## BAILLEHACHE'S PRINTING TELEGRAPH.

The Baillehache apparatus differs absolutely from those of Hughes and Baudot, in that it requires, so to speak, no apprenticeship.
Now, for certain banking houses, like the Credit Lyonnais or the Societe Generale, which have continual correspondence between the main office and numerous branches scattered about the different quarters of Paris, a printing apparatus as easy to manage as the old dial telegraph of Brequet was a desirable thing. The houses that we have just cited, however, have now given preference to $M$. Baillehache's apparatus, which, in the accompanying engraving, is shown in operation in the Credit Lyonnais.
The station comprises a large switch board, the use of which is so well known in telegraphy that it is useless to dwell upon it. Beneath this there are two series of 9 cells each, each of which corresponds to a branch office. Beneath these cells there are three Swiss commutators that permit, through a plug, of connecting any of the apparatus with the station that is calling. This commutator likewise permits of cor, necting all the stations at once with a manipulator reserved for such a purpose. The utility of this latter
manipulator. The play of the magnetized pallet is then in reality the same as in the Brequet apparatus,
and the axis revolves in the same way. The second and the axis revolves in the same way. The second
pallet, on the contrary, is of softiron, and consequently remains attached to the electro every time the needle revolves by jerk.
As we have just seen, the Baillehache manipulator differs from the Brequet, in that it causes the pile cur rent to alternate at every notch. It also possesses the peculiarity that as soon as the handle is placed upon the letter to be designated, the pile cnrrent is cut off, and, while the magnetized pallet remains adherent, the soft iron one detaches itself from the elec tro and presses the band of paper upon the automatically inked type wheel. The forward motion of the paper is effected through the second pallet and the general clockwork movement. When the needle passes to + the type wheel presents a notch that gives no impression; so the words are thus placed naturally. The great merit of Mr. Baillehache's apparatus is that the employes of the offices do not have to undergo an apprenticeship in the use of it. As the num ber of dispatches to be sent is quite limited, the extra rapid instruments of Hughes, Meyer, and Baudot
pose," says a recent author, "one hundred fish for each cubic foot, each weighing ten pounds, the cube, therefore, weighing 1,000 pounds-which is six times the weight of granite, three times the weight of lead, and nearly equal to the weight of gold-we should then have thirty thousand decillions of worlds the size of the earth, of the weight of gold, of nothing but odfish in ten years."
Our correspondent then proceeds to wonder whether it is not very injurious to health to drink such quantities of bacteria "as are found in all good well or spring water?" And he further asks if it would not be better to use distilled water with the necessary salts added to it which are lost in the process of distillation? We reply by asking another question: Why is it that those parties entirely ignorant of the terms bacilli, micrococci, spirilli, and the like, eat, drink, and are merry, and enjoy such robust health that the bacteriologists would gladly exchange places with them? All of which, and much more, leads us to observe that while the subject of bacteria opens up a large field for scientific research, and while great hopes should be entertained that much practical good will eventually result from such a study, in the prevention


THE BAILLEHACHE TELEGRAPH AT THE CREDIT LYONNAIS.
arrangement is seen in the fact that twice per day the general office transmits the transactions of the stock exchange to its branches, and would lose valuable time in communicating it to them separately.
Those of our readers who are familiar with telegraphy will understand why it is important to have a parate manipulator for simultaneous transmissions. It is for the reason that, since all the stations are placed in derivation upon the same manipulator, it is necessary to employ a much more powerful battery for this special operation. This battery, which is placed in the cellar, is of 50 Leclanche elements, which. are renewed every three months. The four receivers seen upon the table are quite analogous in appearance to the Brequet telegraph, and, if need be, can be used in exactly the same way. The elegant addition that Mr. Baillehache has made is of extreme simplicity, and therein lies its great merit. In the interior of the apparatus the axis of the needle carries a type wheel, so that, when the needle is upon any letter of the external dial, the type is at the lower point of the wheel.
The electro-magnet, instead of actuating a single pallet of soft iron, as in the Brequet apparatus, actuates two-one in front of and the other behind the electro. The front one is, like that of the Brequet apparatus, charged with the escapement of the needle's axis, but it differs therefrom in that, instead of being of soft iron, it is of magnetized steel, and that alter nate instead of intermupted current are sent by the
would have been absolutely superfluous.-La Lumiere wouly have

Has the Number of Eacteria No Limit
Mr. J. D. Beck, of Liberty, Pa., sends a communica tion to this journal on the above subject. From it we take the following figures as computed by him: Mr. Beck finds a large number of bacteria in the sap from the sugar maple, "at least 500 in the field at one time." He estimates from this that there are $125,000,000$ in a drop of the sap, and in a common gobletful, holding 3,000 drops, as many as $375,000,000,000$. He further estimates that in the 500 gallons of sap boiled down by some farmers in a single day there are as many as $3,000,000,000,000,000$. Thus he proceeds; but while it is remembered that any slight variation in the number first chosen makes a vast difference at last in the sum total, it is doubtful if any value can be attached to such figures, more than would come from the mental drill in computing the various amounts. It is of the same value that arises from computing the number of codfish there would be at the present time, if all the eggs should become fish, starting with a single fish only ten years ago. Naturalists say that this fish spawns $3,000,000$ eggs in a single season. Starting with this as a basis we proceed, and we find that at the end of ten years the number of fish would amount to 214,449 ,$000,000,000,000,000,000,000,000,000,000,000,000,000,000,000$
and cure of disease, yet, on the other hand, we should eat and drink, in blissful unconsciousness, whatever is set before us, and not worry over the results any more than we now worry for fear that in ten years the whole universe becomes one mass of codfish.
When we are told to "eat what is set before us, and ask no questions for conscience' sake," the writer evidently knew that, should our inquisitiveness be aroused, we would find ourselves surrounded by such bacterial questions that life would become simply un-endurable.-C. H. stowell, The Microscope.

## Weight of Fast Trains.

Mr. J. O. Crawford, Superintendent, gives the following as the approximate weights of the fast trains on the New York division of the Pennsylvania Railroad:


