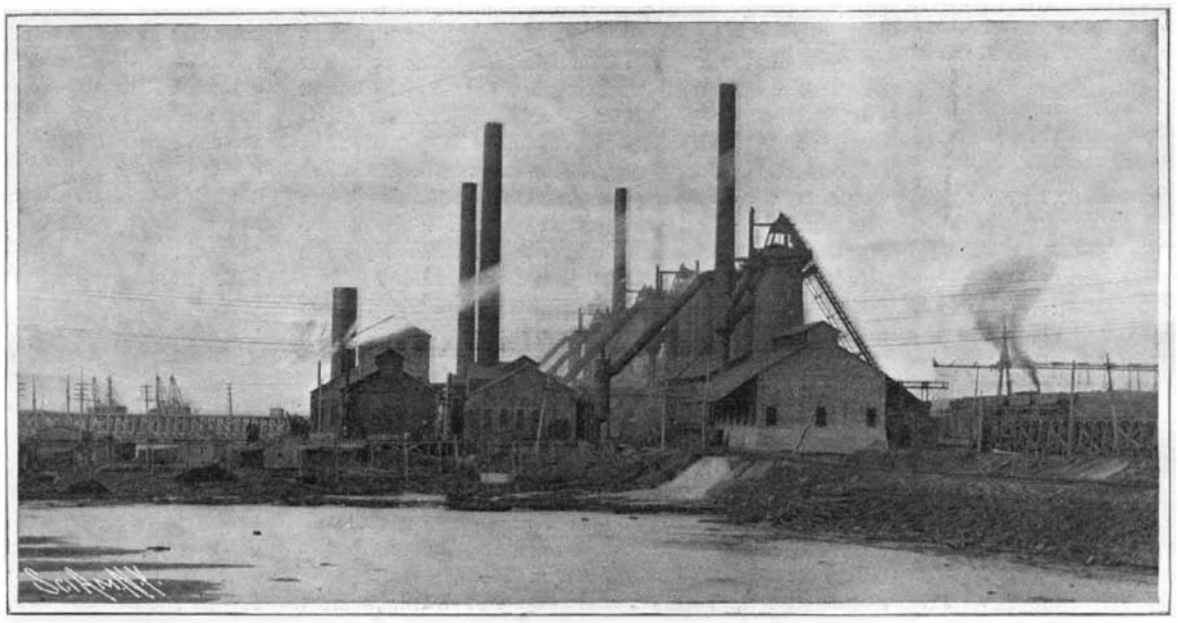
## MINING IN NEWFOUNDLAND.

BY DAY ALLEN WILLEY.

The extent of the Newfoundland fisheries, in which such a large proportion of the inhabitants of the colony are employed, may have caused the importance of its mineral industry to be overlooked to a certain extent. As a matter of fact, however, recent investigation has shown that deposits of copper and iron ore in various forms are so extensive that the island promises to contribute a very large percentage of these metals to the world's supply for an indefinite period. While gold-bearing quartz as well as lead and silver ores have been found in various parts of the island, the accessibility of the iron and copper deposits has caused attention to be confined to these almost entirely. The mining of copper has been carried on about forty years, but only recently have the beds been worked on an extensive scale. The principal center of the industry is in the vicinity of what is known as Tilt Cove, near Notre Dame Bay, on the northern coast. There are four mines adjacent to Tilt Cove, named North, East, South, and West respectively, according to their situation from the town itself. The East mine thus far has been the greatest producer of this group. About 15 miles distant, at Bett's Cove, another bed of ore is now being worked, which is apparently of considerably larger dimensions, while another extensive body is located at what is called Little Bay.



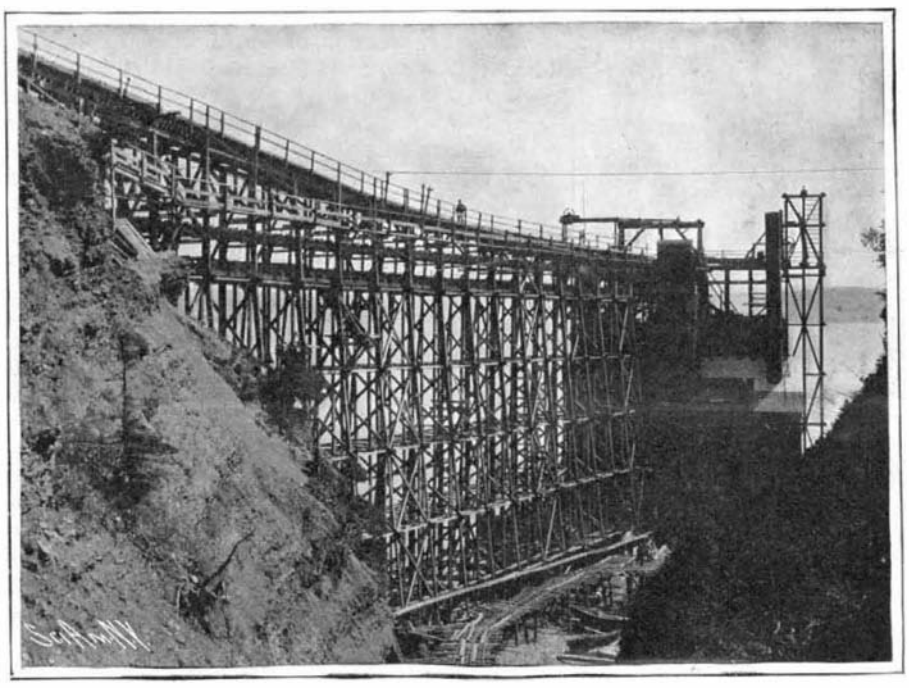
Blast Furnace Plant Smelting Ore from Newfoundland.

At each place the ore is so near the surface and in such a formation that mining has been attended with little difficulty, and the tonnage secured at a very low cost. In some instances the copper has been obtained by lateral excavations, and the bulk of it is secured by means of tunnels and shafts, few of which are over 100 feet in extent. In the industry at Tilt's Cove several shafts have been sunk vertically, and the mineral secured by lateral galleries opening into these, the mining being done mostly with pick and shovel. The ore is raised to the surface by means of large buckets attached to cables wound on drums. It is then emptied into tramcars and hauled by animal power to the ore docks. At some of the ore mines the deposits are so near the docks, and at such an elevation above them, that the loaded cars can be carried to the vessel's side by gravity, being hauled back by a cable system.

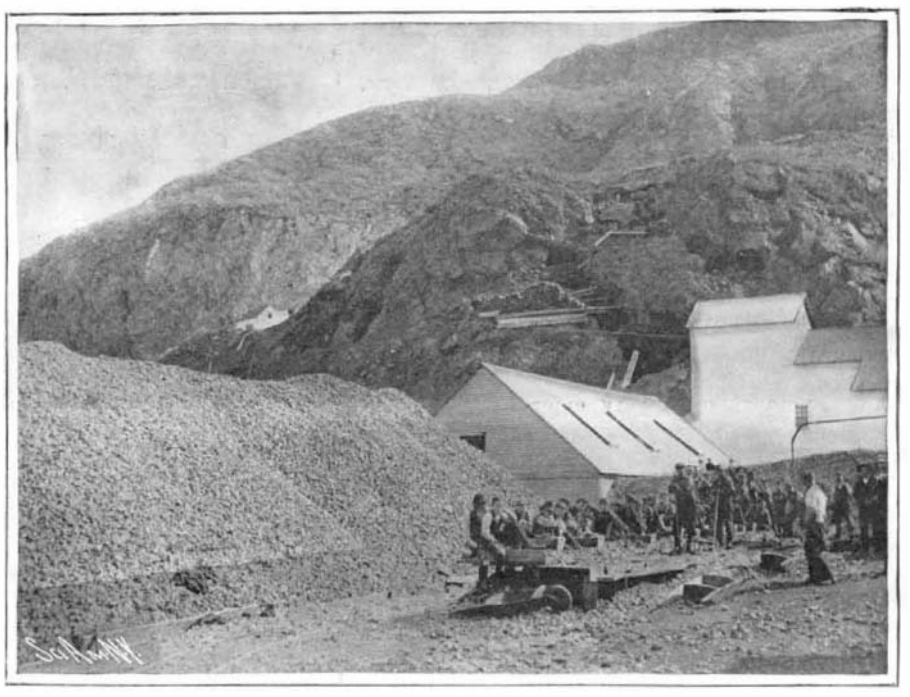
At present the output of the three localities referred to ranges between 75,000 and 85,000 tons of ore annually. None of it is smelted in Newfoundland, about half being shipped to England and half to the United States for this purpose. Nearly all of the deposits are found in the serpentine formation, and are in the lower Silurian series of rocks. The ore occurs, however, in a chloritic slate, which lies parallel to the serpentine rock. The ore assays as high as 12 per cent of pure metal, and the veins have been traced a distance of 40 miles in the Notre Dame region.

It is an interesting fact that the iron-ore deposits, which have been worked on a considerable scale, are located on islands in the bays which indent the coast of Newfoundland. By far the most notable is Belle Isle, in Conception Bay, a few miles from St. John's itself. The island is about six miles long and three in width, and apparently is made up almost entirely of brown hematite. The formation is very similar to that of the Michigan iron ranges, since it is close to the surface and is revealed by stripping off the few feet of the earth and rock which cover it. In fact, much of the deposit has been laid bare merely by using the pick and shovel. When broken out with hand tools it separates in the form of rhomboids, and but little force is required to reduce it to the size suitable for handling. Mining operations have been conducted in Belle Isle for about ten years, and at the outset such a large quantity was secured by hand labor that at times a thousand tons were carried to the shipping point in a day. By the installation of drills operated by compressed air and electricity and mechanical loading apparatus, the mining capacity has been largely increased, but as yet such a large body of ore is still near the surface that it has been unnecessary to do any tunneling whatever.

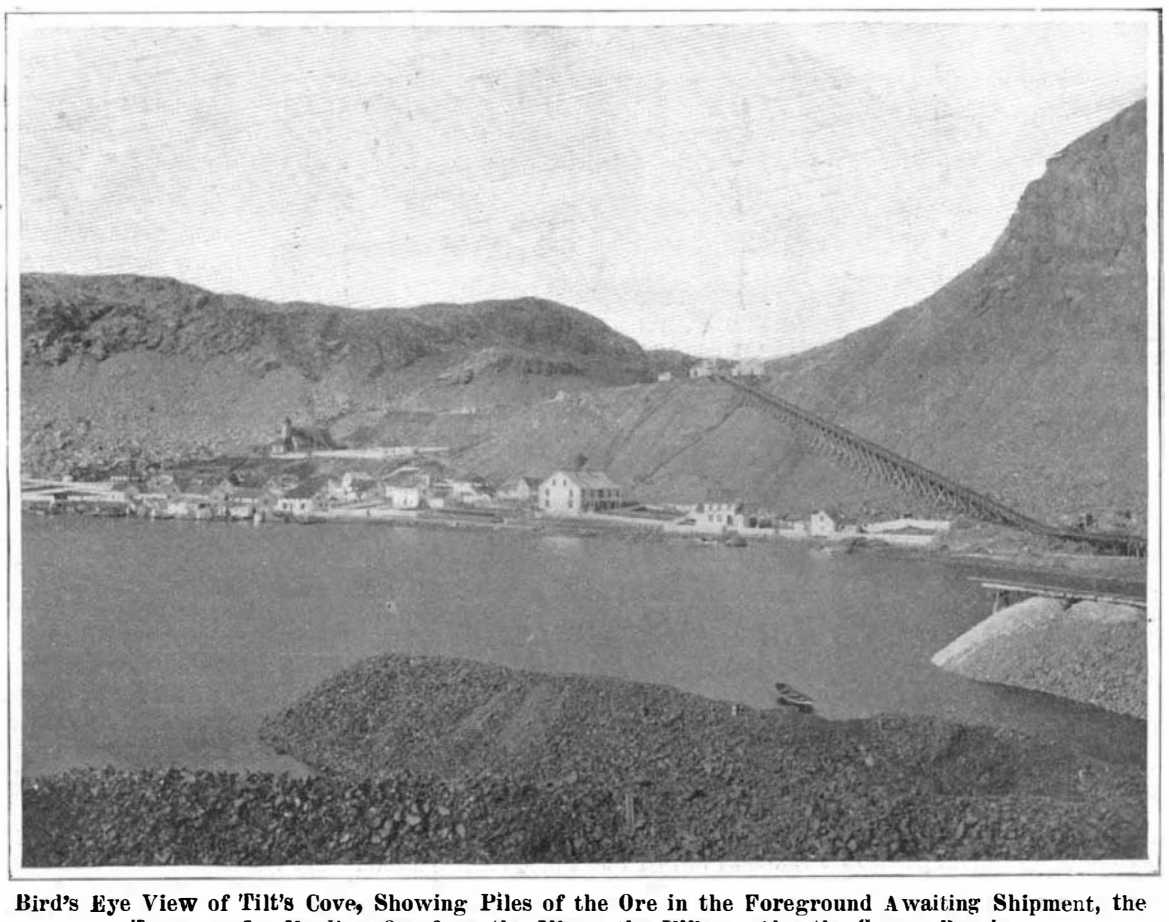
An estimate of the ore near the surface on Belle Isle places it at nearly 30,000,000 tons. The output at present averages about 400,000 tons annually, nearly all of which is sent to Nova Scotia, where it is smelted at the furnaces of the Dominion Steel and Coal Company at Sydney. As fast as loaded, the mine cars are



Iron Ore Shipping Pier at Belle Isle. The Ore is Shipped to England and the United States to Be Smelted.



Piles of Broken Ore at Tilt's Cove Awaiting Shipment. In the Background Can be Seen the Crude Galleries Excavated by Hand, Opening Into Copper Deposits.



Bird's Eye View of Tilt's Cove, Showing Piles of the Ore in the Foreground Awaiting Shipment, the Tramway for Hauling Ore from the Mines, the Village, Also the Copper-Bearing Cliffs in the Rear of the Village.

hauled to chutes built out from the shore line, where the water is sufficiently deep to float a 10,000-ton steamship. The usual method is to run the cars out upon the trestle extending along the top of the chute, and dump directly into the hold. It may be added that the tramway from the mines to the water side is so inclined that but little power is required to transfer the loaded cars to the chutes. From 4,000 to 10,000 tons daily can be loaded at this point, and during the shipping season, which covers about five months of the year when the bay is ice free, a fleet of ten or twelve ore carriers is continually plying between Belle Isle and Sydney.

The ore at Belle Isle contains from 48 to 56 per cent of pure metal, and yields a pig iron especially suitable for rail and structural steel, into which much of it is manufactured. The furnaces of the Dominion Company which are of modern design will smelt from 1,200 to 1,500 tons of ore daily.

The mining of iron pyrites is conducted on an extensive scale at Pilley's Island in Exploits Bay. As the photograph shows, the deposits outcrop on the shore of the bay so extensively that most of the mining is done with hand tools, the formation being very soft. In a few places lateral galleries have been driven into the beds, but a very large tonnage is situated directly on the surface. At present Pilley's Island is yielding nearly 75,000 tons yearly, most of which is carried to the United States for reduction. An analysis of the ore shows that it contains between 50 and 60 per cent of sulphur, which is secured in the treatment, while the metallic iron is utilized in the composition of a high grade of steel.

As in the case of the copper deposits, the iron ore beds, especially in the eastern section of Newfoundland, are undoubtedly very extensive, for veins have been traced along the shore of Conception Bay a distance of over fifty miles. The quantity and accessibility of the Belle Isle deposit, however, has caused the industry to be principally confined to this place.

---

Experiments were recently made with the explosion of fixed torpedoes at a distance by means of Hertzian waves. The apparatus employed is the invention of Señor Balsera, a telegraph official. The results of the trials are declared to have been satisfactory. The inventor has asked for facilities to study the application of his system to the working of torpedoes.

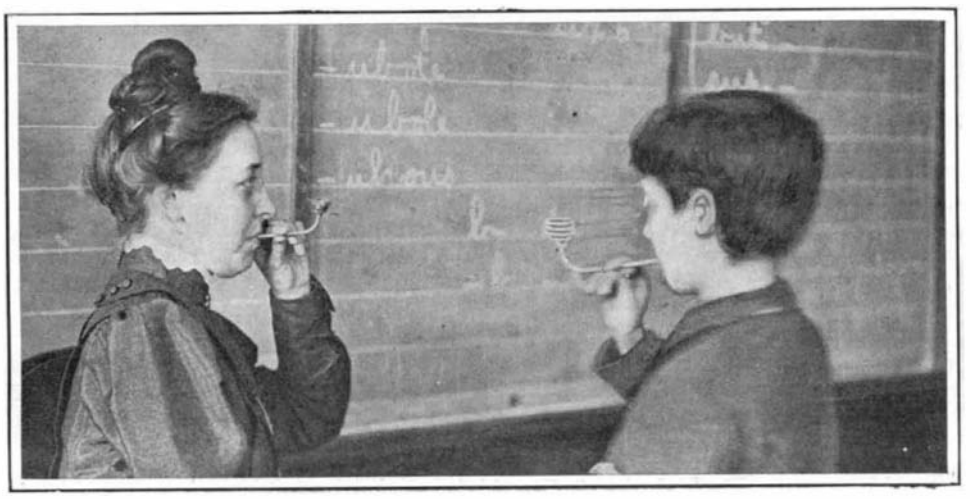
## TEACHING DEAF-MUTES TO SPEAK.

It is a misnomer to refer to anyone as "deaf and dumb." Except in rare instances a child is mute, not on account of any malformation of the vocal organs, but because it is deaf and has never heard a spoken language. The loss of the sense of hearing should, therefore, not necessarily mean deprivation of the power of speech also. It is only within recent years that we have come to realize this fact, and in up-to-date institutions the old-fashioned finger alphabet is now unknown. Every child is taught to speak in the natural way by means of the vocal organs.

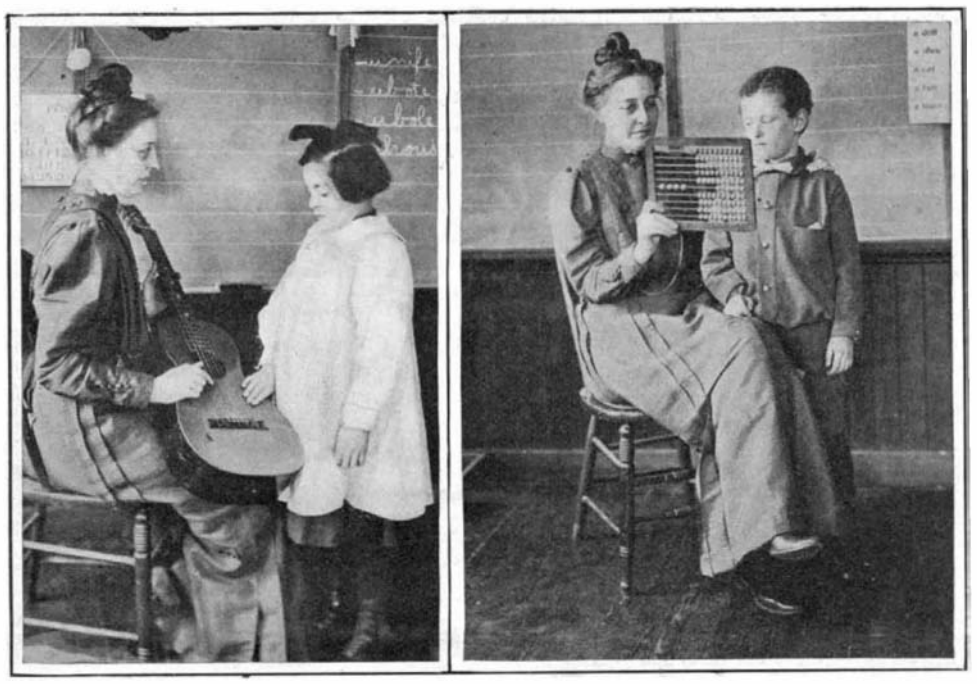
Odd as it may seem, the oral method of teaching deaf-mutes antedates the finger alphabet by over a century. In 1580 a Spanish monk, Pedro Ponce de Leon, taught congenital mutes to speak simply by instructing them first to write in characters the names of objects pointed out to them, and then to enunciate the sounds corresponding to the characters. But so little did the world value his discovery, that in less than forty years after his death he was forgotten, and Juan Pablo Bonet became the recognized founder of that method of instruction which Ponce had begun. This man, who was also a priest, published at Madrid in 1620 the first manual for teachers of the deaf, and which is in some respects still one of the best. The advantage of the articulate over the manual method of instruction was very slow to make itself felt. In 1850 several schools in the United States which had previously taught the sign method adopted a combination of the two. But not until 1867 was a school established which used the method of articulation only.

The articulate or oral system of teaching is based partially upon the imitative nature of the pupil. He has to rely much upon the observation of the movements of the teacher's vocal organs, and he endeavors to produce the same sounds by forming his lips and tongue in a similar fashion. A little instrument somewhat like a paper folder is sometimes used to bring the tongue into the proper position. It is of prime importance that the pupil perceive the difference between his own silent and the vocalized breath. This perception has been styled "the hearing of the deaf," and to produce it is the first aim of the instruction in labial reading. In the elementary classes the boys and girls are drilled into the A B C of articulation by being taken, one at a time, before a mirror and taught to imitate the movements of the teacher in making the sounds. Diagrams are also used to indicate the position of the palate or tongue in producing certain sounds. The whistling sound of *wh* is conveyed to the mind of the child by the aid of a pipe in the bowl of which is a little ball that is blown up and down as the sound is formed. In this way the children are taught to understand the value of various lip and palate formations in combination with the use of the lungs.

It is a strange experience to visit one of these schools, and see the teacher talking gravely to the classes of deaf-mutes and the children responding as quickly as though they could hear all that was said. The only indication of their affliction is found in the flat tone of their voices. Hearing nothing, the children

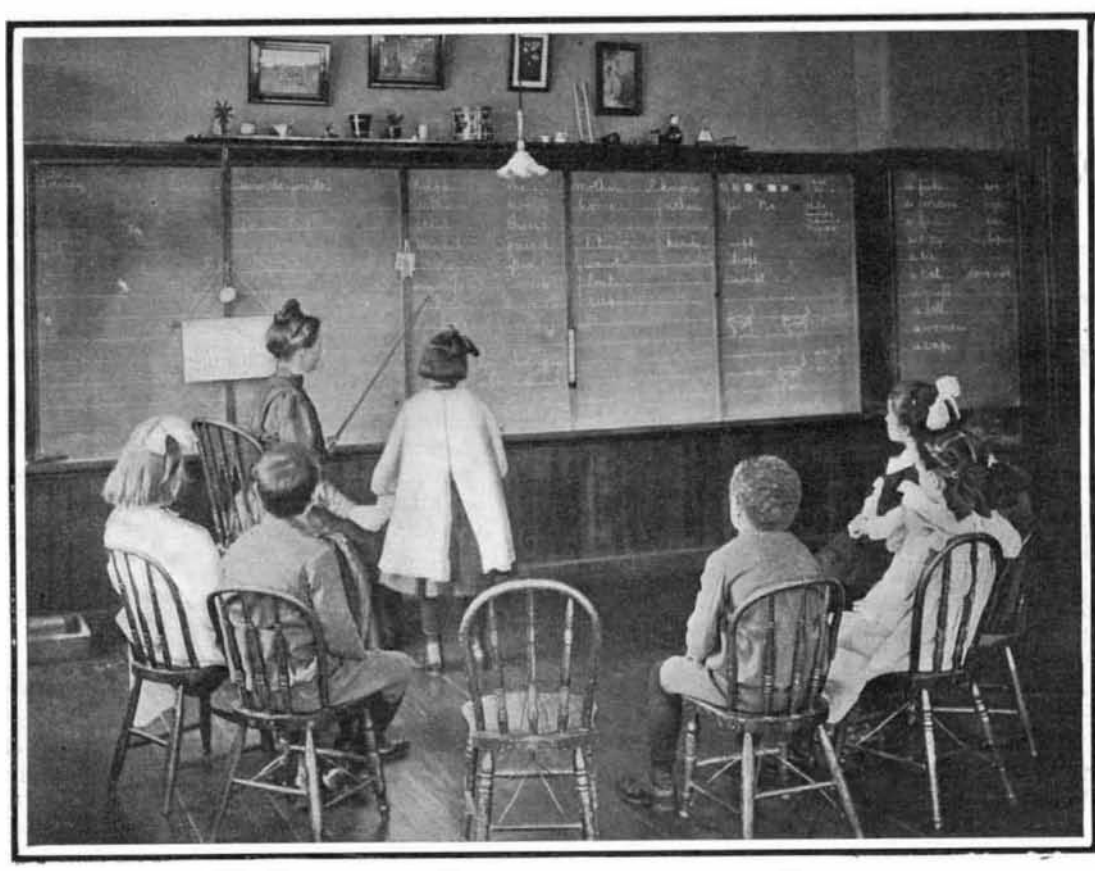


How the Sound of "wh" is Taught.



Demonstrating the Value of Vibratory Sounds.

Teaching a Pupil How to Count.



Teaching Pronunciation by Means of Phonetic Spelling.

Correcting Wrong Breathing in Articulation.

TEACHING DEAF-MUTES TO SPEAK.