When the shell is dissolved in acid, an animal residuum is left, and this felt-like organic substance represents the framework through whose interstices the shelly tissue was deposited. It is termed *conchioline*.

The structure of shell is quite varied, and has been termed *porcellaneous* when it has a luster, like marble or china; *pearly* or *nacreous*, *fibrous*, *horny*, *glassy*, when its texture has these characteristics. In the first form of shell, the component layers are variously arranged in three zones, as you might bank together three sets of cards, the central being transverse, the other sets vertical, or the outer transverse and the central oblique.

Through the increasing interest in the subject, conchological publications have so rapidly multiplied, researches and results have been so incessantly recorded, that large libraries are needed to supply the student with the necessary literature for their identification and discussion. Miss Catherine Wolfe of this city, well known for her generous gifts, has furnished the American Museum with means to complete the handsome conchological library she donated many years ago, in memory of her father, the Museum's first president; and when the books are all purchased, the collection and its library will form a unique feature for public instruction.

The distribution of the molluscan tribes is brought about by two agencies principally, the active habits of locomotion in the young of many species and the drifting of individuals in the oceanic currents; to be sure, many travel slowly considerable distances, as the river mussel, which pulls itself along over the oozy banks of streams, the scallop, which leaps as it opens and shuts its vibrating valves, and the gasteropods, which crawl upon their undulating fleshy disks; but tidal motions of the water effect those wide ranges which ally the faunæ of separated continental areas. It has been more than once pointed out that migrating birds will assist such distributions, as it has been recorded that bivalves have attached themselves to the feet of aquatic birds, from which they will detach themselves when the winged pilgrim settles upon the next hospitable stretch of water. As Woodward says: "In the sea, each zone of depth has its molluscan fauna. The limpet and periwinkle live between tide marks, where they are left dry twice a day; the *trochi* and *purpura* are found at low water, among the sea weed; the mussel affects muddy shores, the cockle rejoices in extensive sandy flats. Most of the finely colored shells of the tropics are found in shallow water or among the breakers. Oyster banks are usually in four or five fathoms water; scallop banks at twenty fathoms."

Naturalists have defined a number of provinces which are distinguished by more or less characteristic groups of shells; these provinces unite sometimes along their edges, sometimes are sharply contrasted, and depend for their greater or less individuality upon the configuration of the continental coasts, the run of tides, and the character and depth of the ocean beds.

Thus, the Arctic province extends from Newfoundland northward on the American continent, and to Iceland and the North Cape in the transatlantic areas, its southern line being loosely limited to the southern boundary of floating ice; the Boreal province embraces the shores of Massachusetts, Nova Scotia, Faroe and Shetland Islands, and Norway. The Celtic province includes the shells of the British Islands, Denmark, Sweden, and the Baltic; the Lusitanian, those of the coast of Spain and Portugal and the Mediterranean, of which latter basin it is interesting to notice that the Atlantic shells prevail in its western extension, dying out more eastward, where exotic species from the Red Sea put in an appearance. The West African province in its tropical region possesses a rare abundance of beautiful shells, *Strombus*, *Purpura*, *Triton*, *Nunex*, *Conus*, and many other valuable genera. South Africa has been dignified as a province, though it possesses many of the shells of the next contiguous area, the Indo-Pacific, which are brought in tide-flows to within its limits.

The Indo-Pacific province is extensive, reaching "from Australia to Japan, and from the Red Sea and east coast of Africa to Easter Island in the Pacific" (Woodward). New Zealand and Australia form a district of conchological interest, having many shells living within its borders, only known fossil elsewhere. The Japonic, Californian, Panama, Peruvian, Magellan, Patagonian, and Caribbean form other more or less specialized areas, and furnish peculiar species or groups of species.

On our coasts hereabouts, the young collector will find access to three sorts of hunting grounds, which are again combined with one another, rocky, muddy, and sandy shores. On the first, attached to the rocks and mingled with the swaying, pendent masses of sea weed, he will gather, among many others, young oysters, the two species of mussel, barnacles, the little *littorinas*, the destructive "drill" which works its way into the shell of the young oysters and then feasts on the nutritious occupants, the *purpura* on exposed headlands, the jingle shells (*Anomia glabra*), the saxicava, which will burrow its way into limestones, and numerous crustacea; on muddy flats he will encounter the pretty bivalve *Chlorophora*, *Tellinas*, *Gouldia*, and mussel, the larger *Pholas*, many softshell clams, and numerous gasteropods; while sandy shoals will supply him with specimens of the great *Fulgur*, the odd encrusting boat shells (crepidula), the fine robust naticas (*Lunatia heras* and *Neverita duplicata*), the razor shells, whose lightning-like rapidity of motion in the sand will astonish him, the innumerable *Gemmæ*, which fill the sand of shallow waters in places, so as to be more numerous than the sand grains themselves, the beautiful *pecten*, and strange and uncouth worms.

Such brief reflections on this absorbing study are suggested to the conchologist who reviews the brilliant cases of shell treasures on the floor of the American Museum of Natural History.

IRON AT ELEVATED TEMPERATURES.

M. PIONCHON.

ABOUT 700°, iron undergoes a modification characterized by an absorption of heat which is extremely rapid within an inconsiderable range of temperature. In the discussion on reading this paper, E. Becquerel remarked that iron, about 600°, presents another remarkable change in its physical properties, since the attractive action exerted upon it by magnets is then sud-

denly diminished. As nickel and cobalt, from a magnetic point of view, present effects of the same order, but at different temperatures, nickel at 400° and cobalt at white redness, it would be very interesting to ascertain if the thermic capacity of these metals does not undergo changes analogous to those of iron near those temperatures.

VENTRILOQUISM.

VENTRILOQUISTS may, according to their specialties, be divided into various categories. Some devote their talent to the imitation of the cries of animals, the songs of birds, the noise of tools, etc.; others imitate the sounds of musical instruments; some mock the noise produced by a crowd, a regiment, or a procession; while others, again, make dolls or dummies speak.

FIG. 1.—METHOD OF MAKING FACES WITH THE HAND.

The following little story told by the Greek authors will be recalled just here. In a sort of competition between an actor and a peasant, in which it was a question of imitating the cries of a pig, the crowd decreed the prize to the actor, and hissed the peasant; but the latter, opening his cloak and showing a pig, began pulling the animal's ears, and thus showed the audience the error that it had just committed.

In our own day, we quite often see ventriloquists exhibiting in public and imitating the cries of the most diverse animals, such as the hog, the ass, the horse, the dog, and the cat, as well as the language of the entire population of the poultry yard.

Among such ventriloquists, we may class those who imitate the songs of birds, especially the song of the nightingale, and who, in scenes that are sometimes charming, almost succeed in producing a genuine illusion. Mr. Fusier, a well known actor, has a very remarkable talent for imitating animal cries, and apropos of this there is an anecdote told which is amusing, if not altogether authentic. It appears that the janitor of this gentleman's house, having several times heard strange cries in his apartment, went up stairs to protest against the violation of the conditions of his lease, which stipulated that the tenant should keep neither dogs nor cats in his rooms, and certainly no hogs, asses,

blowing through the crevices of a door or window. He says that he has often seen this man play this trick in the corner of a cafe, and rarely failed to observe some one get up to see whether the doors were tightly closed, while others who were in a mood for reading a paper contented themselves with putting on their hat, raising their coat collar, or buttoning up their coat to the chin.

Certain ventriloquists, while hidden by a screen simply, have the faculty of making their audience believe that several persons, or even a crowd, are in the vicinity. The celebrated mystifier Mr. Vivier was a very skillful ventriloquist, and succeeded in producing very curious illusions while hidden by a screen in a drawing room. Sometimes he imitated the march of a regiment; giving the sound of the clarion and drum, the timed tread of the soldiers, the orders of the officers, the exclamations of the crowd, and so forth.

FIG. 2.—O'KILL AND HIS FIGURES.

and other animals, such as the janitor accused Mr. Fusier of harboring.

Certain ventriloquists imitate the sound of musical instruments, from that of the violin up to that of brass instruments with the most piercing notes. Others excel in imitating the noise of the plane, saw, etc.

As an example of the illusion that can be produced in this line, the English author Stewart, who devoted himself to ventriloquism, speaks of an individual who imitated to perfection the sound of the north wind

voice of an alleged individual who was imprisoned therein. At Nevers, a peasant seated upon an ass suddenly heard the latter protest against the bad treatment to which he was subjected, and, being nearly frightened to death, took to his heels and left the animal, which he believed to be bewitched.

These bad jokes of Comte's often got him into great danger. At Fribourg, for example, he was arrested by some peasants, who accused him of sorcery, and wished to burn alive in a furnace; but a formidable voice that