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A Disastrous Balloon Ascent.

M. Tissandier, the French aeronaut, accompanied by a party of distinguished scientific gentlemen, recently undertook an ascent over Paris in the balloon L'Univers, in order to make topographical drawings of the fortifications. While at a height of 750 feet the balloon exploded; the great bag at once emptied itself, and the car with its occupants fell with terrible velocity, the former burying itself in the ground. Strange to say, although every individual was more or less wounded, no one was killed.

WHAT WORKING MEN SHOULD EXHIBIT AT THE CENTENNIAL.

A paragraph is going the rounds of the daily press about an elaborate model yacht which somebody is building for exhibition at the Centennial. The hull is to be made of countless pieces of different woods, the rigging of fine silk, the fittings of silver. Every detail of a real vessel is to be repeated in miniature; and to crown all, this remarkable production is to be the work of an individual who never has been aboard the style of craft he proposes to imitate. We mention this instance merely as one of scores, similar thereto, which have lately come to our notice, and which show that hundreds of persons all over the country just at present are at work with the idea of exhibiting like results of their skill at the Exposition. In our estimation, all these people are making an unfortunate mistake, for they are simply wasting valuable time and labor to no good purpose whatever.

If the maker of the yacht above referred to can produce a model, cut roughly from a log if need be, which will possess merit for fine lines or superior design, or which will afford a new idea regarding safety, speed, buoyancy, stability, or any of the qualities sought by marine architects, then he will perform useful work; but we cannot imagine anything more useless than a miniature affair which, because built by a totally unskilled person, cannot be supposed to be a model, and which, too costly even for a child's toy, reduces itself to an evidence of the patience with which the producer has thrown away his otherwise unoccupied time. If any reader of this journal is making minute steam engines to run on a five cent piece, or building miniature furniture or ornaments of immense numbers of fragments, or trying his hand at building working models of large machines on a ridiculously small scale, or indulging in any other like effort, we earnestly counsel him to stop. We grant that model building by learners in trades often serves as excellent practice; but the attempts of tyros are not, it is presumed, ever intended for exhibition, or made with that incentive. To all working men we say: Exhibit. If you have a really nice piece of work which you can command, send it to Philadelphia; but let it be something in your own trade, that is the result of your own individually acquired skill, and not some useless though very pretty affair, tinkering at which has killed a few heavy hours. There will be committees of workmen sent over here from Europe to examine minutely everything, and to report thereon, so that no fear need be entertained but that every article in the great edifice will be critically scrutinized by experts, and judged on its merits.

It is well to remember another fact about these elaborate miniature or piecemeal productions, and that is that the yellow faced, almond-eyed Chinaman, who is now making his way in almost every town in the country, can do that kind of work a thousand times better than you, with all your skill in mechanics, can ever hope to. He can bring over with him from his own country carvings in ivory, or in that hardest of substances, jade, and you can form no idea even of the tools used in cutting the almost invisible lines, much less how the work was accomplished. Your finest productions are incomparably coarse and crude beside these. He can build miniature yachts and steam engines which will excel yours beyond all question, provided you give him something to copy, and then he will reproduce every scratch or accidental stain on the original. Clearly, then, when you attempt the work which is peculiar to the country of the cheapest of cheap labor, you only depreciate your own toil by inviting an unfortunate comparison.

What we want to see in the Centennial are first, new ideas, secondly, evidences of trained and skillful workmanship. Of the former there will be no lack; whether the same will be true of the latter rests with the workmen themselves. We want a display that will tell the world that, besides possessing the ablest inventors, the United States contains the men who can put ideas into shapes that cannot be excelled. Therefore if you have spare time, do not waste it in producing something which does not, but something that does, tell this fact. Do not make fancy inlaid work or build boats, unless such is your trade; if it be, strive to make the best inlaying or the neatest model you ever produced. But if it be without your trade, let it alone; you can no more hope to compete with those whose trade it is to make such things than they with you in your particular branch of industry. If the article you are to exhibit is within your own calling, and is to be the labor of yourself alone, there lavish your work. If the object is of metal, make pattern after pattern until you get a form on which you can imagine no improvement. If you can hit upon a new design—and new designs are sadly needed for a great deal of useful machinery—so much the better. Then try until you obtain perfect castings; and this done, fit the parts to perfection. Do not finish with nickel or silverplate, but go at it with the file. If you know anything about the delicate and beautiful mechanical operation of polishing with that tool, let the world see that you do. It is evidence of superior mechanical skill, and proof that no defects are hidden, as might be the case under a film of plating. If you are laboring on only a part of a machine, and fellow workmen are doing the rest, exhaust all your efforts on your part. It will have the salutary effect of making your comrades do likewise, almost despite themselves, for the finish on the machine must of course be uniform; and besides, your employer will hardly refuse to give you the public credit which would be but a just recompense for your skill and industry.

In a word, stick to your own business, and let that of other people alone. If you are tempted to work on something out of your line, bear in mind that others will take care that the Exposition shall not be wanting in that particular respect, and that your amateur help in supplying a deficiency would

be the last required. Show the world the very best you can do in your particular calling, and this without regard to whether your labors tend to the production of a magnificently finished engine or a neatly forged bolt.

STANLEY, CAMERON, AND NORDENSKJOLD.

The year 1875 will ever be a memorable date in the history of geographical discovery. Within the twelvemonth two of the most important questions of African geography have been settled; and in the far north the demonstration of an open water way between Europe and the countries drained by the great Siberian rivers is perhaps the most important addition to geographical science that could be made in polar regions. Certainly there remains for no future year so many first-rate problems to solve.

The source of the Nile! For twenty centuries it has been the goal of the explorer's ambition. The boldest spirits have essayed its discovery, only to be turned back by insuperable obstacles. Its conquest waited for the plucky energy and resistless push of Stanley.

Starting from Zanzibar in November, 1874, with 300 soldiers and carriers, an important part of whose luggage was the open boat Lady Alice, in sections, Stanley had before him 700 miles of unknown country—part forest and part desert—much of it swarming with hostile savages. By dint of resolute marching and fighting, he accomplished in a hundred days what in the usual course of African travel would have taken as many weeks, though at the cost of half his command; and on February 27, he caught his first glimpse of the great lake with which his name must hereafter be inseparably associated.

Speke and Baker had traced the Nile to the Victoria Nyanza. What was the compass of that great freshwater sea, and whence came its supplies? Thanks to the Lady Alice, which was soon set up and afloat, these questions had not long to wait for resolution. Within the next sixty days, its shores and numerous islands had been mapped, and its tributaries noted. Of the ten considerable streams which feed the Nyanza, the largest and most important proved to be the Shimceyn, in all probability the ultimate source of the Nile. The details of the discoveries thus auspiciously begun we shall not consider here, nor the importance of the region now for the first time opened up to geography. It is enough to note that, through Stanley's daring energy and genius for command, the question which, more than any other, has vexed geographers and challenged explorers for two thousand years has been substantially settled.

In the meantime Cameron has taken up the unfinished work of Livingstone, and—spurred on no doubt by a determination not to be forestalled by his Yankee rival, as he was in the search for Livingstone—he has overcome the obstacles that baffled the veteran explorer, and accomplished perhaps the longest journey ever made by any adventurer in that benighted continent. And its results are as brilliant as the passage was heroic. No other explorer ever crossed the continent so near the equator; and none save Stanley ever achieved so much in so little time. His path lay through the most difficult and dangerous part of Africa, from Tanganyika to the mouth of the Congo; and when the story of the passage is made known, it will, nay, it must, present some of the most stirring chapters of dashing adventure in the history of African exploration.

One thing is certain: The theory of Livingstone has been disproved; and not the Nile, but the Congo, receives the drainage of the great interior basin of the continent. And Africa hides no other secrets to compare with the two which Stanley and Cameron have, within the same few months, manfully wrested from her jealous keeping.

Less significant geographically, but of far greater promise commercially, is Professor Nordenskjold's discovery of an open passage by sea between Europe and Northern Asia. The tract of country thus brought into economical communication with the rest of the world is a vast and largely fertile region, much of it splendidly timbered, traversed by navigable rivers, and only waiting for a suitable outlet for its productions, to become densely peopled. According to Professor Baers the valleys of the Obi-Irtsh and the Yenisei exceed in extent the combined areas watered by the Don, Dnieper, Dniester, Nile, Po, Rhone, Ebro, and all the other rivers flowing into the Black Sea, the Mediterranean, and the Sea of Marmora. The entire region made directly accessible to commerce is estimated by Dr. Petermann to embrace an area one fourth greater than all non-Russian Europe.

The attainment of the pole would give greater renown to the explorer who should succeed in reaching it; but the consequences to humanity would be insignificant compared with those quite certain to flow from this much needed waterway to the heart of Asia.

PHOTOGRAPHING THE INVISIBLE.

Dr. Schnauss, in Photographisches Archiv, essays to enlighten his countrymen with regard to the so-called spirit photographs and that sort of thing, and endeavors to shoulder the blame of such deceptions or delusions upon "that land of humbug, America."

Humbugs do flourish here, we are sorry to admit: humbugs of every grade, from the mysteries of Mumbo Jumbo, devoutly believed in by too many citizens of African descent, to the finer mysteries of Baron Reichenbach's odic force, not less devoutly believed in by many citizens not of African descent. With such a composite population, constantly reinforced by emigrants from every quarter of the globe, it is not surprising that every variety of superstition should from time to time be thrown into, and rise as scum from, the cosmopolitan crucible out of which the average American citizen proceeds. It is not surprising either that keen-witted

and unscrupulous people—too many of them to the manor born—should take advantage of the credulity of the undeveloped citizen, to their own gain and their victim's detriment. Such is the natural consequence of the mixture of diverse grades of civilization. All we claim is that, with time and widening experience, the over-credulous have their wits sharpened and their eyes opened; and if it were not for the constant accession of raw material to be imposed upon, humbugs would die a natural death, even in this favored land of humbugs.

Dr. Schnauss's illustration of American iniquity (so-called) is a case in point. He charges us with the invention of "spirit photography;" then serenely proceeds to demonstrate that his own countryman, Baron Reichenbach—aided and abetted by "a large number of scientific men"—produced the first spirit photographs, in the capital of German intellect, Berlin. What is even more amusing, our learned Doctor goes on to state, as a demonstrated fact, that "several bodies appear luminous to people after their eyes have been accustomed to darkness, as for instance large steel magnets and big crystals; water shaken up in a bottle will emit phosphorescence, and luminous waves may at times be seen coming from the fingers, sometimes greenish, sometimes reddish, according to the side of the body."

We have been laboring under the impression that these pretended appearances were in reality all in the observer's eye—illusions, in fact, the "sensitive" witness seeing simply what he looked for: a position supported by not a few experiments, wherein the doubly deceived observer was led to see what from his own theory could not exist—"magnetic" flashes, for instance, proceeding from a wooden magnet(?) deceptively painted. But to Dr. Schnauss they are actual verities, as he has "seen similar luminous phenomena in the persons of somnambulists." He has gone further, and repeated, "with great care and attention," the photographic experiments of the father of spirit photography, on the strength of which he renders the verdict that the luminosity emanating from one's fingers' ends, etc., as seen by very sensitive persons, is not, as Reichenbach supposed, identical with solar rays!

If the Doctor is a fair specimen of his country's intellectual productions, we may at once abandon all hope of eliminating humbug, so long as emigration continues. Supply always follows demand. But we will give our censor credit for one thing: he has learned, though tardily, what was shown long ago in the SCIENTIFIC AMERICAN, that a genuine "spirit photograph" may easily be obtained, provided the precaution be taken to sketch the required ghost upon the back ground with some colorless fluorescent material, as, for example, a solution of sulphate of quinine. Though invisible to the eye, such a sketch will appear in the picture, as perfect a ghost as the most credulous could wish to see.

**ONE OF MR. EDISON'S CURIOUS EXPERIMENTS.**

If the dark box (illustrated in SCIENTIFIC AMERICAN of December 25, 1875) provided with two carbon points be brought within a short distance of any of the working telegraph sounders, used at the Western Union Telegraph Office, Dey street and Broadway, the sparks, heretofore described by Mr. Edison, he states, at once make their appearance between the points. The flashes thus produced correspond with the opening and closing of the circuit of the magnet, and thus the signal or message that is passing through the instrument is reproduced in the form of light, within the Edison box. No connection of the carbon points by wires with the telegraph instrument is necessary. Simply bringing the box near to the instrument is sufficient.

**WHO INVENTED THE BARREL?**

Few inventions have had a wider or more varied usefulness than the barrel; few give such promise of perpetuity. Unique in principle, simple yet singularly perfect in plan and structure, the barrel is little less than a stroke of genius. Who set up the first one? Who first conceived the happy thought of making a vessel tight and strong out of strips of wood bound together with hoops? And when did he live?

No history of inventions, none of the encyclopedias in our great libraries, no historian of human progress, so far as we know, gives any information on the subject, unless we except the Roman author Pliny, who mistakenly attributes the invention to the Gauls who inhabited the banks of the Po. We say mistakenly, since there is the best of good reason for believing that the barrel was in use long before the Gauls took possession of their Italian home, perhaps long before the Gauls existed as a people.

The monuments of Egypt furnish proof of the early use of hooped vessels, though no date is given of their invention. In one of the inscriptions copied by Wilkinson may be seen two slaves emptying grain from a wooden vessel made with hoops, while a scribe keeps tally, and a sweeper stands by with a broom to sweep up the scattered kernels. Close by an unfortunate is undergoing punishment by bastinado, for short measure perhaps, or, as Mr. Wilkinson suggests, for petty theft. The measure is barrel-shaped, and precisely like the *kayl* of modern Egypt. It would hold, apparently, about a peck. Unfortunately the age of this inscription is not indicated. Measures of the sort would seem to have been in common use very early in Egypt, though not for the storing of liquids, for which purpose skins and earthen vessels were employed.

At first thought, Egypt would be the last place to look for the invention of hooped vessels, its arid climate making it specially unsuited for their employment. Possibly, however, that may have been the compelling cause of their invention.

Throughout the East, the bamboo is largely used for making

hollow vessels, a section of the stem through a node securing a solid bottom, and one between the nodes an open mouth for a natural tub or bucket. In well wooded regions, nothing would be more natural than the employment of hollow tree trunks for the same purpose, or sections of tree stems, hollowed out by fire or otherwise. In drying, such vessels would split and spoil, and it would require no great genius to repair them by means of withes or wooden bands, the primitive form of the hoop.

If the users of such natural barrels should migrate to a region where timber was scarcer, economy of lumber would be likely to suggest the building of barrels from pieces artificially split, in short, the use of staves, by means of which the primitive cooper would be able to make several barrels out of a block that would suffice but for a single dug-out.

But this is speculation merely. It is enough to know for a certainty that the cooper's art, like the potter's, is one of extreme antiquity. We had no suspicion of its venerableness when we began to trace its history in response to the inquiry—who made the first barrel?

**LOWER CALIFORNIA.**

Peninsular California has had the name of being about as worthless a strip of land as the Continent affords—rocky, sunburnt, and barren. Its inhospitable mountains, however, appear to be well stocked with precious minerals, and its shores are not without the elements of fertility for other lands, even if themselves are infertile. The United States steamer Narragansett has been making a survey of the coast, the reports of which show that the mineral wealth of the country is wonderful, embracing rich deposits of silver, gold, iron, copper, antimony, alabaster, and salt. At Triunfo a silver-mining company is producing bullion to the amount of \$50,000 a month. The mines are very rich. At Purgatoria and Providencia copper mines are being actively worked, and are yielding large quantities of rich ore, which is brought to the seashore on pack mules to be shipped to San Francisco and Europe. At the island of San Marios, there is a rich mine of alabaster, capable of yielding an immense profit if properly worked. At Carmen Island is a salt deposit a mile and a half long and a half a mile wide, depth unknown. The salt is pure and beautifully crystallized. It lies in a natural evaporating pan some 400 yards from the sea, with which it is connected by underground passages. Another source of wealth is the guano islands, especially Isla Raza, from which 10,000 tons of the fertilizer have been taken. It is computed that as much as 60,000 tons more lie upon a strip of shore three quarters of a mile long and half a mile wide. The Gulf of California abounds in whales, sharks, swordfish, saw fish, skates, porpoises, seals, turtles, and small fish in great variety. The presence of fossil shells of existing species, at an elevation of 1,000 feet or more above the present sea level, indicates that at a geologically recent period the peninsula was an archipelago, the high mountainous land at the southern extremity forming a single large island.

A California paper reports the recent arrival in San Francisco of the first successful shipment of canned turtles from Guaymas. The turtles of the Gulf are very abundant, and are equal in flavor to the best West India turtles; but they suffer on the voyage so that they cannot be brought alive to the California market. By canning them, it is found possible to place their much appreciated meat, in excellent condition, within the reach of all at moderate prices. (Guaymas alone can furnish 200 tons of the meat annually. The turtles weigh from 25 to 250 lbs., but they will not average more than 15 lbs. of meat, so great is the proportion of refuse. It is expected that canned lobsters, cuttlefish, rock cod, and other delicacies from the Gulf will soon be added to the food resources of the Pacific coast.

**RAPID BRIDGE BUILDING.**

On the 20th day of November last, the Market street bridge, over the Schuylkill river at Philadelphia, was, with the exception of its piers and abutments, destroyed by fire. The loss was a very serious one, as the bridge formed the principal connection between West Philadelphia and the city proper, while over it passed the tracks and large traffic of the Pennsylvania railroad. It was, besides, the most direct route to the Centennial grounds. So urgent was deemed the necessity of replacing the structure that, before the flames were fairly quelled, the mayor's proclamation was issued, and consultations of city authorities and engineers speedily began. Before these deliberations, however, had resulted in any definite project, President Thomas A. Scott presented himself at the mayor's office, with an offer to build a strong bridge with double the capacity of the one destroyed, to cost \$65,000, or \$10,000 less than the insurance on the latter. Furthermore, he would sell the structure to the city for exact cost, and have it ready for traffic by January 1, 1876.

Mr. Scott had anticipated the acceptance of his offer, and had already sent out orders to cut the timber, at various points along his road, and load it on cars. When the formal acceptance came, further commands flashed over the telegraph wires, and down came the loaded cars, attached to the lightning express trains. One hundred and fifty men stood ready on the banks of the river, tools in hand, and at the word given, on the evening of December 5, the attack on the charred remains of the old bridge began. From that moment work was unceasing; one gang of men relieved another, and torches and calcium lights gave illumination all night. Sundays and stormy days were unnoticed, and thus the labor continued, until, at one o'clock on the afternoon of December 24—three hours less than twenty-one days from the time the mayor signed the ordinance, and seven days ahead of time—the bridge was finished and formally opened to travel.

The structure—though of course but a temporary one, since it is designed at some future time to replace it by one of iron or stone—is solid and massive, and good for five or six years of constant wear. In fact, it would last indefinitely with proper repairing and replacement of timber from time to time. It has a Howe truss, and is constructed of white pine, with an oak flooring. It is 540 feet in length, the two end spans measuring 162 feet each, and the center span 216 feet. The truss is 26 feet high in the clear, and 28 feet from out to out. The width of the bridge is 48 feet including the sidewalk, which is 10 feet wide. The new structure is said to be superior to the old one. The proceeding is an example of what energy and discipline can accomplish.

**WATER IN THE PIPES.**

At this season of the year, and especially during cold snaps, the gas has a habit of misbehaving itself in an annoying and, to most people, incomprehensible manner. At night, and just as *paterfamilias* is about to retire, he is startled by an ominous drip, drip, apparently in the floor, sounding exactly like the escape of water from a burst pipe. With visions of soaked carpets and ruined ceilings running across his mind, he makes his way to the story beneath, with the expectation of sadly looking upon a gradually growing dark stain in the middle of the plastering. None is there, however, and he tries another room with the same result; then he goes to the kitchen and shuts off the water from the upper stories, but still the dripping sound continues. Finally, in the course of a critical inspection of the wash basins, he lights the gas in an unoccupied room, and at once the flame proceeds to execute a series of astonishing leaps and jumps. Of course, he establishes a connection in his mind between the sound in the floor and the performance of the gas flame, and thereupon, with a sigh of relief that it is only the gas, bears the less evil resignedly, out of thankfulness for the absence of a possible greater one.

Next time the trouble happens, it may occur in the parlor and ruin a projected entertainment; or in the midst of a dinner company the gas may suddenly proceed to dance and then obstinately go out, either of which proceedings will result in the discomforted host employing a plumber early the next morning. That worthy will arrive at his leisure, of course, with a helper and a couple of small boys and some candles, and with the aid of an air pump proceed to force some water out of the pipes, and thereupon send in a huge bill. In about a month, or after a few more very cold days, the gas will repeat the performance, and the plumber will find another golden opportunity, and this will be continued at intervals through the winter.

If the luckless householder venture to ask the plumber what the trouble is, "water in the pipes" will be all the information vouchsafed, and the questioner will be none the wiser as to how it got there or how it is to be kept out, other than by employing the man of lead and solder and his several attendants, which is exactly that individual's object. But we will tell you, reader, what the cause is, and how to avoid it. The true sources of the difficulty are gas traps, which are low points or depressions in the pipes, due to the latter being carelessly put in. During moderate weather, when there is no condensation of the gas, and hence no formation of water, these give no trouble; but when water does form, it of course settles in these depressions, and either shuts off the gas altogether at points beyond, or else allows the gas to pass fitfully, producing the jumping of the flame. It is obvious that forcing the water out is only a temporary remedy; and that the only proper mode of getting rid of the difficulty is either to take out the pipe and put it in straight, or else tap it at the depression and add a drip large enough to hold a pint of water. A foot of two inch gas pipe makes a drip which will rarely or never fill up, and which answers excellently for the purpose. It is often found that chandeliers fill up with water during cold weather, owing to the parlor drop being led directly from the main pipe, thus drawing into the chandelier the water which otherwise would run down the rising main to the meter. The proper plan is to cross over from the main pipe, no matter how short the distance, and then add the drop.

If occupants of city houses will bear the above in mind, and see that the plumbers strike at the root of the evil as we have pointed it out, they will save themselves sundry annoying bills, and no small amount of inconvenience.

**The Localities of Malaria in the City.**

The Health Board is endeavoring to ascertain the different localities on the built-up portion of this city subject to strictly malaria troubles. Not only is this inquiry to be confined to intermittent and remittent fevers, but to all the obscurer diseases in which the element of periodicity is sufficiently well marked to cause suspicion. A map of the city is sent to each physician, with the request that he will indicate the precise situation of each case of the sort which he may be called upon to treat, and transmit in due time the results of his labors. This is matter of the greatest possible importance in connection with the true sanitary interests of the city; and it is to be hoped that the every medical man will do his utmost to second the endeavors of the Board and offer to it any suggestions which may tend to promote the end in view. It is by the accumulation of such reports that a scientific basis can be made for an accurate estimate of the means which may be necessary to remedy the evil.—*New York Medical Record.*

THE band saw of Messrs. Emerson, Ford, & Co., of Beaver Falls, Pa., took the \$100 gold prize at Cincinnati this fall. It was used on a J. A. Fay & Co. re-sawing machine, and distanced two French band saws in the competition.