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SCIENTIFIC AMERICAN SUPPLEMENT

No. 771.

For the Week Ending October 11, 1890.

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MEETING OF THE BRITISH IRON AND STEEL INSTITUTE IN NEW YORK.

During the week commencing September 29, there were assembled in New York City a larger number of representative men connected with the iron and steel manufacture than were ever before congregated in this or probably any other country. The American Institute of Mining Engineers held its sessions here on September 29 and 30, and on Wednesday, October 1, commenced the daily sessions of the British Iron and Steel Institute, which held its fall meeting here this year on the invitation of the American society. In addition to a very large attendance of members of both of these societies, there was a numerous delegation of German and French engineers present, and one of the principal hotels of the city, which had been made the headquarters of the visiting delegates, was crowded to overflowing. The time not taken up by the regular business at the meetings was devoted to sight seeing and social intercourse of the most friendly nature in New York and vicinity, the visitors then departing to inspect the mines, furnaces, and leading industrial establishments of the country, view some of its more notable examples of engineering work, and obtain a more adequate conception of the great wealth of its natural resources, a task to which a number of the visitors will devote themselves for several weeks.

The British Iron and Steel Institute was founded in 1869, two years before the similar societies in America and Germany, and among its original members were Sir Henry Bessemer, Sir J. Lowthian Bell, and Sir William Siemens. The society has included in its membership nearly all who have been in any way prominent in the iron and steel manufacture of Great Britain for the past twenty years, and although it has formerly held meetings in other cities—in Paris, Liege, Dusseldorf, and Vienna—it is peculiarly significant that it should hold its first meeting on this side of the Atlantic in the first year in which the American production of iron exceeds that of Great Britain. Hereafter, the United States will lead the world in this great branch of manufacture, with a constantly increasing production the magnitude of which no one would wisely undertake to predict, but it is rather as co-workers in the same field, than as competitors, that our iron masters met the visiting engineers.

The address of welcome to the visitors by Mr. Carnegie, the president of the American society, was extremely felicitous, and especially so in its generous acknowledgment of what was due from American iron manufacturers to the foreign workers in the same field, concerning which he said: "What the new land owes to you of the old constitutes so vast a debt as to baffle computation. In your own immediate domain of coal, of iron, and of steel, we have been only your pupils. The original inventions were all your own. The American has necessarily been restricted to the development and improvement rather than to the origination of new methods in this department. The genius of Europe has preceded him and invented the processes under which we still labor. The inventions of Cort, Neilson, Nasmyth, Bessemer, Siemens, Thomas, Whitwell, and Gilchrist, the investigations of Bell, Richards, Snelus, Riley, and others of Europe, have made possible the amazing development of our own country."

In replying to this address Sir James Kitson, President of the British Iron and Steel Institute, dwelt particularly on the idea that the progress which had been made in the iron manufacture during the past twenty years had been in a marked degree due to the establishment of scientific institutions, the discussions before which disseminated the truth as to new methods and processes and discovered and made possible the early rectification of errors and mistakes. The second president of their society had been "Sir Henry Bessemer, whose brilliant discovery of a process for the production of steel, with which his name will forever be associated, has revolutionized the trade and led to vast industrial developments throughout the world. Next came Sir Lowthian Bell, described, and justly so, by your Professor Howe, as 'magister magnus in ignibus,' whose interest in our work and proceedings has been maintained with unflagging zeal for one and twenty years, whose scholarly attainments and scientific and practical knowledge have been of infinite service to this institute."

Among the interesting figures given by President Kitson were the following:

"The production of open hearth steel last year was, in Great Britain alone, 1,429,169 tons. This was very largely employed in the building of ships, the gross tonnage of ships launched in the United Kingdom in 1889 having been 1,288,251 tons, of which 1,215,276 tons were of steel—steel made by the open hearth process being the material generally adopted. It is very interesting, too, to note the rapid progress of the basic process, invented and developed by Messrs. Thomas & Gilchrist, materially assisted by other members of this institute, during the twelve months ending December 31, 1889. The total make of steel and ingot iron from phosphoric pig during this period amounts to 2,274,552 tons, being an increase over the make for the previous twelve months of about 321,318 tons, and making the total production of basic steel to this date 10,845,000 tons. It will be noticed that of the above mentioned make of 2,274,552 tons, no fewer than 1,764,639 tons were ingot iron, containing under 0·17 per cent carbon. With this 2,274,552 tons of basic steel were produced some 700,000 tons of slag (containing about 36 per cent of phosphate of lime), most of which was used as a fertilizer."

Perhaps the most notable event of the week was the presentation to Hon. A. S. Hewitt of the special Bessemer gold medal which had been awarded him by the British institute, for distinguished services in the development of the manufacture of iron and steel. In presenting the medal President Kitson said: "Immediately after Sir Henry Bessemer's first experiments were announced, Mr. Hewitt went to England to investigate it, and so rapidly did he work—as all American iron men seemed to work—that he had the first Bessemer converter running in the United States at his iron works in New Jersey within sixty days after English circles knew of this invention of the pneumatic process. Mr. Hewitt was also the first to build an open hearth furnace in America. He was identified with this branch of the steel business from the first announcement of Mr. Snelus' improved basic lining to the perfection of the Thomas and Gilchrist process, which he introduced in the new world."

In accepting the medal Mr. Hewitt made a forcible speech in elucidation of the value of the Bessemer invention to the world, during which he said:

"The whole product of steel of all kinds made prior to his invention was insignificant. To-day the production has reached 10,500,000 tons, being at least one-third of the whole consumption of iron in the world. It is still rapidly advancing upon the domain occupied by the ordinary iron of commerce, and it is quite evident that the time is not far distant when this commodity will be regarded as a relic of the past, although in some special branches its use will survive, serving to remind us of processes which otherwise would have been consigned to history. I do not propose to enlarge upon the practical application of the Bessemer process to the manufacture of steel, but, if you will bear with me, I think it would be well to direct attention to the effects of this invention upon the economic, social, and political condition of the world. A very few considerations will serve to show that the Bessemer invention takes its rank with the great events which have changed the face of society since the time of the middle ages."

Memorial to Alexander L. Holley.

On the afternoon of October 2, the members of the British Iron and Steel Institute joined with the American society in the ceremony of unveiling a memorial statue of the late Alex. L. Holley, in Washington Square, New York City. Previous to the unveiling, a eulogy was delivered by Mr. James Dredge, of *Engineering*, London, who told of Holley's early life, his strong liking for mechanics, and delight in making drawings of engines. He left Yale to take the scientific course at Brown University, and was graduated in 1853 with honors; after which he entered a number of machine shops about the country. He wrote on scientific subjects connected with an engineer's profession for various magazines and papers, and in 1857 became the owner of a paper devoted to railroad matters. He was not successful financially in this venture or in several others of a similar nature, and went to Europe to study the railroads there. He published several books as the result of his experiences, which aroused great interest in the engineering profession. His most conspicuous successes resulted from his association with Sir Henry Bessemer, of whom he purchased the American rights for his invention of the new process for making steel. He became intimate with all the great engineers of the world, who were attracted by his writings and speeches as well as by the records of his work. He was himself an inventor and improved many points in the Bessemer process. He died on January 29, 1882.

The statue is a bust, modeled by Mr. J. Q. A. Ward. It is of bronze, and a perfect likeness of Mr. Holley. The pedestal, of sandfinished limestone, is particularly handsome. The rectangular die rising from two steps is surmounted by a handsome ornate cap, the whole being eight feet high. It is flanked by two wings, jutting out near the back and terminating in rectangular posts five feet high. The inscriptions are:

"In Honor of ALEXANDER LYMAN HOLLEY. Born in Lakeville, Conn., July 20, 1832. Died in Brooklyn, N. Y., January 29, 1882. Foremost among those whose genius and energy established in America and improved throughout the world the manufacture of Bessemer steel. This memorial is erected by engineers of two hemispheres."

Do not spare sulphur from the mixture when you salt your cattle. It will cool and purify their blood, and probably save you from having distemper or bloody murrain. Sulphur is the only remedy I have ever found, says W. W. Hobson, in one of our exchanges.

The Worst Serpent in the World—the Fatal Cobra de Capello.

Portuguese traders found in the East Indies a peculiar serpent in early days, and named it in their own language "the snake of the hood," and even till this day this fatal serpent is generally known as the "cobra," rather than "Naja tripudians," which illustrates the force of a natural appellation.

The "Naja tripudians" belongs to the genus "Najadæ," or hooded serpents, class "Elapidæ," sub-order "Colubriform," and order "Ophidia."

To locate the cobra exactly it may be an assistance to notice that the order "Ophidia" is divided into two great sub-orders, each subdivided:

1. Colubriform. 2. Viperiform.

The second sub-order is represented in India and Ceylon by six genera.

Viperiform serpents are all poisonous.

The first sub-order is represented in India and Ceylon by nine genera of venomous snakes and seventeen genera of innocuous snakes.

Colubriform serpents of the subdivision "venomous" present four genera of "Hydrophidæ," or sea serpents—which we do not wish to consider—and five genera of the class "Elapidæ," or gliding serpents, and to the genus "Najadæ" belongs the species "Naja tripudians," commonly known as the "cobra de capello" or hooded snake, and locally in India and Ceylon and the East Indies, in its varieties, as "gokurruh," "kutiuh" in India, "pariah nahum" and "nulluh nahum" in Ceylon, and by similar localisms in Singapore and other parts of the East Indies.

My observation of the cobra has been limited to Ceylon, and particularly to Jaffna, a Tamil district in the northern province of the famous "pearl and spice isle."

The Hindoo religion prevails there, and the superstitious reverence in which devout Sivites hold this terrible reptile may account in Ceylon as well as in India for some part of the annual loss of life from the bite of venomous serpents.

Tamils speak of two cobras in Jaffna. First "pariah nahum," or low caste furious cobra.

This serpent has the ocellus or spectacle mark upon the back of the hood. In speaking of the hood, the natives—referring to this double mark—say "pardum," or picture. This serpent attains a length of from three to six feet, and is of a medium brown color upon the back, unvariegated, while the ventral surface is metallic in luster and grayish white in color, with two purplish blue bands diametrically crossing at the neck.

The second variety, euphemistically called "nulluh nahum," or good cobra, is smaller and more deadly, if possible, while the ocellus is faint or missing, and the back delicately marked with inverted V-lines of dark brown upon a lighter groundwork of the same color, somewhat intermixed with faint yellow dashes.

This serpent is very beautiful and remarkably perfect in shape, as evinced by a specimen that was killed in Batticotta church upon the evening of September 1, 1889.

All the species of genus "Najadæ" are hooded, but not all ocellated.

The hood is expanded by means of free elongated ribs sidewise.

The cobra only expands its hood when angered, cornered, or struck.

It is very terrifying even to strong nerves and cool heads.

Cobra venom is different from viperine poison, for this serpent is not a viper at all.

The toxic element is venom peptone, according to Dr. Weir Mitchell, and attacks nerve centers at once.

Men who have been bitten by a cobra die in from one to three hours of inability to breathe.

Many antidotes for "venom de Naja" have been suggested, affirmed and employed, but any crucial test shows them to be unavailing.

The conclusion is at present that there is no known physiological antidote, although NH_4OH and $KMnO_4$ are very useful.

There seems to be a wide and dangerous field of discovery open to analysts, physicians, and specialists in this line. Speed the undiscovered!

Amherst, Mass. WM. D. MARSH.

Edison's Accidental Discoveries.

Dr. William D. Gentry, of Rogers Park, Ill., a lifelong friend of Mr. Edison, relates the following interesting reminiscences:

"When I look back to twenty-five years ago, and put Tom Edison as I then knew him alongside of the Thomas Edison of to-day, and note what has taken place, I am prepared almost for anything. Twenty-five years ago, as I sat by Edison in a New York telegraph office, I little thought that there slumbered within that man the fire of a genius that would one day startle the world. There was nothing wonderful about Edison. A plain and unpretentious man, he came and went without troubling any one with his conversation. Perhaps he spoke to me more than to any other man in the place, because we sat at adjoining tables.

"One day his wire gave out or went wrong in some way. He was working New Haven, I was operating Boston. He started to fix it, and while thus engaged his message came back over my wire. I called him. 'Tom, can you explain this?' He looked for a moment, and then remarked, 'Why, that is caused by induction; the two wires are near each other.' He went off, and shortly afterward came back, seemingly lost in thought. 'Yes; that's what causes it,' he repeated. 'I wonder if we could devise a plan like that to make two circuits on one wire, so that two men could send and two others receive at the same time?' And he went back to his instrument.

There is a tide in the affairs of men
Which, taken at the flood, leads on to fortune.

"Tom Edison took it then. Out of that little accident, he devised the duplex telegraph system. Then followed the quadruplex, and these have saved the telegraph company millions of dollars.

"He had been working on a telegraph system, but he discovered that the Wheatstone system—I think that is the name—covered the ground, and he gave it up. You know the rest. Edison's achievements are now no secret.

"The steps leading up to that perfected phonograph, how Edison discovered that the sound waves of the human voice might be so directed as to trace an impression upon a solid substance, are just as wonderful. Edison found it almost accidentally while he was experimenting with a different object in view. In manipulating a machine intended to repeat Morse characters, he found that when the cylinder carrying the indented paper was turned with great swiftness, it gave off a humming noise. That led to several experiments, such as fitting a diaphragm to the machine, which would receive the vibrations made by the voice. The cylinder, when rapidly revolved, caused a repetition of the original vibrations, just as if the machine itself were speaking. That settled the matter, and Edison found that the problem of registering human speech so that it could be repeated by mechanical means as often as might be desired was solved. Yes: Edison is a genius."

Fortunes in Small Inventions.

Every little while the newspapers take up the subject of inventions and tell their readers how many have made fortunes out of small inventions. The Pittsburg *Dispatch* gave the other day a list of small things that have made their inventors wealthy. It commences with the pen for shading in different colors, which yields an income of $200,000 per annum. The rubber tip at the end of lead pencils has already made $100,000. A large fortune has been reaped by a miner who invented a metal rivet or eyelet at each end of the mouth of coat or trousers pockets to resist the strain caused by the carriage of pieces of ore or heavy tools. In a recent legal action it transpired in evidence that the inventor of the metal plates used to protect the soles and heels of shoes from wear sold upward of 12,000,000 plates in 1879, and in 1887 the number reached 143,000,000, producing realized profits of $1,250,000.

A still more useful invention is the "darning weaver," a device for repairing stockings, undergarments, etc., the sale of which is very large and increasing. As large a sum as was ever obtained for any invention was enjoyed by the inventor of the inverted glass bell to hang over gas to protect the ceilings from being blackened, and a scarcely less lucrative patent was that for simply putting emery powder on cloth. Frequently time and circumstances are wanted before an invention is appreciated, but it will be seen that patience at times is well rewarded, for the inventor of the roller skate made over $1,000,000, notwithstanding the fact that his patent had nearly expired before its value was ascertained.

The gimlet-pointed screw has produced more wealth than most silver mines, and the American who first thought of putting copper tips to children's shoes has realized a large fortune. Upward of $10,000 a year was made by the inventor of the common needle threader. To the foregoing might be added thousands of trifling but useful articles from which handsome incomes are derived, or for which large sums have been paid. Few inventions pay better than patented toys. That favorite toy, the return ball, a wooden ball with an elastic attached, yielded the patentee an income equal to $50,000 a year, and an income of no less that $75,000 fell to the patentee of the "dancing jimcrow."

The invention of "Pharoah's serpents," a toy much in vogue some years ago, was the outcome of some chemical experiments, and brought the inventor more than $50,000. The sale of the little wooden figure, "John Gilpin," was incredibly large for many years, and a very ingenious toy, known as the "wheel of life," is said to have produced upward of $100,000 profit to its inventor. One of the most successful of modern toys has been the "chameleon top," the sale of which has been enormous. The field of invention is not only vast and varied, but is open to everybody, without respect to sex or age, station or means.

Two Important Movements.

There are at present two commendable projects under way in this country, and ones that will be the means of imparting to those of our rising generation who are inclined to become thorough mechanics a theoretical and practical knowledge of mechanism.

The first project originated with the noted shipbuilder and philanthropist, William H. Webb, who, since his retirement from the shipbuilding industry, has been seeking a means by which young men may become educated in the art, science and profession of shipbuilding, and also afford free and gratuitous aid, relief and support to the aged, decrepit, invalid, indigent or unfortunate men who have been engaged in building hulls of ships or vessels, or marine engines for such, or any part of either the hulls or engines in any section of the United States.

The new institute to be built will be known as Webb's Academy and Home for Shipbuilders. Real estate located in this city, and valued at over one million dollars, has already been deeded to this home. The cost of grounds, buildings, and additional endowment required will necessitate an investment of two million dollars, all the State law allows.

Notwithstanding he long since ceased to build ships, Mr. Webb has not lost his interest in the profession, as is shown by his exertions to establish a home for old shipbuilders and a school for young ones. There are only two similar institutions in the world—one in London and one in Paris. What a favorable opportunity will this be for any young man who is a native or citizen of the United States, and who may, upon examination, prove himself competent, of good character, and worthy. With these requisites he will be entitled to free and gratuitous education in shipbuilding and marine engine building, together with board, lodging and necessary implements and materials while obtaining such education.

The other project is the opening of the engineer corps of the navy to young mechanics who have shown a special aptitude. Those who are urging these changes seem to be influenced by the consideration that the extensive machinery of the new steamships of the navy requires a greater number of engineers than the old style war ships. The tendency of the naval academy education is toward the theoretical rather than the practical, and the navy draws from its ranks men who are far better fitted to design and construct machinery than they are to stand in the engine room and run the engine.

This matter will receive attention in the coming annual report of the engineer in chief and secretary of the navy, and will be watched for with interest, as it will be the means of affording employment to many competent and worthy engineers.—*American Shipbuilder.*

Bromoform in Whooping Cough.

Dr. Hugo Lowenthal, of Professor Senator's clinic in Berlin, has tried bromoform in the treatment of whooping cough, it having been recommended by Dr. Stepp, of Nurnberg, and he is disposed to agree with him in considering it a very valuable remedy. Dr. Lowenthal says that it exerts an almost specific action upon whooping cough, at all events, if it is used at the commencement. A hundred children were treated with it, varying in age from 8 weeks to 7 years. The doses given were from 2 to 5 drops three or four times a day. The liquid was simply dropped into a tablespoonful of water, and formed a bead floating in the water. The quantity dispensed at once was about a drachm. The parents were cautioned to keep the bromoform from the light, as otherwise it is liable to be decomposed. As a rule, the good effects of the medicine began to show themselves on the second or third day, the vomiting being arrested within a week after the commencement of the bromoform. In cases where complications, such as pneumonia, occurred, they ran a favorable course, and where there were relapses, a return to the bromoform soon arrested the symptoms. In a very few cases the drug appeared to produce sleepiness and lassitude, and in one case, that of a weakly child a little over a year old, where a drachm had been given in the course of three days, a semicomatose condition was induced. Subcutaneous injections of ether revived the child, who was found to have pneumonia. This, however, ran a rapid and favorable course, and afterward the whooping cough was successfully treated by renewed doses of bromoform.—*Lancet.*

Another Tunnel under the Hudson River.

The scheme to connect Staten Island and Long Island by a tunnel under New York Bay at the narrowest point of the channel, near the mouth of the Hudson, is beginning to take definite shape. A bill to authorize the construction of such a tunnel was introduced lately in Congress, and referred to the Committee on Commerce. The concern seeking the franchise from Congress is the New Jersey and Staten Island Junction Railroad Company. The immediate point in view is to give the trunk lines now centering on the Jersey shore a Brooklyn terminus.