

"III.—*We have to secure a reinforcement of the voice:* (a) by lining the interior of a building with elastic materials, such as wood, and, where possible, having the ceiling of the same; (b) by employing the resonance of cavities within a building, having spaces above its ceiling and below its floors; (c) by endeavouring to obtain some simple ratio between the various dimensions of the room."

GOLD BEATING.

The art of gold beating, says the *London Builder*, is a very ancient one. There seems great probability, that, like some other arts, it has been known and practiced and forgotten. Homer refers to it; Pliny, more practical, states that gold can be beaten, one ounce making 550 leaves, each four fingers square—about four times the thickness of the gold now used. This is most probably such gold as was used in the decoration of the Temple—"It was covered with plates of burnished gold." The Peruvians had thin plates nailed together. It is possible that if decorations of this character were used in these parts, their insecurity would so trouble some folks that they would have no rest till they were effectually "nailed". The Thebans have in their wall histories some gold characters done with leaf said to be as thin as the gold of the present day. Coming down with a jump from the long past to the present age, we find our country celebrated for its gold-leaf. Italy used to excel us, but Italy has been in a long sleep, and is only just awakened. It is one of the last things our overgrown offspring undertook to make for herself. Until very recently she imported all the gold-leaf she required from this country. The gold-beater's skin made here is still the admiration of the world (of gold beaters). This skin is gut skin, stretched and dried on frames, after which each surface is very carefully leveled, a labor intrusted to the delicate hands of young girls. A mold (as the number of square pieces of skin beaten at one time in the gold-beating process is called) is an expensive article, costing from £9 to £10, and when useless for gold beating is still of some value. Fifty or sixty years back a workman made 2,000 leaves of gold from 18 or 19 dwts. of gold; now, by better skin and skill, he is enabled to produce the same number from 14 or 15 dwts., showing a considerable reduction in the cost of produce, and, as may be expected, a deterioration in the quality of the article. One grain of gold beaten between this skin can be extended to some 75 square inches of surface, the thickness of which will be 1-367650th part of an inch. These figures represent what may be done. What is done for the purpose of trade is somewhat less—namely, 56½ square inches per grain, 1-280000th of an inch in thickness. To give an idea of its thinness, it would take 120 to make the thickness of common printing paper, 367,650 sheets of which would make a column half as high as the Monument.

THE MANUFACTURE OF PINS.

About the middle of the last century, the Ryland family introduced into Birmingham the two new industries of wire drawing and pin making, which at that period were regarded as twin handicrafts. After a steady development of five and twenty years the pin trade was transferred to an ancestor of the present eminent firm of Thomas Phipson & Son. A few years since every schoolboy's manual contained a sketch of the operation of pin making as a remarkable instance of the division of labor. A single pin had to undergo the manipulation of not less than fourteen pairs of hands before it was ready for the cushion in a lady's boudoir. This forcible illustration no longer applies. Pin making like other industries, has been subject to the scientific progress and improvement of the age, and the process is now comparatively simple. An American engineer, named Wright, patented in 1824 a pin machine which during the revolution of a single wheel produced a perfect pin. Mr. Thomas Phipson thus describes Wright's machine, which, having undergone many improvements, is now in operation at the factory of the former, here: The principal shaft gives motion in its rotation to several sliders, levers, and wheels, which work the principal parts of the machine. A slider pushes forward pincers, which draw wire from a reel at every rotation of the shaft, and advance such a length of wire as will produce one pin. A die cuts off this length of wire by the descent of its upper "chop," and the latter then opens a carrier which takes the wire to the pointing apparatus. Here it is received by a holder, which turns round while a bevel-edged file wheel, rapidly revolving, gives to the wire its rough point. It proceeds immediately by a second carrier to a second and finer file wheel, by which the pointing is finished. A third carrier transfers the pin to the first heading die, and by the advance of a steel punch one end of the pin wire is forced into a recess, whereby the head is partially produced. A fourth carrier removes the pin to a second die where the heading is completed. When the heading bar retires a forked lever draws the pin from the die and drops it into a receptacle below. It is then ready to be "whitened" and "stuck". The whitening is performed in a copper vessel placed on a fire in which the pins are boiled in water along with grains of metallic tin and little bitartrate of potash. When the boiling has continued for about one hour the pins and tin grains are removed, thoroughly washed, dried, and polished in bran. Various kinds of apparatus are employed for sticking the pins in sheets of fluted paper, and also in folding paper for the wrappers.—*The Engineer.*

SPECTACLES.

With most persons, there is an epoch in life when the eyes become slightly flattened or arises, probably from a diminished activity of the secreting vessels. The consequence is