GEOLOGIC MAPPING

A field geologist tries to look at every outcrop of rock. In the North Cascades, that means visiting outcrops one could actually get to. In my thesis days, detailed topographic maps of the area of Cascade Pass and vicinity had not been made. I had good aerial photographs and U.S. Forest Service maps with rivers, streams, and hachures where there were big cliffs. A geologic map shows the distribution of different rocks plotted on a geographic base, in my case, the Forest Service maps. I could locate pretty well with the aerial photographs because they are taken from an airplane in overlapping pairs, which if viewed through a magnifying device, which reveals the same area from a different position for each eye, produce a three-dimensional view. One can then transfer the known point to the map. The 3D view made you feel like you were flying over the terrain. I had to compare the detailed bends and kinks in a creek or canyon with the drainage depicted on the map. In some areas, I could measure the angles to peaks depicted on the map with my Brunton compass and plot those angles on the map as lines. If at least two, better three, lines intersected, the location was known. This seems pretty primitive now in the era of GPS (Global Positioning System). So, climb up to the outcrop, hammer off a sample, look at the sample with a hand lens if necessary, find myself on the photograph, prick the location with a pin (hard to write on photographs), write down details of the rock, and label the sample with adhesive tape and pencil. The pack grows heavier, but the picture of the rock distribution grows in my mind. These are age-old procedures that geologists have used (minus the aerial photographs) since the first geologic map of England was made in the early 1800s by William “Strata” Smith (1769-1839; see https://en.wikipedia.org/wiki/William_Smith_(geologist)).