Some New Alcohols.

The term *alcohol* was originally applied only to that volatile and intoxicating constituent of fermented and distilled liquors which imparts to them their peculiar value. It is always obtained by fermentation, and usually separated by distillation. It is very combustible, has a burning taste, and dissolves a great many substances that are insoluble in water.

In 1812 Taylor discovered another volatile substance, possessing the same remarkable solvent powers, and equally combustible. It was found in crude wood vinegar, and is often called wood spirits, but the chemist preferred to call it alcohol, adding the prefix "methyl," to distinguish it from vinous alcohol, now called ethyl alcohol. In time other substances were discovered more or less similar to the two above described, among which was fusel oil. The chief constituent of this has since been isolated and named amylic alcohol.

When organic chemistry had advanced sufficiently to render a classification of the known compounds, these substances were grouped together into a class in which were placed all substances of similar chemical composition, although quite unlike in physical properties. The characteristic of an alcohol is that it contains an atom of hydrogen united with one of oxygen (called hydroxyl), just as caustic potash and soda do, but where the latter has a metallic atom the alcohol has a group of carbon and hydrogen atoms, with one more than twice as many of the latter as of the former. Another characteristic of all normal alcohols is their power of forming aldehydes, ethers, and acids. Formic acid is made from methyl alcohol, and acetic acid from ethyl alcohol.

There are a whole series of well known alcohols in which the number of carbon atoms gradually increases from one to nine. Here a break occurs. The next one has sixteen atoms of carbon joined to thirty-three of hydrogen, and is called cetyl alcohol. Then another break, and an alcohol is known with twenty-seven atoms of carbon, called cerotyl alcohol. The former is found in spermaceti, the latter in Chinese wax.

The first nine are liquid at ordinary temperature, the others solid; and all, except the methyl and ethyl alcohols, are more or less oily. Until very recently the number of solid alcohols was very small.

There was every reason to expect that the long break in the series between nonyl alcohol, which has nine atoms of carbon, and sexdecyl or cetyl, which has sixteen, would some day be filled up, for within this space were three acids having respectively ten, twelve, and fourteen atoms of carbon each. Not long since F. Krafft announced that he had succeeded in preparing these and several others. Ordinary ethyl alcohol is easily oxidized and converted into an aldehyde, which by further oxidation passes into acetic acid. Alcohol − H = aldehyde + O = acid $C_2H_5HO - H_2 = C_2H_3HO + O = CH_3COOH$.

It is natural to suppose that human ingenuity can reverse the process, converting acids into aldehydes, and these again, by reduction, into alcohols.

Krafft first prepared the barium salt of *capric* acid, $C_{10}H_{20}O_2$, and mixed it with the formate of barium, then subjected the mixture to distillation underreduced pressure. The result was an aldehyde, $C_{10}H_{20}O$, which he then dissolved in ten parts of glacial acetic acid and added three or four parts of zinc dust at long intervals, heating to gentle boiling for a week. On pouring out the acid solution and adding water the acetic ether of the desired alcohol separated as an oil, which was rectified to purify it. The alcohol was obtained from it by saponification.

This normal decyl alcohol is a strongly refracting, intensely sweet smelling, unpleasant tasted, thick oily liquid, which crystallizes in large rectangular plates that melt at 7° C. (44½° Fahr.).

The dodecyl alcohol, $C_{12}H_{26}O$, was prepared from *lauric* acid in a similar manner. It was found to melt at 24° C. (75° Fahr.) and boil at 143½° C., under 15 mm. pressure.

Tetradecyl alcohol was made from *myristic* acid; it is also a solid alcohol, and melts at 38° C. (100° Fahr.).

The next alcohol of the series, $C_{16}H_{34}O$, was prepared from *palmitic* acid, and found to be identical with the natural cetyl alcohol.

Octadecyl alcohol, $C_{18}H_{38}O$, was prepared from *stearic* acid, as in the manner before described. It melts at 59° C. (138° Fahr.).

These five new alcohols are of interest in many respects; and it is to be hoped that Krafft will soon add the other missing alcohols, at least to the thirtieth member of the series. H.

A Live Walrus in London.

A live walrus has just been introduced to the Westminster Aquarium. This animal, which is about five months old, is believed to be only the second of its race which has been captured alive, and it was taken at its mother's breast. The steam whaler Polynia, which came into the Tay on Thursday week, brought it, and Captain Walker, who commands the ship, gives a most interesting account of the capture of the "infant." He states that the vessel was slowly steaming up Davis Strait less than a month ago when a full grown walrus was observed floating on the top of the water, apparently asleep. The captain shot the animal, and a boat was lowered to harpoon and save the body. While engaged in this work, the baby walrus, which had been sucking the sleeping mother, made its appearance, and was at once dragged into the boat. The little creature uttered terrible cries, which brought two male walruses to its rescue. They attacked the boat ferociously. Being armed with formidable tusks of more than 2 feet in length, they placed the boatmen in great jeopardy, and the Henry's "express" rifle, which had killed the mother of the baby, was again brought into requisition. This killed the two males. Captain Walker fed the creature on salmon, of which the ship laid in a stock, and on this food it flourished, becoming quite docile and a playmate with the sailors. The fact of the capture was telegraphed from the Shetlands, and on Wednesday, when the ship was expected in the Tay, there were agents from the American, German, and largest English exhibitions waiting in Dundee. The ship was boarded at sea by Mr. Farini, who acquired the animal for the Westminster Aquarium, and it had its first introduction to London public life on Saturday last. It was not seen to the best advantage, as it had been confined in a box, and, as it had not had the use of water, its skin was not in its natural state. The young walrus is between four and five feet long, is a male, and has beautiful scarlet eyes. It is now cutting its tusks, and this condition gives it as much pain as cutting teeth does a child, and the rubbing of the gums gave it evident ease. The creature has caught a little chill in coming from the extreme northern latitudes to our milder climate; but otherwise it is healthy, and gives promise of offering an opportunity for an interesting study of its race, which attains the length of 15 feet. It is fed entirely on fish. The walrus formerly taken was fed on pork, and came, therefore, to an untimely death. The tusks of the mother walrus are also exhibited.

A Gigantic Organ.

The largest organ probably ever constructed was lately completed at Ludwigsburg. It is destined for the cathedral church at Riga. There are in it 7,000 pipes, 124 stops, with pedals, etc., proportionately numerous. A very complete "swell" arrangement allows the increase and diminution of sound to be effected with singular perfection and delicacy of effects. The filling of the pipes could not be carried out by organ blowers, but is effected by machinery worked by a gas engine of 4 horse power. This organ is 20 meters high, 11 broad, and 10 deep (about 65½ ft., 36 ft, and 33 ft. respectively). The largest wooden pipe is 10 meters (32¾ ft.) high, and its cubic contents are 70·6 cubic feet; while by a curious contrast the smallest pipe is made only a centimeter and a half high, and is attached to the greatest one.

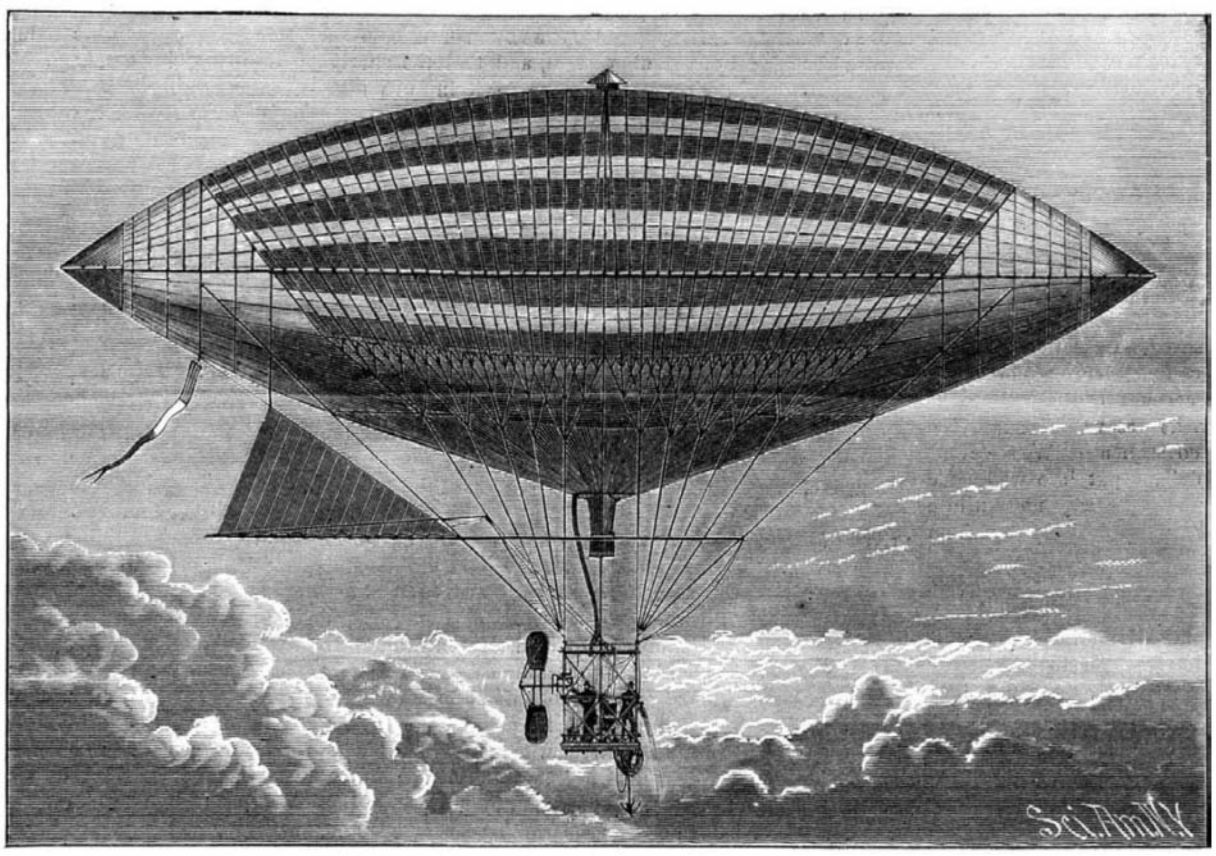
TISSANDIER'S ELECTRIC BALLOON.

The construction of the electric balloon included that of three distinct apparatus, to wit: 1. That of the balloon, properly so-called; 2. That of a hydrogen apparatus for inflating it. And 3. That of an electric motor designed for moving it by means of a screw which in revolving takes its purchase upon the air.

The construction of an aerial ship of elongated form presents serious difficulties, and can have as a guide only two previous experiments—that of Mr. Henri Giffard in 1852, and that of Mr. Dupuy de Lôme in 1872. In the small balloon that we operated at the time of the Exhibition of Electricity, says M. Gaston Tissandier in *La Nature*, we adopted as a mode of suspending the car a longitudinal rod beneath, like the one in Giffard's steam balloon. It has seemed to us since then that it would prove advantageous to place the helix behind a large parallelopipedic car that had sufficient height to protect the propeller against the danger of a shock on descending. The car, in this case, would be connected with the balloon by oblique suspension cords, and the affair would be prevented from getting out of shape by means of flexible rods fixed to the two sides of the balloon.

The construction of a balloon thus conceived was under taken in the shops of Mr. H. Lachambre, who assumed the responsibility of manufacturing it. A small model of about 15 cubic meters capacity had previously been made, and it was only after studying the working of this in a captive state that the construction of the large one was begun

The electric balloon is in shape like those of Messrs. Giffard and De Lôme, and is 28 meters in extreme length by 9·2 meters in diameter at the center. It is provided beneath with a conical neck that terminates in an automatic safety valve. The fabric is percaline, this being rendered impermeable by a new varnish of excellent quality. The capacity of the balloon is 1,060 cubic meters. The suspension covering is formed of ribbons sewed to longitudinal elliptical pieces that keep them in the geometrical position that they are to occupy. The ribbons, thus arranged, fit perfectly to the inflated fabric and form no projections, as would be the case with a netting. We reproduce in Fig. 1 the diagram that was used for shaping the pieces of the balloon and the different parts of the suspension covering. This latter is fixed, at the sides of the balloon, to two lateral flexible rods, which follow its contours accurately from point to point, in passing along a line with its center. These rods are formed of thin walnut laths adapted to longitudinally-sawed bamboos, and strengthened by strips of silk. To the lower part of the covering is fixed a network that terminates in twenty suspension cords, which are attached in groups of five to the four upper angles of the car. The latter is cage shaped, and is constructed of united bamboos consolidated by cords and copper wires covered with gutta-percha. The lower part of the car is formed of cross-pieces of walnut which serve as a support for a basket work of osier. The suspension cords entirely envelop the car and are woven into the lower basket work. They had previously received a coating of rubber, so that, in case of accident, they might be preserved from contact with the acid contained in the car for supplying the piles. The suspension cords are connected horizontally by a ring of cordage situated two meters above the car.



TISSANDIER'S NEW ELECTRIC BALLOON.

The stoppage apparatus for descent (the guide rope and the anchor line) are attached to this ring, which, in addition, is designed for distributing the traction equally during a descent. The rudder, which is formed of a large surface of unvarnished silk held beneath by a bamboo, is affixed behind.

The following is the weight of the different parts:

Balloon, with valves	170	kilogr.
Suspension covering, with rudder and suspension cords	70	"
Lateral flexible rods	34	"
Car	100	"
Motor, helix, and piles, with the liquid for operating them during two and a half hours	280	"
Stoppage apparatus (anchor and guide rope)	50	"
Weight of fixed material	704	"
Two excursionists and instruments	150	"
Weight of ballast	386	"
Total	1,240	kilogr.

The ascensional force, reckoning 10 kilogrammes excess for the ascension, was 1,250 kilogrammes. The capacity of the balloon being 1,060 cubic meters, the gas therefore gave an ascensional force of 1,180 grammes per cubic meter, a result that had never before been obtained with preparations of hydrogen on a large scale.

From the end of September the gas apparatus was ready to operate, the balloon was stretched out upon the ground, under a long movable tent, so that it could be at once inflated; the car and motor were stored away under a shed, and my brother and I only awaited fine weather in order to perform our experiment.

On Saturday, the 6th, a high barometer was noted, and on Sunday, the 7th, the weather became fine, with a slight wind, and we therefore decided that the experiment should be made the next day, Monday, October 8.

The inflating of the balloon was begun at 8 o'clock in the morning, and was continued uninterruptedly until half-past two in the afternoon. This operation was facilitated by the equatorial cords which hung from the right and left of the balloon, and along which were let down the bags of ballast. These cords are shown in Fig. 2, which gives a front view of the balloon. The aerial ship having been completely inflated, the car was at once fixed in place along with the ebonite reservoirs, each containing 30 liters of acid solution of bichromate of potash. At twenty minutes past three, after piling up the ballast in the car and balancing the latter, we slowly ascended into the air through a slight E.S.E. wind.

At the surface the wind was nearly null, but, as frequently happens, it increased in velocity with the altitude, and we ascertained by the movement of the balloon over the earth that it attained at a height of 500 meters a velocity of 3 meters per second.

My brother was specially occupied in regulating the ballast in order to keep the balloon at a constant altitude, and not far from the surface of the earth. The balloon hovered over the earth very regularly at a height of four or five hundred meters. It remained constantly inflated, and the gas in excess escaped through expansion by opening, under its pressure, the lower automatic safety valve, the operation of which was very regular.

A few minutes after the start I operated the battery of bichromate of potash piles, which was composed of four troughs of six compartments each, forming 24 elements mounted in tension. A mercurial commutator permitted us to operate at will six, twelve, eighteen, or twenty-four elements, and to thus obtain four different velocities of the helix that varied from 60 to 180 revolutions per minute. With 12 elements in tension we found that the speed of the balloon in the air was not sufficient, but over the Bois du Boulogne, when we set our high speed motor running, by means of 24 elements, the effect produced was entirely different. The forward motion of the balloon suddenly became perceptible, and we felt a fresh breeze that was produced by our horizontal movement. When the balloon was facing the wind, its front point then being directed toward the steeple of the church of Auteuil near our starting place, it held its head to the aerial current and remained motionless—a fact that we ascertained by taking datum points on the earth under our car. Unfortunately, it did not longer remain in this favorable position, but after operating well for a few instants, became suddenly subjected to gyratory motions that the play of the rudder was powerless to completely master.

Despite such rotations, which we shall find a means of avoiding in future experiments, we began the same maneuver again for more than twenty minutes, and this permitted us to stand perceptibly stationary over the Bois du Boulogne. When we endeavored to move forward, in cutting the wind in a direction perpendicular to that of the aerial current, the rudder inflated like a sail and the rotations occurred again with much more force. We infer from these facts that the position that an aerial ship should occupy should be such that its larger axis makes with the line of the wind only an angle of a few degrees.

After performing the experiments that we have just described, we stopped the motor, and the balloon then passed over Mont Valerien. After it had once become accustomed to the behavior of the wind we again set the screw in operation, and ran this time in the direction of the aerial current. The speed of the balloon was thus increased, and by the action of the rudder we then easily swerved to the right or left of the wind. We ascertained this fact by taking, as before, datum points upon the earth below. Moreover, several observers at the surface verified it.

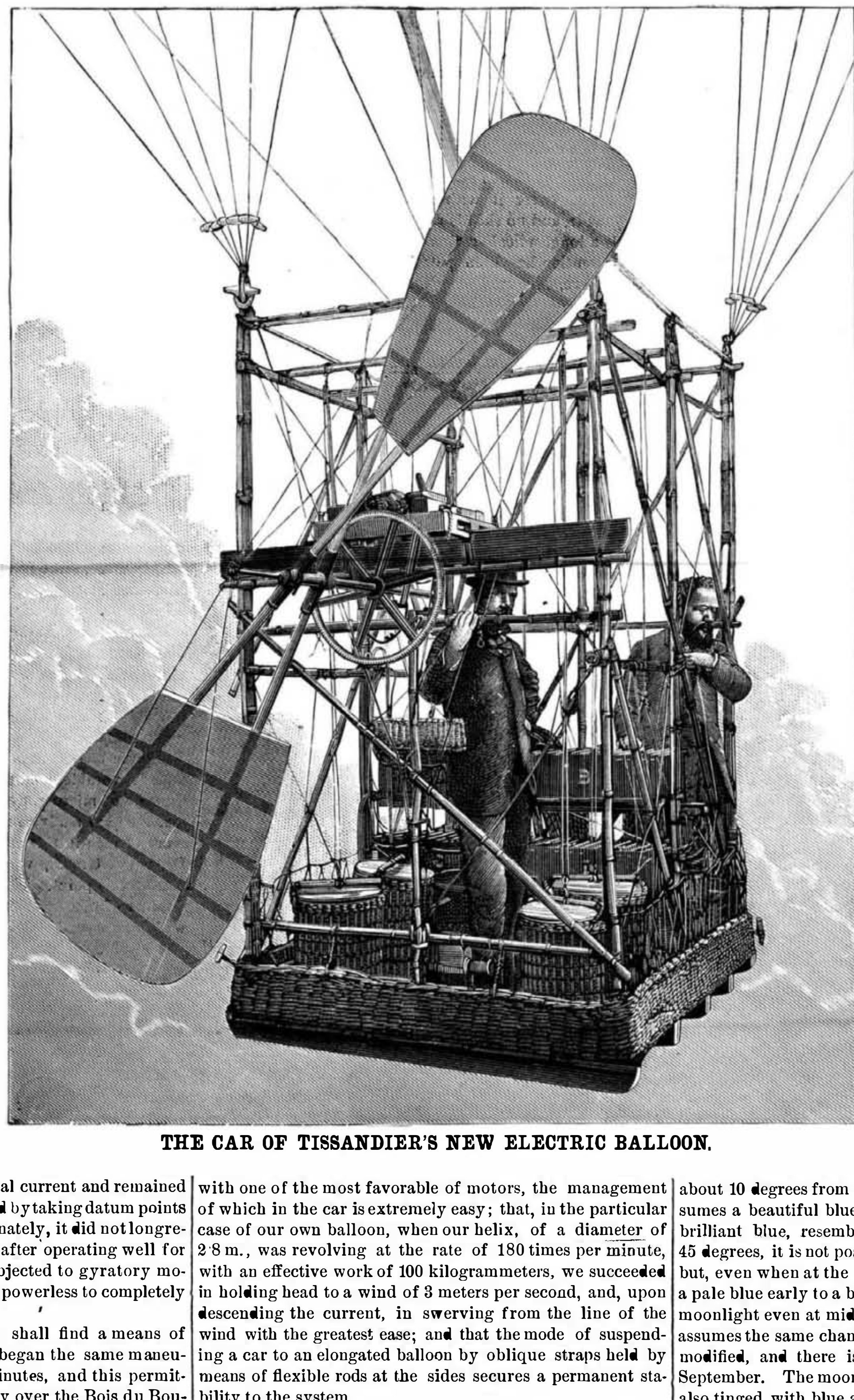
At thirty-five minutes past four we effected our descent upon a large plain in the neighborhood of Croissy-sur-Seine, where the maneuvers connected with landing were performed by my brother with complete success. We left the balloon inflated all night, and, on the next morning, it was found not to have lost the least quantity of gas, but was as fully inflated as on the preceding eve.

We would have liked to begin a new ascension on the same day, but the cold had, during the night, cause the crystallization of the bichromate in our reservoirs, and the pile, which was far from being used up, was thus not in a state to work. We had the balloon moved to the banks of the Seine near Croissy, and here, to our great regret, we had to proceed to empty it and lose in a few seconds all the gas that we had taken so much pains to prepare.

Without entering longer into any details on the subject of our return, we may conclude from this first experiment the following facts: that electricity furnishes a balloon with one of the most favorable of motors, the management of which in the car is extremely easy; that, in the particular case of our own balloon, when our helix, of a diameter of 2·8 m., was revolving at the rate of 180 times per minute, with an effective work of 100 kilogrammeters, we succeeded in holding head to a wind of 3 meters per second, and, upon descending the current, in swerving from the line of the wind with the greatest ease; and that the mode of suspending a car to an elongated balloon by oblique straps held by means of flexible rods at the sides secures a permanent stability to the system.

We must add that our ascension of October 8 should be only considered as a preliminary trial trip, which will be renewed along with such improvements as our material permits of. We must especially observe that we had in our car a considerable excess of ballast, and that it will be easy for us, hereafter, to employ a much more powerful motor.

Aerial navigation will not be created all at once, for it necessitates numerous trials, multiple efforts, and a perseverance that is proof against everything.



THE CAR OF TISSANDIER'S NEW ELECTRIC BALLOON.

THE town of Butler, Pa., uses natural gas for illumination and for fuel. The whole town is supplied by one well.

Potato Digger's Disease.

Dr. W. Zenker, of Stettin, has recently given a description (*Berliner Med. Wochenschrift*) of a "new disease" which affects farm laborers, particularly those engaged in digging and gathering potatoes. Dr. Zenker calls it a "new disease" in the sense that it has not before been described. He believes, however, that it must have existed for a long time among the peasantry of Germany and all agricultural regions. The disease is thought to be a neurosis of the locomotor apparatus of the feet and legs, the thighs and trunk not being affected. It is caused by the peculiar strained position into which the legs and feet are thrown while digging and gathering potatoes. The laborer, says Zenker, stoops down and supports himself upon the knees and feet. He moves about in this position with the knees strongly bent and feet strongly extended, and he keeps at this for hour after hour for many successive days. The position is not a natural or easy one, and any beginner who attempts it will soon feel a weariness and numbness in the limbs.

The result of this kind of labor is that in some cases one or both feet and legs become paretic, the paresis affecting both motion and sensation. The patient finds that one extremity feels heavy, cold, numb, and sometimes painful, and the foot drags in walking. The physician on examining it finds that the movements of flexion and extension are slow and weak. Lateral motion is limited. The affected leg feels colder to the touch than the healthy one. Tests show a loss of pathic and tactile sensation almost complete. In some cases electric currents are but slightly felt, while both faradic and galvanic reactions, though present, are feebler than normal. The leg does not atrophy.

A case of this kind may rapidly improve, or it may continue almost *in statu quo* for several years; the patient still walks about, though with a limping gait. The treatment has, so far, consisted in foot baths, massage, and electricity. It has not always proved successful.

Dr. Zenker reports in detail only five cases, but he believes that the disease cannot be a very rare one in the autumn months, and begs that other physicians practicing in the country will report the results of their observations.

We are unable to say whether any such affection as Zenker describes exists in this country. It has not been described as yet in any American text book. It would be a matter of interest to know whether any of our readers have come across the disease.—*Medical Record.*

Green Sunlight.

The green sunlight recently seen in India was, it appears, observed in Ceylon from September 9th to 12th. One correspondent writes to the Ceylon *Observer:* "Paleadierakam, September 12.—I write this from the above place on my way to Trincomalee, being much interested to learn whether the same phenomena exist thoughout the island. The sun for the last four days rises in splendid green when visible, *i. e.*, about 10 degrees from the horizon. As he advances, he assumes a beautiful blue, and as he comes further on looks a brilliant blue, resembling burning sulphur. When about 45 degrees, it is not possible to look at it with the naked eye, but, even when at the zenith, the light is blue, varying from a pale blue early to a bright blue later on, almost similar to moonlight even at midday. Then, as he declines, the sun assumes the same changes, but *vice versa*. The heat is greatly modified, and there is nothing like the usual hot days of September. The moon, now visible in the afternoons, looks also tinged with blue after sunset, and as she declines assumes a most fiery color 30 degrees from the zenith. The people are in terror at these phenomena, some even expecting the end." The correspondent asks, "Can this be the result of the eruption in the Sunda Straits?"

Salicylic Acid to Avoid Variola.

The editor of the *Southern Clinic* certifies, along with Dr. Claridge and Dr. De Cailhol, to the abortive power of salicylic acid in variola, given in the ordinary doses. Dr. Bryce thus concludes: "I believe salicylic acid used early and freely will place small-pox in the category with measles, chicken-pox, and other trifling complaints.—*Louisv. Med. News.*

Early Stage of Inebriety.

There are found in all parts of the country men and women who use alcohol regularly and in limited quantities. To the casual observer they go on for years in this state and are apparently no worse, and finally die at last of some common disease, leaving the reputation of having lived what the inebriate would call an "ideal life" of moderate drinking. Why they drink is not clear. If they have any reasons, it is always sustained by their unbounded faith in the capacity to abstain at any time at will. These cases are inebriates in every respect, except in the prominence and intensity of the symptoms. There is no difference between the chronic case of the lowest type and the highly respectable, moderate drinker, except one of degree.

Both are suffering from a positive physical disease. In one case the disorder is developed, in the other it is in the incipient stage. In the latter, from some obscure reason, the case never goes on to full development, but is always on the "border land," awaiting the action of some exciting cause, which may or may not be applied. A repelling power exists, which builds up and neutralizes the injuries received from alcohol to a certain extent. It is not will power which makes the difference between the inebriate and moderate drinker. It is physiological and pathological conditions of the brain and nervous system, which the possessor ascribes to will power. Alcohol cannot be used in moderation without grave injuries to the nerve centers.

The moderate drinker is always diseased, although to the non-expert there are no clear symptoms or coarse lesions that can be seen. A careful study will reveal physically an irritable condition of the heart, with stomach and digestive troubles, also changing and disordered functional activity of all the organs, at times. Psychically the disposition, habits, temper, and mental state slowly and gradually degenerate and become more unstable. The higher mental forces drop down or give place to lower motives and ambitions. No matter what his position of life may be, or his objects or plans, the moderate use of alcohol will alter and break down both physical and psychical energy and precipitate destruction. Moderate users of alcohol always die from diseases provoked and stimulated by this drug. They always transmit a legacy of defective cell energy and exhaustion, which most readily finds relief in any alcohol or narcotic.

But only a small per cent of moderate drinkers remain so until death. The disease goes on to full development in inebriety, in a vast majority of cases. The boasted will power to stop at all times is powerless before its peculiar exciting cause. Those who never go beyond this moderate use have simply never been exposed to this peculiar exciting cause. The moderate use of spirits for a lifetime is a mere accident in the order of nature, and the ability to stop, resting in the will power, is a popular fallacy. A certain number of cases have signs of incipient phthisis, which may never burst out into the full disease.

A small number of cases exposed to small pox, or any infectious disease, never take it; but these are the rare exceptions, whose causes are unknown, from which no deductions can be drawn. Moderate drinking that does not go on to inebriety is also the exception. The chain of exciting causes that bring on these extreme stages may or may not be understood, but they always break out sooner or later in the history of the case. Practically the study of this early stage of inebriety is of the utmost value in the treatment. Here remedial measures can be made of the greatest avail in checking and preventing any farther progress of the disease. When inebriety is fully recognized as a diseased condition, requiring study and medical care, this prodromic period of moderate drinking will receive the attention it deserves.

In the mean-time, as scientific men, we must continue to call attention to this early beginning of inebriety, so full of indications and hints of the march of disease, whose progress and termination can often be predicted with positive certainty.—*Journal of Inebriety.*

Heathen Chinee Telegraphs.

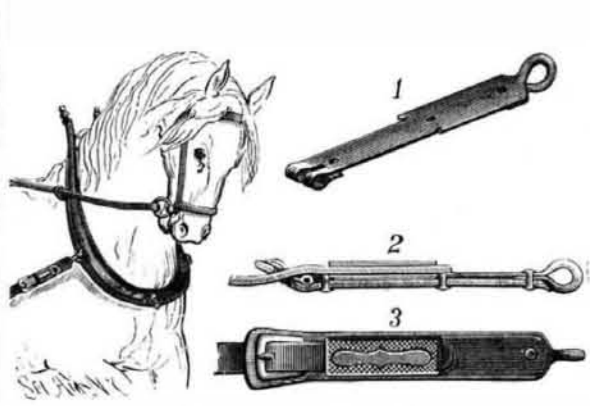
Owing to the peculiarity of the Chinese characters, each of which represents a word, not a letter, as in our Western tongues, the Danish Telegraph Company (the Great Northern) working the new Chinese lines have adopted the following device. There are from five to six thousand characters or words in ordinary Chinese language, and the company have provided a wooden block or type for each of these. On one end of this block the character is cut or stamped out, and on the other end is a number representing the character. The clerk receives a message in numbers, and takes the block of each number transmitted and stamps with the opposite end the proper Chinese character on the message form. Thus a Chinese message sent in figures is translated into Chinese characters again and forwarded to its destination. The sending clerk, of course, requires to know the numerical equivalent of the characters or have them found for him.

The Yellowstone Geysers.

The London *Times* says "that at the first glimpse it is uncertain whether the scene around the Yellowstone geysers resembles more a factory or visions of the Inferno. The roads are toilsome and perilous. The alkali, lime, and sulphur dust is knee deep. The hotels are gypsy encampments with the prices of Saratoga palaces, and without their civility. Anything like a picnic in this seared and scarred land appears equally out of place with a picnic by the Dead Sea."

HAME TUG.

The hame tug clip, Fig. 1, is folded at its forward end to form the eye in which the ring of the hame of the harness is placed. At its rear end the clip is folded under and slotted for receiving the buckle that holds the draught tug, as shown in Fig. 3. The rear part of the clip is made narrower than the fore part, for the purpose of enabling the offsets to be formed at the edges of the clip in order to prevent the box loop from forward movement when in place upon the hame clip. The box loop is prevented from backward movement upon the hame clip by coming against the folded part. The leather lining of the hame clip is secured by rivets which hold the folded end of the clip. The lining is cut away at its rear end to form an opening, through which the draught tug passes to the buckle, which is supported by the lining so that it will not come in contact with the tug, to wear and cover it with rust. The tug is easily and quickly made, and no skill is required in putting it together. Fig. 2 is a longitudinal section of the hame tug.



LELIE'S HAME TUG.

This invention has been patented by Mr. E. C. Lelie, of St. Genevieve, Missouri.

TRACE BUCKLE.

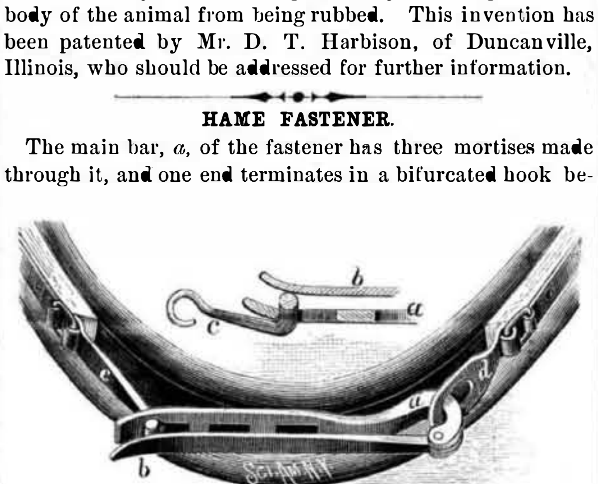
This buckle is adapted to hold the trace and the front trace strap, and also the back strap and belly band. The

HARBISON'S TRACE BUCKLE.

buckle is formed of a frame having buckles secured to its upper and lower sides, for holding the back strap, which passes through both buckles over the trace and has the belly band attached to it. At its forward end the frame is formed with a stud, as shown in Fig. 1, which holds the trace, the bent loop, Fig. 2, of the front trace strap serving as the keeper, as will be understood from Fig. 3. The rear end of the frame of the buckle is formed with a loop for receiving the side straps of the harness. Behind the buckle is a chafe leather held by the back strap and belly band to protect the body of the animal from being rubbed. This invention has been patented by Mr. D. T. Harbison, of Duncanville, Illinois, who should be addressed for further information.

HAME FASTENER.

The main bar, *a*, of the fastener has three mortises made through it, and one end terminates in a bifurcated hook be-



JONES' HAME FASTENER.

tween the members of which the hook lever, *b*, is pivoted by a rivet or bolt. The bar, *d*, is formed with a mortise and hook as shown, the hook being intended to pass through and be secured to the link at the bottom of the ordinary iron, or wood bound, hame. The hook may be lengthened and twisted, or turned at a right angle to the mortise, and made so as to pass through the holes in a common wooden or plow hame. At *c* is represented a bar formed with a toggle at one end and a hook at the other, the hook serving the same purpose as the hook on the bar, *d*. The toggle is used to connect the bar, *c*, with the main bar, *a*, and for bringing the hames nearer together at the bottom by passing it through one or the other of the mortises. Both the bars, *d* and *c*, may be made of folded and bent round wire. To use the fastener the hooks of both bars are passed through the links at the bottom of the hames, the toggle is placed in one of the mortises, and then the lever, *b*, is passed through the mortise in the bar, *d*, and brought down against the main bar, drawing the hames together.

This invention has been patented by Mr. B. F. Jones, of Beauregard, Miss.

"Can Human Blood be told from that of the Dog?"

BY C. H. STOWELL.

In a recent case on trial at Wellsboro, Pa., Dr. Thad. S. Up de Graff, of Elmira, N. Y., swore very positively on this point. The newspapers give Dr. Up de Graff the credit of convicting the prisoner. It is not the proper place here to determine whether the prisoner was guilty or not; it is in the precincts of this journal, however, to determine whether the expert testimony was according to facts. Dr. Up de Graff was given some of the stained clothing to examine, and by processes entirely unknown to the writer (according to all accounts seen), by decantations, washings, etc., some corpuscles were procured and measured. Dr. Up de Graff positively testified that this was human blood and not dog's blood. When asked if he was the only one who could tell this, he replied that "there were but *four* men in the world who could tell human blood from dog's blood;" and of course he was one of them. When asked why he could do so much better than others, the reply was, "On account of the superior character of his glasses, and that his microscope cost sixteen hundred dollars." The testimony of Dr. Up de Graff makes him give a positive size to the human red blood corpuscle. What do standard writers say on this subject?

Gulliver says they are the $\frac{1}{3200}$ of an inch.
Flint says they are the $\frac{1}{3500}$ of an inch.
Dalton says they are the $\frac{1}{3731}$ to $\frac{1}{3050}$ of an inch.
Richardson says they are the $\frac{1}{3378}$ of an inch.
Woodward says they are the $\frac{1}{3092}$ of an inch.
Frey says they are the $\frac{1}{2840}$ to $\frac{1}{4630}$ of an inch.
Welcker says they are the $\frac{1}{3230}$ of an inch.

Where is the exact size to judge by? The red corpuscles are also subject to change in size by the varying changes in the blood and by many drugs. Wagner, in his General Pathology, gives a long list of remedies that when administered change the size of this corpuscle. How delicate is it, also, to the various reagents used in microscopical work! I have seen red corpuscles as small as the $\frac{1}{5000}$ of an inch, and as large as the $\frac{1}{2800}$ of an inch. I have never measured red blood corpuscles in lots of fifty each and had any two exactly alike, although using a delicate cobweb eye piece micrometer and a one-fiftieth objective.

Listen to what Mr. Woodward, of Washington, says: "The average of all the measurements of human blood I have made is rather larger than the average of all the measurements of dog's blood. But it is also true that it is not rare to find specimens of dog's blood in which the corpuscles range so large that their average size is larger than that of many samples of human blood."

Human blood cannot be told from dog's blood, except under favorable conditions, and not invariably then. For the sake of microscopy it is a pleasure to know that only *four* men are ready to make such statements. There are a score of men in this country with glasses equal, at least, to Dr. Up de Graff's, who would testify directly opposite to him on this point. If Dr. Up de Graff is ready to receive a number of pieces of cloth, labeled and stained, respectively, with human and dog's blood, under favorable and unfavorable circumstances, this journal will see to it that said cloths are prepared with accuracy by competent parties. If he succeeds, he shall receive all the glory these columns can sound forth, but if he fails he will be referred gently to his Wellsboro testimony.—*The Microscope.*

Photography of Moving Objects.

The dry plate process and special arrangements of the camera, by which exceedingly brief exposures are possible, have enabled the photographer to take views of rapidly moving objects. With particularly sensitive plates some startling results may be obtained, and not only can moving animals and vessels be photographed, but the spokes of the wheel and the fast trotter can be shown with sharp and distinct outlines. Even views from the windows of a quick train can be obtained. The necessary time of exposure has been reduced to such a small fraction of a second that absolute steadiness of the camera itself no longer enters into the problem. The dry plates are gradually driving out the wet ones in the galleries, and those who pose in uncomfortable positions are no longer in danger of being tired out. The artist no longer finds it essential to tell his patrons to "look pleasant," but he aims to tell them something interesting, when the natural expression comes over the face and is instantly caught by the camera. The taking of the baby's picture is no longer accompanied by dread. Much of the best work done with the dry plate process has been by amateurs.

Sulpho-Carbolate of Soda for Bee Stings.

Dr. Thomas Edwards, in the *Lancet*, September 22, 1883, says that in a case of great swelling of the face from the sting of a bee he gave fifteen grains of this drug in an ounce of water every four hours, with most gratifying results.