Correspondence.

Bell's "Undulatory" Current.

To the Editor of the Scientific American:

In your issue of July 16, 1881, I see that a very important and sweeping decision has been made by a learned judge of Boston in regard to the right of Alex. Graham Bell to transmit articulate speech by electricity.

Mr. Bell says that "in this specification (174,465) the three words, oscillation, vibration, and undulation, are used synonymously, and in contradistinction to the terms intermittent and pulsatory." We wish to ask, Is not the impulse from a Blake transmitter a pulsatory current and not an undulatory current? Who ever heard of a wave in a pile of cord-wood or a mass of pig iron? If Judge Lowell sustains Mr. Bell in his right to transmit vocal sounds by electricity, what are we to do with Gray and his singing telephone that was made before Bell came upon the stage? Is not singing a vocal sound? Mr. Bell or his company have not said one word about the Blake or the Edison transmitter which transmit all of the messages in our exchanges.

Why have they not prevented Mr. Edison from putting up his telephone, if the opinion of Judge Lowell is correct?

The impact is made by the transmitter and carried along the wire to the chalk cylinder, and there by the force applied to the crank of the electromotograph the receiver talks in loud tones, as is impossible for the Bell receiver in this case. The method of producing electric impact is the same as is to-day used by all telephones and not by a "Bell phone."

From the fact that the vibrations of the human voice can be photographed (see SCIENTIFIC AMERICAN for June 18, 1881) with distinctness, and also from the fact that the phonograph shows positive indentations upon its surface, and that those irregularities will, when brought in contact with the point fastened to the diaphragm, reproduce articulate speech, shows conclusively to us that the transmission of speech by electricity is not the result of electric undulations, but of positive "impact," pulsation, and that every time the hammer in a Blake transmitter strikes the carbon button with, say, one unit of force we get a displacement of the diaphragm equal to that unit of electric power transmitted, and it follows because a certain number of carbon particles come in contact with the hammer; but you double the sound and you double the force, and in doubling the force you double the number of carbon atoms in contact with the metal, hence the increase of sound by the increase of quantity of electric impact. Who can look the facts squarely in the face and say that a wave of electric fluid ever passed through a solid mass of iron? It looks to us almost as speculative as Jules Verne's trip to the moon.

ORSON MILLARD.

Flint, Michigan.

Bullion Safes.

To the Editor of the Scientific American:

Noticing the communication of Walter L. Smith, in your issue of 13th, in regard to safety of contents of express or bullion safes, and as the quantity of money and bullion in transit is so largely increasing, the idea is of increasing importance.

In the West a combination lock is largely used that admits of its combinations being instantly cut off, and, when required, instantly replaced, and at the same time thoroughly reliable and simple in operation.

In use on express safes it works admirably. For instance, starting the bullion safe from San Francisco, the local express agent moves a slide on the lock to No. 1. This puts on one combination. When safe is closed and locked the agent does not know the combination that will unlock, nor does the route agent.

When this safe arrives at Reno the local agent has one combination that opens that safe. He opens, receipts for contents to route agent, adds what bullion he has on hand, and locks the safe on two combinations, the last one unknown to himself.

The next local agent at St. Louis opens that safe on the two combinations known to him, and by simply moving a slide puts on three combinations, the third being unknown to himself.

Upon arrival at Chicago the local agent opens the safe upon three combinations and closes on four combinations. Cleveland agent opens on four combinations and closes on five. Buffalo agent opens on five combinations, closes on six. And New York opens on six combinations.

This course, as can readily be seen, places the responsibility at all times upon one individual, and upon the superintendent's office, and protects the route agent. These locks have been used with eighteen combinations.

They are peculiar, as the combinations *can* be divided between two persons, requiring the presence and aid of both persons to open any safe—for instance, the local and route agents operating to open the safe at any given place or station.

For ordinary or daily use, upon opening the safe in the morning the slide is changed from 6 to 1, leaving one combination for day use.

The general superintendent of express safes can order any route agent to make certain changes in these locks which will change the entire combination, the result of this change only being known to the person ordering it to be made. At any subsequent time the superintendent can pick up the combination so changed by using the model upon his desk, and then for the first time any one know upon what combination that safe locks and unlocks; information can then be telegraphed to proper persons.

The use of the time lock is also possible for guarding bullion safes, as the invention and introduction of the non-lock-out time locks render use of time locks possible, as no accident will cause a lock-out of these reliable and desirable devices.

S. M. BARRETT.

Cincinnati, O.

Transmitting Speech by the Telegraph Key and Sounder.

To the Editor of the Scientific American:

I see in your last SCIENTIFIC AMERICAN, in an article by George M. Hopkins, engravings of a method of transmitting articulate speech by an ordinary key and sounder, but it gives no information as to how it is done except by saying it is only a matter of adjustment. Will you please tell me through the columns of your paper how this is done?

H. F. DODGE.

Clinton, Mo., August 3, 1881.

[The sounder is mounted on a thin board, and the sounder lever is rigidly secured by the adjusting screws so that the armature is very near the poles of the magnet.

The key is placed on a thin board or on a resonant box, and the screw which passes through the key lever and bears upon the spring is loosened until the platinum points are in light contact. By placing the ear in contact with the board upon which the sounder is mounted, and listening while adjusting the key, the proper contact may be readily secured.

Another method of adjusting the key is to turn the back adjusting screw until the contact points of the key touch, allowing the upward pressure of the spring on the key to remain normal. The required delicacy of contact may then be secured by screwing down on the spring so as to increase its upward pressure on the key. The key is mounted as in the other case.

This experiment requires a current whose strength is eight or ten volts.

By listening to the sounder whatever is said in the vicinity of the key may be heard.]

The French Population in New York.

Some time since a committee was appointed by representatives of the twenty-three French societies in this city to found an infant school on the French plan for the small children of that nationality in this city. The first work of the committee was to investigate the numbers, needs, tastes, and habits of our French population, and to select the location most eligible for the institution contemplated. A member of the committee, Mr. Gustave May, reports that the French speaking population of New York city, including natives of France, Belgium, Switzerland, Alsace, and Lorraine, number between twenty and twenty-five thousand. The most of them speak English imperfectly or not at all, and are chiefly concentrated within a comparatively small district, extending from Canal street on the south to Washington Square on the north, and bounded on the west by Sixth avenue and Varick street and on the east by Broadway. French families of the higher class are domiciled in other and more eligible quarters of the metropolis, but the poor Frenchman, with a pittance of income or capital just enough to start in furnished apartments, inevitably gravitates toward a region of which South Fifth avenue is the main thoroughfare.

"It is a curious fact," observed Mr. May, "that among immigrants from France to the United States the women find remunerative employment far more readily than the men, and the support of the family often devolves for a considerable period upon the wives and daughters, while the husbands and brothers live in enforced idleness or eke out scanty incomes by odd jobs and irregular services." The cause of this social anomaly, which makes the woman the bread-winner of the family, it has been critically observed, is due to the fact that she is generally an expert in some one of the industries that command steady employment and good wages. She is a good laundress, an adept in the manufacture of artificial flowers, a first-class *bonne*, a neat seamstress or milliner, or an excellent servant in some one of the special capacities that secure entrance to Fifth avenue families. Very few days elapse generally before the women find remunerative work in some department of useful or ornamental industry, but the men often linger in discouraging idleness for months before positions can be secured. Good gardeners find business very readily at high wages. The range of employments is very limited, however, for the male immigrant, and he frequently has to depend for a considerable period upon the deft and business fingers of his wife, sister, or daughter. And in too many instances, it would appear, the French immigrant straightway forgets that he is not in Paris, and, instead of earnestly studying English and looking for employment, he spends his time with his confreres planning social and political reforms and discussing vinous projects for ameliorating the condition of working men.

A Salle d'Asyle for New York.

A committee of our French citizens have decided to establish in Washington Square a day asylum and training school for the small children of the French working people of that neighborhood. Schools of this character are as peculiar to France as the kindergarten is to Germany.

First, there is a schoolroom provided with desks, seats, etc., even with cradles, swings, and baby carriages for the benefit of the younger pupils. Children from two to six years of age are admitted. Each is received at the vestibule by a servant or nurse, taken to the bathroom, cleansed, and attired in a neat uniform for the day. The clothing that the child wore on entering is then brushed and put away to be resumed when its parents or guardians call for it late in the afternoon. The hours are made to correspond to the working hours of the population in the midst of which the school is located—from 7 o'clock in the morning until 6 or 7 in the evening. Having been bathed, uniformed, etc., the pupil is taken to the schoolroom, where the tuition consists of some simple object lessons, calisthenics, repetition in concert, and so on. The division into classes is left to natural bias and capacity, and the selection of studies to be pursued is governed by the natural inclinations of the child as ascertained by the observation and patient vigilance of sympathetic instructors and nurses. A large yard suitable for a playground for the children is essential, and shade trees form a necessary feature. One section of it is neatly turfed and thus transformed into an ornamental green; others are left open for the cultivation of flowers or plants, or for any horticultural fancy that may strike the active and awakened imagination of the pupil. The exercises in the schoolroom are brief, not occupying more than a few minutes at a time; but even in play the manners, habits, and physiological aptitudes of the child are carefully studied and trained to grace and beauty.

At noon a simple dinner is neatly served by the attendants. It consists, not of dainties, but of some nutritious soup, bread and milk, and other articles fitted to diet of children. If the parents are able to pay for this simple meal a fixed charge of two or three cents is generally exacted; but this is an open question and one not permitted to stand in the way of the pupil's admission or training. There are now, it is stated, no fewer than 17,000 of these *salles d'asyle* in France, and the number is being yearly augmented.

Improved Photo Emulsion.

The following is the specification of M. Stoerk's patent, March 27 and May 20, 1880:

"My invention consists in introducing into a solution of gelatino-bromide of silver in water an antiseptic more volatile than the water, which mixes with it in all proportions without precipitating the gelatine, which has no injurious action on the gelatine or on the silver bromide. For this purpose I give the preference to acetone, methylic alcohol (pure 1,000 spirit), or alcohol, either separately or combined. I introduce this substance in the proportion of 50 per cent.

"*Manipulation.*—In 1,000 parts of pure water I dissolve 30 parts by weight of ammonium bromide. To this solution I add gradually a solution of 45 parts by weight of silver nitrate in 500 parts of distilled water. The silver bromide thus obtained is washed during a space of six hours half a dozen times to remove the nitrate of ammonia, as well as any excess of ammonium bromide, so that there remains after this washing nothing but silver bromide containing water.

"I next add enough pure water to make up 500 or 640 parts containing 5 parts of ammonia, and 24 to 30 parts of neutral gelatine (Nelson's No. 1), and I raise the whole in a water bath to a temperature of 35° C., and keep it at that heat for six hours. Then I add to the emulsion thus formed from 50 to 100 per cent of its own volume of acetone, and thus obtain a non-putrescent and rapidly desiccating emulsion, which is always fit for use.

Colored Photographs.

A recent communication to the French Academy of Sciences announces a new method of taking photographs in color, which, although it is not a solution of the prime problem for photographers, how to photograph nature in her own hues, is at least some mechanical approach to it. It is the invention of MM. Ch. Cros and J. Carpentier, and consists in taking three separate photographs of the red, yellow, and blue tints, then combining them. Three negatives of the object are first taken, one through a screen of orange liquid, one through a screen of green liquid, and one through a screen of violet liquid. The varying opacities and transparencies of these negatives indicate the relative quantities of red, yellow, and blue tints in the object. The proofs are taken on plates of glass coated with coagulated albumen which has imbibed bichromate of ammonia. A transparent negative, or first photograph, is applied to one of these, and exposed for some minutes to a diffused light, so that the transparencies and opacities of the negative shall imprint themselves on the sensitive albumen. The proof plate is then plunged into a coloring bath, and in the parts protected by the opacities of the negative, the coloring matter spreads and fixes itself. By repeating this operation with the three different negatives the three colors are combined on one glass plate, and a fair imitation of the original object is the result. Of course, for the image obtained through the green screen the coloring bath is red; for that through the orange screen, blue; and for that through the violet screen, yellow. The same screens and pigments serve to reproduce all sorts of polychromes. The screens hitherto used are glass vessels filled with solutions of chloride of cobalt, chromate of potash, and sulphate of copper. When the electric light is used the screen is put before the lamp, so that the object will be illuminated by a monochromatic light and photographed in the ordinary way.