



# HOW TO GET MORE GOLD



PHOTO: R. BAKER



**Global Mercury Project**



**Less Mercury, More Gold and Better Health**

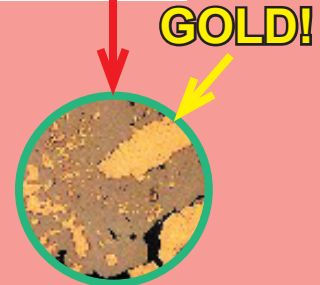
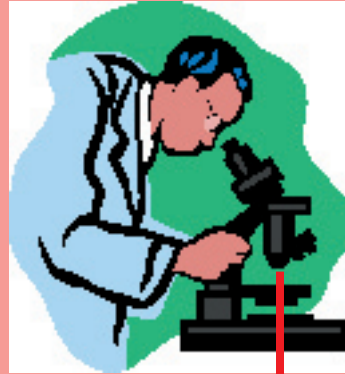




## STEP 1

UNDERSTAND  
THE TYPE AND  
SIZES OF THE  
MINERALS IN  
THE ROCKS

TYPE AND SIZE  
DETERMINE HOW TO  
GET THE GOLD OUT OF  
THE ROCK

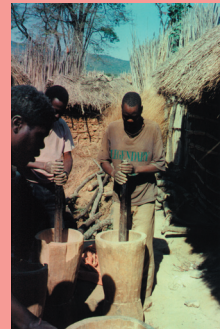


# GET THE MOST

## STEP 2

TEST HOW  
MUCH GOLD  
CAN BE  
BROKEN FROM  
INSIDE THE  
ROCK

RE-GRIND AND PAN  
TAILINGS AND THEN DO  
THIS AGAIN AND AGAIN  
UNTIL YOU GET NO  
MORE GOLD







## STEP 3

USE GOOD  
GRINDING  
TOOLS

WHAT KIND OF  
GRINDING  
EQUIPMENT CAN  
YOU AFFORD?



# GOLD FROM YOUR ORE

## STEP 4

USE GOOD  
CONCENTRATION  
METHODS

CENTIFUGES ARE  
THE BEST  
(BUT EXPENSIVE)  
NO MERCURY  
NEEDED!



GOOD CARPETS  
FOR SLUICES





## ANALYTICAL TOOLS

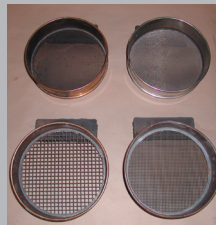
GET HELP FROM  
TECHNICIANS FROM  
GOVERNMENT OR  
LOCAL MINES



MORTAR  
& PESTLE



PAN



TEST  
SCREENS



HAND  
LENS



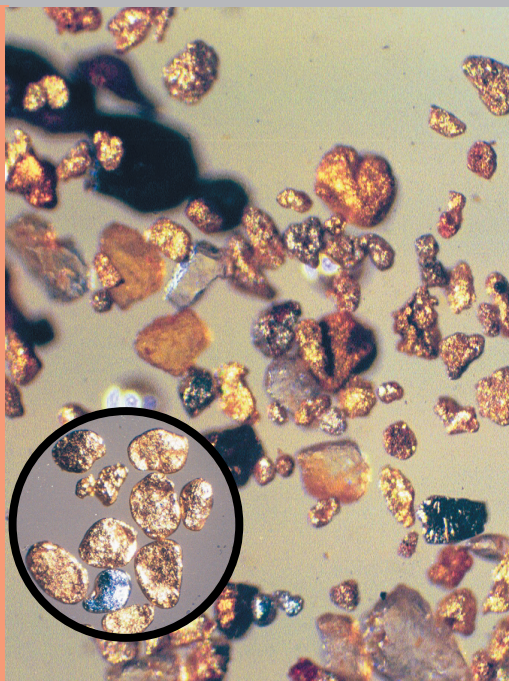
MICROSCOPE

## STEP 1:

### WHAT SHAPES ARE THE GOLD PIECES?

--FLAT PIECES ARE  
HARDER TO CATCH IN  
SLUICES THAN ROUND  
PIECES

--SMALL PIECES ARE  
HARDER TO CATCH  
THAN BIG PIECES



PHOTOS: CLEANGOLD/PLATH; GUNSON







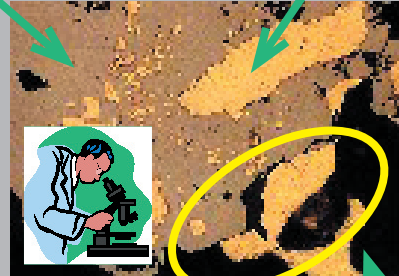
HOW IS  
THE GOLD  
ATTACHED TO  
THE OTHER  
MINERALS IN  
THE ROCK?

IS THE GOLD BETWEEN  
MINERAL GRAINS?

IT CAN BE HARD TO GET  
GOLD THAT'S INSIDE  
PYRITE

PYRITE

GOLD



QUARTZ

GOLD  
BETWEEN QUARTZ  
AND PYRITE  
GRAINS IS  
EASIER TO BREAK  
FREE

## UNDERSTAND YOUR ORE

HOW BIG ARE  
THE PIECES OF  
GOLD IN THE  
ROCKS?

LITTLE  
PIECES  
HARDER TO  
BREAK FREE

BIG  
PIECES  
EASIER TO  
BREAK FREE





# HOW LONG TO GRIND?

## 1. GRIND YOUR ROCK

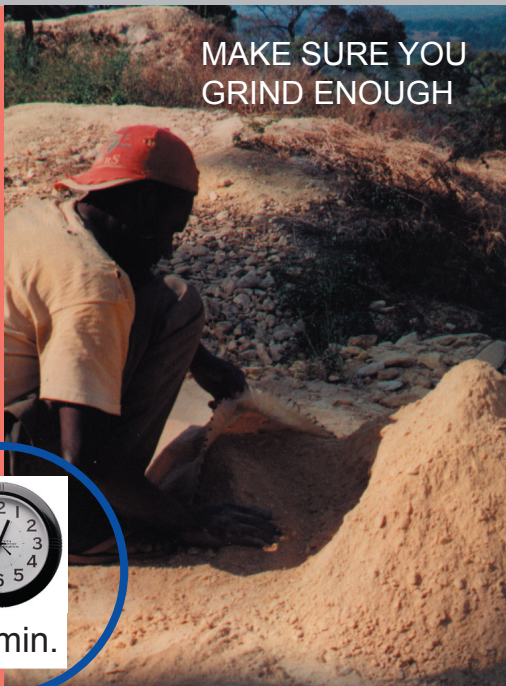
--GRIND FIRST FOR 10 MINUTES

--THEN PAN THE GOLD



10 min.

MAKE SURE YOU GRIND ENOUGH



## STEP 2:

## 2. RE-GRIND THE "WASTE"

--GRIND AGAIN FOR 10 MINUTES

--THEN PAN THE GOLD



10 min.







### 3. RE-GRIND AND PAN THE WASTE AGAIN

--DO THIS A FEW TIMES  
UNTIL YOU GET NO  
MORE GOLD



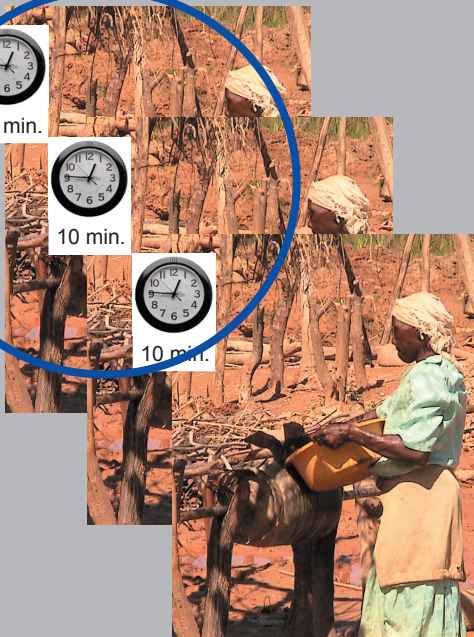
10 min.



10 min.



10 min.



## TEST YOUR GRINDING

### 4. THE BEST GRINDING TIME FOR THIS ORE IS:

THE TOTAL OF ALL THE  
GRINDING AND RE-  
GRINDING TIMES



TOTAL





## SIMPLE TECHNIQUES



SMALL RING OF  
SACKING  
PROTECTS HANDS

ROCK FILLED  
STEEL BOX  
ON STEEL PLATE



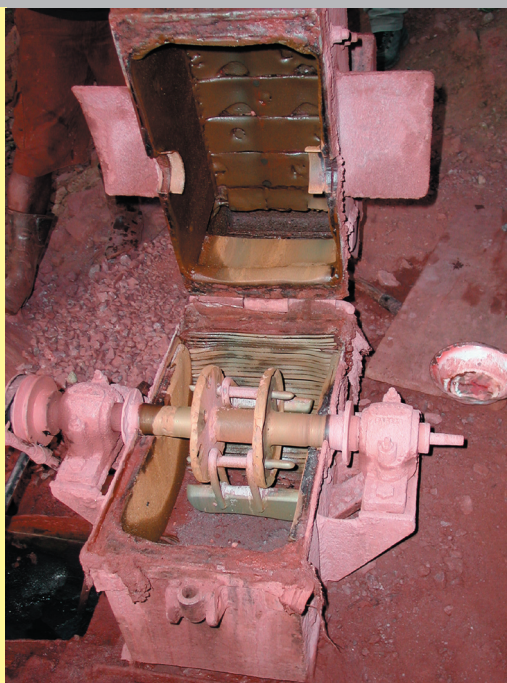
PHOTO: M. PRIESTER

## STEP 3:

### HAMMER MILLS

GOLD STAYS CLEANER

GOLD PIECES ARE NOT  
FLATTENED

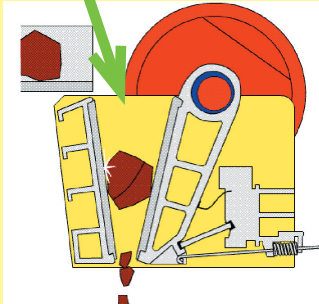






## JAW CRUSHER

BIG ROCKS IN



SMALL ROCKS  
OUT



# CRUSHING AND GRINDING

## WET BALL MILLS

FILL MILL ABOUT  
40% FULL:

BALLS-----2 PARTS  
ORE-----1 PART  
WATER-----1 PART

**SMALL BALLS** GRIND  
FINER THAN BIG BALLS  
--USE BOTH BIG AND  
SMALL AT THE SAME  
TIME

**AIR IS BETTER TO  
BREATHE** WITH WET  
MILLS--LESS DUST!



**ONE MOTOR  
CAN DRIVE  
MANY MILLS**





## SCREEN YOUR GROUND ORE

CONCENTRATION  
WORKS BEST WHEN  
PARTICLES ARE THE  
SAME SIZE



## STEP 4:

### 2 STAGE SLUICE

ZIG-ZAG SLUICES SLOW  
DOWN THE SLURRY AND  
RECOVER FINE GOLD

--USE DIFFERENT  
SLOPES AND/OR  
CARPETS ON EACH  
STAGE

LONG SLUICES DON'T  
HELP--MOST GOLD IS  
RECOVERED IN THE  
FIRST 50 cm







## SLUICE DESIGN

THE RIGHT FLUID  
SPEED AND DEPTH  
ALLOW THE GOLD TO  
FALL INTO THE CARPET

--IF FLOW IS TOO  
SLOW THE CARPET  
FILLS WITH SAND

--IF FLOW IS TOO FAST  
THE GOLD IS WASHED  
AWAY



TURBULENCE LOWERS  
FINE GOLD RECOVERY

## GOOD CONCENTRATION

FINE GOLD  
CONCENTRATES  
WHERE THE SPEED IS  
SLOW

RIFFLES INCREASE  
TURBULENCE AND  
CAUSE LOSS OF FINE  
GOLD

KEEP FEED RATE  
CONSTANT AND FLOW  
SMOOTH BY CHANGING  
WIDTH AND SLOPE





# PROTECT your children's future



**KEEP KIDS AWAY FROM  
DANGEROUS EQUIPMENT  
AND MERCURY!**

