

THE "AUTOPHONEON."

[A Report to the Polytechnic Association of the American Institute. Read and accepted, February 12, 1863.]

The committee appointed to examine a new musical instrument, constructed by Joseph Dixon, report that they proceeded to his residence in Jersey City, and were ushered into a music-room in which is placed an automatic organ, called by the inventor an "Autophoneon." The case is eleven feet high, nine feet long, and four feet deep; it has a front of finely-wrought rosewood; but a portion of the apparatus is in the story below, so that the actual height of the instrument is twenty-one feet. It has a keyboard of five and a half octaves, and twelve stops for the use of an organist. After listening to several "voluntaries," which displayed the fine tones and capacity of the instrument, the organist retired, and the inventor touched a lever, when a series of waltzes and familiar airs followed, with a fullness of harmony and brilliancy of execution which were truly astonishing. The front lid of the instrument was then raised, exposing to view the principal machinery by which these marvelous effects were produced. Above the keyboard was seen a cylinder seven feet three inches in length, and thirty-four inches in circumference. Upon this immense barrel are placed the brass pins and staples which operate the keys of the instrument. The pitch of the sounds depends upon the longitudinal position of the pins or staples, and the length of the sounds depends upon the length of the staples in the direction of the circumference. Above the cylinder is a brass bar extending from one end of the instrument to the other, having on its lower side finely-cut slots, one-half of an inch apart, in each of which a steel finger, fitted with great accuracy, plays in a vertical direction. The number of fingers is one hundred and sixty-six. The advantage gained by this great number of keys is that the instrument gives the complete harmony as arranged for an orchestra; each series of pipes having a separate and independent part. The cylinder contains several thousand pins and staples, or enough to play six hundred and forty bars of music in "two-four" time, with all the parts as performed by a full band. The increased or diminished dynamic effect is regulated by steel fingers, which also set in motion the pneumatic action operating the drums.

The distance between the steel fingers is sufficient to allow eight rows of pins and staples to be placed upon the cylinder, which, by a lateral motion, brings each row in turn under a finger, so that in eight revolutions of the cylinder each finger has traversed a path of pins 272 inches in length; this number, multiplied by 166, shows that the whole distance traversed by all the fingers is 3,762 feet and 8 inches.

Ten cylinders have already been made, and the pins and staples have been arranged on four of them. The work is done by first covering the cylinder completely and firmly with white paper, on which, by means of the fingers and a graduating machine, the position of the pins and the length of the staples is marked. After the pins and staples have been driven into the wood to the proper depth, the paper is removed. The time required for arranging the pins and staples on one cylinder is three months. In order to obtain a perfectly smooth and uniform surface, presenting everywhere the same arrangement of grain for holding the pins, it was found necessary to construct the cylinders from solid logs. The bass-wood trees required were cut at the right time in the forests of Schoharie county; and after proper seasoning were bored, so as to leave a shell of about three-quarters of an inch thick, by machinery especially constructed for this purpose at a cost of several hundred dollars. The cylinders are highly polished and have their ends enclosed by brass disks, of diameter sufficient to form a protecting rim; connected with these disks are the axles on which, when in place, the cylinder revolves. The linear extent of the ten cylinders, placed end to end, exceeds seventy-five feet.

A weight of 300 lbs., which is so geared as to be easily moved, is raised to a height of 11 feet; and, when connected with the cylinder, causes it to revolve for about one hour and a half. The speed is regulated by a fan wheel. The bellows, which supplies the pipes with wind, is placed in the story below and operated by a novel hydraulic apparatus, which is self-acting, that is to say, its valves are tripped in-

ternally, faster or slower as more or less wind is required; the bellows itself always directing the movement. A correct idea of this ingenious contrivance cannot be given without drawings.

It only remains to speak of the pipes. They have been constructed with great care, a large number having been rejected after subjection to a trial. The points satisfactorily attained are correct imitations of the sounds of not only the wood and brass instruments but also of the stringed instruments of the orchestra. Having perfected this part of the "Autophoneon," the inventor is able to give the correct interpretation of all written music. For instance, the complete overtures of "Don Giovanni" and "Figaro" are played with surprising sweetness and power. The slow and solemn anthem and the exciting music of the dance are equally within its range and capacity. It not only executes the most rapid passages but adds those peculiar effects which can only be produced by contrasts in the *timbre* and dynamics of sound.

Eight years have elapsed since Mr. Dixon commenced the construction of this instrument for his own use; and the cost thus far is nearly ten thousand dollars! Instruments somewhat similar to this belong to several of the crowned heads of Europe, but they are all of inferior size. It is a matter of especial gratification to every American that the largest automatic musical instrument ever constructed has been planned and completed by a single enterprising fellow-citizen, who, in following the bent of his genius, has demonstrated how far machinery, which already has the credit of doing the drudgery of the world, can be made to minister to our more refined tastes. Respectfully submitted,

JOHN B. RICH, Chairman.

Paganini's Violin.

While examining and talking with the officer (who was very polite and interesting) about this beautiful work, he accidentally happened to remark that the veritable violin belonging to Paganini was locked up in a secret closet of the room in which we then were. We begged him to let us have just one peep at it; so he obligingly procured the key, and took out the glass case containing the old violin with its broken strings, there being only one whole one; and I thought, who knows but what this is the very one upon which he produced such wonderful harmony as to touch every heart with sounds more soul-stirring that have ever since been heard? By the side of the violin lies the box in which he kept it, with "Paganini" in gilt letters upon it. Several seals fastened a blue ribbon to the violin to which a paper was attached. This, we were told, was the city stamp, as it had been found necessary to take every precaution against the possibility of its being stolen, which had been attempted many times. Therefore they keep it locked up so secretly.

Paganini was a native of Genoa, and his daughter (who, I am told, is very rich) wished to purchase her father's violin of the Government at any price, and she earnestly desired to own it, but the Government would not grant her request, saying if by any turn of fortune she should ever come to want, this valuable violin might be sold and perhaps taken away from their city, but, if they kept it, here it would be. I asked what "make" they supposed it to be. The officer said that, a year ago, a celebrated French violin-maker from Paris came here on purpose to see it, and, if possible, make one like it. He begged hard to be allowed to take it out of the glass case or rather globe in which it is kept, that he might take it in his own hands and examine it, but this privilege could not be granted upon any account; so our officer said he came every day for seven days, and examined it, taking measure as well as he could from the outside. His opinion was that it was an old violin of some German make. The officer who so kindly showed us the violin was an old man, and related many highly interesting anecdotes of the great violinist. He said that in his youth he went twice to hear him play in the great theatre in Genoa, and never would he forget the tones which came from that violin; sometimes the whole audience would be in tears, as the sympathetic artist made his instrument fairly moan through the immense building, almost rending the hearts of all who heard it. Then, in a moment, the whole house

would be in a roar of laughter at his "Carnival of Venice," and his spirit and manner would enliven the most grave and sedate. Truly this is genius; this is art, such as few artists have ever attained to. Although he frequently played in Genoa, still (as the old man told us) he never could be heard for less than ten francs, and the poor soldiers often denied themselves other amusements to save up money to be able to hear Paganini. The house was always thronged when he played, and he made a large fortune, which he left to his children. Locking up the closet, the old gentleman remarked that it was very seldom visitors ever saw this treasure, as they had so much trouble to keep it they did not show it to everybody. I thanked him heartily, telling him I never could, as I know I never shall, forget that I had seen Paganini's violin.—*Milan Correspondent of the Chicago Journal.*

Gratuitous Advice to the Navy Department.

The British steamer *Princess Royal*, recently captured in attempting to run the blockade of Charleston, is reported to have on board the materials for plating a vessel of war, and an English mechanic who is familiar with the plans designed to be used. Our advice to the Navy Department is to adopt the plans and materials of our enemy without delay. They are probably much better than any that the dull heads and lukewarm hearts of some of our "practical naval constructors and engineers" have the capacity to produce. Let the Secretary of the Navy bear in mind that it was the rebels who first taught us the value of plating vessels with iron, while our own chief naval constructor pronounced it "a humbug;" and for once act upon our advice, without reference to the opinions of persons whose loyalty is not any too fervid. A moment's reflection will convince the honorable Secretary that the rebels, considering their limited means, have performed wonders upon the sea, and that any designs of theirs, in reference to future operations, are entitled to prompt consideration. The English mechanic who was captured in the *Princess Royal* is our prisoner, and as he came in her to work for pay, we have no doubt he will work for us as readily as he would have done for the rebels. But we warn the Secretary not to submit our advice to the Bureau of Construction, for that venerable body are too long-winded and too lazy to comprehend the value of anything which does not originate with themselves. As a specimen of their want of guile, we state that a vessel now in course of construction in Charlestown (Mass.) navy yard, though partly planked, has not yet been fully designed. The whole of her plans have not been forwarded from Washington, so that her talented and scientific builder, Mr. Hanscom, is yet in the dark concerning many important parts of the work which are necessary to make her complete.—*Boston Commercial Bulletin.*

The Twinkling of the Stars.

According to M. Arago, astronomers and others have failed to arrive at a satisfactory explanation of the twinkling of the stars, on account of their failure to give an exact definition of the term "scintillation." He affirms then, that, in so far as naked eye observers of the heavens are concerned, scintillation, or twinkling, consists in very rapid fluctuations in the brightness of the stars. These variations are always accompanied by variations of color and secondary effects, which are the immediate consequences of every increase or diminution of brightness; such as considerable alteration in the apparent magnitude of the stars, and in the length of the diverging rays, which appear to issue in different directions from their centers. It has been remarked from a very early age that the phenomena of twinkling is accompanied by a change of color. It is asserted that the name of Barakeach, given by the Arabians to the star Sirius, signifies the star of a thousand colors. M. Arago also asserts that the planets twinkle.

STEEL SHIRT-COLORS.—A Portland tailor advertises a very beautiful article of enameled steel shirt-collars, manufactured at Sheffield, England. They can hardly be distinguished from the paper collars, so fashionable, and will no doubt entirely supersede them. If they become soiled, you have only to sponge them to restore their whiteness. The use of cotton in the manufacture of shirt collars is at an end.