went on during the deposition of the series. This is evidence that folding goes on in depth.

The formation of a geosyncline goes on together with considerable compression. Thus one can understand how the narrow troughs in California, like that in which the Orinda was deposited, have been so greatly compressed. If a layer is compressed, it must lose in width what it gains in thickness. As a consequence, although not a necessary one, the deposit may be pressed up and elevated. Thus as a result of the compression the block containing the Orinda beds was elevated, and now after erosion it forms the Berkeley Hills.

During this erosion a number of terraces were cut, a fact which indicates that several periods of uplift had occurred, causing a corresponding number of erosion cycles.

Professor Penck expressed the view that sinking, compression and elevation have gone on very slowly. There was first the formation of a very gentle anticline, a mere swell, and this was eroded to give an initial peneplain. Continued elevation during erosion produced several phases of leveling. This idea of the sequence of events was advanced by his son, the late Walter Penck.

During the formation of the Berkeley Hills there must have been other vertical movements, since there is a fine development of longitudinal valleys resulting from faults and flexures.

The sequence of orogenetic movements following bathygenetic is proven also in the Alps. Many years before, Professor Penck had made a study of the glacial deposits there. Although he then had an idea that the mountains were formed by folding (he would now say thrusting) he realized that there was another movement, since the Pliocene strata gave evidence of a vertical movement following the period of folding. He now believes that there was a gentle, though not uniform, movement in the Alps at a late period, a movement which is still going on. The elevation began before erosion had done much work in the Alps, so that the topography so formed is not of striking appearance. As elevation continued, however, and the valleys were cut deeper into the Alpine overthrust mass, a very rugged topography resulted.

In conclusion, Professor Penck emphasized that this sequence of sinking, deposition, compression and folding with uplift is not shown by every orogenetic province, such as the Cordillera of the Colorado region.

During the discussion following the formal address the evidence of recent and continued movement in the Alps was further brought out by Professors Collet and Penck. There was at least one post-glacial volcanic eruption in the Alps, and even in the last few years earthquakes have been reported.

Professor Daly suggested as a cause of the uplift in the Alps the melting of the deep rocks with consequent increase in volume by as much as 10 per cent.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A LOCATION FINDER FOR MICROSCOPES

EVERY one who has wasted precious time—and who has not?—in trying to find a particular portion of a microscope slide will be interested in a new device for accurately and readily locating on a slide any region of special interest.

The common practice of "ringing" such special regions (by India ink, wax and glass-cutting pencils) is crude at best, and under certain conditions difficult or even impossible (*e.g.*, with immersion oil on the slide, unremovable condensers). This device consists of (1) a lined chart (Figure 1) to be applied to the

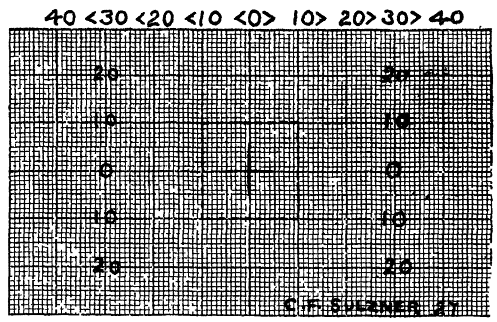

FIG. 1

ordinary stage, and (2) an inexpensive aluminum stage square to keep the microscope slide parallel to the stage chart lines and to control further the slide position, as described later.

When the stage of the microscope is thus marked or divided into millimeter spaces, as shown in Figure 1, locating any desired region on a microscope slide is greatly facilitated. To this end, the millimeter-spaced chart is first "centered" with a low-power objective, so that the intersection of the vertical zero and the horizontal zero lies in the optical axis. The chart having thus been centered, it is then held firmly in place, while corner after corner is carefully lifted, moistened on the under side with rubber cement, and pressed down on the stage. After verifying the optical-center-position of the chart, the glue or cement may be allowed to "set" and the detachable center removed, thus leaving a hole in the chart two centimeters square, which is larger than the original stage opening, and, therefore, prevents the chart from interfering with the passage of light or with the use of the condenser or immersion oil. (If the chart extends beyond the stage, it may be quickly trimmed down by using a sharp scalpel or a safety razor blade.)

When a region of interest is noted, the worker makes sure that the slide is lying parallel with the stage chart lines, in order to determine accurately which of the horizontal and vertical lines are nearest to the slide. The parallel position of the slide may be assured by using the small aluminum try-square which forms part of this device. Since mechanical stages are by no means universally supplied on microscopes, even for advanced students and research workers, this simple, inexpensive aluminum square will be very helpful.

Having assured himself that the slide does lie parallel to the horizontal chart lines, and that the region of interest is still in the center of the field of vision, the worker reads the horizontal position of the near edge of the slide (*e.g.,* 19) by pulling back the aluminum square or the mechanical stage, thereby exposing clearly the near edge of the slide which is thus left lying in position with the region of interest still in the field of vision. (In making the horizontal readings, it will be easier and more accurate to take the horizontal reading of the near or lower edge of the slide, for the readings of the far edge of a slide will have to be made more or less slant-wise through the glass slide itself, unless the worker leans far enough forward over the stage to read the exact location of the under edge of the slide where it touches the chart.)

Having ascertained the horizontal line reading of the slide, the number of the vertical line nearest the left (or right) edge of the slide is next determined, giving us, let us say: left, < 34, or right, 42 >.

The exact location of the slide when the object of interest is in the field of vision may be recorded by using arrows as above, to indicate whether the left or right corner is the key or location corner, *e.g.,* 19. < 34 or 19.42 >); or by merely reversing the position of the higher vertical number as in the records 34.19 or 19.42. (It will, of course, be necessary to make sure that the slide is not reversed; the top edge of the slide is, however, usually clear from the writing on the label or markings on the slide itself.)

To locate again a region previously observed, it is only necessary to place the slide on any charted stage, with the key or record corner of the slide in the position called for by the record, in this case, the lower left corner at 19. < 34 or the lower right corner at 19.42 >.

This should bring the object into the field of vision with low powers, and very near it with high powers. With a mechanical stage, slight shiftings, front and back, and left and right, may be made, making sure that the slide is not moved far in any direction from its recorded location. With the aluminum square, it will be found best to determine the horizontal position (*e.g.,* 19) very exactly, and then move the slide to the vertical line recorded for it (left 34 or right 42). If the object is not then in the field of vision, shift the slide left and right slightly on the firm base afforded by the aluminum square; reset the square, if necessary, and again placing the slide with its lower edge against the aluminum square, shift it left or right as before described.

Note that the location readings obtained by such a location chart are universal in application—not only applicable to any microscope for which the worker has adjusted a location chart, but also universal in language, utilizing as it does only metric units (millimeters), arabic numbers and self-explanatory signs as the arrowheads.

This device, too, is easy to use. Since the optical axis is always zero, instead of some purely arbitrary number, no elaborate mathematics (subtractions, etc.) is demanded because of the arbitrary markings of the mechanical stage (*e.g.,* 82 in one microscope with fixed mechanical stage, purchased recently). Neither does this device involve adjusting the location records for variations for slide length. Note, too, that a universally applicable location record may be taken directly while the slide is actually in use by the worker, as it lies naturally on the stage, the only necessary precaution being that the slide must be parallel with the vertical and horizontal lines when any location reading is taken. No extra work is required: no "ringing," no removing of condensers or diaphragms, and no time-consuming verification of the location of the object of interest within the ring enclosure after the ring is made. All that is necessary is to read the intersecting lines at one corner of the slide and record them on the label or slide itself.

With this device one's own slides may be definitely charted, so to speak. Much that teachers now do for students may be done by the students themselves. Slides may be sent to others for comparison and consultation, with the assurance that we shall be talking about the same thing. And slides for sale or exchange may be given location readings which will multiply their value many times.

Samples of these water-proof paper stage charts, suitable for fastening to the ordinary microscope stage, with directions for application, may be secured by writing to the originator of this device, Mr. Charles Sulzner, in my care.

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