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(Illustrated articles are marked with an asterisk.)

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SCIENTIFIC AMERICAN SUPPLEMENT

No. 651.

For the Week Ending June 23, 1888.

Price 10 cents. For sale by all newsdealers.

THE EMPEROR OF GERMANY.

On June 15, the Emperor of Germany, Frederick III., passed away. On March 9, three months and six days before his own death, his father, William I., died, leaving his son and heir-apparent suffering with cancer, an incurable disease that threatened his death at any moment. He was born October 3, 1831, in the palace at Potsdam, a castle which was built by his ancestor, Frederick the Great. He was an only son of the Emperor William. His mother, the Empress Augusta, had been Princess of Saxe-Weimar. He visited England when but seven years old, and there made the acquaintance of Victoria and her family, among whom he met his future wife. In 1855 he was betrothed to the Princess Victoria, and three years later he married her. His return to the Continent with his bride was made the occasion of great rejoicings and ovations.

He served in the army with much distinction through the campaigns of 1866 and 1870–71. Though apparently a born soldier, and acting no perfunctory part when in the field, he is said to have been greatly opposed to war, not recognizing in it a path to glory, but a painful necessity.

He had been troubled for some years with his throat, when, in 1887, the cancerous symptoms developed that have been the premonitors of his death. Attended by the best physicians, he was an invalid at San Remo when the news of his father's death reached him. He at once returned to Berlin and was crowned Emperor. Thus he secured the imperial status for life of his wife, which, had he never been Emperor, might have been endangered. His proclamations and all that he has done in the few months of his tenure indicate a man of the best motives, and make it probable that Germany, in his death, has a cause for true grief. He was personally very popular, and during his father's life was called by all "Unser Fritz" (Our Fritz). In our issue of March 17, 1888, will be found some notes of his father's career, with which his son was so intimately blended, and the portrait of his son and successor, Prince William, will be found in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 643. The latter, whom we soon may see Emperor of Germany, was born January 27, 1859, and hence will ascend the throne at a comparatively early age, prepared for a long reign.

THE INTERNATIONAL CONGRESS OF ANTHROPOLOGY.

On Monday, June 4, the International Congress of Anthropology began to hold its first annual meeting. Columbia College was the scene of the initial gathering. The congress is the outgrowth of the New York Academy of Anthropology, an organization that has been in existence four or five years. The meeting of the present year lasted until Thursday evening. The science to which the association is devoted has of late years received such extension, and its methods have been so systematized, that the new congress seems to have chosen a fitting time for organization. One of the leading papers, by Dr. Henry Maudsley, of London, dealt with the tendency in some quarters to treat criminals as insane. The paper was an earnest protest against the sentiment as applied to all criminals, and maintained that we all have within us the potentiality of crime. Yet the "essential criminal," the author believed, might be considered as mentally defective. No theories of criminal anthropology are so well proved as to justify their introduction into criminal law. Allied topics were discussed by others.

The discovery of America before Columbus was the subject of a paper by Mr. James Phinney Baxter. He presented the latest grounds for the claim of the Norsemen to the discovery. Prince Roland Bonaparte, in discussing the paper, claimed an earlier discovery by the Chinese. The subjects of alcohol, vaccination, and general topics were considered in other papers. Mr. Geo. F. Kunz exhibited some remarkable jade carvings. On Thursday, June 7, the congress adjourned to meet again in 1892. The interest throughout the session was maintained, and on the last day increased, and there is every reason to predict a long and useful future to the association.

APPARATUS FOR COOLING AIR IN THEATERS.

An apparatus has been introduced in the Standard Theater, of this city, which in a very simple way is designed to solve the problem of securing a cool auditorium in summer. A fan is placed in the basement which draws air from outside the building and delivers it through the furnace pipes and registers to various parts of the auditorium. The air before it reaches the fan is drawn over ice arranged on shelves. This cools it so that a temperature of 70° is easily attainable. While the fan situated in the basement is delivering cool air, a second fan on the roof exhausts air from the interior, thus maintaining a constant change of atmosphere. The arrangement, in utilizing the furnace connections, and in general detail, is remarkably simple, and could be readily applied to many places, such as hospitals, where coolness is all important. For a single evening's work about two tons of ice are expended.

"ARE FAST OR SLOW STEAMERS THE SAFEST?"

In the current number of the *North American Review*, the masters of the Atlantic "greyhounds" respond over their signatures to the question: "Are fast or slow steamers the safest?" and, as might be expected of seamen, every one of them engaged in an attempt to shorten the voyage, devote themselves with unanimity to commending high speed. Like Samuel Weller in the now historical case of Bardell vs. Pickwick, they remember everything favorable to their own side, but are as obscure and uncertain as the fogs they are wont to race through as to the merits of the other. The nautical reader, especially, will regret that the coasters, both steam and sail, and the Banks fishermen were not invited to speak to the other side of the proposition, for, like the question, "Is fox hunting a healthful amusement?" in which the fox's opinion differs very materially from the huntsman's, the question as to whether fast or slow ships are the safest depends a good deal upon which you are on; that is to say, from what point of view you look upon it. If the intention was to inquire into the dangers which come from a desire to make quick trips—and it would seem to have been this—another form of question suggests itself as being better calculated to produce the required result—such, for instance, as this: Is it not unsafe as well as unlawful to run at full speed in foggy or thick weather?

We don't have to go to the mariner to learn whether or no fast ships are safe. The record shows beyond peradventure that they are, when they are run in clear weather. But the record doesn't say how many slow vessels have been run down by fast ones during thick weather, or how soon we may expect to hear of a dreadful accident as the direct result of the wanton violation of the international sailing directions. Surely the experienced navigators who framed these laws had some good reason for insisting that steam vessels should slow down while running through the fog. It is not so long ago when the Clyde Maritime Association, made up of experienced steamship builders, rejecting the claim set up by the officers of the Cunarder Oregon that she was run into, decided that, on the contrary, she got her fatal injuries by striking a sailing vessel while running at full speed in thick weather.

Here is the gist of what the masters of the fast boats say:

Captain Brooks, of the Guion steamer Arizona: "If you have a danger to encounter, the sooner you get over it the better; and if one steamer takes seven and another ten days to cross the Atlantic, it is evident that you have three more days of risk on the slow ship." He would run fast in the fog because the ship going the fastest gets the least injury.

This is all very well for the Arizona, but not so well for smaller vessels that may be in her track; and what is likely to be the consequence when she may happen to strike a ship of her own weight running at the same rate, or a lighter one that has a still greater momentum?

Captain Perry, of the White Star steamer Britannic, says that, after forty years' experience, he has concluded that, in a collision between two ships at sea, he'd liever be on the faster one; but in striking ice or rock he would prefer to be going slow.

Captain Murray, of the Guion steamer Alaska, says you can run out of a storm quicker with a fast ship than a slow one, and mayhap save a daylight or a tide in entering port by the difference of time between a fast ship and a slow one.

The master of a ship that had been running slow through the fog might very reasonably respond to this that he was as likely to strike daylight or a high tide, on sighting port, as if he'd been running faster.

Captain McMickan, of the Cunarder Umbria, says he believes in slowing down in thick weather.

A glance at his uninterrupted series of fast trips shows, however, that he doesn't practice what he preaches, or else that there is never any thick weather at sea when he's afloat.

Captain Lewis, of the Inman line City of Chester, says: "A steamer that goes nine knots in fine weather would find it hard to keep her head up to the gale in boisterous weather, especially if lightly loaded, and would be in danger of falling into the trough."

But if she were capable of making 18 knots, and with full head of steam on could only then eat into the gale, she would not be "going fast in thick weather," and consequently not be endangering human life so far as reckless speed was concerned.

Captain Kennedy, of the White Star steamer Germanic, deplores the fact that while speed on the ocean has increased, the science of sound signaling, so important in preventing collision, has not advanced, and he thinks that if a good system of sound signaling was in use, there would not have been any collision between the Britannic and Celtic.

Captain Frangeul, of the French line steamer La Bourgogne, says: "My opinion is that while extremely fast ships lessen the duration of dangers, they augment their number."

This is the most striking remark in the whole series of interviews, and it is obviously true.

Captain Land, of the Inman line City of Berlin, says a fast-going ship is safer in a fog than a slow-going one, because she can be turned quicker.

Perhaps a fair answer to this would be that if not going so fast, you'd have more time to turn in.

One captain complains that the Board of Trade (English) orders you to go slow in a fog, and the government (the post office) offers you a premium for making short passages.

Another, a clear-headed old mariner, declares with great truth that the question of fast or slow sailing resolves itself into a question of fogs.

MISCELLANEOUS NOTES.

The Senate of the United States has passed a bill for the purchase of three squares of ground near the Capitol, for the erection of a Supreme Court building. It will be a large and magnificent edifice.

An expedition for the exploration of the site of the ancient city of Babylon is now being organized under the auspices of the University of Pennsylvania. The staff of the explorers consists of the Rev. John P. Peters, of Philadelphia, for director; Dr. R. F. Harper, of Yale College, and Prof. E. Hilprecht, of the University of Pennsylvania, as assyriologists; Prof. John Henry Haines, photographer; and Mr. J. D. Prince, of Columbia College, as architect and physician. It is expected that they will begin work in the autumn, as no digging can be undertaken before November. This expedition is the result of a former effort in the same direction which was made in 1885, under the auspices of the American Archæological Institute, and for which the late Miss Catherine L. Wolfe gave the sum of $5,000. The subscribers to the fund of the present expedition embrace several well known citizens of Philadelphia, among whom are Messrs. Geo. W. Childs, H. C. Lea, H. H. Houston, Joseph B. Potts, Stewart Wood, W. W. Frazier, and C. C. Harrison. It is said the expedition will be very completely equipped, and the most interesting results may be expected.

The presidential address before the Alumni Association of Stevens Institute of Technology, on June 13, was delivered by Alfred R. Wolff, M.E. It contained many suggestions of interest. He thinks there might be advantageous changes from some of the studies which now occupy considerable time. Some abstract developments now dwelt upon at length, he thinks, might be advantageously omitted, while physical experiments and applications in heat, electricity, and the like might be more copiously introduced as exercises, both with the view of imparting a fair hold on the abstract taught and also as imparting requisite information and methods of procedure. "Better acquire some things thoroughly," he says, "than a greater number superficially, for only in a thorough acquirement can a correct and mature judgment be formed."

The statistics of the production of coal in the United States for the year 1887, prepared by Chas. A. Ashburner, have been issued by J. W. Powell, Director of the United States Geological Survey. From these statistics it appears the total production of coal was 123,965,255 short tons, valued at the mines at $173,530,996. Of the above, 39,506,255 tons were anthracite, valued at $79,365,244, the remainder being bituminous, brown, lignite, etc. It appears that coal is found in about 30 different States and 7 Territories. The little State of Rhode Island supplies 6,000 tons of coal.

Dr. Hobart Cheeseman, N. Y., states that the oxalate of cerium has been proved a remedy for cough in every stage of phthisis. He has had an extensive experience with the drug, and speaks of its utility in the highest terms. Dr. W. H. Gardner, surgeon in the United States army, recommends the oxalate of cerium in seasickness. He says: "I do not think I exaggerate when I state that it will cure or materially relieve 75 per cent of all cases." It is administered in doses of ten, fifteen, or twenty grains every two or three hours, in about one tablespoonful of water. He also says he has used it in hundreds of casesof sick headache with marked success. Healso confirms Dr. Cheeseman's experience in regard to its useful effect in relieving cough.

Dr. Thomas Addis Emmett, of this city, describes his method of tracheotomy without the cannula. He uses a silver wire which is passed through the skin and the trachea, so adjusted as to turn the edges of the skin over into close contact with the edge of the opening in the trachea. He thinks it a comparatively easy matter to obtain an early union between the edges of the skin and the lining membrane of the trachea, and at the same time to preserve the necessary opening into the air passage. He thinks the cannula can never be so perfected that its presence in the trachea will avoid irritation.

A Reckenzaun electric boat has lately been constructed in Newark, N. J., and a successful trial trip from that place to New York recently took place. She is a trim little launch, 28 feet long, 6 feet beam, and 3 feet deep. Two long benches run fore and aft in her, back to back. Under them are storage batteries. The motors are aft under the deck. A trap door opens and reveals a 7 horse power motor for full speed and a 2 horse power motor for half speed. They are regulated by a handle convenient to the steersman, for whom there is a comfortable seat in the stern, and they drive a screw propeller. A handsome canopy covers the little boat, and from each of the eight posts hangs an electric lamp.

Gen. W. B. Franklin, of Connecticut, has been appointed by the President as Commissioner-General of the United States to the Paris exposition of 1889, and has accepted the office.

The Department of Labor.

The bill creating a National Department of Labor has become a law. The head of the department will be known as the Commissioner of Labor, and his salary will be $5,000 a year. He is to hold office for four years. The duties of the commissioner are to acquire and diffuse among the people of the United States information connected with labor in the most general and comprehensive sense of the word, and especially in relation to capital, the hours of labor, earnings of working men and women, and the means of promoting their material, social, intellectual, and moral prosperity. It is especially charged to ascertain, whenever industrial changes shall make it essential, the cost of producing articles at the time dutiable in the United States in leading countries where such articles are produced, under a classification showing the different elements of cost of such articles of production; to establish a system of reports by which, at intervals of not less than two years, he can tell the general condition, so far as production is concerned, of the leading industries of the country. He is also to investigate all controversies and disputes between employers and employes which may tend to interfere with the welfare of the people, and report thereon to Congress. The law virtually expands the present Bureau of Labor Statistics, which is a branch of the Interior Department, into a division of the government.

PHOTOGRAPHIC NOTES.

How to Ascertain the True Focus in a Lens.—One plan, described by Mr. Thomas Grubb, which we take from the *British Journal of Photography*, is as follows:

On the ground glass of the camera draw two vertical lines with a pencil, say one each an inch from the side, although this is not important, so long as both are of equal distance from the margin. Now place the camera on a large sheet of paper on a table facing a window and focus sharply any very distant object—a chimney or a tree—which is so placed as to cut one of the lines drawn.

Then run a pencil along the outer side of the baseboard of the camera, thus drawing a straight line on the paper underneath. Now rotate the camera as if the center of the lens tube was on a pivot, so as to have the object fall upon the line at the opposite margin of the ground glass, and draw a second line on the paper along the other outer side of the baseboard of the camera. Now remove the camera, and by means of a long, straight rule carry these two diagonal lines forward until they meet or intersect each other. Then where they diverge connect them together by a cross line equal in length to the distance apart of the two parallel lines on the ground glass screen. Draw a center line at right angles to the cross line, bisecting the angle formed by the inte section of the two side lines, and measure the distance from their intersection to the cross line, which represents the equivalent focus of that special lens.

Another method intended to find the precise focal center of a lens is described by Mr. Mathiot. First, a very distant object was accurately focused; then the position of the ground glass was marked on the base frame of the camera by drawing a line on it. Next an object was focused full size, and the position of the focusing frame was again marked.

By pushing in the camera bellows two marks are seen on the camera bed. Twice the distance between these two marks was then measured from the focusing surface and the distance marked upon the brass mounting. This last mark corresponded with the position of the focal center, or apex of the cone of emitted rays. This point, once fixed, serves as a basis for all subsequent operations.

Mr. Mathiot focused by measurement, not trusting his eyes.

Having found with his lens, to reproduce an object the same size, it should be distant 6 feet 5 inches, then to obtain an image one-eighth its full size it would have to be placed 11 feet 3 inches from the optical center of the lens. Thus different distances from the lens would produce proportionate images on the ground glass, always sharp and in focus.

Difficulty in Stripping Films from Paper.—It is claimed by James McGlashan that the insoluble sensitive film which is flowed over the soluble gelatine film renders the latter insoluble after a time, because of its absorption, by dampness and other causes, of a portion of the chrome alum in the sensitive film.

Paper recently coated, he found, stripped perfectly, but after it had stood seven or eight months, although kept in a dry place, it would not strip. Films should also be stripped from the paper immediately after development and fixing.—*Photo. News.*

John Jackson, in the *Br. Jour. of Photo.*, states that he has been able to strip the films, no matter how old, provided they have been kept dry. Immediately after development is finished, the negatives should be soaked for about one minute in a bath of weak hydrochloric acid, strength one drachm to twenty ounces of water, then well washed to clear them of acid before immersing in the hypo. bath. After fixing, the negatives should be rapidly washed in running water, or several changes of water, for half an hour, after which time they should be put down on the prepared glass and stripped after having been under pressure for twenty minutes. *On no account* should they be left soaking for a protracted time in water. If the stripping cannot be performed at once, the negatives ought to be taken out of the water and dried on sheets of vulcanite. When required to be stripped, which can be done at any future time, it is only necessary to soak them in an acid bath, as above given, wash the acid from them, and proceed to put them down on the glass, and strip as usual.

Orange Glass Substitute.—Mr. J. B. Huffman, of Chillicothe, Mo., sends the following substitute for orange glass for dark-room work to the St. Louis *Photographer*. It is simple and easily tried:

Asphaltum	3 parts.
Spirits of turpentine	1 part.

Coat the glass plate from one to four times, as desired, flowing the same as if it were collodion.

Preventing Halation.—In some kinds of gelatine plates, especially those coated with a thin emulsion, it frequently happens that a certain amount of disagreeable halation or fogginess is observed, where, for instance in a landscape view, the dark limbs of trees appear against a bright sky, or when an interior is taken with windows facing the lens.

Mr. A. A. Pearson, in a communication to the Leeds Photographic Society, which is reported in the *Br. Jour. of Photo.*, speaks of a remedy as follows: It is necessary to cover the back of the sensitive plate with a substance that will reflect non-actiniclight. He prefers the old fashioned burnt sienna, as the rays it reflects are orange and non-actinic. This pigment can be obtained at a paint store ground in water to an impalpable paste free from grit, and it is only necessary to thin it with a little strong dextrine solution and glycerine with a drop of liquefied carbonic acid or oil of cloves to preserve it.

The sensitive plates are brushed over the back with it, put into an ordinary drying rack with films facing each other, and a large space between the wet backs, and stood on a metal plate which has been heated, and carried into the dark-room. They will dry in half an hour. In developing, the halation will be still further reduced and even cured by taking the plate out of the dish as soon as the windows appear (supposing it to be an interior) and carefully painting them with a fifty or sixty grain solution of bromide of ammonium or potassium, then returning it to the dish. He preferred to do it with a camel's hair brush.

Combining Developing Material with Sensitive Plates.—According to M. Vidal, plates are being made in Belgium prepared with a coating on the back which contains the proper amount of pyro. and alkali in a dry state to develop it. It also acts as a preventive of halation. After exposure in the camera the sensitive plate is placed in a tray of water. Soon the backing is dissolved, and, mixing with the water, forms the developer of proper strength for bringing out the picture.

M. Vidal suggests that a more simple plan would be to prepare sheets of paper in this way. After the plate was immersed in the tray the sheet of paper could then be plunged in over it, and as its salts impregnated the water the image would be gradually brought out. If it developed too fast, the sheet of paper could be taken out. Some such simple plan would be quite convenient to the traveling photographer.

An excellent way is to have the dry salts measured out and put up in small homeopathic bottles. To form the developer, simply dissolve in the requisite amount of water.

Mr. Edison's Baby and His Phonograph.

According to the New York *Herald*, Thomas A. Edison, the inventor, has been interesting himself with his new baby and a phonograph at his home. When the baby crowed with glee, the crow was registered on the phonograph; when it got mad and yelled, its piercing screams were irrevocably recorded on the same machine. That phonograph is now a receptacle of every known noise peculiar to babyhood. It is Mr. Edison's intention to take a record of the strength of the baby's lungs every three months. "I will preserve the record," said he, "until the child becomes a young lady. Then the phonograph can be operated for her benefit, and she can see for herself just what kind of a baby she was, and won't have to take her mother's and the nurse's words for it."