

XXV. The shadow of a vertical cliff 113 ft. high just reaches a boat in the sea 93 ft. from its base. Find altitude of the sun in degrees.

XXVI. A rope 38 ft. long just reaches to the ground when fastened to the top of a tree 29 ft. high. How far from the foot of the tree does it touch, and what angle does it make with the level?

XXVII. ABCD is a quadrilateral.  $AB=42.1$ ,  $BC=49.6$ ,  $BC=37$ ,  $CD=49$ ,  $AC=60$ . Construct and find area.

XXVIII. Find area of plot of land bounded as follows: From A, N. 69 deg. E., 47 rods to B, thence N. 21 deg. W., 20 rods to C, thence S. 89 deg. W. to D. Thence to A.

XXIX. Draw a regular figure of eleven sides each side 1 inch long.

XXX. In a quadrilateral ABCD, given  $A=60$  deg.,  $AB=6$ ,  $BC=7$ ,  $AC=9$ ,  $BD=6.5$ . Find other parts.

Yale University, February 29th, 1904.

THE National Union of Teachers in England and Wales has just affiliated the Sierra Leone Teachers' Association. Projects for the affiliation of other teachers' associations within the British Empire, with the great central Union of Teachers in England and Wales, which contains more than 50,000 members (three of whom are members of the House of Commons) are under consideration. More than 300 members of the N. U. T. are members of the County and Borough Educational Committees under the English Educational Act of 1902. The address of this comprehensive and powerful union is Bolton House, Russell Square, London, and the secretary is Mr. J. H. Yoxall, M. A., M. P.

Though not in active work of teaching now, I am pleased to note the steady improvement, widening influence and increasing helpfulness of the REVIEW, which I read with interest every month.

Sackville, N. B.

C. E. L.

A man named Mason is advocating the introduction of what he calls his "cosmo-Roman alphabet." He would strike out twenty-one of our present letters and adopt twenty-four new ones, each of which would stand exclusively for one definite sound. He would use the dollar sign to express the sound of "sh." We should welcome anything that would reform the foolish system of English spelling, but it seems to us that the dollar already stands for too much, and we don't believe the agitation will accomplish anything.—*Exchange*.

## Mineralogy and Geology in Schools—No. VI.

By L. A. DEWOLFE.

The last paper dealt with uses of a few of the more common minerals and rocks, and suggested blowpipe work and the teaching of mineralogy and geology in connection with geography. In high school work I should also make these subjects the basis of chemistry. As chemistry is usually taught, all the materials are artificially prepared. This fact itself destroys half their interest. Rather take the mineral in its natural state and see how these various salts could be prepared. After that is learned, one may use the drug-store material for convenience. If the child can take, say, a piece of copper ore, reduce it to metallic copper, and dissolve this in *nitric acid* to form *copper nitrate*, the substance is his own very much more than if he had bought it already prepared. Tests for the metals learned in mineralogy are of use in later work in chemistry. Flame tests are valuable not only as tests. The boy no sooner sees the crimson *strontium* flame than he remembers the color in red fire-works. He'll now want to know what gives the other colors in fire-works, and what makes the sparks. Bead tests make him familiar with the coloring of glass. Cobalt blue will not be new to him the first time he sees it in a borax bead. These color tests also furnish a text for a lesson on gems, for gems are only naturally colored minerals.

If in your mineral collection you have a suitable group set apart as an illustrative *scale of hardness*, beryl and corundum may find a place among them. They are sometimes stained so as to be suitable for gems. The rich green beryl known as emerald is stained with chromium, and the paler variety with iron. The gem form of corundum is sapphire, which is also probably stained with chromium. Besides the gems, one can teach uses of the impure varieties of the same mineral. For example, emery is an impure black form of corundum. Why is it suited to its use in emery wheels? Powdered garnet is sometimes substituted for emery, and is used in making sandpaper. A better variety is used for jewels in watches, while the best is the gem usually known as carbuncle. It is not difficult to find small garnets in granite suitable for school specimens.

Just as we gave an outline of the origin of rocks and soils in a previous paper, so should we give talks on the origin of the useful minerals. (Distinguish