

Liquid Helium Reduces Resistance of Metals to the Electric Current

Noted German Professor Makes Discovery That May Result Eventually in a Substantial Reduction in the Cost of Electricity for Every Day Use.

(Special Dispatch.) LONDON, July 25. PROFESSOR KAMERLINGH ONNES, of Leyden University, has discovered a method by which the resistance of various metals to the passage of electric current through them may be reduced to the vanishing point, and apparently abolished. Professor Onnes found that mercury subjected to a temperature of 4.19 degrees centigrade, or to one of 3.8 degrees, would offer no resistance to the passage of electric current, and would become superconductive. The professor then wound a thousand turns of very fine lead wire on a bobbin. At an ordinary temperature the wire offered a resistance of 736 ohms, but when plunged into a bath of liquid helium it offered none at all, and the current introduced into the wire by induction persisted for many hours without the least perceptible diminution. It is expected that the discovery will open a new path of research into the constitution of matter. Details of Professor Onnes' experiment were laid before Professor Howes, of the South Kensington Royal College of Science. "It has been known for some time," said this authority, "that the resistance of a metallic wire to electric current decreases when the temperature of the wire is reduced. The colder you make your wire the more easily the current passes through it. It was known that this reduction in resistance went on continuously with the reduction in temperature, and it looked as if, in order to abolish resistance, we should have to reduce the temperature of the wire to absolute zero, which is 273 degrees centigrade below freezing point. How cold this is may be imagined from the fact that boiling point is 100 degrees centigrade above freezing point. That seemed to be an unattainable ideal. "Professor Onnes has, however, succeeded in reaching temperatures lower than have ever been reached before. "It will be noticed that he obtained this extraordinarily low temperature by the use of liquid helium, which he was the first to produce. He spent an enormous amount of money in producing liquid helium, and there was great joy among scientific persons when he produced a few spots. He must now have found how to secure it in larger measure, but its production in such quantities must still be very expensive, since the gas from which it is procured is very rare. "The discovery of a method of abolishing resistance to electricity does not lead toward the electric storage battery, but suggests the possibility of a reduction in the cost of electricity. "If you can abolish resistance you abolish the heat caused by resistance, and therefore you could use a very thin wire for a very high voltage. The cost of electrical wiring would thus be reduced very considerably. But in order to do this you must first bed your wires in liquid helium, or find some other way of reducing the temperature of the wire to nearly zero." Sir Oliver Lodge, interviewed at Birmingham, said Professor Onnes was one of the best experimenters on the Continent, and to all of his assertions great weight was attached. "The discovery he announces," continued Sir Oliver, "does not take us altogether by surprise, because many experiments have found that as temperature goes down conductivity improves to a surprising extent. "So much has been known from the researches of many observers, but Onnes has gone further, and by utilizing the low temperature at present known—that of liquid helium in a vacuum—he has reached a conductivity far lower than anything previously known. "It appears probable that lead does, as he says, offer hardly any resistance to the electric current. One consequence of that is that the current can go on circuiting in accordance with the first law of motion like a railway train without friction and without any propelling power—not for ever, of course, but for a long time. "What the practical bearing of this discovery will be it would be premature to guess. It may effect something in regard to the perfect transmission of wire, although in what way a wire can be kept at so low a temperature in practical circumstances I do not see. "But whether it has practical application or not, it is a discovery of very considerable magnitude. It will throw a good deal of light on electricity and matter, and cannot fail to be a revelation of the utmost importance."

CHARMING FIGURE AT MIDNIGHT BALL



The present Duke of Sutherland succeeded to the title last year. In the year before that he married Lady Elleen Gwladys Butler, who is the elder daughter of the Earl of Lanesborough. The Duchess was a train bearer to Queen Mary at the coronation in 1911. She is one of the most beautiful women in society.

SEEING GAY PAREE BY AUTOMOBILE

OUR CORRESPONDENT GETS NEW IDEAS OF OLD CITY FROM VISITING AMERICANS AND CANADIANS—THEY INCLUDE THE LADY FROM PEORIA AND DOCTOR FROM SHEBOGAN, WHO MAKE NOTES.

(Special Dispatch.) PARIS, July 25. WE are now going down the Avenue de l'Opera, Opera avenue, one of the most (hoak! hoak!) famous, if not the most famous, shopping (hoak! hoak!!!) street in the world. The city of Paris has a population of 2,000,000. Your correspondent was seeing Paris in one of the automobiles that leave from in front of the American Express Company every afternoon, with a guide to tell about the points of interest along the route. Your correspondent thought he had seen Paris before—a little of it, at least—but this was seeing it in a new way, and through the eyes of visitors recently arrived from New York, Pawtucket, Denver, Salt Lake City, Springfield (Ill.), Lafayette (Ind.), Montgomery (Ala.), Peoria (Ill.), Sheboyan (Wis.), from the far off Philippines and from Canada, upon whom the city was making its first impression. "The population of France," continued the guide in a megaphone voice which rose superior to the din of the Paris streets, "is forty-three millions—diminishing all the time. "There's one less now," called out the Doctor from Sheboyan, Wis., in a voice vibrating with professional interest, as the automobile just failed to cut down a pedestrian crossing the street. "The guide ignored the interruption. He took the view that if any jokes were to be made he could do it himself. DRINKING IT ALL IN. As for the Doctor, he did not look as if he could easily be squelched. He sat with his mouth as well as his eyes open, the better to drink in everything that came along. On his knees he had a prescription pad, upon which he made voluminous notes in lead pencil. In the seat behind the writer sat a Young Thing in a blue serge dress and blue silk stockings. (The latter detail was noted when she got out of the automobile at the Louvre.) Beside the Young Thing was Her Ideal, who also wore a blue suit and had the beatified smile of the newly wed. (Your correspondent did not notice the color of his stockings.) It was obviously a honeymoon couple. "On the left," the guide was saying, "is the largest dry goods store in Paris." "Forget it!" objected the Doctor. "My wife knows too much about the shops of Paris already. I've barely enough money to get home on now." The party left the automobile and entered the Louvre. "To visit all the galleries," said the guide, "requires a walk of twenty miles. We will omit a few of them." The statue of Washington occasioned more interest, and the Lady from Peoria clapped her hands. Veracity, it would appear, still has some standing in the company. Enthusiasm Grows. The avenue du Bois de Boulogne was entered, and the enthusiasm of the party was visible as the great Arc de Triomphe loomed closer and closer. The Young Thing stood up, camera in hand, and

What the Surgeons Say on Question of Vivisection

Dr. Foveau de Courmelles, of Paris, in an Interesting Article, Shows That It Is His Opinion New Methods Should Replace Tortures Inflicted on Man's Most Loyal Friend.

(Special Dispatch.) PARIS, July 25. THE question of vivisection and the arguments both for and against it are once more being discussed with great earnestness. What distinguishes the present controversy from former ones is that physiologists are no longer content to treat the question with silence and disdain, but now condescend to discuss it to state their case and to declare that vivisection is necessary. The arguments are the same—The affirmation that without vivisection there can be no physiology, and other aphorisms of the same nature, such as, war and the killing of animals for sport exist, and are necessary evils; vivisection is also an unfortunate necessity, but even more useful. Its opponents, who are so sentimental and whose feelings are so easily affected, would, it is said, do better to put the interests of man above those of animals and to devote their attention first of all to the scourge of war and to the killing of animals for sport. These are very unscientific reflections for men of research and erudition, and are merely generalities and side issues. Practice Is Useful. Indeed, they entirely lack the clear thought which would be necessary to convince medical men who disapprove of torture, thinking, as they do, that suffering is worse than death, and who have realized the uselessness of vivisection, and even the hindrance it has been to research. Our friends, the protectors of animals, have also taken their part in the discussion, and it would have been pleasing to find them more scientific in their argument than their adversaries. The contrast afforded would have been amusing and instructive for the general public. But notwithstanding the many scientifically trained minds formed during the last few years and the spread of scientific knowledge, none of the opponents of vivisection have made use of such arguments. This has been particularly regrettable because the supporters of vivisection have scored a momentary triumph. The public has been moved by the descriptions of the horrible tortures suffered by animals, which, for that matter, were old and oft repeated, but it has none the less preferred the idea that such sufferings are necessary. Tell every mother the world over—say the vivisectionists—that the torture of thousands of dogs is necessary to save her child, and it will soon be seen whether a single one of them would hesitate for an instant if the choice were given her! Vivisection of No Avail. The defenders of animals describe the heartrending sufferings which are inflicted on the latter, but they do not demonstrate that these tortures are useless. As a consequence, and I have said so for nearly twenty years, they engage in a fruitless task. What should be shown—and I have already said so in these columns some years ago—is exposed at great length in my book, "La Vivisection, Erreurs et Abus," published in 1911, which M. L. Millevoye, the anti-vivisectionist. It is that vivisection is useless, and, more important still, this should be irrefutably proved. My book has not been refuted point by point, as I disapproved in detail the arguments of the vivisectionists. When we showed the exact shape of the stomach, obtained in 1898 by a repeat operation to the X-rays, and when by means of the same discovery of Rouget's we traced the course of digestion, the action of drugs and the action on the head and lungs as well as the life of these organs, at the same time correcting many of the errors into which the physiologists had fallen, no answer was forthcoming to our assertion. When we advanced the fact that animals were so dissimilar to man—as witness the frog, which is never killed by electric currents; the horse, which succumbs to currents which exercise curative effects on human beings—no one was able to deny these differences, which have caused so many erroneous conclusions and which render the greatest variations met with in drugs and have led to many mistaken treatments in the practice of medicine. Used Cinematograph. When we proposed the use of the cinematograph, which can show thousands of times, without pain, the operations considered useful for the purposes of instruction, and which are so imperfectly to be observed when performed upon animals, for an illustrative course of lectures, which are otherwise more of a school of cruelty than anything else, clever surgeons made use of the newly invented apparatus in their teaching. Did not this offer to those surgeons, who had until then done no teaching work, and were merely acquiring a reputation for skill in their profession, a new means of displaying their skill, while avoiding the necessity of suffering and death? When many eminent surgeons, such as Professors Nilaton, Lawson, Tait and Quenn, proved that animal vivisection was of no use as practice for operations, and did not result in the acquirement of skill, many surgeons unsuccessfully tried to prove the contrary. When we showed, with the support of Professors Albert Robin and Huchard that in medicine, the art of curing and the curative treatment by drugs have rather been hindered by the errors, than advanced by the merits of vivisection, not a few doctors supported us with applause.

A LION HUNTING STORY WITH REAL THRILLS

Stewart Edward White, Author, Kills Monster Beast in East Africa After Most Exciting Experience and Hairbreadth Escape.

(Special Dispatch.) LONDON, July 25. THOSE who have been "on safari" hunting big game in East Africa—and their number must now amount to thousands—will read with great interest Mr. Stewart Edward White's modestly told story of a hunting journey from Mombasa through the Shimba Hills, Nairobi, Kapiti, the Taoro River and Masailand. Mr. White had the good fortune to shoot almost a "record" big lion. He thus describes the incident:— "We had proceeded in this fashion for about a mile, when suddenly, and most unexpectedly, the biggest lion I ever saw leaped straight up from a bush twenty-five yards in front of me, and with a tremendous roar vanished behind another bush. I had just time to throw up my .405 shotgun-fashion and let drive a snapshot. Clifford Hill, who was ten yards to my right, saw the fur fly, and we all heard the snarl as the bullet hit. Naturally we expected an instant charge, but, as things turned out, it was evident the lion had not seen us at all. He had leaped at the sight of our men and horses on the skyline, and when the bullet hit him he must have ascribed it to them. At any rate, he began to circle through the tangled vines in the direction of the "From their elevation they could follow his movements. At once they set up howls of terror and appeals for help. Some began frantically to run back and forth. None of them tried to run away; there was nowhere to go! The only thing that saved them was the thick and spiky character of the cover. The lion, instead of charging straight and fast, was picking an easy way. We tore directly up hill as fast as we were able, leaping from rock to rock and thrusting recklessly through the tangle. About half way up I jumped to the top of a high, conical rock, and thence by good luck caught sight of the lion's great yellow head advancing steadily about eighty yards away. I took as good a sight as I could and pulled trigger. The recoil knocked me clear off the boulder, but as I fell I saw his tall go up and knew that I had hit. At once Clifford Hill and I jumped up on the rock again, but the lion had moved out of sight. We all manoeuvred rapidly for position. Again luck was with me, for again I saw his great head, the mane standing out all around it, and for the second time I planted a heavy bullet square in his chest. This stopped his advance; he lay down. His head was up and his eyes glared, as he uttered the most reverberating and magnificent roars and growls. The dogs leapt and barked around him. We came quite close, and I planted my fourth bullet in his shoulder. Even this was not enough. It took a fifth in the same place to finish him, and he died at last biting great chunks of earth."

Paris Becomes a Bit Too Gay

Vulgurities Displayed for Benefit of Visitors, Who Return Home Severely Shocked.

(Special Dispatch.) PARIS, July 25. PARIS is tired of having the epithets "Parisian" and "gay" applied to it for the vulgurities that are displayed chiefly for visitors. For some time past there has been a revolt against the indecencies of certain of the Paris revues, which are produced mainly for the foreign visitor. It is from these revues that the foreign visitor returns to his homeland satisfied that Paris is living up to its reputation as the "gay" city. Proceedings have now been instituted by the authorities against two revues whose posters are certainly the most frank to be seen on the boardings to-day. They are "Cache ton Nu," at the Moulin Rouge, and "L'Orgie a Babylone," at Olympia. The managers of both these music halls are charged with offending the public morals. Furthermore, the principal dancers in each revue, whose costumes would not be difficult to describe, since there is so little of them, have also been called to answer for the alleged indecencies of the production. The campaign against the inartistic nude has resulted in the closing of a number of minor establishments, but it is on the first time that an attempt has been made to bring well known halls to book for being too "Parisian." Prudence. Washington Star:—"A fat man is always good natured," said Mr. Dolan. "He who describes himself as 'fat' is so difficult to offend," replied Mr. Raftery. "He has to go easy in an argument with a friend because he knows he's not in condition to see it through to a finish." To Be Determined. Washington Star:—"What are you going to do when you get home?" "I don't know yet," replied Senator Sorghum. "I've got to wait and see whether my reception by the town folks is in the nature of an ovation or the third degree."

English Women Mill Slaves

Data Collected by Government Inspectors Show Life of Drudgery in Factories.

(Special Dispatch.) LONDON, July 25. SOME unhappy stories of factory life are contained in a Blue Book which gives the result of a year's work by the Government's staff of 217 men and women factory inspectors. Nearly 300,000 factories and workshops in which more than 5,000,000 men, women, boys and girls labor were under inspection. It is stated that the number of fatal accidents increased from 1,200 to 1,300 last year, and other accidents increased from 154,972 to 176,882. Last year was a period of trade activity, and better trade means more accidents. Miss Tracey, one of the inspectors, describes the effect on girls of the succession of long days in a factory. "A well known man in a Lancashire town," she says, "was telling me only the other day about how he would wake in the morning to the clatter of the girls' and women's clogs as they went past his house at half-past five in the dark on their way to the mills. "He had had exceptional opportunity of judging of the effect of the long day's work, and he told me how bonny children youthful to him lost their color and their knowledge to energy in the hard drudgery of this daily toil, how the girls would fall asleep at their work, and how they grew worn and old before their time. "We see it for ourselves and the women tell us about it. Sometimes one feels that one dare not contemplate too closely the life of our working women, it is such a grave reproach. "Miss Tracey gives an account of a day in the life of one of these women:— "She told me she left home at 5:15 A. M., walked two and a half miles to the factory, stood the whole day at her work, and at six, sometimes later, started to walk home again, and then had to prepare her meal, mend, and do her household work. This case is only typical of thousands of women workers. "Some of the women and girls have to handle heavy weights. Miss Whitworth, another inspector, found a delicate woman helping another to carry fifty-three pound weights. "Is it right I should have to do this kind of work and only have eight shillings a week?" asked the woman. "A case of a woman who worked as a jute spinner until six P. M. on the night her baby was born is mentioned. Another woman returned to the factory eleven days after the birth of a child. "Women in a laundry had to work from six A. M. until midnight on Friday and from six A. M. to nine P. M. on the next day. In a Midlands bakehouse a boy of seventeen was at work from one A. M. until one A. M. the next day, being allowed only an hour or two for sleep. In a jam factory women and girls were kept at work from six A. M. until nine P. M. four or five days in the week. Words of Cheer. Washington Star:—"Won't you join our sunshine society?" asked the kindly stranger. "No," replied the man from the mountains. "We take sunshine as a matter of course. But if you can show us any new ideas about moonshine we might listen with interest." Extremists. Boston Transcript:—"We recently heard of a man so stingy he wouldn't even give you a pleasant look. Of another man so economical he could live a double life on it a week. Of a third man so bold he makes an egg look like the head of a violin virtuoso."

WHAT EUROPE POSSIBLE

Better Feet Petersburg May for Worst Back Ho

LONDON, July 25.—The Berlin papers while fully recognizing the gravity of the situation are to find grounds for the hope Austro-Serbian conflict will be averted. The news that Austria laying crossing the Danube has ended hopes that the interchanges between the chief capitals result in checking the outbreak until Austria finds a demand. Much attention is given to the alleged expressions of French states that France means to let Russia be attacked by another. The fact that France is making exertions at St. Petersburg to persuade Russia from interfering is regarded as promising. The Empress is returning to Berlin to meet the Emperor on the 27th. All Prepare for War. LONDON, July 27.—It is not that hostilities between Austria and Serbia had not begun in Europe in general the hope that war might be averted, was, however, little chance in view of the more optimistic reports that the German Emperor returned to Potsdam to-day from his cruise in northern waters with Sir Edward Grey. Sir Edward Grey, who was here on his way to-day that Sir Edward Grey, foreign secretary, had successful representations to Italy and France for a conference between the representatives of countries in England on the Serbian situation with a view to operative mediation. The Italian and German Ambassadors here saw Sir Grey this morning with result has not been ascertained. The members of eight diplomatic corps and of the British foreign office early astir. Sir Edward Grey, Premier Asquith, shortened his end trip and reached London this morning. After conference with Winston Churchill, Lord of the Admiralty, and Asquith, Sir Edward received