

moving wave shadows. A mixture of sun and shade gives complexity and introduces time to the equation by varying effects as the sun's position changes from sunrise to sunset. Lighting utilizes the optical qualities of water's transparency with reflection and refraction. Artificial lighting can create new expressions by free choice of light sources.

**Wind** Streams flow regularly unless loaded by heavy rain, tides follow a consistent pattern unless disturbed by major earth movement, but wind changes dramatically season by season, day by day or even moment by moment.

Motionless air at the surface leaves water completely smooth like a mirror. The gentlest air flow is usually light puffs which brush the surface and disturb patches of the mirror intermittently. Air does not flow at a constant speed at the earth's surface because friction against land or water causes turbulence, even at very low velocities. At more than a few kilometres per hour there is enough energy conveyed to create surface ripples. These are very small waves of up to ten centimetres wavelength which are called surface tension waves. They appear in an instant and can disappear just as quickly because the surface tension of the flat mirror can dominate and so kill them. Stronger winds blow up larger gravity waves. These are quite different in action as they have acquired enough energy from the wind to be able to continue for a long distance.

Gravity waves are rather like sound waves. They move in a constant direction until they gradually lose their energy, are impeded by an obstruction or are reflected from a solid surface. Reflected or refracted waves move back through primary waves and form interference patterns; absolutely fascinating and often beautiful. Constantly blowing wind increases the height and wavelength until monstrous waves, which can travel thousands of kilometres, develop. Winds are created by the earth's pressure gradients and temperature differential. Their turbulence is influenced by physical barriers. Wind blows water from jets and waterfalls to form spray.

**Sound** Sound is nature's most delightful way to herald the presence of water. The mellow rumble of the ocean, out of site beyond sand dunes or the gentle gurgle of a trout stream foretells what is ahead.

Water's sounds have all the characteristics of music; variety of volume and pitch, sharpness, softness, rhythm and, most importantly, harmony. Falling water in cascades is heard as a range of superimposed frequencies. The pitch and character of each sound depends on the mass of individual water units and landing surface. Massive bulk flow to almost weightless droplets fall a variety of distances and land in deep water, shallow water or even on bare rock and generate a multitude of sounds.

Raindrops produce different sounds on roof iron, sand or stone pavement. The level of sound from water can vary from absolute silence to a numbing volume.

**Colour** Water in nature is rarely a 'colourless liquid' as the dictionary says. Often water is tinged with vegetative stains or coloured with suspended clay. This clay being opaque particles, affects turbidity so much that a shadow cast on the surface can be as sharp as if it was cast on mud.

Most colour we see in water is either from surroundings reflected on the surface or underwater objects seen through its transparent body. The degree to which we see reflected colours depends on the angle of viewing due to the refraction angles between air and water (hence a fisherman's efforts to keep low and so remain unseen by his quarry) and light differential. A sunlit red and white building is easily reflected on the surface of a pool which has a dark bottom.

**Depth** 'The deep blue' The deeper the water the deeper its colour. A view of a coral atoll from the air is remarkable for the wonderful variation of tones in blues and greens in the surrounding seas. Light is absorbed as it passes through the transparent medium. Any colour from the light source, which is often the clear blue sky, gets deeper and deeper as the light intensity reduces with depth.

The joy of effectively working with water, by knowing and understanding the medium, is the reward for study and diligence. It is the same sort of joy that a blacksmith gets from forging cherry red iron and cabinet maker from paring sweet smelling rosewood.