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Contents.

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For the Week Ending January 7, 1893.

Price 10 cents. For sale by all newsdealers.

SAFETY SUGGESTIONS FOR OCEAN STEAMERS.

Considerable anxiety prevailed in this city during the past week owing to the non-arrival of the British fast mail steamship Umbria, of the Cunard line, plying between New York and Liverpool. The apprehensions for her safety were considerably relieved by the arrival of another vessel that reported having seen and signaled the missing steamer at sea. The Umbria was then under sail, 750 miles distant from New York, and signaled that she was disabled, but required no assistance. From this it was assumed her machinery was out of order and repairs were in progress.

The large and splendid German steamship Spree lately met with a serious disaster, due to the breaking of her propeller shaft. Ragged parts of the machinery broke a hole in her after compartment, which soon filled with water, and the great vessel was left helpless, to drift upon the waves. Fortunately her compartment bulkheads remained tight, and her signals of distress were seen by another steamer, which took her in tow and finally brought her into port.

The accident which occurred to the double propeller ship City of Paris a few months ago will, doubtless, be remembered by most of our readers. In this case one of the propeller shafts broke down and the flying fragments of iron broke through the bottom of the ship, and also through the longitudinal compartment bulkhead of the adjoining engine room, so that the water quickly filled both engine compartments, disabled both engines, and left the vessel helpless. A double propeller ship had been previously regarded as particularly safe; it was reasoned, if accident happened to one set of machinery, the remaining engine and propeller could drive the vessel at nearly normal speed. The futility of such expectations was well illustrated in this particular case.

The question whether all reasonable means of securing the safety of ocean steamers in case of accident are at present made available is an interesting one. We think they are not, and that much might still be done, without material augmentation of weight or expense in the fitting up of the vessels. We will make a few simple suggestions.

Nearly all steamers of the class mentioned are provided with a number of independent donkey engines, boilers, and pumps. It seems as if it would not be a difficult matter to carry pipes to bow and stern, and arrange suitable connections with the pumps, so that in the event of accident to the main propelling machinery, the various streams of water could be joined and used to propel the ship, the same as now practiced on jet-propelled vessels. With a proper arrangement of jet pipes, the vessel could then be readily steered in case of breakage of the rudder, and kept head to wind if the engines were disabled. It is also probable that, by a simple attachment, the main engines and boilers might be used for jet propulsion, in case of loss of the propeller blades, which is not an uncommon accident, as we all know.

We have in our back volumes several times illustrated the construction and operation of jet-propelled boats. The method is simple, practical, and successful; but as yet it has not been made equal in speed or economy to the ordinary propeller, and hence is not in general use.

It has, however, been successfully applied to life boats, and a fine example is seen in the English steam life boat Northumberland, which is now in active service in England. An engraving of this little vessel, with particulars, will be found in the SCIENTIFIC AMERICAN of September 6, 1890.

As applied to life boats, one of the particular advantages of the jet system is that there is no projecting propeller to be injured or fouled by ropes, or by pounding on sands or wreckage.

The Northumberland pushes out against fierce breakers with the utmost facility, and is not only propelled, but readily steered by means of her water jets.

In addition to the supply of jet pipes to ocean steamers as above indicated, it would seem as if these vessels might also be furnished to advantage with one or more steam life boats such as the Northumberland.

The suggestions here made apply not only to ocean passenger vessels, but to war ships. Every one of the boats of our new navy ought to be fitted with jet steering and propelling pipes. In the event of battle the disablement of rudder or engine leaves the ship a helpless target before the enemy's guns. The addition of the simple means here indicated would enable them to turn quickly into any desired position, even if engines and rudder were broken, and thus to stand up against the foe.

The Coming of Columbus' Ships.

Orders have been issued by the Navy Department to Rear Admiral Benham, commanding the European squadron, for his flagship Newark and the gunboat Bennington to convoy the Columbian caravels Pinta and Nina from Spain to the United States by way of the West Indies.

The Newark is now at Smyrna and the Bennington is at Cadiz. The former will visit Naples to receive the Vatican exhibits, Marseilles to receive the French Columbian relics, and will then proceed to Cadiz to assist in fitting out the caravels for their voyage across the Atlantic over the original course taken by Columbus. The caravel Santa Maria, representing the discoverer's flagship, will be sent over separately by the Spanish government, but will join the other vessels at Havana.

The entire fleet is to start from Cadiz not later than February 15, so as to insure its arrival here in time to participate in the Columbian naval review at Hampton Roads next May.

The Medical Uses of Compressed Gases.*

BY CLEMENT B. LOWE, PH.G., M.D.

Within a comparatively recent period there has been introduced to the notice of the medical profession the use of compressed gases, the principal ones now being used in this way being oxygen and nitrogen monoxide (formerly known as nitrous oxide, or laughing gas).

The medicinal properties of both of these gases have been known for many years. Experiments made upon animals have shown that the inhalation of oxygen produces no injurious effects, but the reverse; they gain in body weight through the stimulating effects upon the nutritive functions, these results being produced mainly by the effects of oxygen upon the blood through the increase and stimulation of the red corpuscles. The effects thus produced upon animals have been verified by numerous cases reported by physicians of prominence. The chief diseases in which it is indicated are diseases of the respiratory organs, characterized by difficulty in breating, such as asthma, croup, etc., also in the early stages of phthisis pulmonalis; in chronic indigestion, and especially in asphyxia from poisonous gases, such as carbon monoxide, etc. In the latter case its use may be invaluable; for instance, a person has been found insensible from the inhalation of carbon monoxide produced by imperfect combustion in a stove in a bed chamber. If the carbon monoxide has not been present in sufficient amount to saturate all of the hæmoglobin of the red corpuscles of the blood, recovery takes place, *but very slowly*, it being weeks or months before the patient is restored to normal health. In such a case the inhalation of oxygen would be of the greatest valve, the hæmoglobin being at once changed to oxyhæmoglobin and the blood in the arteries being restored to its bright scarlet color.

The anæsthetic properties of nitrogen monoxide were discovered by Sir Humphry Davy. It was first used in dentistry by Dr. Wells, of Hartford, Ct., and more recently as a remedial agent by some of the most eminent physicians of the country, Dr. J. E. Blake and A. McLane Hamilton being prominent among them. It is also being extensively used by medical quacks under the name of compound oxygen. It should be stated that in many cases the latter gas has given better results than those from oxygen. It is stated that one of the best known of New York City physicians has used more than 20,000 gallons of nitrogen monoxide in his practice during the past two years, chiefly in the treatment of nervous diseases. He regards it as a sheet anchor in nervous prostration, insomnia, melancholia, etc.

While, as before stated, the use of these gases therapeutically is not new, the use of them in a compressed form is more recent, as previous to the use of the apparatus devised by the S. S. White Dental Manufacturing Company, of this city, which, through their courtesy, I shall have the pleasure of showing you this afternoon, oxygen had to be made by the physician himself, necessitating the use of expensive apparatus and the loss of valuable time. Even if procured from those who manufacture it for calcium lighting (with but one exception in this city), it would taste of illuminating gas (carbureted hydrogen), on account of the same pump being used to compress both gases.

As the use of these compressed gases shall become more frequent by the medical profession, pharmacists can add to their stock these cylinders, and be ready to supply them at a moment's notice as they would any other remedy, as is already done by a member of our college.

In using the apparatus the compressed gas is first conducted into a rubber bag or a metallic gas receiver, from the former of which it is inhaled under ordinary pressure, the gas passing through a bottle partly filled with water. If to be used as an enema, the gas is displaced from the receiver by water flowing from a can placed about 22 inches above the receiver, and is passed through a bottle, containing warm water, to the patient.

Nitrogen monoxide is used in the same way for inhalation, but when used as an anæsthetic, of course, the face piece as used by dentists should be employed.

NEW ARMY POST.—One hundred thousand dollars has been appropriated by Congress for new army post buildings near the city of Helena, in the County of Lewis and Clarke and State of Montana.

*Read before the pharmaceutical meeting of the Philadelphia College of Pharmacy. *Journal of Pharmacy.*

American Ostrich Farming.

BY H. C. HOVEY.

Tame ostriches have long been kept as curiosities; but ostrich farming dates no further back than 1866, when the breeding of these splendid birds for industrial purposes became necessary, in order to prevent their extermination. Formerly abundant in Asia, the wild ostrich is now rarely found on that vast continent, except in parts of Persia. In Africa it used to range in great herds from Algeria to Cape Town; but so remorselessly has it been hunted for its plumage, as well as for the excitement of the chase, that the market value of the undressed feathers ran up to $500 per pound. With such a price set on his head, the gigantic bird was doomed. The statistics of slaughter are not readily accessible; but, according to one authority, the annual importation of feathers from a single region would necessitate the killing of half a million ostriches. Stringent legislation was enacted, but not so easily enforced amid the African deserts. The honor belongs to the French Acclimatization Society of having first directed attention to the practicability of ostrich farming. Successful experiments were made at Algiers and at Cape Town. The new business grew so rapidly in favor, especially at the Cape, that the colony reported, at the end of the first decade, 32,247 domesticated ostriches; and by 1880 the number had increased to 100,000, with an investment of $40,000,000, and an annual yield of plumes worth more than $4,000,000.

Owing to the increased supply, together with the fluctuations in fashion, the plumes are less costly than formerly, yet the business is sufficiently remunerative to attract the attention of enterprising Americans. Ostriches were imported from Natal in 1882, 1883, 1886, and 1887, each bird having a separate padded box, and most of them making the voyage safely. They were landed at New Orleans and at Galveston; but the climate not being exactly favorable, they were taken overland to Southern California and Arizona. Among places where the experiments have been carried on may be mentioned Anaheim, Los Angeles, Carpentraria, San Diego, in California, and Phœnix, in Arizona. The writer visited several ostrich "pastures," but was particularly interested in the methods and success of the American Ostrich Company. The manager, Mr. E. J. Johnson, brought over the colony of parent birds, twenty-three in all, from Cape Town, in 1883, and after a careful inquiry into climatic and other conditions, located them in the sheltered valley of the San Luis Rey, seven miles from the town of Fall Brook, Cal. A branch farm was also established at Coronado Beach, under the care of Mr. J. R. Campbell, and another at Riverside, under Mr. H. Bentley. A large number of young birds have been successfully raised, three of which have gone to Honolulu, six to Denver, and others elsewhere, besides about a hundred still on hand.

The Fall Brook farm comprises about 380 acres, subdivided for the various uses indicated. The "hatchery" covers half an acre. Chicks three months old are turned into a field of twenty acres. At the age of six months they are promoted to a larger field of forty acres. The full-grown birds occupy a pasture of a hundred acres. When breeding, each pair is confined to a field 200 feet square. This is necessary, for the reason that the breeding birds are pugnacious and even dangerous. It is a curious fact that the female ostrich chooses her mate, and those once paired are paired for life. The males, however, do the fighting, both with each other for the supremacy of the ranch and also with unlucky intruders. Their manner of warfare is peculiar. They do not strike with the beak, but with the foot; always forward, never kicking, using right and left alike, and in rapid succession. Their aim is accurate, and it is said that they can strike with sufficent force to pierce an inch plank. They seem void of affection, even for the owner that feeds them from the time of hatching. Mr. Campbell, who has raised over a hundred ostriches, said that his birds would, at breeding time, attack him as soon as they would a stranger.

There are three breeding seasons a year. The male digs a nest in the sand, where the female deposits an egg every other day until from ten to twenty are laid. Then the obedient male bird takes the main care of the nest, sitting from 3 P. M. till 8 A. M., when the female sits till afternoon. Each nest is seven feet wide by three deep. A singular fact, not hitherto noted, is that the male, who sits at night, is black, while the female, who sits by day, is gray, each being adapted to its environment by color protection. After the chicks are hatched the male takes care of them, even to brooding over them at night. Occasionally he contrives to steal a few chicks from another male, and then there is a row. Indeed, there is so much jealousy and annoyance that many chicks have thus been lost. It has been found safer and more economical to hatch the eggs by the Petaluma incubator, which I had the pleasure of seeing in operation. The temperature must be kept at 101° Fah., day and night, for forty days. With the utmost care, only about sixty per cent of the eggs hatch out and about twenty per cent of the chicks die afterward. They are at first very sensitive to cold. At midday they are allowed to run about in the sunshine, but as night approaches, even in the equable climate of Southern California, they must be taken under cover. From the age of three months they are able to take care of themselves, unless a cold storm comes on; and they seem to be exempt from disease. No adults have died except from accident.

A full grown ostrich is a magnificent creature, weighing 250 pounds, and measuring five feet from the ground to the back, and ten feet to the head when erect. The hens, however, are less than these figures. The eggs weigh from three to three and a half pounds, and are always white. They are rather strong when boiled, but make an excellent omelette. Ostriches are notoriously voracious, and will greedily devour refractory substances if allowed to do so. But their main diet is corn, melons, fruit, and vegetables. They reject meat, insects, and all animal food, although taking a malicious joy in killing the young of poultry if they come within reach. Their method of destruction is grotesque. I saw one of them reach over a fence, and in defiance of a mother hen, pick up one of her brood, lift it aloft, hold it there for a while, and then let it drop. A few repetitions of the lifting and dropping were fatal, and this seemed to satisfy the persecutor. The ostrich has no gizzard, but takes his food directly into his capacious stomach. His feeding attitudes are unique. He first gathers as large a mouthful as possible; and then, lifting his head on high, lets the force of gravitation convey the load slowly down his long esophagus.

"Bromming" is the term applied to the unearthly sound that the ostrich imagines to be song. When I first heard it I actually mistook it for the trumpeting of a distant fog horn! In the desert it might well be a fit answer to the roar of the lion. So very peculiar is the sound, that I took pains to ascertain exactly how it was produced. The process, after all, is simple. The bird inflates his long neck, till it looks like a great bag; he then lets the air out again in three installments. He blows thus thrice in succession, making nine roars in all. The performance is then over for the time being. Bromming is occasionally heard by day, but more usually breaks the silence of the night, and is probably meant as a challenge. Two of the herd always are on guard while their companions sleep. They take turns in this duty.

Ostrich chicks are comical little fellows with downy heads and necks and striped bodies. The feathers are allowed to grow without being disturbed until maturity. The moulting time is in the fall, when all the best feathers would be dropped were they not previously plucked. This is not a very easy task in the case of such a powerful and pugnacious bird. One method is by driving the victims, one at a time, into a plucking box that restrains them from violent resistance. Another way is for an attendant to grasp the bird's head and forcibly draw it to the ground, in which position it cannot see to strike while being robbed of its plumage. The wing and tail feathers alone are plucked. Each bird yields from one to two pounds, worth from $50 to $250, according to quality. They are sorted at the farm and then sent to the manufacturer, who dresses them for the market. About one-fourth of the annual harvest finds sale in California, and the rest are disposed of in New York. The natural colors of the feathers of the male ostrich are pure black and spotless white; while those of the female are drab and white. The pure white is the most highly prized. The very finest are retailed in California at ten dollars a plume. The more common kinds shade down as low as one dollar each. Boas are also made of the black, white, and gray mixed, and sold at from $25 to $75 each. There is also a market for the eggs, which bring about two dollars apiece as curiosities.

In conclusion, while mistakes may have been made and losses incurred, the fact seems to be established that ostrich farming in America is an assured success. The birds, instead of degenerating in captivity and exile, thrive and multiply rapidly, and the plumes rival those of Natal or Barbary, and by more skillful breeding may yet compare with the wild feathers of the Sahara.

Decadence of Natural Gas.

There is hardly a doubt that the natural gas supply, even in the most favored districts where this agent has been discovered, is generally approaching extinction, and it will soon cease to be an important factor among the fuels of the country, particularly as far as its use in manufacturing industries is concerned. What were recently the most prolific fuels in Ohio have abated their yield to that extent that several factories dependent on natural gas for heat have had to introduce other fuels; some have ceased operations, and several are seeking locations in the more fruitful territory of Indiana. But, judging from experience elsewhere, the supply even in the last named State will not last so very long either; and furthermore the expense of sinking new wells and making the necessary connections with existing plants will cost so much as to preclude the possibility of continuous profitable use of the fuel. It must be allowed, however, that the decadence of the natural gas flow is not steadily progressive, even in the oldest territories whence the supply has been drawn. In this city (Pittsburg), for example, there is more to be had now than was afforded last winter; but the increase comes mostly from new wells, and, as noted above, there is a limit to the extension of this resource.

The gas companies, here and elsewhere, find that it is more profitable to them to furnish fuel to private consumers than to manufacturing establishments, and so they are curtailing the supplies of the latter, except in places where the gas is in great abundance.

In some industries the fact of the supply beingirregular does not cause such great loss, though, of course, that condition is always inconvenient. But for glass manufacture it is of paramount importance that the supply of fuel should be always steady and reliable. The cooling of a glass furnace, even temporarily, involves the destruction of the pots, not to speak of the other losses accruing from it, and after a furnace once becomes cold, it takes some time, even under the most favorable circumstances, to get it going again. So that to make glass successfully, the source of heat must be constant and always to be depended on, else continual loss and trouble are certain to ensue. There was never, perhaps, a better fuel for this manufacture than natural gas, from its cleanliness, universal applicability to all purposes, freedom from smoke and refuse, and easiness of adaptation to every description of plant and furnace. But since the first premonition of the decline in its supply and probable extinction, inventive men have been exercising their faculties in the endeavor to provide a fuel as nearly equal as possible in its advantages to natural gas, and if they have not succeeded entirely, they have come very near it; and wherever there is coal to be had a good substitute for natural gas can be obtained, and that without having to resort to the use of the former in its raw state, as was the case before the natural gas came in. Of course the cost of artificial gas will depend on the supply and quality of the coal in whatever locality it is needed, which vary considerably in different sections. Crude oil, too, has its advocates as a glass-making fuel, but while it has been successfully used in some places, the general results of its application have not been such as to inspire confidence in its value as an important adjunct for heating purposes in glass manufacture.—*Glass and Lamps.*

The Armour Institute, Chicago.

Philip D. Armour, the millionaire packer, started for New York December 12, on his visit to Europe, leaving behind him a Christmas gift of over $1,500,000 to the city of Chicago. Absolutely unknown to the public, work has been going on for a year past toward the erection of a magnificent five-story building on Armour Avenue, and it is now all but ready for occupancy. This building will be known as the Armour Institute, and will be to Chicago all that the Drexel Institute is to Philadelphia and the Pratt Institute to Brooklyn. This building is but a small part of the gift. In addition to it, and for its support, Mr. Armour gives $1,400,000. All that money and brains and labor can do will be done toward making it the greatest institute for manual training, science, and art in this country.

Mr. Armour conceived this idea years ago, and the plans have been carefully gone over with George W. Childs, John C. Black, and Mr. Armour's sons, Ogden and Philip. The building and the funds for the support are to be turned over to a board of directors. It is expected that the school will open on the 1st of next September. During the next few months the most complete apparatus obtainable for every branch and a library bearing upon every line of study will be secured. The building has been erected and is now being finished without regard to expense. In the basement will be placed the electric plant, and here will be located the students in forging and iron work. On the first floor is a library sixty feet square. Woodworking rooms and the rooms for reception and for the president of the institute are also located here. On the second floor are the chemical laboratory, the chemical lecture room, the physical laboratory, the physical apparatus room, the physical lecture room, and electrical rooms. The third floor will be used by students in free-hand drawing, mechanical and architectural drawing, and in commerce and business. The fourth floor is devoted to the domestic sciences, there being departments of cooking, dressmaking, millinery, and kindred studies. On this floor are also recitation, lecture, and class rooms. At one end of the fifth floor is the gymnasium, 60×53 feet. At the other end is the technical museum. Connecting the two are dressing rooms for the gymnasium and elaborate bathrooms fitted up in white marble. The faculty of the institute will be of the highest standing, and it is Mr. Armour's desire that students may have opportunities to be prepared for the higher universities, or practical work in any field of mechanical or scientific labor. Every possible convenience for scientific research and experiments will be provided. The institute is not located in a fashionable portion of the city, and Mr. Armour's idea in placing it where he has is said to be to put the institute among those whom it will most benefit.—*Press Telegram.*

THE atmosphere, if compressed, would make a sea thirty five feet deep around the globe.