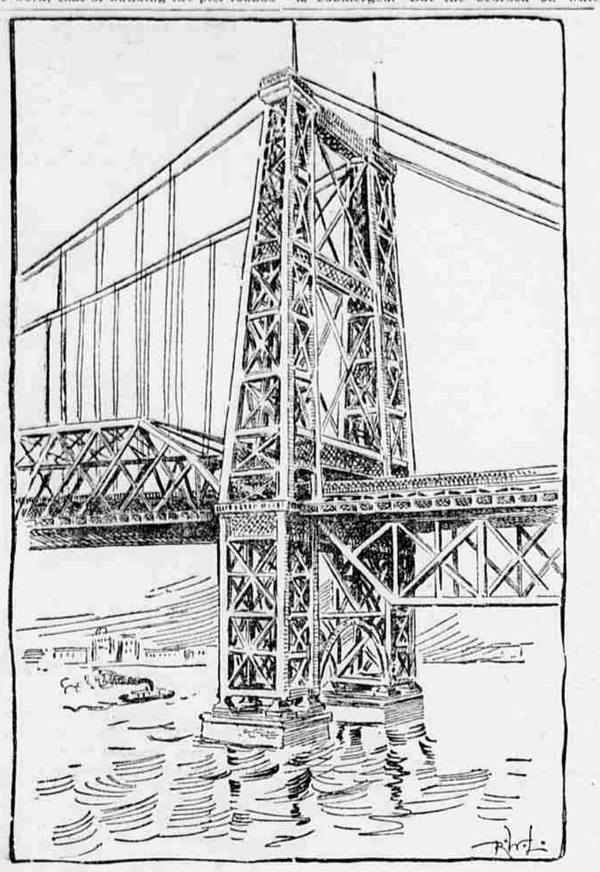
CITIES LINKED BY STEEL

New Bridge to Bind the Principle Sections of Greater New York.

REARING AN IMMENSE STRUCTURE

Description of the Great East River Bridge from Foundation to Superstructure—Huge Towers of Steel.

The early days of May will see an actual beginning in the construction of the new East river bridge, which is to join the two principal sections of Greater New York and and become the twin of the present Brooklyn bridge. Within the next few days the first of the huge caissons which are to be used in building the foundations of the bridge piers will be towed into position and the work of erecting the piers will begin. It has taken a long time for the work to reach even this preliminary stage. It was in 1892 that a charter was first granted for the building of a bridge across the East river at the point where the new structure will stand. Practically no progress was made until 1895, when the task of building the bridge was undertaken by the cities of New York and Brooklyn and by them turned over to a board of commissioners. A year and a half was required for the completion of plans and the clearing away of legal difficulties, and it was only last fall that the contract for the first of the work, that of building the pier foundations for the New York end of the bridge, was awarded. However, the old saw which says, "A thing begun is half done," seems to apply with especial appropriateness to the building of great public works such as this, and it is confidently asserted that the bridge will be finished and opened to traffic within a year after the opening of the twentieth century.



STEEL TOWER OF THE NEW YORK EAST RIVER BRIDGE.

Mr. Buck, the chief engineer of the new bridge, may be called a bridge expert. At any rate, several of the greatest engineering triumphs of recent years in bridge construction were planned by him and he is to be classed well up among the half dozen men who are the leaders of American engineers in this line of work. In this statement the word American might just as well be replaced by "The world," for it is a fact that in the essential points of economy, lightness and up-to-date construction Americans lead the world in building bridges. Besides the great spans already built in this country across the East river, the Niagara, the Ohio and the Mississippi, American firms and American engineers have constructed giant bridges in Mexico, Australia and several South American countries, including Peru, where is probably the highest bridge in the world. In a number of these enterprises, both at home and abroad, Mr. Buck has been the engineer, and it is safe to say that there is no man better fitted to speak with authority on the subject than he. When asked recently to describe the construction of a great bridge from the engineer's point of view, Mr. Buck said:

AN ENGINEERING FEAT.

"The building of an immense bridge must be looked upon as an engineering feat rather than as a settled business, such, for example, as the erection of sky-scrapers. The reason for this is very evident. In putting up buildings, the conditions under which the work must be done vary but little, and new problems once worked out are settled for good and all. In bridge building, on the other hand, one never has the same conditions twice over, and the engineer's task becomes one of adaptability, while fresh and perplexing difficulties must be met and overcome at every hand. Still, the general plan of procedure is in all cases much the same.

"To begin with, in any given undertaking there are certain fixed conditions and requirements that cannot be departed from. The bridge is to be between certain points; therefore, it must be of such and such a length. It is to carry a certain estimated amount of traffic; to have so many tracks, drives and pathways. That practically decides its width. It is to be cantilever or suspension, as seems most feasible under the existing conditions; that settles the general style of construction.

"With these conditions as the basis of his calculation, the engineer sets to work to figure out his plans. Since the bridge is to to be suspended by huge cables, he decides what is, to his mind, the deflection of the cables, or 'versedsine,' that will give the greatest firmness, durability and sustaining power. The answer to this question has its effect on the appearance of the completed structure. For example, in the new East river bridge the cable loop will fall away from the towers more sharply than in the old Brooklyn bridge. The middle portion of the bridge must be 135 feet above high water, so the towers will have to 335 feet high to get the proper deflection. The next point to settle is the carrying load of the cables. Having fixed upon a certain form of steel construction for the platform of the bridge, the weight per foot of the suspended superstructure can easily be determined. Then a certain live load is assumed from the best obtainable estimates, and, with these two factors, the necessary sustaining power of the cables is settled. Of course, in making these estimates everything is taken into account, such as the effect of the temperature on the cables, and a margin is allowed, as in all these estimates.

"Having advanced to this point, it is possible to determine how much weight will come on the towers, and this settles the important question of how much foundation is necessary. The size of the anchorages is determined by the pull of the cables, and with anchorages and foundations completed your bridge is done."

"Although the rearing of an immense bridge sounds a simple matter under this modest description, it is in reality a most stupendous and difficult undertaking.

THOUSANDS OF MILES OF WIRE.

Perhaps an idea of its extent may be obtained from the statement that the masonry in the piers would build a large church, that the steel in the towers of the new bridge would build three miles of elevated railroad, and that the wire in the great cables, if stretched out in a single straight line, would reach almost around the globe.

In the actual work of construction the order followed by the engineer is reversed. The foundations and anchorages are first built. The work of building the foundations is in itself highly interesting, since the work must be carried on many feet under water.

To tunnel to bedrock beneath the mud of sand at the bottom of a river seems a difficult matter, but in reality it is comparatively safe and simple. It is done by means of caissons, which, if not originally designed by Americans, have been so greatly improved by our engineers that they may be called an American invention. In appearance a caisson is simply a huge inverted dry goods box of steel or wood. Those which are to be used in the East river bridge will be built of timbers, stoutly braced to withstand high pressure. The one that has already been built is 76x60 feet and nineteen feet high. In its construction something like 400,000 feet of pine have been used and some acres of Georgia timber land have been denuded to form these temporary structures for work on the new bridge. On its lower side, as it rests in the water, the caisson has a working chamber eight feet high, which will accommodate some forty or fifty workmen.

The completed caisson is to be towed to the foot of Delancey street, New York, and when it is located on the exact site where the pier foundation is to stand workmen will begin erecting the masonry foundation on its top, the weight causing it to sink in the water. At this spot the water is only twenty feet deep, so that the caisson will rest on the ground as soon as it is submerged. But the bedrock on which the foundation must rest is sixty feet below, and the intervening mud and sand for an area as large as that of the caisson must all be removed. This is done by the utilization of compressed air. As the huge box gradually sinks in the water under the weight of the stone work piled upon it, strong pumps force air into the working chamber through tubes provided for the purpose, forcing the water out. Then workmen descend through an elevator pas sage, which runs up through the caisson. At the bottom they find a large workroom lighted by electricity and having telephone connection with the outside world. As they shovel up the earth from beneath their feet they place it in the mouth of a blower, which is simply a tube extending up to the surface, and the pressure of the air carries it up through the tube. With these conveniences the bottom of a river bed is not a bad place in which to work. The greatest drawback is from the great air pressure, which increases as the depth becomes greater.

IMPOSSIBLE TO BE LAZY.

The increased pressure is about one-half pound for each foot of depth, or about two atmospheres at the depth of sixty feet. The first effect of the great amount of oxygen in this artificial atmosphere is to make the men unusually active, so that even a lazy man will feel invigorated and will make his shovel fly rapidly. For this reason, however, they can work for short hours only, and they are subject to a peculiar affection known as the "caisson disease," but which the workmen themselves describe as "the bends."

When the rock foundation is reached the rock is blasted and smoothed away until a level surface is obtained. Then the workmen fill the room in which they have been employed with concrete, and the column of masonry, which has been kept level with the water's surface, gives a solid and continuous foundation, on which the bridge proper will rest.

In the present Brooklyn bridge this masonry is continued for the whole height of the towers, but in the new bridge the towers will be of steel. The latter construction has many advantages. For instance, in the present bridge the towers each weigh five times as much as all the rest of the bridge, while in the new bridge the towers will weigh only about the same as the main span, although they will be sixty feet higher than those of the older structure. These towers will be built of steel plates and angles and will rest on the masonry piers just desribed, which will stand twenty-three feet above high water. Steel is cheaper than masonry, too, and less time is required for its erection. It may be remarked here that the substitution of steel for stone is an American development and that for this reason American bridges are the lightest and cheapest in the world.

At the tops of the steel towers will be sliding saddles, over which the four great cables which are to sustain the bridge will pass. These great wire ropes will be eighteen inches in diameter, three inches larger than those in the present bridge. Each one of them will contain 68,000 separate wires, each 3-16 of an inch in diameter. Together they will have a sustaining power of 68,000 tons, or 2½ tons for each wire. It would be impossible to transport one of these huge cables after it is put together, so the strands that go to make up each one are made and tested separately at the factory, and then strand by strand they are strung across from pier to pier and fastened together.

As these cables are to support not only the 12,500 tons weight of the bridge itself, but the assumed live weight of 12,000 pounds per lineal foot, it is evident that they must be not only strong in themselves, but they must also be strongly anchored.

ANCHORING THE BRIDGE.

The anchorages will be located between 500 and 600 feet back of the bridge piers at each end. They will be of masonry, 100x150 feet, and together will weigh 160,000 tons, or thirteen times as much as the main span of the bridge itself. The cables will be secured to them by plates and pins in the strongest possible manner.

Next to these essential features the most striking thing about the new bridge will be the great stiffening truss, which will extend from pier to pier and will be of steel, forty-five feet high. Their object is to make the bridge rigid and to keep it from swaying, as it would if left entirely to the cables. The superstructure of the bridge will be united to these trusses by a double system of bracing from above and below, and will make the whole structure very firm. The floor itself, on which will rest the two elevated tracks, the four surface car tracks, the carriage ways and the footpaths, which altogether make the bridge 118 feet wide, will, of course, be made of steel girders and plates.

To show the attention required by seemingly unimportant details it may be well to note the precautions taken against damage by the wind. What is called wind pressure is to be resisted by joining the cables in the center and by a double system of lateral bracing. An allowance of several hundred pounds is made also for the "wind load" of the bridge. The great width of the new bridge will be a considerable protection against wind, but some other suspension bridges have been greatly injured and even wrecked by great wind storms. Changing atmospheric conditions, temperature, etc.—in fact, everything that could possibly affect the bridge in any way—is provided for with equal care.

A MODEL BRIDGE.

When the new bridge is completed, it will be the model of its kind. It will not be so long as the Great Forth bridge in Scotland, in fact its length will be nearly the same as that of the present Brooklyn bridge, but it will have certain improvements on both of these. The abrupt deflection of the cables, the greater height of the towers and the fact that they are to be of steel instead of stone, have already been mentioned, and there are various other new features. For example, the new bridge will be unlike the earlier one in that only its main span will be supported by the cables. The approaches will be separate deck bridges and will rest on piers of their own. It is estimated that to build the new bridge itself will cost $7,500,000, and that, with the cost of approaches, etc., it will involve the expenditure of $12,000,000. A few statistics of the bridge follow:

	Feet.
Total length	7,200
Length of main span	1,655
Height of towers	335
Height of bridge at towers (above high water)	117
Height of bridge in center (above water)	135
Width	118
Total cost	$12,000,000

It illustrates the rapidity of advancement in bridge building that this new structure, which is a marvel of its kind, will be eclipsed almost before it is finished by the great railway bridge across the Hudson between New York City and New Jersey. This will be nearly twice as large as any suspension bridge now in existence. It will have a span between piers of 3,254 feet. Its steel towers will rise to a height of 587 feet above high water. The contract for it, which has already been let, stipulates that it is to be built within ten years, but its promoters say that it will be finished in seven years. Its erection will cost $25,000,000, and with land approaches will require the expenditure of something like $50,000,000. Truly this will be a colossus undreamed of by the ancients.

IMPIETIES.

The priest and priestess of one of the minor religions contemplated the votive offerings of edibles of the highest grade which had been placed before the idol.

"Pretty good layout today," said the priest.

"And just to think," said the priestess, with the light that can come only in the eyes of woman illuming her orbs, "we got them at a sacrifice!"

The Independence (Iowa) Herald tells a story of a country merchant who visited that city and purchased from a dollar store a table caster, which he took home with him, and after putting a tag on it, remarked $14, made a present of it to a Methodist preacher, whose church his family attended. The reverend gentleman took the package home, opened it and examined the contents. The next day he took the caster with the tag attached back to the groceryman, and said to him: "I am too poor in this world's goods to afford to display so valuable a caster on my table, and if you have no objections, I should like to return it and take $14 worth of groceries instead. The merchant could do nothing but acquiesce.

There was a written examination on the Book of the Acts the other day in a London Sunday school, and one scholar turned in the following: "When they saw Stephen they were in such a temper that they knashed him with their teeth, and charged him to be taken out of the city and stoned. Stephen said: 'Ye stiff-necked things, why speak ye so?' The second supernatural event was the striking down dead of Ananias and Sapphira his wife for telling lies to Peter. This was supernatural, because it is not natural to have persons struck down dead for telling lies! Ananias and Sapphira were two great prophets. Ananias prayed to God to take him to heaven, and it came to pass that as he was on his horse he was carried up to heaven."

Why is it that church stories are always funny? Here is really a very good one: Not many years ago, in a country church, the rector, preaching with great earnestness for home missions, took for his text "Feed me with food convenient for me." As he came down from the pulpit well content with the effect his eloquence had produced on the congregation, the disturbing thought struck him that he had made no arrangement for the collection (sure to be a liberal one on this occasion). As he passed through the chancel he whispered hurriedly to an intelligent choir boy, "Go into the vestry, take the plate you will find on the table, hand it round to the congregation, and then bring it to me." The boy departed on his errand, and the rector took his place within the communion rails and gave out the offertory hymn:

The last words of this had scarcely died away when the boy stood before him, a plate of biscuits in his hand and an apologetic expression on his chubby face. "Please sir," he exclaimed, in an audible voice, "I've handed them all around to everybody, and nobody won't take none!"

POEM BY JOHN QUINCY ADAMS.

(Miss Mary Thompson of Terre Haute, Ind., eldest daughter of ex-Secretary of the Navy Thompson, has an autograph poem dedicated to her by John Quincy Adams. She recalls the writing of it when she, as a child, stood at his side and curiously observed the movement of his palsied hand while he wrote the poem. A quill pen was used, and, although the lines are tremulous, each letter is well defined. Miss Thompson has the distinction of having been the first female child ever taken on the floor of the house of representatives, where her father sat at the side of Mr. Adams, and where he wrote this poem):

TO MISS MARY GARDINER THOMPSON.

Oh! had I, lovely maiden, but the power
Here, on this page, thy destiny to write,
With lavish hand what blessings would I shower
To fill thy future days with keen delight.

Spring, summer, autumn, winter, each in turn
To thee the tribute of his joys should bring;
For thee stern winter's social fires should burn,
For thee resound the minstrelsy of spring.

For thee should Flora shed her soft perfume,
For thee her luscious fruits should summer yield,
For thee should autumn's waving harvest loom,
For thee Pomona's vintage crown the field.

And all the rolling seasons should be thine,
And thine they shall be, for thy soul is pure,
And virtue shields, with energy divine,
From all the ills that mortals must endure.

Thus as through life thy fickle fortunes fly,
Should winter's frosts with pain thy bosom wring,
Turn thee to virtue's sunshine in the sky
And bloom afresh in never-fading spring.

JOHN QUINCY ADAMS.

Washington, 24th August, 1842.

SPECULATING ON TELEPATHY

The Theory of Thought Transference and What it Amounts To.

CLASSED AMONG THE SCIENTIFIC FADS

The Wide Vista of Possibilities that Lure Seekers After Psychic Phenomena—Absence of Demonstrated Facts.

The Scientific American for the 13th of last March has an article headed "Prof. Crookes on Thought Transference," which will be read by many with intense interest. It begins by remarking that no man of science has contributed any thing to the recent discussion of scientific subjects which will appeal more plausibly and more entertainingly to the public imagination than has Prof. William Crookes, F. R. S., in his recent presidential address delivered to the Society for Psychical Research. Prof. Crookes, among other services to science, has invented the tube called by his name and which has recently attracted so much attention in connection with the wonderful discoveries of the cathode and the X rays. He occupies so distinguished a position in the scientific world that a suggestion of his deserves respectful consideration, though he has lessened his authority by his unscientific credulity of fads. In the address referred to the learned professor said that the "psychical science was the embryo of something that might in time dominate the whole world of thought." He has certainly raised great expectations; we are all attention to the novel views he may lay before us.

With the modesty becoming a true scientist—and which is totally wanting in the usual style of quacks and faddists—Prof. Crookes did not pretend in his speech to have demonstrated the truth of his conjecture. He simply suggested a theory to explain how thoughts could perhaps be transferred directly from one mind to another, as is supposed to be done in telepathy. Was it not conceivable, he simply asked (after making an elaborate calculation as to the vibrations which produce sound and light), that intense thought concentrated by one person upon another with whom he was in close sympathy, could induce a telepathic chain along which brain waves should go straight to their goal without loss of energy due to distance? He does not here maintain the reality of such thought transference, nor even its possibility or compatibility with the properties of material substances such as there are in this world of ours. All he claims is that we shall not deny its possibility unless we can prove it to be inconsistent with laws of matter certainly known to exist.

IS IT POSSIBLE?

Though a long experience acquired in the study of scientific fads and follies and fancies has made me be slow and reluctant to accept any startling discoveries in such matters, and, as a consequence, I freely confess that I am incredulous to the theory proposed by even so distinguished a professor, still I must, and do, plainly acknowledge that I cannot see the absolute impossibility of his hypothesis. It would be a vast, yet, as far as I can see, not an absurd extension, of the well known natural laws under which sound is conveyed by vibrations of the atmosphere, and light by vibrations of the thinner element either.

True it is that thought, in its proper meaning of intellectual action, is spiritual, and, as such, immaterial. The immaterial cannot possibly be acted upon or transferred by any material substance; the idea, for instance, of virtue or vice, God or spirit, cannot be transmitted on wings or waves. But yet in man, who consists of spirit and matter, substantially united into one being, thought works in connection with phantasms, or brain pictures; and these, for all we know, may consist of brain waves, or undulations. If they are such, nothing shows the impossibility, but, on the other hand, nothing proves the slightest probability of their being carried along a subtle substance—be it ether or some material more subtle still—till they infringe upon and affect another brain, on the same principle as the waves of air set in motion by my friend's lips produce corresponding vibrations on the tympanum of my ear, and, by means of these, enable me to reproduce in myself his phantasms and his simple thoughts. All this would require a wonderful adaptation of means to an end, an incomprehensible, an infinite wisdom in the Creator; but this is no real objection, since, as a matter of fact, His wisdom is truly infinite.

SOME CONSEQUENCES.

What a wide vista of possibilities opens here before us. The telephone and telegraph may, perhaps, soon become things of the past, relics kept in museums as tokens of the ignorance of the nineteenth century, as we keep as curiosities Indian bows and arrows. Men will then converse with one another at any distance by mere brain power, "which is to act without loss of energy due to distance." We shall need for this purpose no machines at all. There will be no patents taken out on the neophone or enkephalophone—whatever name may be coined for it—as there are patents on the telephone, making the luxury so expensive that not every man can enjoy the use of one. With his brain power alone in action, the editor will sit in his easy chair and ask his agent in Lincoln or Washington, or President McKinley himself, about the latest phase of legislation, which will at once be mentally telegraphed while the editorial is being written. We shall then be able to consult our lawyer or doctor by merely wishing it, or call for a policeman when we meet a footpad on the street. Even the housewife will no need to put on a wishing cap to have her orders conveyed to the butcher or the milkman. Visits in the evening to closely sympathizing friends will go out of fashion, for the parties can keep up a brain chat with one another all the day. The general in a battle will send his order by telepathy, etc.

WHY DELAY THE BOON?

I am sorry that Prof. Crookes speaks so diffidently of the practical results. "The time may come," he says, "when it (the theory) can be submitted to experimental tests." And why wait for a time to come? What prevents us from experimenting at once? Men's brains are ready today for any new adventure. Why should we wait till our posterity will reap the fruit of these wonderful discoveries? If there is anything in them, let us have it at once. The medium of transference—be it ether or what not—is ready now and has been ready for centuries. It may take time to perfect the process of telepathy, but if, as the professor thinks, "intense thought, concentrated by one person upon another with whom he is in close sympathy can induce a telepathic chain along which brain waves shall go straight to their goal without loss of energy due to distance," it must travel as well to-day as it will in 100 years from now. If it will not do so, does this not throw the strongest doubt on the existence of the telepathic medium? And if nature uniformly persists in refusing to give evidence of such power in man as the theory supposes, does not the theory cease to be scientific? For a theory is called scientific in so far only as it plausibly explains existing facts without contradicting other facts. But where are the existing facts which the theory is to explain?

LET US HAVE FACTS.

As soon as the principles of steam power and electric power were understood, we at once had some of the effects made visible. So with the telegraph, the telephone, the telescope, the microscope, bicycles, photographs, etc., etc. Let us have telepathic messages at once. Happily, Prof. Crookes, as president of the much-vaunted Society for Psychical Research, is in the best position conceivable to test the value of his hypothesis and mature his theory. We have speculations enough, the air is full of them. Let us have facts—solid, hard and stubborn facts, that will convince the most skeptical.

The professor complains of hindrances in the shape of "scientific superstitions," whatever that may mean. There is nothing that will dissipate the mists of superstitions but bright, luminous facts. Show us clearly what telepathy can do; show how your theory is carried out in practice, and all scientific prejudices will give way before the solid proof. I must confess, however, that, so far, I have never seen those psychical phenomena, so much lauded as being fraught with promise of endless possibilities, treated in that common-sense, straight-forward way in which we deal with real science. In the physical sciences we proceed by induction, as Bacon has taught us, though others did it before him. We first get the solid and undoubted facts, and then we explain them by suggested hypotheses, or theories. But in this psychical business we seem to get plenty of theories and few, if any, undoubted facts. It is all wrapped in mystery.

A recent work, "The Law of Psychical Phenomena," by Thompson Jay Hudson, LL.D., a book which in this city has mystified many minds little given to close reasoning, makes the honest statement that, in the matter of which it treats, we are not in possession of well established facts by which we can safely test the truth of new speculations. The author admits (p. 82), that "it is comparatively rare that scientific investigators disagree regarding the demonstrable facts pertaining to a subject under investigation." But he adds: "Yet this is the condition in which we find the science of hypnotism (the effects of which he classes under psychic phenomena) after more than a century of research by some of the ablest scientists of the world. Thus far," he continues, "the different schools have distrusted or denied each other's facts and waged war upon each other's theories. The most carefully conducted experiments of one school will, in the hands of the other, produce opposite results." Notice, he does not say "will receive different interpretations," but "will produce opposite results," or effects. He justly adds: "Hence each experimenter is irresistibly led to distrust the scientific accuracy of the methods employed by others, or to admit their integrity only at the expense of their intelligence." He admits that the well authenticated facts of one school appear to the other as "an appalling hodge-podge of falsehood and delusion, chicanery and superstition."

GIVE US THE TEST.

What can be the value of Prof. Crookes' present hypothesis cannot be ascertained till we can test it by undoubted results, not such ghost stories as Mr. Podmore gives us in his "Apparitions and Thought Transference," but by experiments that can be repeated by various scientific men so as always to yield the same effects in the same circumstances. Such tests may be required of any science, for science consists in tracing known effects to their real causes, and in the case of physical agency, the same causes working under the same circumstances must ever produce the same effects. But we have a special right to call for such tests in the case of psychical phenomena, because they have been in all ages and they are today connected with a vast amount of imposture, superstition and extravagance. Let the Society for Psychical Research, over which Prof. Crookes presides, draw up lists of such demonstrated facts as we can study up and verify. Till this be done the professor's shrewd guess, or theory, will deservedly be received with the ordinary smile of polite incredulity.

LEARN A LESSON FROM LOURDES.

This incredulous smile used to greet every reference to the wonderful events that have been attracting vast multitudes of pilgrims to Lourdes during forty years in succession, and it is still common enough among those who are proof against all facts that clash with preconceived notions. I suppose that is what Prof. Crookes would call "scientific superstitions." If the Society for Psychical Research would only do as Lourdes is doing we should know where we stand with regard to its pretensions. The historian of Lourdes, Mr. Henry Laserres, gives us in his two works on the subject not only the official reports and attestations concerning the remarkable facts which he narrates with full details, but also the names and addresses of all parties concerned, and he has offered rewards, 10,000 francs, I believe, to any one who would prove any of the cures in question to have been misrepresented in his pages. That is the way to talk to an incredulous generation. In consequence of his universally acknowledged character for truth and accuracy, he could write to the novelist Zola a recent public letter of scathing rebuke for his notorious perversion of the facts.

The directors of the pilgrimages to that celebrated shrine employ a permanent open court of inquiry, presided over by a learned scientist, and inviting to all its sessions physicians and other men of learning from any country or persuasion to partake in the daily investigation of newly recurring wonders. They approve only such as are scientifically demonstrated to be above all natural powers. With such well ascertained data before him, every man of thought can leisurely and deliberately make up his own mind and put his own conscientious interpretation on the undoubted facts; but to question the real occurrence of the facts themselves would be unreasonable, unless flaws in them be distinctly pointed out. And it is very remarkable that, while not infidels alone, but also some Christian scientists, refuse to pronounce on the miraculous nature of the cures constantly recurring, no scientific process has been instituted by any of them to dispose of the facts themselves as unreal or distorted. The course pursued has been that many have honestly acknowledged them to be genuine and correctly reported; many who went to scoff have remained to pray; others have gone away thoughtful and hesitating; others, like the brave boy passing a graveyard at night, have kept up whistling or talking aloud for fear of seeing ghosts; others again have refused to go near the place, and these are the loudest in ridiculing it; a great multitude continue simply to ignore it as if it were not in existence. Mr. Hudson, in his "Law of Psychical Phenomena," classes it with the invocation of the gods by the Egyptian priests, with mind cures, Christian science animal magnetism, etc. (p. 24). But then he explains the miracles of Christ and the apostles on the same principle as all these (cc., xxiii., xxiv.). Those who feel called upon to refute the lessons that Lourdes pretends to teach, ignore the cures that the court of inquiry has approved, and fasten upon the multitude of rejected cases, many of which are no doubt the effects of an excited imagination.

CONCLUSION.

Let the Society for Psychical Research, under the presidency of their worthy Prof. Crookers, imitating the example of the Lourdes tribunal, draw the line distinctly between reliable and unreliable data in telepathy, and give us, not a hodge-podge of truth and fiction, like Mr. Hudson's book, or like the yearly reports called "Proceedings of the Society for Psychical Research," but a series of demonstrated facts upon which we can base our test of theories. Till this shall have been done, I attach no importance to a mere distant point of analogy, such as suggests the novel theory to the learned professor. If this be accomplished, and we get facts demonstrated along with hypothesis, both plausibly connected together, I for one will hail it as a precious addition to the treasury of science. Till then, I class telepathy among the fads.

X RAYS.

NEW AND NOVEL.

In a newly painted hair brush for military or traveling use the back is hollowed out and fitted with a sliding cover to hold a comb, soap, etc.

A recently designed chair can be changed into a bed by dropping the back and raising the footrest, the sides opening out flat to make it wider if desired.

A handy music-holder that needs no standard can be attached to a table by means of a spring clamp and has steel arms to hold the sheets of music in place.

Snare drums can be attached to chairs for orchestral playing by means of a new device, consisting of a frame to hold the drum fitted with clamps to fasten to the chair.

Cradles and rocking chairs are to be manufactured soon which are fitted with pneumatic and cushion pads on the bottoms of the rockers to make them noiseless and comfortable.

To keep mucilage brushes from drying up a new device has the brush placed inside a metal frame, to spring downward when wanted for use by pushing on a knob at the top of the handle.

A new collar button has points placed inside the hinged portion for the purpose of holding the band of a necktie and preventing it from turning around on the neck or slipping out from under the button.

The combination of a dipper and funnel has just been patented, a short nozzle being placed in the bottom of the dipper, with a valve operated by a spring level running parallel to the handle of the dipper.

One of the newest designs for an oil can has wooden casing of cylinder shape surrounding a barrel-shaped tin or glass can, which is pivoted in the casing at the ends and tips downward to let the oil flow out.

Tips and ferrules for umbrellas and canes which can be changed for summer and winter use are composed of rubber or steel points, and are fitted with a screw to fit in a metal socket in the end of the cane.

Water bottles with small necks are so difficult to clean that one recently patented will be much appreciated, the neck being detachable and fitted to the bottle with a glass collar holding a soft packing to prevent all leakage.

Music leaves can be turned automatically either backward or forward by a new device consisting of two cylinders placed on opposite sides of the music rack and connected with tubes running to two sets of bellows near the pedals, pressure on either set of bellows moving the piston rod on that side to operate the finger engaging the top sheet of music.