

with a hammer, the draughtsman draws it with a pencil; the manual process differs, but the cerebral action is the same. In like manner the painter draws with a brush, a carver with chisels, a tailor with shears, a mason with trowel, and the carpenter with various tools. The lathe is a machine for drawing different forms in iron and wood, the band saw for sawing out designs, the loom for drawing fabrics of all sorts. With all these machines if a pattern is not used, the operator is the artist, and designs his own work. If a pattern is used the one that designed it is the artist, and the operator is but a part of the machine. He is an artisan.

If a blacksmith can draw beautiful designs on paper, he can hammer them out of iron. If the draughtsman can draw a horseshoe on paper, he can hammer it out of iron as soon as he has overcome the technical difficulties. If a person can draw a design on paper he can construct that design in any trade or department as soon as he has overcome the mechanical difficulties of that department.

Outside of the mechanical arts, drawing is the basis of a large number of branches. It is the basis of the *decorative arts*; frescoing, tapestry, embroidery and lettering; the *plastic arts*; carving, moulding, modeling and sculpture; the *reproductive arts*; etching, engraving, lithographing, printing, photography; the *productive arts*; which include original work in any department.

*Drawing shortens the school course.* By cultivating the perceptive powers, the time is shortened in acquiring those branches that wholly or in part depend on observation. Trained percepts add wonderfully to the powers of the imagination. A cultivated imagination enables the pupil to see a river in a rill, a mountain in a hillock of sand, or a lake in a pool of water; will enable him to journey

with you in imagination across the trackless ocean, through the jungles and forests, up the rivers, over the plains and across the mountains; will enable him to see forms beyond the range of vision, and compass magnitudes too vast for measurements. Imagination is the creating faculty.

*Drawing is one of the surest means of acquiring knowledge.* To draw an object requires an intelligence and close observation; to reproduce that object, a cultivated memory. To reproduce a modified form of that object, a trained imagination, and lastly, to represent an idea from that object requires knowledge, memory and imagination. For example, it requires close observation to draw a cat; an acute memory to recall the image, and reproduce it on the blackboard; a trained imagination to be able to represent the cat climbing a tree, and lastly a combination of these three to associate cats together, making a harmonious composition.

*Drawing cultivates the hand and lays the foundation of technical education.* It is a study that seldom or never becomes involuntary like writing, but is always under the direct supervision of the mind. To draw even the most simple object requires the concentration of the mind in directing the hand for its reproduction. This constant working of the mind and hand in harmony with each other leads to great precision and accuracy in the use of the hand. The precision and accuracy may be utilized in any department of work. *Drawing is the basis of accurate observation.* To reproduce an object requires the closest scrutiny of that object, not only of the details but of the whole form taken as a unit; not only the shape of the tree, but the character of its branching and foliage as well. Not only the form and color but the number and arrangement of its petals, stamens and pistil. A