

Let us suppose that at one side of a room there stands a long and deep wooden box with two horizontal copper rods on its top placed near together and extending from end to end. The wire from the positive pole of the battery is attached to one of these rods and the conducting wire of the negative pole to the other. The trough is nearly filled with a straw-colored solution made by dissolving silver in aquafortis (nitric acid) and obtaining nitrate of silver in crystals, then forming another salt—the cyanide of silver—by combining the silver of the nitrate with the cyanide of potassium.

Let us also suppose we have an old or a new teapot to be plated with silver. After its surface has been perfectly freed from grease and oxide, it is ready to be put in the solution by a copper wire suspended from the copper rod connected with the negative wire, and just opposite to it; there is also suspended in the box a sheet of silver connected with the other copper rod that is in communication with the positive wire of the battery. An electric circuit is now formed and a current passes down through the sheet silver dissolving it, thence it passes through the solution to the teapot or article to be plated, and deposits a coat of silver over its surface, by decomposing the solution, and making it adhere to the negative pole. When a coat of sufficient thickness is deposited, the article is lifted out, washed in soft water, and its surface polished with a steel burnisher, when it becomes as bright as the face of a mirror. This is a description of the art of electro-plating, and it may be practiced for pleasure by almost any person having a small machine or battery and a very inexpensive apparatus.

The wire which proceeds from the copper plate of a galvanic battery to a depositing trough is called the *anode*—the positive pole; that which proceeds from the zinc plate to the trough, is called the *cathode*, or negative pole. The plate of silver to supply the solution is connected to the anode. The current passes from the positive to the negative pole, carrying the silver with it and making it adhere to the prepared metal. In reading scientific works on electric science many persons become confused with the use of the terms positive and negative. The zinc plate is the positive element, the copper the negative; but as the current passes from the copper along the wire, the pole of the copper is the anode. The electricity passes to the zinc, thence it traverses to the copper through the solution, forming the mysterious electric circuit.

Not many years ago silver-plated wares were all manufactured by placing leaf silver upon the surface of copper and brass articles, then submitting them to the action of fire, by which the silver was partially fused and thus made to adhere. This was called "fire-plating," an art still pursued to a considerable extent in England and France. But electro-plating, though so recently discovered, is much more generally practiced. Much of the hard wares, such as communion service plate and tea-table sets, which are exposed in jeweler's show-windows, are indebted to the electric current for their beauty and brilliancy.

MELODEONS—HARMONIUMS.

The organ is undoubtedly the king of instruments for sublimity and variety of tone, but next to it, we believe, the American melodeon holds the second place. The tones of the organ are produced by wind forced through pipes, those of the melodeon by wind rushing through reeds. The latter are rectangular openings or narrow slits in which are thin metallic pallets; against these the wind is made to impinge by a bellows and thus produce the different tones according to the size of the reeds and the velocity of the wind rushing through them. The small brass reeds upon which boys produce inharmonious mouth music by blowing through them, will afford some idea of the nature of a musical reed instrument, and an accordion, operated by a small bellows between the hands, will impart some idea of the melodeon in its simplest form. The European seraphine is merely an enlarged accordion; the wind to operate the reeds is compressed in a bellows underneath the key boards, and it is driven through the reeds by opening a communication between them and the outlet of the bellows. The keys throw open the valves of the passages. The American melodeon is essentially different in one principle of its arrangement from the seraphine, and it is greatly superior on ac-

count of this improvement. Instead of placing the reeds in such a manner, in relation to the bellows, that the wind is forced from the bellows through them, they are so situated that the wind rushes through them into the vacuum produced in the bellows; they are placed in connection with the inlet instead of the outlet of the wind chest. By this improvement the makers are enabled to arrange the reeds more conveniently for examination, and also make them produce superior tones. This essential feature of American melodeons was invented only about fourteen years ago by Jeremiah Carhart, of Buffalo, N. Y., but now of New York city, and was secured by patent, which is now in force.

From the date of this improvement there commenced a new era in the manufacture of such instruments. Quite a number of patents have since been secured for different improvements, and the business has become greatly extended, there being quite a number of manufacturers in different sections of the country, principally, however, in the Eastern and Middle States—the whole turning out about two hundred instruments weekly.

The most simple melodeons have one set of reeds and one bank of keys, and a compass of four octaves. A higher class of melodeon has a range of five and six octaves with one set of reeds. Another has two sets of reeds with one bank of keys, and a still higher class has two banks of keys, two and sometimes three sets of reeds, and from one to four stops. Quite lately a new and far higher style of this instrument has been introduced and has been called the harmonium. Although this instrument was originally from France, those which have been made in this country have had all the peculiarities of the melodeon applied to them, and no foreign instrument is capable of rivaling them in variety and quality of tone. The American harmonium surpasses every known instrument of this class for the performance of organ music, or any music that can possibly be elicited from a keyed instrument where the tones are sustained as long as the keys are held down.

A musical friend of ours having lately obtained one of these instruments, made by C. Peloubet, of Bloomfield, N. J., he dissected it for our gratification, and permitted us to enjoy a full examination of its parts, and we will endeavor to give such a description of it as to convey a good idea of its arrangement and powers. Its exterior resembles a large melodeon, but it has three manuals or key boards for the hands, the one rising behind the other in steps. A long seat for the performer enables him to reach either of the key boards or the pedals for the feet, and these can be touched either separately or operated together. On the sides are placed eight knobs, called stops. Each set of keys is really an instrument in itself; it has its own wind chest and its separate connection with the bellows below, which latter wind reservoir the three key boards have in common. Each key moves but one pallet valve, forming the connection through the wind chest between the air outside and the vacuum formed in the bellows. The reeds or stops of the upper or "swell" bank of keys are inclosed in a box, which may be opened or shut at pleasure by a lever, which is moved by the foot, thus making a swell, from which the bank of keys takes its name. The second or middle bank of keys contains three stops. These are all loud and full, hence called "great organ." The lower bank of keys controls tones of a subdued and gentle character, suitable for the accompaniment of a melody or for church harmonies, hence it is called "choir organ." The stops control the quality of the sounds. The three on the upper bank of keys are the "stopped diapason," "flute" and "tremolante." These may be drawn separately or altogether. When the tremolante stop is drawn, trembling sounds, expressing mournful accents, are emitted. There are four stops of different characters on the middle key board (great organ). These may be drawn separately or altogether, and by a stop called the "coupler" they can be combined with any of the stops of the upper key board. The choir organ, or lower bank of keys, has a sweetly-voiced stop, different from any of the preceding. From this general description it will be apprehended that an endless variety of tones can be produced by this instrument. One combination or effect follows another with such facility that it appears difficult to persuade ourselves that these are produced by one in-

strument. But really it is several wind instruments combined in one, for there are seven sets of reeds, each having a pitch or character of its own, and thus truly seven instruments may be used separately or in conjunction; it therefore offers facilities for the performance of music of the most diversified character. The little knob at the one side, called "flute," when drawn out and put under the performer's control, calls out the soft tones of the "breathing flute;" it answers to the touch of the finger, and airy melodies, like notes of warbling songsters, are heard. Another stop produces tones like the martial voice of the trumpet. The "stopped diapason" produces tones of a plaintive character, suited to a devotional spirit. In short, as the stops are called, one after another, to add their voice to the choir of reeds, the effect is grand to a degree which we could scarcely have believed possible in any instrument but a large organ. A stop is a long cushioned strip, which covers and opens a passage for the wind to pass through the reeds. In this instrument the wind can be made to pass over five sets of reeds, with one set of keys, and by the touch of one lever, thus producing five notes through two passages in passing to the one chest.

The inspiring influence of music upon man in all ages and conditions of life is well known. It tends to elevate the hopes, refine the feelings and soothe the woes of humanity. On the battle field, in the temple and at the fireside its power is felt and acknowledged. One of the greatest improvements rendered to social life in modern times is the construction of a higher class of instruments for the domestic circle. Home should be rendered happy by all the accessories which make it agreeable to young and old, and in the march of improvement a new instrument like the harmonium, approaching so nearly to the kingly organ, and yet made subservient to the execution of music in the household, as well as in the church, is certainly a valuable acquisition to the refinements of life.

THE COAST SURVEY AND THE GOVERNMENT.

Some of our cotemporaries are very justly calling public attention to the great value of the Coast Survey not only to our navy, but also to our disembarking troops upon the Southern coast. To the commerce of a maritime nation it is of the utmost importance that the survey of the coast of the country should be not only on an extended scale, but also be most carefully done. Now, while the enemies of the government are throwing all possible obstructions in the way of our vessels, minute details of the maps of the Chesapeake, the North Carolina Inlets and Sounds, Port Royal entrance, Bull's Bay, Fernandina, and various other points on the Gulf coast, are of immediate interest and importance; and we fully realize that the nation is more than repaid by the war-use of the coast survey for the annual appropriations granted to it for a totally different purpose. The Confederates are also supplied with these charts of the Coast Survey, but they are much more valuable to us than to them, as we have command of the sea. On our ships and in our regiments forming expeditions to operate on the Southern coast these charts are studied, and thus mistakes and probable disasters have been avoided. Not a ship of our great fleet but was moving upon almost familiar ground; not a boat but landed its troops just wheresoundings and topography directed.

To such expeditions as must be now constantly moving southward the value of the carefully prepared charts of the Survey Office cannot be over estimated, and it is right that the press, as representing the people, should acknowledge their indebtedness to the source from which they extract pages of information day after day.

GEOFFREY ST. HILAIRE.—Late news from Europe contains intelligence of the decease of this renowned zoologist, in Paris, on the 9th ult. He was born in 1805, and was therefore 56 years of age at his death. He was the son of E. Geoffroy the celebrated French anatomist, and was a prodigy of scientific learning at 19 years of age. He was a professor of the natural sciences and published several works on anatomy and physiology, which have won for him a high position among the great names of the earth. He was one of those cool, utilitarian French philosophers, and was the first to advocate the use of horse-flesh for human food in France.