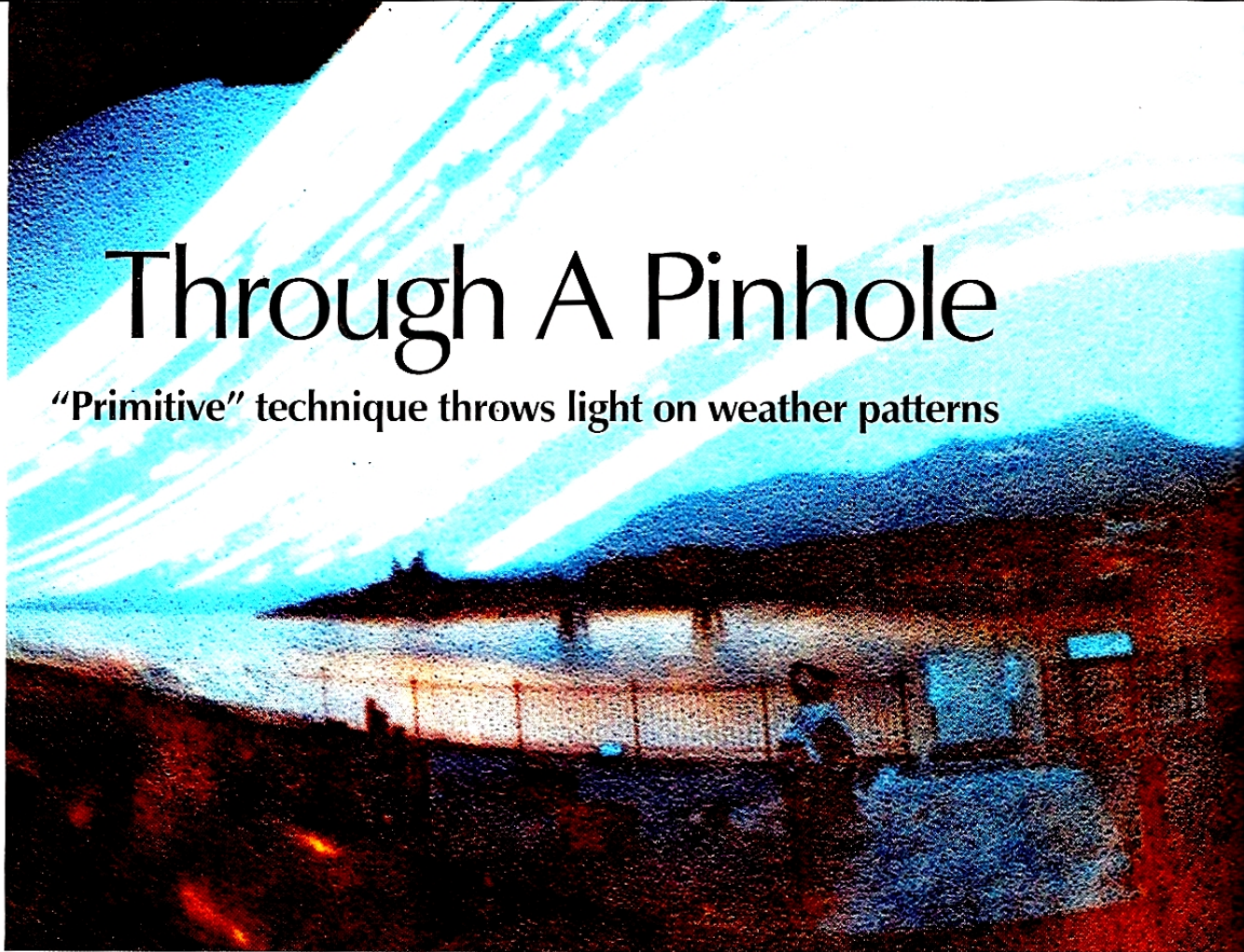


Through A Pinhole

“Primitive” technique throws light on weather patterns



by PROFESSOR JOHN C. BROWN,
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NORTHWEST Scotland in general, and the (Misty) Isle of Skye in particular, are not renowned for their sunshine, though the ever-changing mix of sun, cloud, mist and rain brings its wonderful cloudscapes, rainbows, waterfalls and rich greenery. On the other hand, often to the disbelief of many outsiders, Scotland does experience occasional long arid spells.

Pinhole camera made from a 35mm film cassette tub with a pin-pierced baking foil window

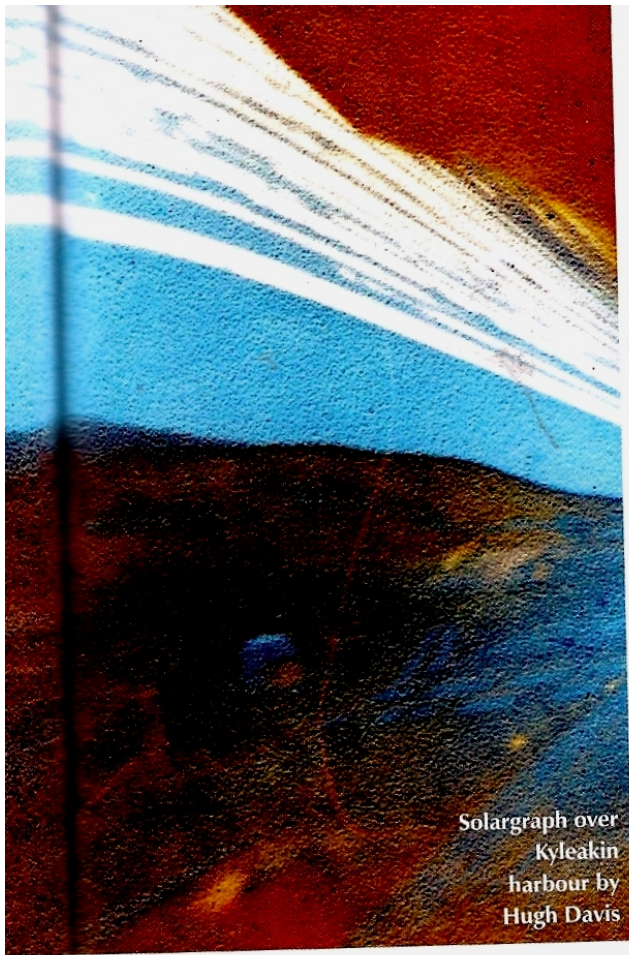


Recent ones include those of early summer 2012, during which production at the water-starved Carbost Talisker Distillery temporarily slumped and livestock were parched, and in March/April 2013 wildfires abounded in Skye and north-west Scotland.

A simple and beautiful way of recording long-term weather variations is by using long exposure pinhole camera photography – a quite recently invented technique called Solargraphy (or Solarigraphy which is a little easier to pronounce).

A solargraphy pinhole camera is basically a piece of very low speed photo-sensitive paper or film, curved to fit inside the back of a closed (dark) cylindrical container facing a baking foil window with a tiny pinhole in it. Containers commonly used are the plastic tubs of 35mm film cassettes. For larger cameras with better angular resolution of detail, soft drink cans with the end resealed are used, while crazily huge pinhole cameras have been made from rubbish bins.

The container is mounted firmly facing in a fixed direction. This is usually south to face the midday sun, but can be east or west to record images dominated by sunrise or sunset, or to include a striking foreground



Solargraph over
Kyleakin
harbour by
Hugh Davis

feature. Pinhole cameras have a very wide angular field of view (up to 180 degrees). So if you try solargraphy yourself, and want to include a foreground feature, make sure you place the camera near the feature so that it fills more than a tiny part of the image.

When the pinhole is uncovered, the sun, if out, burns a narrow trail across the film, mirroring the diurnal arcing track of the sun in the sky. The most intense parts of tracks

“The sun, if out, burns a trail across the film”

occur when the sun is highest in the sky, hence brightest, while dark gaps appear when the sun is temporarily cloud covered.

On successive days through the sun's six-month seasonal cycle of varying elevation (lowest at midwinter, highest at midsummer) it will leave slightly separated trails, though in continuously sunny weather these almost merge into broad bands of brightness. On the other hand, prolonged cloudy spells of days or more result in dark gaps between

bright arcs. Since the height range spanned by the sun's arcing path from June to December, or say June to September, is just a reversal of that from December to June (or March to June), exposures are usually restricted to be within either the first or the second half-year so as to avoid autumn/spring track overlap.

Once the exposure is complete (usually, but not necessarily, midsummer to midwinter or vice versa), the film is normally removed and fixed without development. This is because development destroys both the low sensitivity on which solargraphy is based and any colour recorded in the photo-sensitive material used. The raw results are quite subtle having rather low contrast and colour (where applicable), but can be scanned and digitally manipulated to enhance these and other interesting features.

Solargraphs thus show not only the beautiful geometrical aspects of the annual variation in the daily path of the sun, and how that depends on the observer's latitude, but also a continuous record of sunshine variations through the days and the months. I have spent a lot of time over the years in and around Skye – especially the south end. Thus, along with friends there, I have had the opportunity to make solargraphic records of some Scottish weather patterns and to capture nice solar track images over many scenic foregrounds.

The example on the bottom of page 45 is a solargraph for the second six months of 2012, alongside a normal (narrower field) camera

lens image (by M.I. Brown) of the same scene. A first half-year solargraph for 2012 would have shown a good sunny spell around Easter, just like that in 2011, and again in 2013. However, this second half-year image confirms Skye to have also been one of the sunniest sites in the UK for a couple of months in early summer 2012. While much of the UK was suffering heavy rain, Skye was in drought. These images were taken from Eilean Bàn (one-time island) »



Contrasting photographic views of the total solar eclipse in Antalya, Turkey, in 2006

home of *Ring of Bright Water* author Gavin Maxwell) courtesy of Hugh Davies of Eilean Bàn Trust. This lies just off Skye and is the location of one of the Skye Bridge pillars, as well as of Eilean Bàn (Stevenson) Lighthouse, which provide striking foreground features.

Solargraphy is of course not restricted to rural settings, and some fantastic cityscape results have been obtained. For instance, jumping south from Skye to Glasgow brings us to the first solargraph I ever saw (facing page, above). It is a 2004 shot across the River Clyde and features Glasgow's Science Centre, plus Tower and Imax (no BBC

solargraph exposure of the Turkish Antalya 2006 total solar eclipse. The eclipse totality appears as a gap in the bright solar track for that day. More exotically, Diego López Calvina of Madrid, an innovative pioneer of solargraphy, has recorded solar paths as seen by pinhole cameras that are themselves in various forms of semi-regular motion. These produce less regular/more abstract results such as those from cameras attached to the heads of sunflowers which turn to follow the sun, and one attached to his bike during Madrid commutes and trips.

Returning to the original subject of

Scotland and Skye, aside from their intrinsic beauty, the solargraphs of Skye skies provide striking visual evidence against the widespread myth of a perpetually

“Sunny periods are not uncommon on Skye”

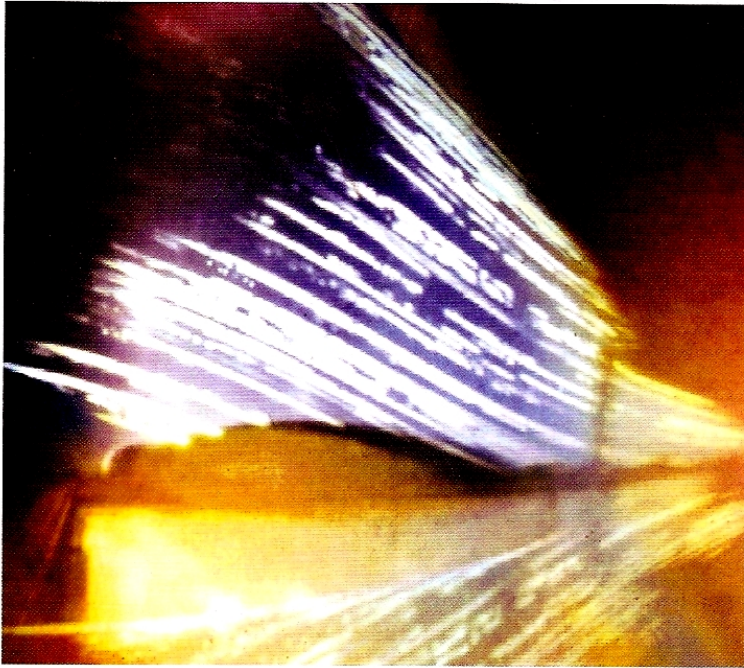
building at that time). It was taken by Mario di Maggio (then of GSC) and shows both primary solar tracks and their reflections in the river.

Nor is Solargraphy restricted to such long-term recording of the sun's path and of weather trends. It has also been used in many other creative ways, the possibilities being limited only by the user's imagination. For example I myself took a single day

Misty Isle. They show clearly that prolonged sunny periods are not uncommon on Skye, though they may be rather too unpredictable for long term holiday planning.

Finally, one factor making these solargraphs so special is the same as that which gives us the very long summer days: the prolonged periods of sunrise and sunsets year-round, and the long deep shadows on

PICTURES: PROFESSOR J. C. BROWN, J. TRYGG, MARIO DI MAGGIO

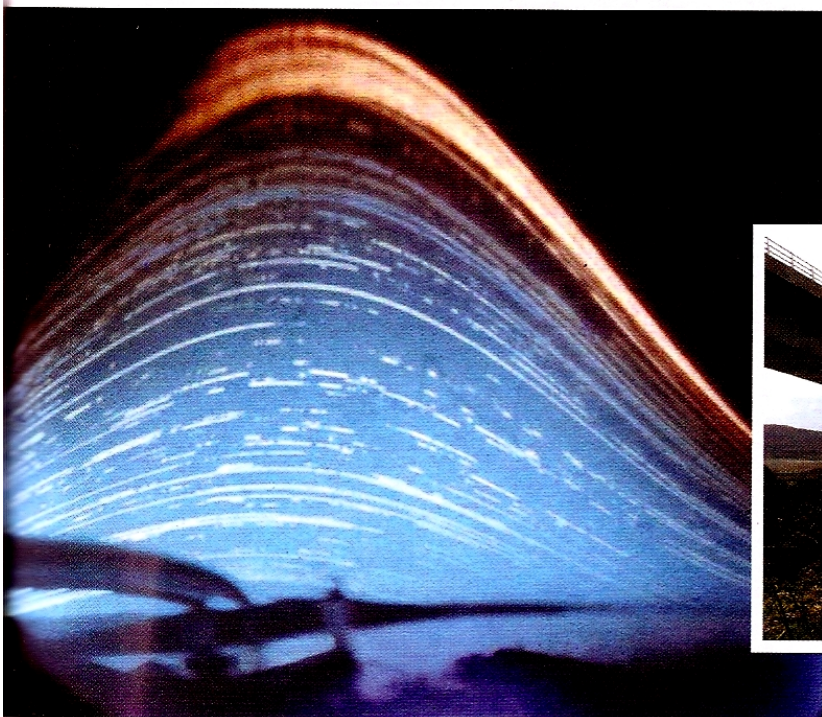


Solargraph for the first half-year of 2004 across the River Clyde to Glasgow's Science Centre, showing both the primary solar tracks and their reflections in the river

our hills, glens and clouds which make Scotland so lovely. That factor is our high latitude. In the tropics one may be able to bask daily in hot sun but sunset and sunrise are over in minutes, periods of long shadows are brief, and solargraph tracks are near to straight lines passing overhead. These lack the beauty of the elegant arching solar tracks we see, peaking above the horizon profile of our hills, lochs, and castles. ☺

LEARN MORE

See www.solargraphy.com/ by Tarja Trygg of Helsinki's Alto University and the www.timeinacan.org/ project. She runs a world-wide solargraphy project with an album of global results. She gives advice on how to do it yourself, and on processing results. We are grateful to her for supplying the cameras and processing all the solargraphs in this article.



Solargraph for June to December 2012, alongside a normal (narrower field) camera lens image of the same view. It shows Skye Bridge and the Stevenson Lighthouse on Eilean Bàn, and the sunny spell of early summer that made NW Scotland the driest place in the UK.

