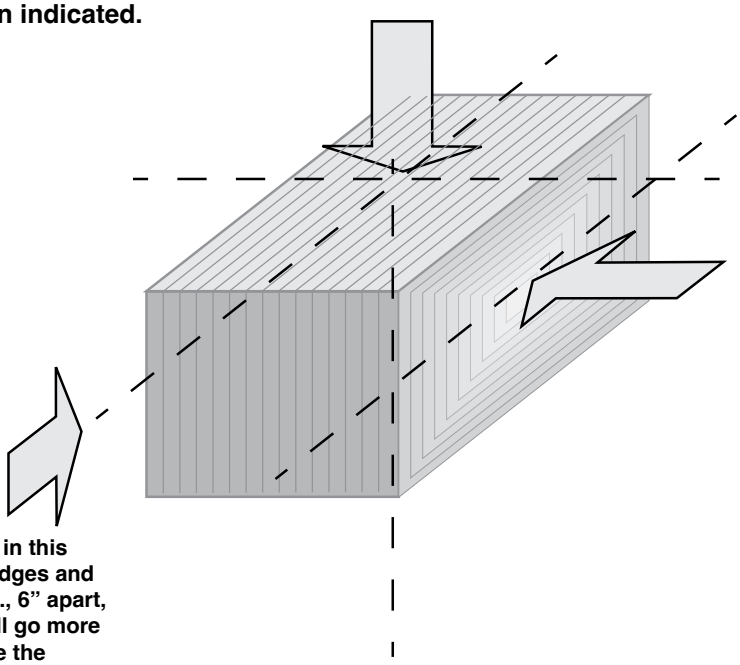
Rift direction in a Quarry Block

A Technical Note by George Pratt

3. It will be the most stubborn to split in this direction. More wedges, deeper drill-holes i.e., hand-width apart, 12" deep if your drill is long enough. Old quarrymen call this *'hardway.'* The break will want to turn and run along the rift.

Carving/fretting will also be tough going; it's all end-grain, the toughest carving in any stone.

An imaginary stone with a rift in the direction indicated.



2. It will split somewhat stubbornnly in this direction and the break will want to turn and run into the rift i.e., it will wane and run out the side of the stone instead of going right through Drill deeper holes i.e., 8" —or 12" if your drill is long enougn.

This will be the easiest face to carve and fret with a saw. These will be the easiest frets to break, can be wider apart for fast removal

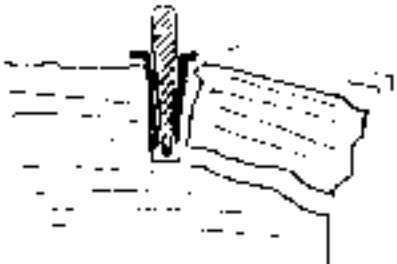
1. It will split readily in this direction with few wedges and shallow drill-holes i.e., 6" apart, 6" deep. The split will go more assuredly if you place the shims/wedges along the longest axis of the block. You can see that if you try to split from the end of the block, the break has a long way to run and even though it is in the rift direction, it can run off . . .

Aside from splitting, carving will be very resistant on this face, as will saw-cutting. Frets will not break easilyl, have to be closer together.

Large sculptures mean huge amounts of stone removal—hard dirty work that can only be done by the 'armstrong' method. Sculptors contemplating a large work, particularly in granite, need to seize every little advantage they can. In this, they are well advised to plan *how they will orient the figure in the stone.*

The great expanses of carving should be planned for the easiest carving face; the lesser parts, although we can't dispense with them, should be on the 'hardway' faces. The amount of energy conserved will make your judicious planning a good investment. .

In cases where I have said the break will want to turn and run along the rift, this is especially true if you are attempting to break an end off a stone. All splits go better if you are breaking the stone in equal halves.



To guarantee breaking an end off cleanly, you would have to drill the holes right the way through. Longer shims and wedges would help.

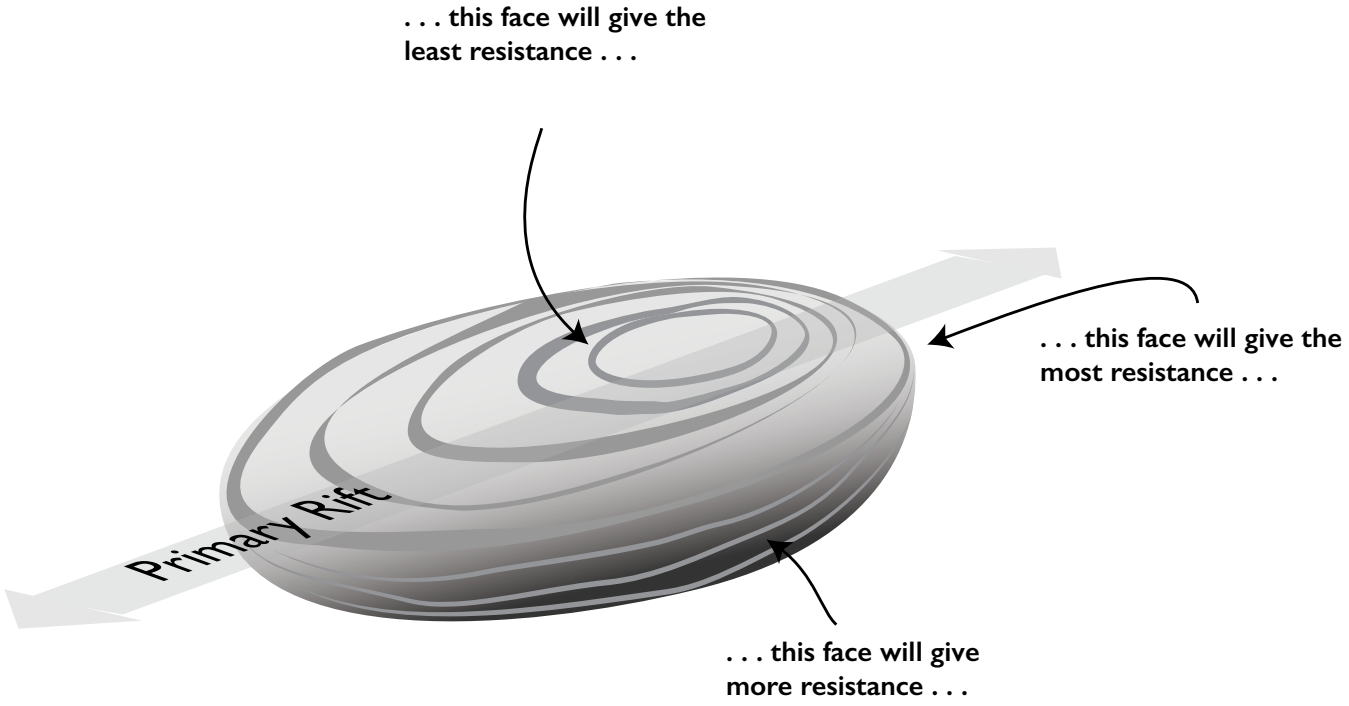
ABOUT Carving Resistance . . .

A technical note from George Pratt

A stone of granular construction, showing how Mother Nature has worked her hand at wearing it away, the result being a flattened egg created over a zillion years. These are commonly called 'riverstones'.

Clearly it takes this shape because the three different faces have resisted abrasion to three different degrees. By abrasion, we mean tumbling in the earth or being washed in a river or other natural forces over a long period of time.

The characteristics of splitting and cleavage etc. is shown on another page, but forgetting all that for now, the sculptor wants to know how a granular stone will behave under chiselling or drilling or sawing action. The simple answer is that it will resist those actions in the same way as it resisted Mother Nature.



You can see how the term 'bedding direction' came into being. Such stones were obviously formed from molten lava laying in pools and hardening into rock. From the term 'bedding direction' comes the term 'rift'. Builders of stone structures e.g., fences, walls, etc. figured it out early on how to maximize strength in a structure by always laying the bedding direction on its flat plane. Moisture can wick its way into the rift of a stone standing on edge, then freeze and crack the stone open. Bedding direction or rift is not always so easy to perceive in granular stones; a clean new granite quarry block often presents a tough challenge to identify the rift. (See previous page.) I use the riverstone here for clarity of illustration.

The primary rift in this stone was from Pan's nose to the back side of the 'treetrunk'. (The quarry-men marked it for me when I bought the stone.. Rifts are difficult for amateurs to discern!) I took my own advice and oriented Pan the way I did to make the going easier. As described on the tech pages, you can see that the lion's share of the carving can be done by going in from the sides, even shaping out features that ultimately are viewed from the front. The hard carving was therefore pretty well limited to the face and pan pipes i.e., the end-grain.

The granite for Pan was that found in the great quarries of northern Vermont; my particular block came from the Quebec side of the border where the granite is very white compared say, to the '**salt-and-pepper'** granite of the Pacific Northwest. The reason for its whiteness was its high content of quartz (silica) which made it uncommonly hard. I had to experiment with blades to be able to carve it; it requires blade segments with a matrix that is softer then what we are used to with western granites, this so that the matrix wears away faster (the word is 'ablate') thus continuously throwing fresh diamond up to the work face. **Soft matrix cuts hard granite.** Mass producers of common turbo blades most of us use don't customize in this way but a company in Ontario (Lamage) does and they made me twelve blades for the job.

I created Pan for a new sculpture park they built back in my hometown in Ontario. They didn't have much money but they wanted the hometown boy to have a signature piece in the park. They gave me room and board in a nearby lakeside cabin plus what few $ they had plus paid for the stone and blades. I blitzed it daybreak to sunset for ten solid weeks mid-April to mid-June, right in the heart of blackfly season. I was away from home, so there were no distractions. Working entirely alone, tens, hundreds of thousands of frets and hammer strokes, it was totally exhausting and the blackflies were torture— but I wore a younger man's clothes then it was the best sculptural experience I've ever had.

Sundry tech notes:

I used 5" segmented blades by **Lamage of North Bay**, Ontario—drove them with a 6" **Metabo** mini-gi-rinder—6' because it has more power than their 5" and you need power if the grinder is to last. As it was, I went through 3 sets of bearings on the grinder. For the purpose I had two grinders, rotating them to the service shop the minute the bearings began to chatter. Tough as they are, even Metabo bearings will wear out with long hours on hard granite.

I kept constantly sharpening the blades as I worked,, this by every ten minutes touchng the running blade against a running aluminum oxide wheel on a bench grinder sitting on the ground beside me and which I never shut off while I was working.

Carving, breaking frets was with a 1" T&H air hammer both flat and 4-point carbide facing chisels

ABOUT PAN, FROM GREEK MYTHOLOGY:

Pan is thought of as a quaint little god of the fields and forests; but in truth, he was not a very nice guy. He was an ugly little fellow, half-man, half-goat. He spent his days pursuing and molesting the lovely little nymphs of the forests, who constantly had to flee to hide from him. (Thus we get the word 'panic'—they ran in panic.)

One day he was in hot pursuit of a lovely nymph named Syrinx who, in desparation, leaped into a nearby river, beseeching the river gods to protect her. To do so, they changed her persona by transforming her into a reed and placed her among other reeds that grew by the riverside. In frustration over his unrequited conquest, Pan plucked the reeds and fashioned from them the first Pan pipe which he played in wistful memo-ry of his unrequited pursuit. We call that instrument a 'pan-pipe' but in truth, it's name is a 'syrinx'.

This is the pencil sketch I made for the customer in proposing the sculpture ….