REMARKABLE BIRDS.

Our latest English advices report that many additions of interest and importance have recently been made to the Zöological Society's collection in Regent's Park, London. Among these are some specimens of a bustard, which is common in the Cape settlement, South Africa, and is known scientifically as the *eupodotus kori;* and we publish herewith an engraving of two of them, selected from the pages of *The Field.*

Burchell, in his "Travels in the Interior of South Africa," gives an account of this bustard, which he found on the borders of the Orange River. He says it is there known as the *wilde paauw*, or peacock, and is much esteemed for food, sometimes growing enormously fat, and increasing to a weight which a man can only carry with difficulty. In the Sichuana language, he tells us, the bird is called *kori*, from which its present scientific appellation has been derived.

In the Cape Colony, where it is migratory, arriving from the interior in greater or lesser numbers according to the drought, it is called the *gom paauw*, and is pretty generally distributed in the open plains dotted with mimosa jungle in the northern and eastern parts of the colony. It is a noble bird, and, when seen stalking about in its proper haunts, says Mr. E. L. Layard, "affords a sight to a hunter's eye never to be forgotten."

Andersson states that the kori bustard is found throughout the year in Damaraland and Great Namaqua Land, and is common as far as Ondonga; but is partially migratory. He never saw one weighing more than thirty pounds; but was assured on good authority that, in some parts of the Free States and the Transvaal districts, individuals are sometimes shot weighing from sixty to seventy pounds. This statement, however, must be accepted with reservation. The spread of wings is 8 feet 4 inches. Its flight is heavy, but nevertheless rapid, and at night, says Anderson, when changing its feeding ground, it may be seen flying at a great hight. It feeds on insects and berries, and is very partial to the sweet gummy exudations of the low mimosa thorn, so abundant in Damaraland. This, no doubt, is the origin of its Cape name, "gom paauw," although Andersson, who refers to this propensity, does not give the local name for the bird; while Mr. Layard, who mentions the name in his "Birds of South Africa," says nothing about the bird feeding on gum. He states, however, that it is never found far from the mimosa jungle that skirts the rivers.

In addition to the food above mentioned, the kori will eat reptiles, and can swallow a lizard or snake of considerable size. A female bird of this species, which was shot by Mr. Layard and a friend, disgorged the largest chameleon they had ever seen, and the crop contained in addition a mass of small snakes and locusts.

The three smaller figures in the background, in the act of "showing off," are Australian bustards, of which remarkable species we published illustrations and descriptions on page 162, volume XXVIII. Mr. Bartlett, the superintendent of the Zöological Gardens, has reason to believe that this curious display, which takes place in the pairing season, is different with each species.

Diphtheria.

Dr. George Johnson, senior physician to King's College Hospital, England, gives an interesting paper in the London *Lancet* on this subject, from which we derive the following:

"I propose in the present communication to discuss some important practical questions relating to the etiology, the pathology, and the treatment of diphtheria.

There are practitioners who, believing that diphtheria is a specific contagious disease, maintain that defective drainage and filth have little or no influence in its causation, while others, denying its contagiousness, assert that its origin and spread may always be explained by its insanitary conditions. I believe that both classes of negationists are in error. I have no doubt that the disease, though not highly contagious, is communicable from the sick to the healthy, and I have as little doubt that it is often caused by filthy emanations from sewers and cesspools, and this, too, when it is in the highest degree improbable that any specific poison can have been introduced from without into the decomposing stuff that has excited the disease. In proof of the contagiousness of diphtheria, the following, amongst a multitude of similar cases, may be set forth:

M. Valleix, a colleague of Trousseau, while examining the throat of a patient, received into his mouth a small quantity of saliva spurted out by the patient in coughing. Next day, on one of his tonsils there was a pellicular deposit, and some hours later both tonsils of the uvula were covered by false membrane; the disease made rapid progress, and in forty-eight hours he died. Another of Trousseau's provincial colleagues was performing tracheotomy in a case of diphtheritic croup, when he applied his mouth to the wound to suck blood from the trachea. He thus inoculated himself, and died in forty-eight hours. [Several other similar examples are then cited, also cases where the disease was apparently communicated to persons visiting or living in the apartments of the diphtheria patient.]

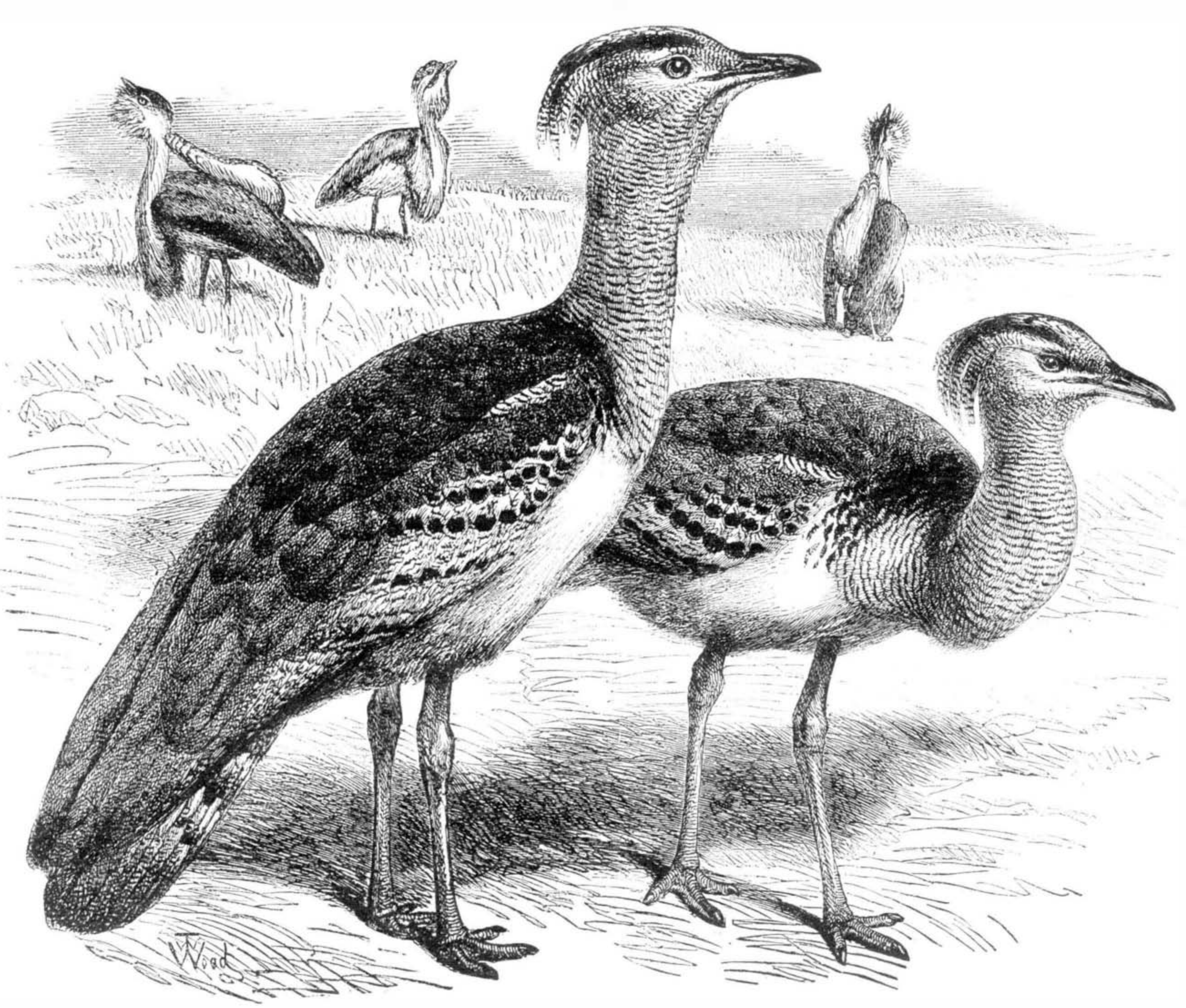
I believe that all the cases which I have cited are examples of the diphtheritic infection being conveyed either through the air or more directly by the actual contact of the morbid secretions with the tissues of the recipient. To oppose to positive evidence of this kind such negative statements as that, in numberless instances, medical attendants and nurses have come into close contact with diphtheritic patients, without taking the disease, appears to me a vain and frivolous objection. Diphtheria is not a highly contagious disease. In the scale of infectiousness it stands far below scarlet fever, for instance, and there is reason to believe that the susceptibility to disease differs almost infinitely in different persons; but a medical attendant who entirely ignores the contagiousness of the malady is likely to neglect reasonable and necessary precautions to protect himself and others from the risk of infection.

When a case of diphtheria occurs in a house without evidence of importation from without, still more when several cases occur together or in quick succession, there will be good reason to suspect that sewers, cesspools, or contaminated water may be the source of the disease. My belief is that, in a very large proportion of cases, there is as close a relation between diphtheria and insanitary conditions as exists between typhoid fever and similar insanitary conditions; and I scarcely need say that, if this be so, the general recognition of the fact is of the greatest importance with reference to the adoption of preventive measures. There is reason to believe that much more harm would result from ignorance of the filth origin of diphtheria than from practically ignoring its infectiousness.

Many instances have come to my knowledge in which fetid fæcal emanations have appeared to be the direct cause of diphtheria.

One case was of a family consisting of a lady, her husband, four children, and three servants. The house is drained into a cesspool about twenty yards distant. The accumulation of many months was emptied one day while the wind was blowing towards the house from the cesspool, and a very offensive smell reached the house. Three days afterwards all the four children became feverish and complained of sore throat; the tonsils were seen to be inflamed and covered with yellowish white patches. In a few days two of the servants were attacked, one rather severely, and, lastly, the lady. Her tonsils were inflamed and covered by false membrane. The only member of the family who escaped was the husband, who was away from home all day, and one servant.'

In another case the family consisted of the father and mother, seven children, and three servants. 'On going up the garden to the house, my nose was assailed by a horrible stink, and, seeing some men at work close to the house, I stopped to see what they were doing. I found that they had ripped open a drain running in front of the house within ten



SOUTH AFRICAN BUSTARDS.

yards of it, and they had opened a cesspool into which the drain flowed. I found the mother, five of the children, and two of the servants suffering from sore throat.' Mr. Bateman says:—'I am at the present time (January, 1874) attending at another house where a young lady and the parlor maid are suffering from severe sore throat with the usual patches. A cesspool had been opened a few days before quite close to the house. I feel quite certain that all these cases were caused by the sewage filth, and in particular by that portion of it which, floating in the atmosphere, was respired by the persons affected Many other cases were cited.

It appears to me to be a matter of almost absolute certainty that the foul cesspool was the primary source of all these cases.

My friend Mr. Salter, of Tolleshunt D'Arcy, in Essex, who has had a large experience of diphtheria, writes to me that he has 'had unquestionably a great many cases of diphtheria whose origin can be distinctly traced to sewage poison, either gaseous or liquid,' and he gives me some particulars of an outbreak in one family, four children and a nurse having been attacked in quick succession, which he attributes to the percolation of sewage into the well which supplied the family with water.

I look upon the occurrence of an indigenous case of diphtheria in a house as an indication of the necessity for a most rigid inquiry into the condition of the drainage and the water supply. At the beginning of the present year, a gentleman living in one of the best houses in Queen's Gate asked me to see his butler, whom I found suffering from a severe attack of diphtheria. The basement of the house looked the perfection of cleanliness, but I advised that a sanitary engineer should be called in to inspect the premises. The result was the discovery of an untrapped sink pipe near the butler's sleeping room.

It is notorious that, in the houses of some of the most exalted and wealthy, and in open country districts, the sanitary defects which originate such diseases as diphtheria and typhoid fever are almost as common as in the meanest cottages and in the most crowded cities; but it is obvious that overcrowding in the small rooms and cottages inhabited by the lower classes must greatly increase the danger arising from other insanitary conditions.

In opposition to the doctrine which I am now advocating, it is sometimes stated with perfect truth that diphtheria never visits some houses which are dirty within and without, and which are surrounded by every form of abominable filth. The reply to this is that no one believes that any and every kind of foul emanation from decomposing organic matter will suffice to cause diphtheria. As every black powder containing charcoal is not the explosive compound which we call gunpowder, so every fetid gas escaping from a drain or a cesssool is not laden with the perilous stuff which will excite diphtheria. We believe that a combination of conditions, local and atmospheric, is required to generate or develop the morbid poison, and the absence of any one of these may prevent its formation."

In view of the great prevalence of this disease at the present time in New York city, and the extensive mortality therefrom resulting, we would again call the attention of our Board of Health to the importance of issuing an order, without further delay, requiring all house owners to make a pipe connection from the house drain to the kitchen chimney. As we have heretofore shown, by this simple expedient, costing probably not more than ten dollars for each house, the sewage gas will then escape up chimney, and not find its way into the apartments of the building, to poison the atmosphere, and generate diphtheria, typhus, and other malignent diseases among the occupants. It is well known that the ordinary pipe traps do not prevent, except in part, the backing up of the foul sewage gases. The only effectual remedy is an open escape pipe into the chimney. If the escape pipe connects with the kitchen chimney, which is all the time, winter and summer, kept warm by a fire, there will always be an attending column of air to assist in carrying off the sewage gases, and, to some extent, render them innocuous.

Water.

The sixth and concluding lecture of the course on chemistry by Dr. Frankland, F.R.S., to working men in connection with the Royal School of Mines, was delivered lately. Subject: Water.

The lecturer said: People usually imagine that they know all about water perfectly well, but, in truth, we are very far from knowing all about it; a whole course of lectures would not be sufficient to go through all the known properties of water. We will look at a few of its principal qualities: First, as to its color; doubtless you would say, if asked, that water is colorless, and so it appears to be when you look only at a thin stratum; but looked at in a stratum of sufficient depth, it will be seen that water has its own peculiar color—a bluish green tint. This we show by passing a ray of white light from the electrical lamp through a horizontal tube, which is 15 feet long and half filled with pure water from the laboratory, and you see the light, passing through the air in the top of the tube on to the screen, is white; that through the water has a bluish green tint. This layer corresponds to a reservoir 7½ feet deep, and a stratum of pure water of that depth would give this color.

Another quality of water is its comparative incompressibility; it was doubted for a very long time whether it was compressible at all, and the celebrated Florence experiment did not settle the question; but it has been shown that it is slightly compressible, that, for one additional atmosphere, 1,000,000 volumes of water are compressed to the extent of 51·3 volumes.

Again, the specific heat of water is greater than that of any other substance we know; that is to say, a certain weight of water contains more heat than an equal weight of any other substance; and this greatly influences the climate of islands and countries lying near the sea. Thus, in the hot summer months, when the land gets strongly heated, the water absorbs the rays of the sun, but its temperature rises much more slowly, and thus it moderates the heat of the land; whereas in winter the reverse takes place: the land parts with its heat readily and becomes cold, while the water gives out a much greater quantity of heat in falling through a similar number of degrees. For this reason the climates of islands are more uniform, and subject to less extremes than those of inland countries. The heat given out by 1 lb. of water in cooling 1° would raise 1 lb. of air 4°; or 1 cubic inch of water in losing 1° of heat warms 3,076 cubic inches of air 4°. On this account, too, our east winds, blowing over large surfaces of land which has but low specific heat, are so much colder than our west winds which come to us over water. Water, too, has a high latent heat, and this, too, has an important bearing in the condition of water as it exists in Nature. Thus, 3 cubic feet of water at the temperature of 32° Fah. gives out, when it becomes converted into ice, a quantity of heat equal to that given out by the burning of a bushel of coal.

Further, water expands on freezing, and the coating of ice thus formed on the surface has a tendency to prevent large masses of water from being entirely frozen. Sometimes we hear of ground ice, or ice formed on the beds of rivers; and the lecturer, who was in Switzerland last winter, noticed that in all the rivers there this ground ice was formed. It admitted of a very simple explanation. Owing to the curious property of this maximum density of water, in still water the ice will be formed on the surface, as before explained; but in these Alpine streams the whole mass of water is kept agitated and mixed up, and consequently keeps throughout of a uniform temperature. Thus we may have the whole body of water uniformly cooled down to 32° Fah., and ice will then form as readily at the bottom as at the top; in fact, more readily, for it is easily proved that ice forms (and the same is the case with other liquids as well as water, in crystalizing) most readily in contact with rough surfaces, and therefore forms first in contact with the stones on the bed of the river; and when once formed there it goes on increasing. If water be perfectly still, it may be cooled down several degrees below 32° Fah. without freezing; and people have sometimes been surprised to find the water in the jugs in their rooms in a morning, which was quite liquid when they took up the jug, freeze as they attempted to pour it out. Being perfectly quiescent, it had cooled below 32° without freezing, but froze as soon as it was moved.

One of the properties of water most useful to chemists is the power it has of dissolving a great many substances; and this is of great commercial value, since such gases as hydrochloric acid gas and ammonia gas can be dissolved, and the solution become marketable articles. At 59° Fah., and under 29·921 inches pressure, 1 volume of water will dissolve 780 volumes of ammonia gas, or 450 volumes of hydrochloric acid gas. With regard to solids, it is found that, as a rule, they are more soluble in hot than in cold water (common salt is equally soluble at all temperatures). Hence, if water at a high temperature be saturated with them, as it cools they will be deposited, and it is found that they assume in deposition definite geometrical forms; these are called crystals. (Beautiful crystalization effects were then shown on the screen by means of the electric lamp and solar microscope, the crystalization of red prussiate of potash being exceedingly beautiful and interesting.)

LONDON WATER.

The above remarks apply to pure water, but we never meet with pure water in Nature: all natural waters contain more or less dissolved matter; the difference is only one of degree. We may divide the water we meet with around us into (1) drinkable or potable water; (2) mineral water; (3) polluted water, so fouled, by the drainage of towns or the refuse of manufactories, that it is no longer fit for domestic use. As the result of researches and observations carried on during the last fifteen or twenty years, it has been asserted that water is one of the most ready means of transmission of germs of epidemic diseases, for example, water contaminated with the excrementitious matter of persons infected with those diseases. Many people will not believe the thing to be true, because the idea is so horrible; but it is nevertheless the case. People in large towns are constantly in the habit of drinking water which is contaminated with their own excrementitious matters, and in this way such diseases as typhoid fever and cholera are spread. I could give instance after instance of this. The presence of these matters in water is not so easy to detect as you might think; and unfortunately, the waters so contaminated taste somewhat better than the pure waters, and people often prefer them, being unaware of the cause of their preference There are means for testing the purity or impurity of your water I will mention one or two simple ones: Get a solution of nitrate of silver or lunar caustic (buy the crystals at the chemist's, and dissolve them in distilled or rain water). Here are three specimens of water, to each of which I will add a few drops of this solution of nitrate of silver The first is distilled water, and you see it remains perfectly clear. The second is the ordinary Thames water, supplied by the Grand Junction Company to this building; here we have a moderately large white precipitate. The third specimen I have obtained from a notorious pump in Bloomsbury square, and you see what a copious precipitate we get from that; it becomes as white as milk. If, then, the nitrate of silver gives a very copious precipitate (it will usually give some precipitate; but say if it is more than that Thames water gave) beware of drinking the water. It may be fit to drink, but the probability is that it is contaminated with those noxious matters. There is no wonder that our third specimen gave such a precipitate (and all the shallow wells of London are as bad), for the water in them is nothing more than the soakage from the cesspools and similar places in the neighborhood. And yet people in the neighborhood constantly drink it, and often prefer it to that supplied by the companies, especially in summer, when it is cooler than the vapid warm water from the taps. Some parts of London are supplied with water from deep wells sunk into the chalk. Now, if you subject that water to the next test I will mention, you will see its superiority. Take a tumblerful of water, let a beam of sunlight from a slit in a shutter pass through it, and observe the path of the light in the water. Here we have two specimens of water; the first from the pipes of this building, that is, Thames water, the other the deep well water. On sending a beam from the electric lamp through both of them, we see at once that the path of the beam in the first reveals itself as a broad and very marked band of light, while in the second the path of the beam is almost invisible. That is to say, there is nothing like so much suspended matter in the latter specimen as in the former, although the Thames water is as clear as sand filters can filter it; but there is no filter so efficient as the soaking through several hundred feet of chalk.

Henry Highton.

Rev. Henry Highton, a gentleman long and well known in scientific, telegraphic, and scholastic circles, died recently in England. As a scientific man he is associated with various discoveries in connection with electrical telegraphy, for which he more than once received a medal from the Society of Arts. He took out his first patent as early as July, 1844, for a telegraph worked by static electricity and a chemical recorder. In 1846 he invented his well known gold leaf tele graph, which, however, was never practically used. A small strip of gold leaf inserted in a glass tube was made to form part of the line circuit, and it was placed between the poles of a large permanent magnet. Whenever the line currents passed through the gold leaf, it was instantly moved to the right or left, according to the direction of the current. Its delicacy is so great that efforts have been recently made to introduce it upon our long cable circuits. In 1848 he took out a patent, with his brother Edward, for a new form of needle telegraph, and various other modifications; and in 1850 the British Electric Telegraph Company was formed for the express purpose of working and bringing into more general use the inventions of Messrs. H. and E. Highton. He recently (1872–3) introduced a new form of battery, and has been engaged in perfecting a mode of working long submarine cables by means of his gold leaf receiver, and a new electromagnetic induction apparatus, by which the sensitiveness of telegraph instruments is considerably increased. He also, some years ago, invented and perfected a new kind of artificial stone, now largely used for paving and building purposes.

Stoppage of Carriers in Pneumatic Tubes.

Although this accident is exceedingly rare, yet the possibility of its happening at all necessitates the discovery of a ready means for localizing the position of the arrested carrier. The method hitherto employed has not given good results. It is to apply to the mouth of the pneumatic tube a receptacle full of compressed air of a known pressure, which is allowed to enter the tube. The resultant pressure in the receptacle and the tube, as far as the arrested carrier, furnishes datum to estimate the carrier's distance. The distances so measured have not been approximately correct. M. Ch. Bontemps adopts another method, based on the law of the propagation of sound waves in pipes. He fits to the mouth of the pneumatic tube a kind of drum, an instrument furnished with an elastic membrane whose inflations or depressions are automatically registered upon a revolving cylinder A diapason likewise traces, upon the same cylinder, seconds and fractions of a second. The under part of the membrane is set in motion by an explosion, say that of a pistol. The blow raises the membrane, and its upward motion is at once registered. The wave speeds onwards along the tube with a speed of 363 yards a second, and strikes against the obstacle; thence it is reflected back to the membrane, and a second motion is registered. It now only remains to calculate the exact time between the two registers, representing twice the time the wave takes to traverse the distance from the tube's mouth to the obstacle. This arrangement is said to be so exact that the possible error does not exceed 2 meters, or 6½ feet.

Cheap Telegraphy.

Competition is the life of business; and where that business is conducted by people of experience and ability, the public are the gainers.

The Atlantic and Pacific Telegraph Company now loom up as competitors with the Western Union Telegraph Company. General Eckert, an experienced telegrapher and manager, long connected with the Western Union, has taken the presidency of the Atlantic and Pacific. A lively competition is expected, and telegraphing, in some directions at least, is likely to be done at reduced prices.

Dr. Demarquay, of the Hospice Dubois, recently removed a lipoma weighing 3,200 grammes, about 7 lbs., from the shoulder of a woman aged seventy-three. The tumor had been twenty years in existence, and the old woman used to wear it in a bag, and carry it on her shoulders as a soldier his knapsack. The operation was perfectly successful, and the patient is doing well.