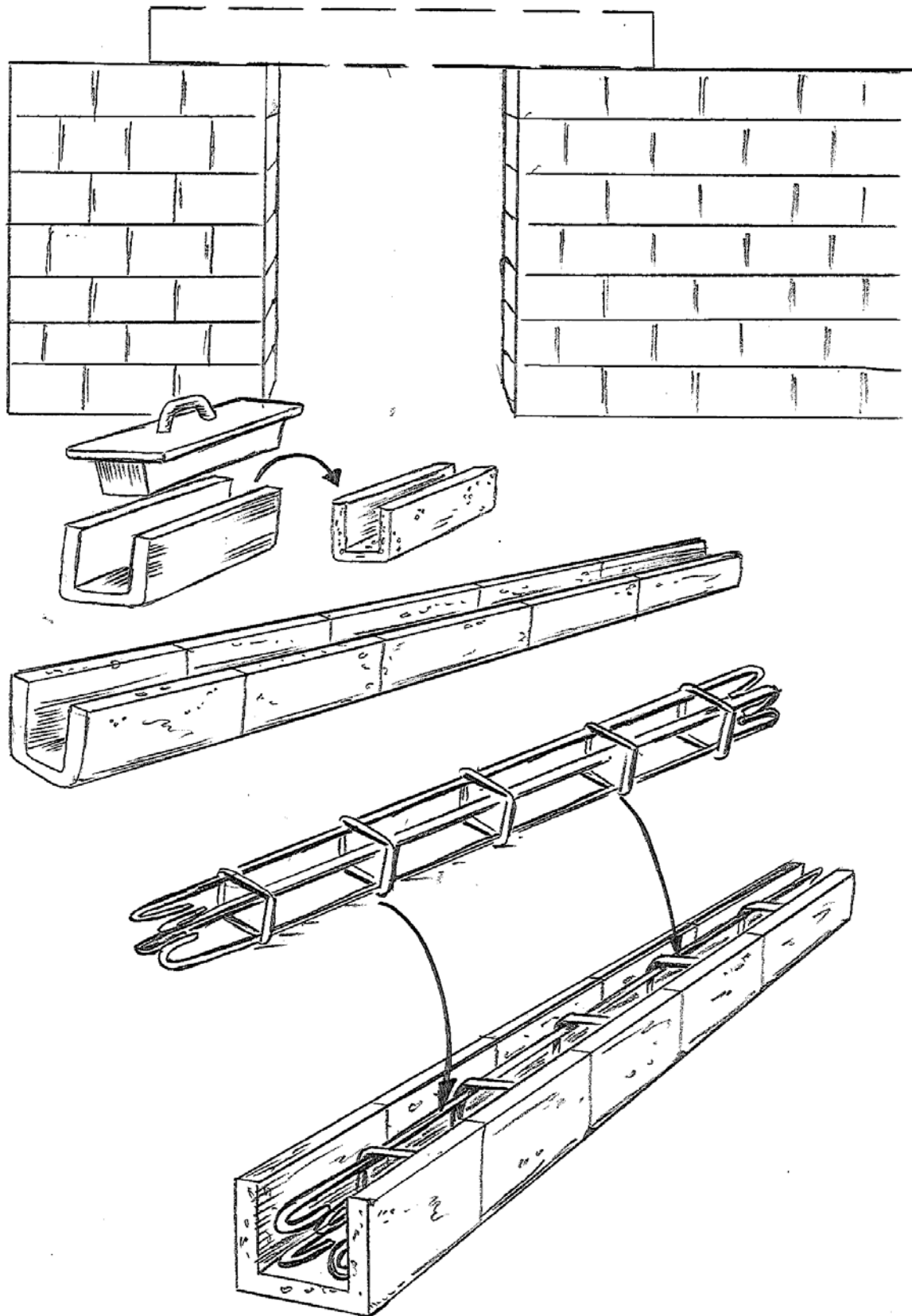
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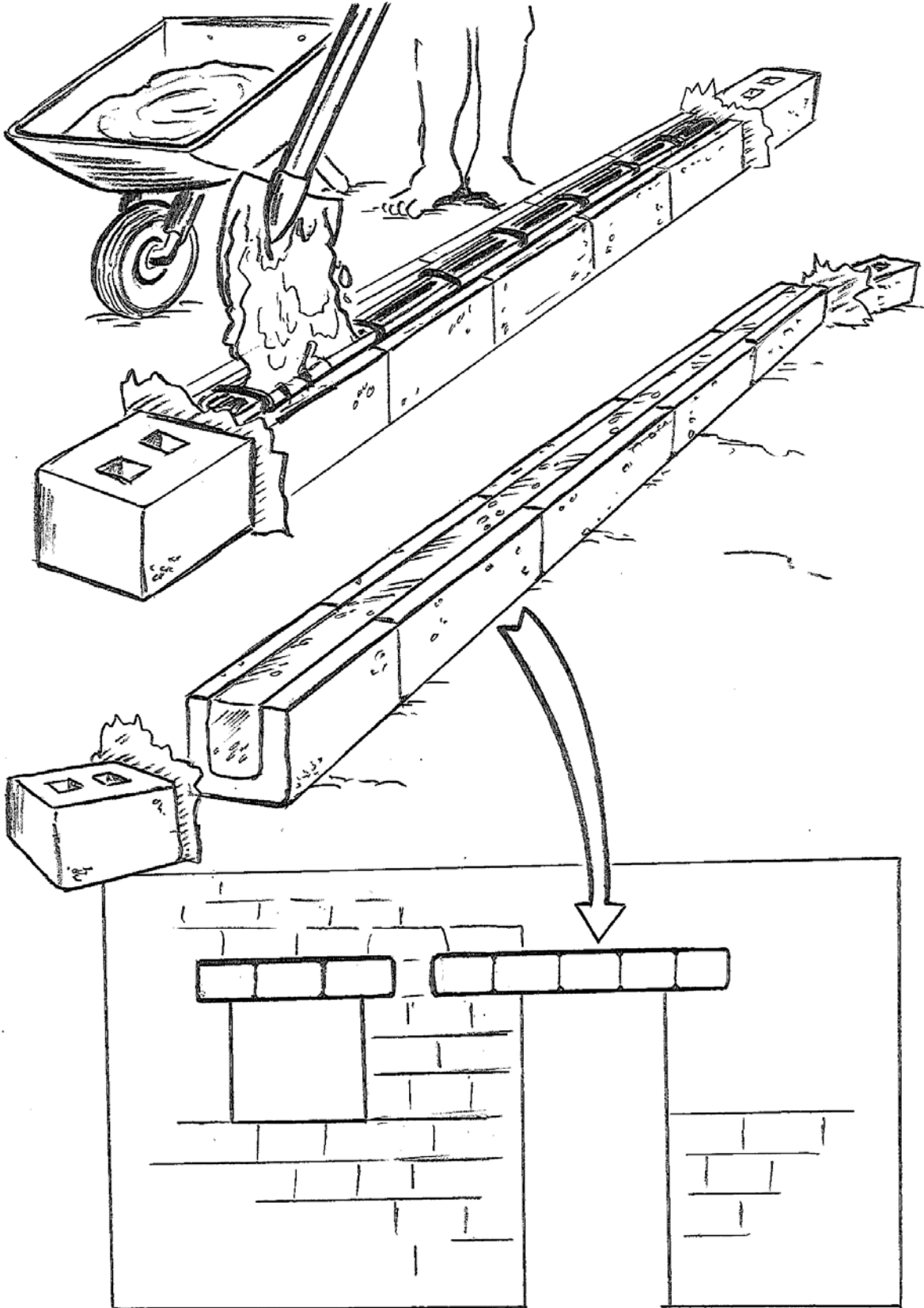
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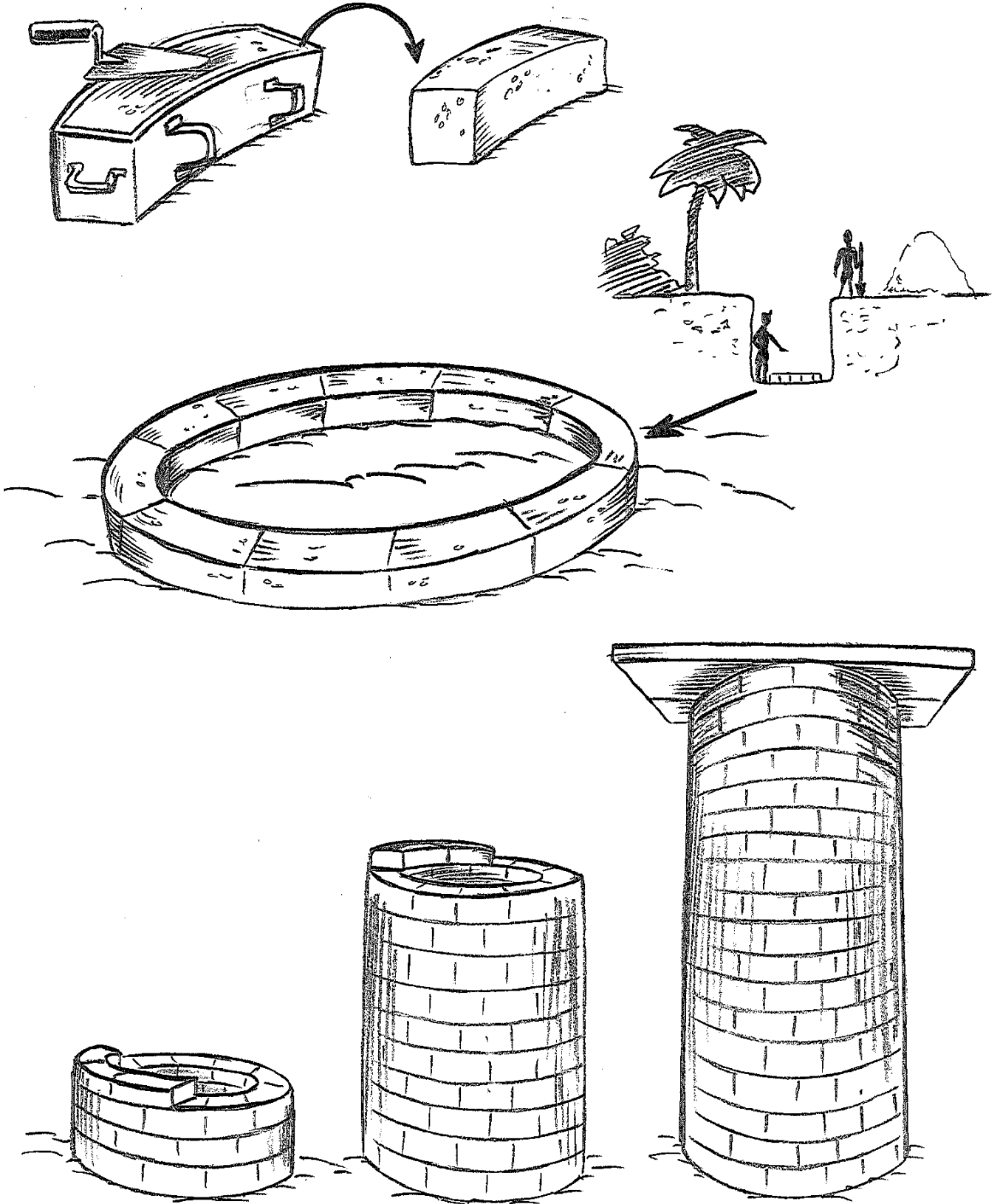
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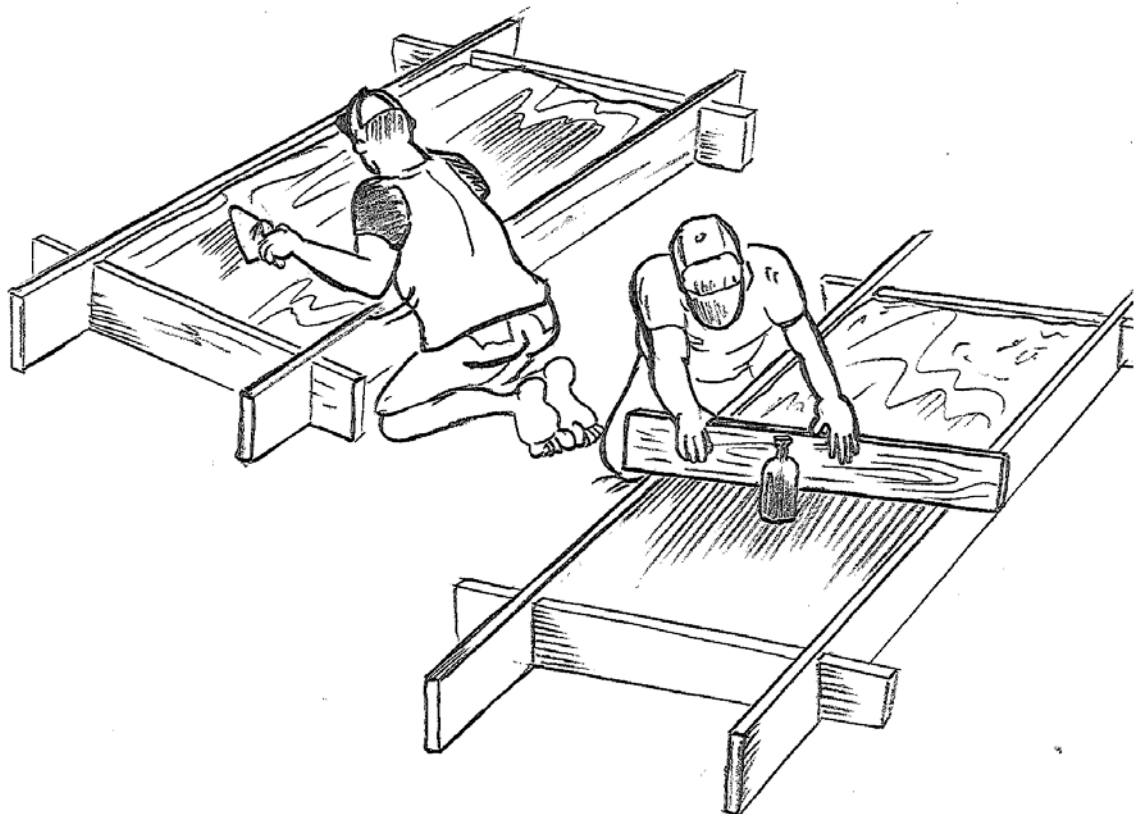
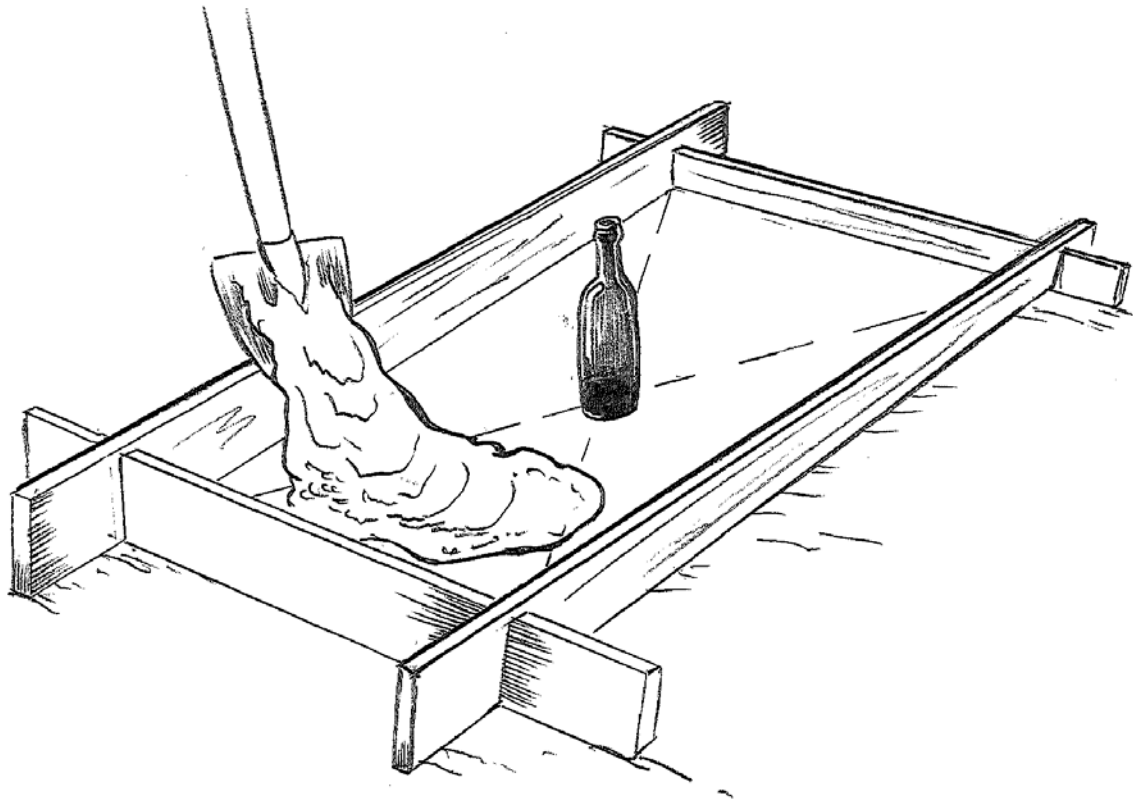
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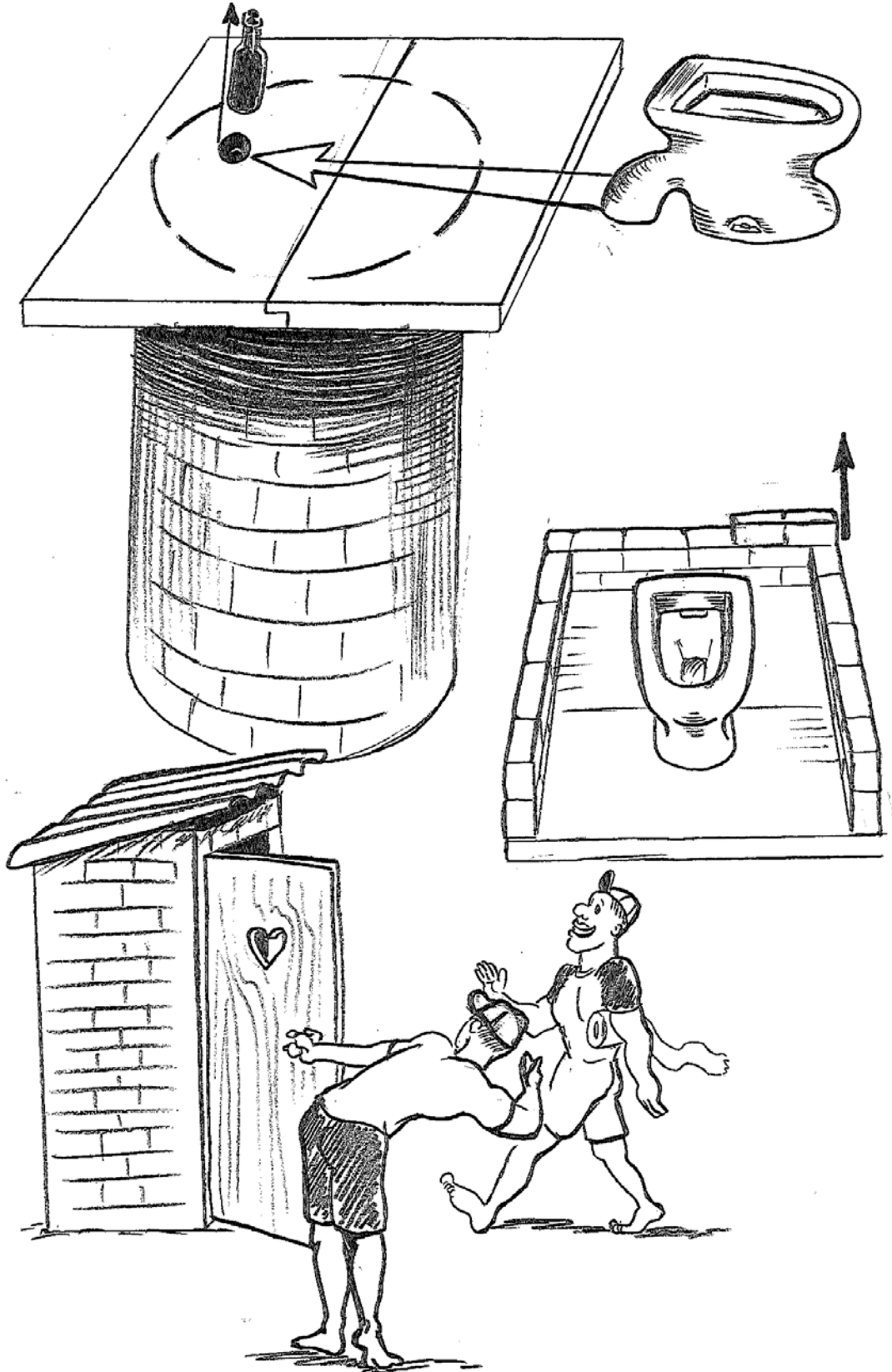
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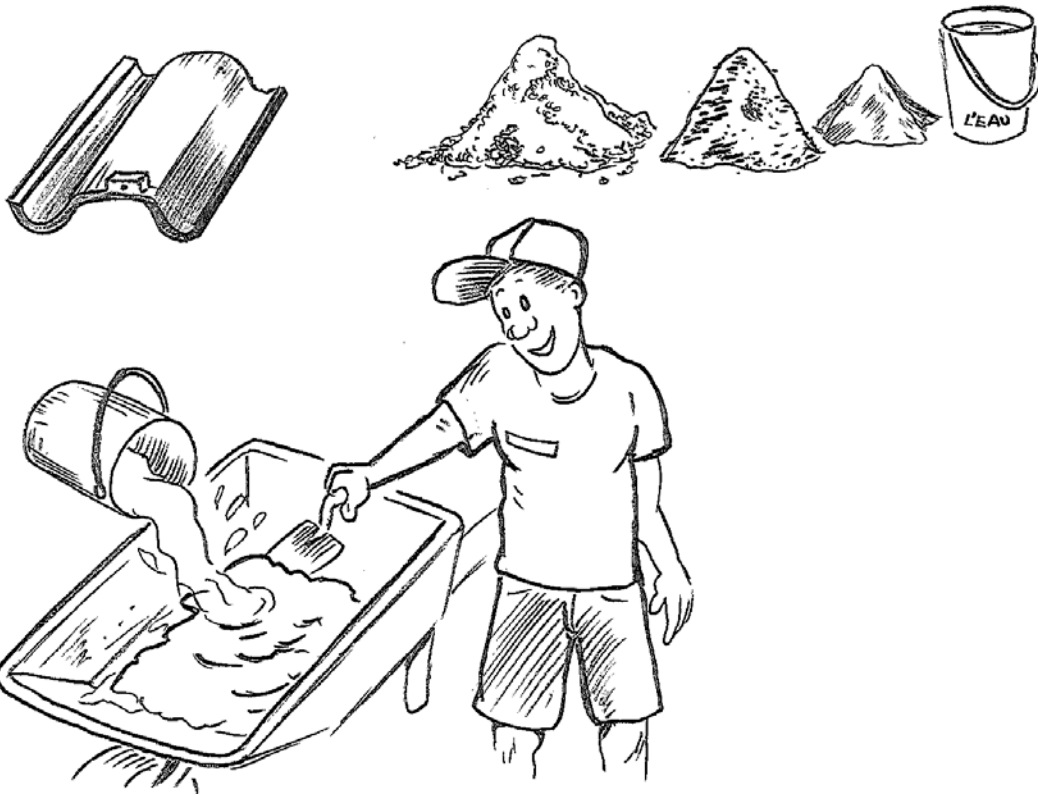
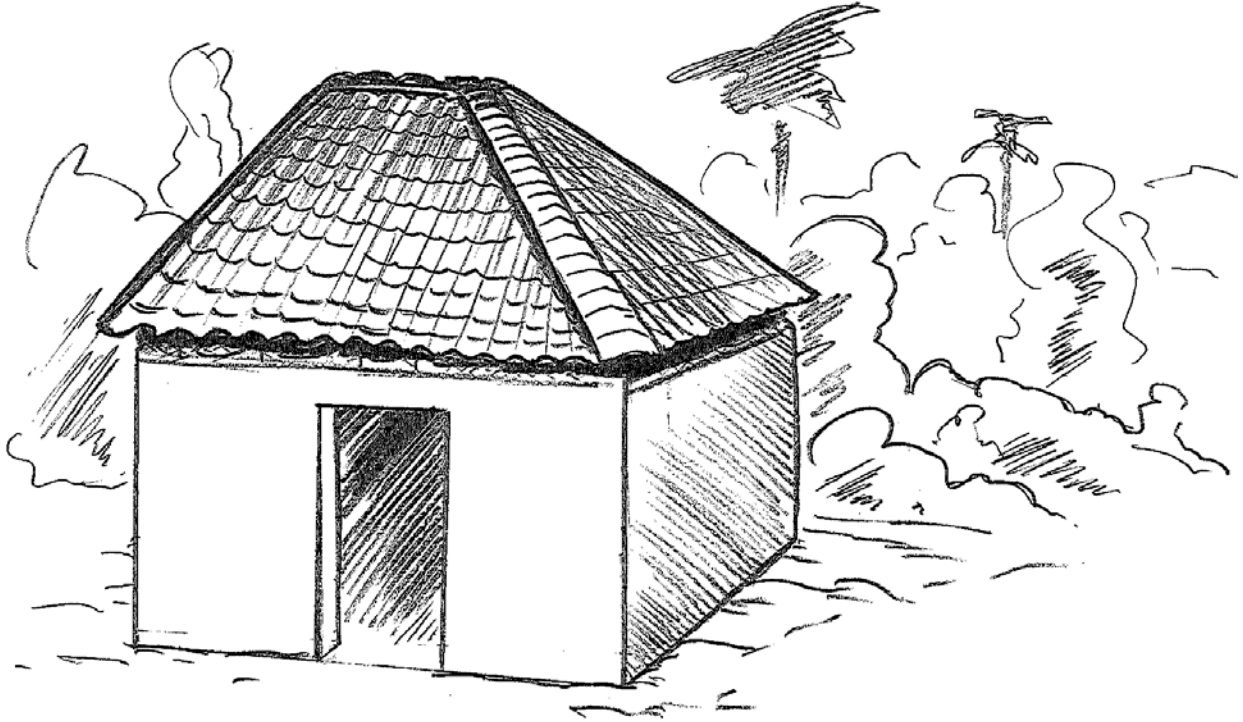
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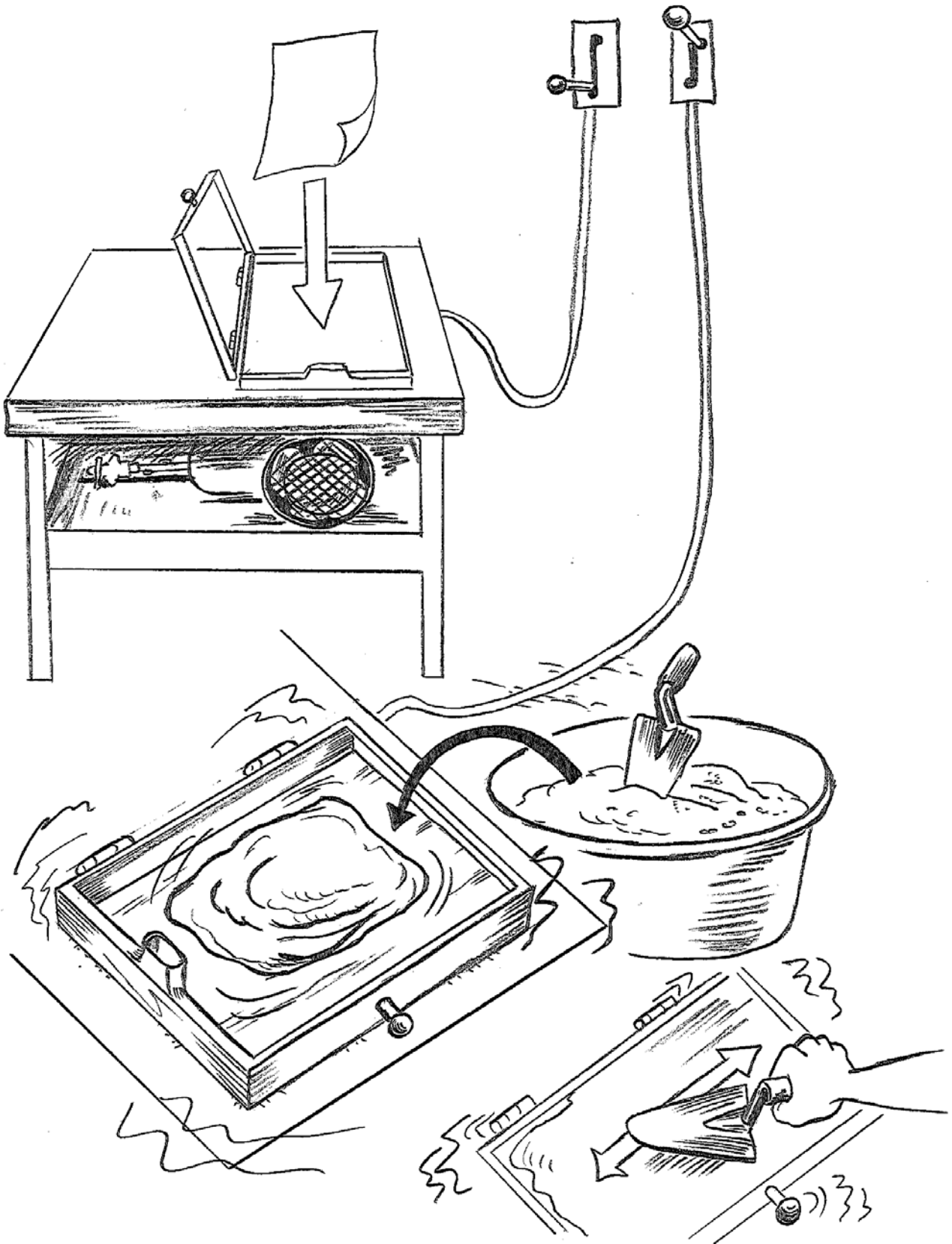
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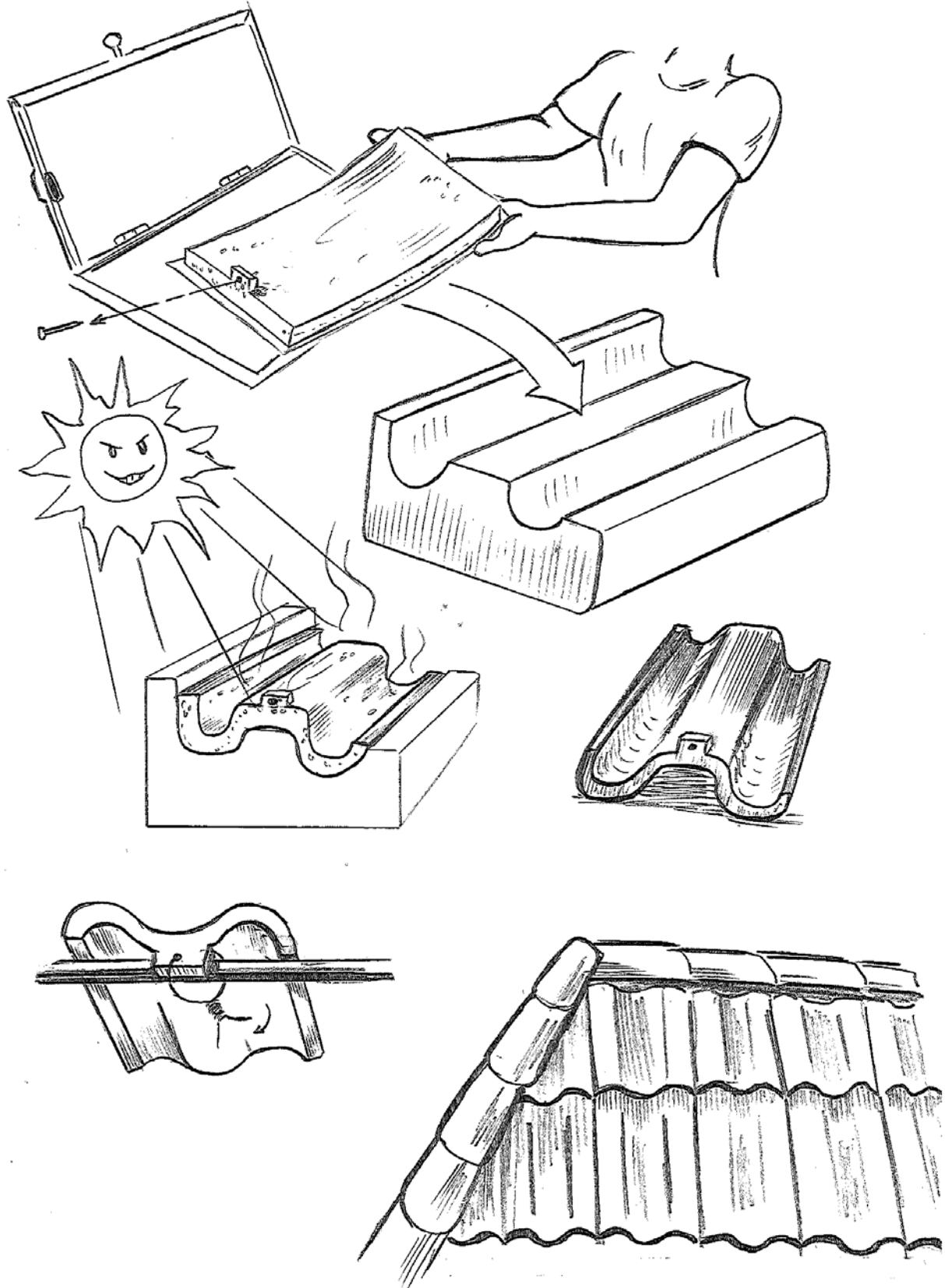
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Video CEMENT: Technical Information

Mixing the concrete to make solid blocks

Mix unrefined sand with cement and water and press the blend into a block mould. Make sure that the concrete is compacted so that the blocks get sturdy.

Different types of cement blocks

Modify the shape of the mould, depending on its specific use, for example, ensuring ventilation of a house, for making windows, or for making decorative walls.

Tools for building a wall

A string, a hammer, a trowel, a spirit level and the cement.

The building

The cement fixes the blocks in the right place. With the string, it is possible to place the blocks well and to determine their exact position. This technique allows you to build straight walls as well as corners.

Building a lintel with cement

Line up the moulds and put a metallic structure inside. Pour the cement mix into the moulds so that the metallic structure is covered, thus becoming a strong cover for the metallic structure, and a lintel for the window.

Building latrines

120 rounded blocks are required to make a trench for the latrine. Two stones - a platform - to place the WC.

To avoid the concrete from sticking, coat the moulds with oil. Put a bottle in the middle of one of the moulds so to keep some space for the draining pipe used to evacuate the tank. Mix carefully the sand and the cement. Distribute the mix above and under the metallic structure. When the concrete platforms have dried, remove the bottle.

Making the tank

120 rounded blocks are required. They are arranged in circles one on top of the other. The platform with the WC is placed on top of the tank.

The tile of vibrated cement

Make a mix of two quarters of unrefined sand, one quarter of fine sand and a quarter of cement. Put a plastic sheet on a "vibrating plate". Then, place a metallic frame on the plastic. Pour the mix into the frame, spread it over the surface and switch the motor on.

The surfaces must be smooth. On top, form a small square-shaped concrete hook. Then, put the vibrated cement into a shape in which the rainwater can run off the finished tile. Pierce a small hole into the concrete hook stopping.

Finally, soak the tiles in a bowl for a week to prevent them from cracking.

Video CEMENT: Text of Soundtrack

Traditional houses in Haiti, such as those built in wood and mud are not weatherproof and lack comfort. Gradually, the demand for housing made out of cement blocks is growing, even in poorest areas. Cement blocks can be quickly made with the appropriate tools. You just have to mix unrefined sand with cement and water and pack down the mixture into a block mould. Make sure that the mixture is compact, so as to obtain solid blocks.

Apart from these standard blocks, other kinds can be created by modifying the shape of the mould. Each kind of block has a specific use, for example, ensuring the ventilation of a house, creating windows, or making decorative walls.

The tools needed for this work are a string, a hammer, a trowel, and a spirit level. And of course you need cement.

The cement serves to fix the blocks in place. At each stage the workman has to check the stability, symmetry, and precision of his work.

The string means you can place the blocks and ensure their exact position.

Thanks to this technique, it is possible to build both straight walls and corners.

The cement lintels allow for more solid window frames, thereby saving on precious and scarce wood.

To make a lintel, hollow moulds are lined up and a metal structure placed inside.

The cement mix is then put into the moulds, covering the metal structure, and left to dry.

When dry, the cement blocks are solid and stuck together, creating a strong cover for the metal bar and a frame for the window.

In overcrowded neighbourhoods, such as Bayacou in Port-au-Prince, the installation of latrines is a matter of necessity. Pierre Bienaimé, in charge of construction, orders curved blocks of cement to

construct an evacuation well for some latrines. He shows the place chosen by the families who are to use the latrines. It is they who will dig the hole for the well.

The latrine bowl will be placed on a platform made of two slabs of concrete. To make these slabs, Pierre prepares a structure of metal wires. This fixes the cement inside the mould.

To prevent the cement from sticking, the two moulds are covered in oil.

A bottle is placed at the centre of one of the moulds, so as to create the necessary space for an evacuation tube from the bowl to the well.

Pierre carefully mixes the concrete made up of white sand, unrefined sand and cement.

He checks the consistency and makes sure that the mixture is not too liquid.

This mix is then spread out into the mould, onto and under the metal structure. It is worked in to remove any air bubbles.

Pierre pats the mix with a piece of wood and smoothes the surface of the concrete. The next day the slabs are ready and Pierre can lift out the bottle and take off the mould. He shows everyone how the bowl will be laid.

The 120 curved blocks of cement, which are needed for making the latrine well, are also ready. The men of the area begin to place them one on top of the other.

Step by step, the well is built. The blocks are not cemented together, so the liquid can drain through them. Only solid waste remains in the well, which can be emptied once a year. The platform with the lavatory can be placed on top of the well. And that's it - the latrines are ready. You only need a gallon of water, or three litres, to clean them.

Corrugated iron, although useful, does not protect houses properly. Often used for roofing, it does not weather very well, particularly in the wind.

An alternative exists in the shape of tiles made out of vibrated concrete. These are light, strong, and cheap to make. These tiles are made in Cayes Jacmel. The mixture for this tile is made out of two quarters of unrefined sand, a quarter of fine sand and the last quarter of cement.

Paul C. places a plastic sheet on a vibrating plaque. A metal frame is then placed on this plastic. He puts his mixture into the frame and spreads it evenly on the surface. He then starts up the machine. The vibrating machine works with an irregular jerking movement.

Its vibrations shake the mixture and make it compact. The surfaces have to be smooth, particularly the surface touching the plastic.

A small square shaped hook in cement is placed at the top near the edge of the tile to allow it to be hooked to the roof beams.

Paul then lays his vibrated concrete onto a purpose built shape that will help the rainwater to run off of it. He pierces a small hole in the cement hook to pass the attached wire through.

After a night on the shape, the tiles are then soaked in a tub for a week, which strengthens them and prevents them from cracking.

Paul can also add colouring of different shades - green, red and yellow - to brighten up the tiles, embellishing and also protecting the houses of the region.

Further Notes

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The Campaign Package

This Campaign Package has been developed and provided by the UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training, Bonn, Germany. Its purpose is to facilitate the organisation of campaigns for mobilisation and motivation of young people, and for providing them with vocational orientation and guidance. The focus is on marginalised youth in the informal sector of least developed countries.

The package consists of eight components.

The current pilot version is being provided in English only. It will be evaluated in the field. Depending on the feedback that UNESCO-UNEVOC will receive, the package will be developed further.

The activities presented in this Campaign Package are not a guarantee of monetary success. The content is based on research, examples and advice from experts. Every attempt was made to ensure accuracy, and neither the authors nor the UNESCO-UNEVOC International Centre can be held responsible for incorrect information or changing circumstances.

UNESCO-UNEVOC International Centre

Hermann-Ehlers-Str. 10
53113 Bonn
Germany

unevoc@unesco.org
www.unesco.org/unevoc
www.unevoc.unesco.org/learning+working

Authors:

Yael Eichner, Astrid Hollander, Sharon Kirabo-Steffens, Hans Kröner

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Booklets accompanying the Video Series "Learning and Working"

The video series was filmed in Haiti. We would like to express our special gratitude to the people of Haiti.

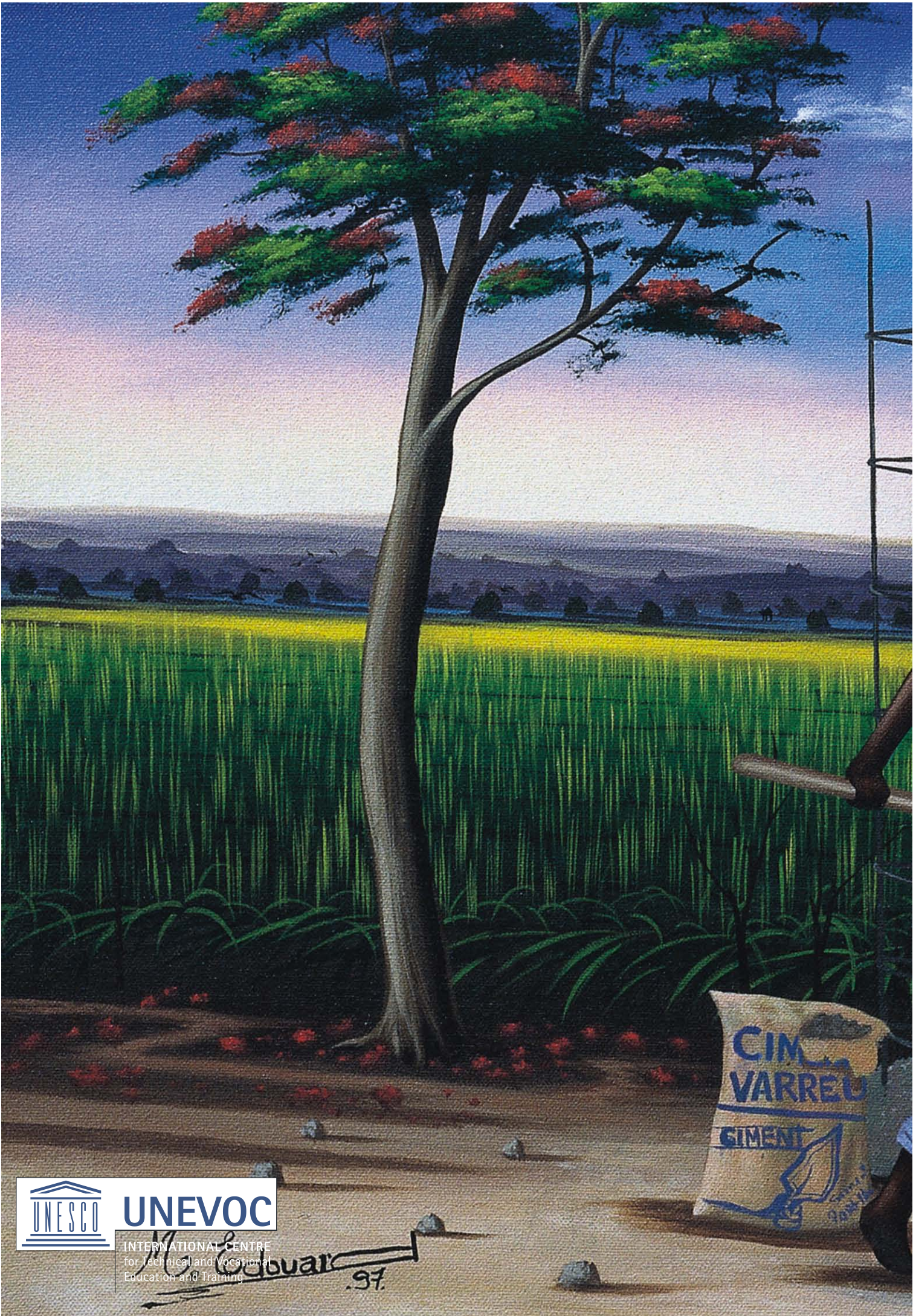
Coordination: Martina and Jean-Claude Ramigé

Text: Martina Ramigé, UNESCO

Paintings: Edouard Michelet

Graphics: Stefan Nowak, Martin Warnke

Layout: Yael Eichner, Till Heeg, Astrid Hollander, Ramigé Film Production



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M. Sedouar
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