proper negotiations, the company began the manufacture of another musical innovation, the Orthophonic Victrola. The new instrument proved a sensation and once more the company was on a full production schedule, with orders totaling more than $20,000,000 worth of instruments at factory prices. The talking machine was now able to capture the finest sounds that could be recorded. The great artists of opera and the concert stage flocked to the Camden recording studios. Great orchestras were included. Outstanding musicians in Europe could be recorded on their own home territory.

Shortly afterward the company completed negotiations with the Radio Corporation of America for rights to combine the Orthophonic Victrola with the radio, and Victor began the production of a combined radio and talking machine. The success of this venture resulted in a merger of the two firms. Meanwhile, Victor engineers perfected a new radio, shown for the first time in 1929. Production mounted and employment increased.

The RCA Victor Company began to function January 1, 1930. Today, in Camden, the capital of radio and the phonograph, it takes thirty-one buildings, covering ten city blocks, and over 14,000 workers in peak times, to turn out the radios, phonographs and records that reach the farthermost parts of the world.

While the capital of the motion picture world is in far away Hollywood, the voice of the modern movie owes much of its present attainment to the researches of RCA engineers. When the first talking pictures made their appearance, the sound was recorded on large discs, such as those used with the Victrola. But the disc had a number of inherent disadvantages in this application. There was the constant danger of the records breaking. If for any reason the film had to be patched, the sound was thrown out of synchronism with the picture. Synchronization between pictures and sound was a difficult problem. Since light travels faster than sound, the voices of the actors reached the audiences after their lips had been seen to frame the words.

The persistence of the researchers developed a method of converting sound into electric impulses by passing it through a microphone such as that employed on a radio. These electric impulses were made to actuate a delicately balanced mirror from which a beam of light was reflected on the photographic film negative. The light waves were photographed on the film. Thus a sound picture of today is an actual photograph not only of the actors but of the sound waves produced by their voices. These sound waves appear on a separate "track" alongside the picture on the completed motion picture film.

Recently the Camden laboratories have made another contribution toward the perfection of sound reproduction, using the ultra-violet ray. Ordinary white light, which is used in the recording process, is composed of all the colors of the spectrum, each color having a different wave length. It is difficult to focus more than a number of these wave lengths sharply at the same time, with the result that the sound image is blurred and distorted. But, by placing an ultra-violet ray filter in front of the white light, all wave lengths but those within the narrow ultra-violet range are eliminated. This makes it possible to focus the light beam on the film negative and permits a