THE GREAT TUMBLE WEED OF THE PRAIRIES.

(*Cycloloma platyphyllum.*)

JOHN R. CORYELL.

During his wanderings in the great West, Mr. Daniel C. Beard, the well-known artist and naturalist, came upon a curious vegetable growth known popularly as the tumble weed and scientifically as *Cycloloma platyphyllum.* At the time he was unable to secure a specimen of the weed, but lately, through the kindness of Mr. Henry Worrall, of the Department of Agriculture, Topeka, Kansas, he was enabled to obtain photographs of some of the finest specimens of the great weed preserved in the buildings of the department. The genial gentleman referred to was even courteous enough to permit himself to be used as a medium for comparison.

THE GREAT TUMBLE WEED OF THE PRAIRIES.

A startling story is told by the veracious Western man of a party of English tourists who were out on the plains on a shooting excursion. They had been out the greater part of the day without meeting with any game, and were repeating for the hundredth time that their luck was "beastly," when one of them noticed a large animal some distance away, which was approaching them in a leisurely but apparently inquisitive manner, for it paused occasionally as if to study them.

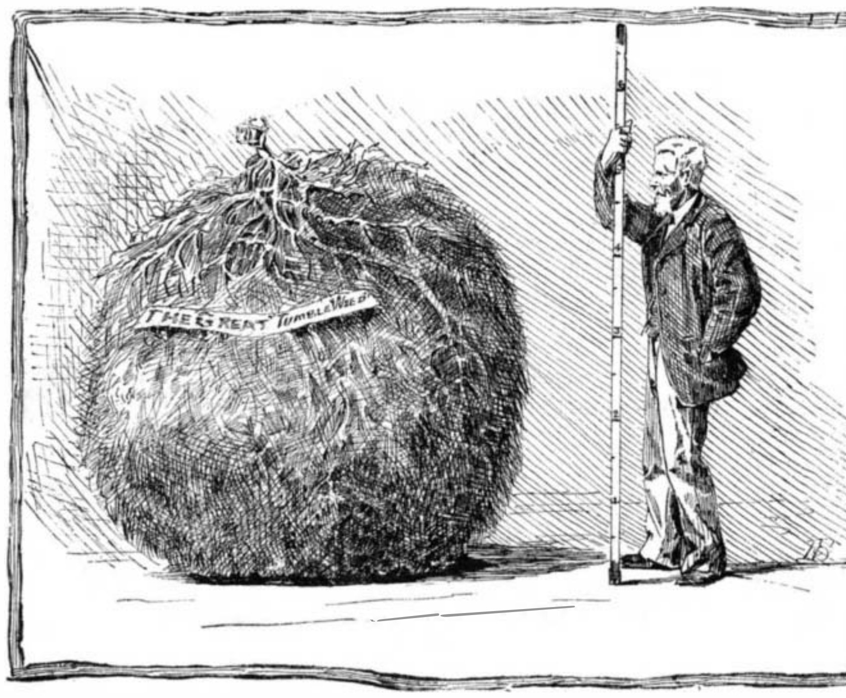
The Englishman pointed the animal out to his companions, and they agreed among themselves that it must be a bison, though its movements were different from those of any four-legged creature they had ever seen before. However, they did not make much of that fact, as a breeze that had sprung up had raised considerable dust and made it impossible to see very clearly.

It was so evident that the bison—if such it were—was attracted by curiosity, that one of the hunters determined to beguile it by a device he had heard spoken of as very successful with the antelope. Accordingly he lay upon his back and kicked his heels in the air, while the crack shot of the party prepared to shoot when the proper time came. The creature was so far away and approached so slowly that the decoy grew tired and had to be relieved. It was so evident that they were drawing the creature toward them, however, that each in turn cheerfully and even enthusiastically kicked himself tired.

The breeze had grown momentarily stronger, and though it was fortunately blowing toward them, it created so much dust that it was not easy to get good aim. However, the animal had increased its pace, and with an occasional bound into the air was rapidly approaching them. It was impossible to make out which was his head and which his side, so the appointed hunter, with as careful aim as the strange character of the game rendered possible, fired.

The animal had been hit, for they could see the fur fly, but it paid no attention to the shot, unless it was to bound into the air and increase its speed so much that in a few moments it was near enough to be easily distinguished. It was an uncouth monster of huge proportions, and progressed not in the usual way, but by a series of prodigious leaps. The hunters were greatly startled by the appearance of this unknown animal, but they realized that they must lose no time in shooting if they hoped to keep it from them. They all fired at once; but whether wounded or not, the monster only sped the swifter.

They paused in amazement for a moment, but were roused into sudden activity when one of their number shouted that a whole herd of the monsters was upon them. True enough all over the plain they came with frightful rapidity, making such tremendous leaps that there seemed as many in the air as on the ground. The hunters lingered no longer, but with the haste of terror threw everything from them, and ran to such purpose that they distanced their pursuers and found shelter late in the afternoon in the town from which they had started. Their story caused a great sensation, but not of precisely the kind they had expected. The next morning it was found that the tourists had left for San Francisco.



THE GREAT TUMBLE WEED OF THE PRAIRIES.

The story, if not true, at least serves well to illustrate the peculiar habit of the great tumble weed. This strange growth, which belongs to the pig weed family, is very abundant in the great Arkansas valley, and varies in size from the huge specimen shown in the illustration to one foot or less in diameter. It grows upon a disproportionately small stem, which, however, is of sufficient stoutness to sustain the mass until it has ripened and dried, when a slight gust of wind will suffice to blow it over and snap the brittle standard.

It now rolls over and over at every puff of wind, and being both light and elastic will perform a series of bounds over any impeding bowlders or bushes. In a high wind the fantastic spectacle produced by a number of these balls of varying sizes can easily be imagined. And as the English tourist with his store of wonder adjectives and odd expletives is the stock butt of the Western man, it is not strange that he should be brought into service to illustrate the most striking feature of the tumble weed.

Aside from its spectacular phase, this habit of the tumble weed may be viewed in an even more interesting light. Man sees everything from the standpoint of utility to himself, and he may not comprehend the necessity for the existence of the tumble weed at all; but in every created thing there seems to be inherent a continual effort to propagate its kind. Examples of the working of this spirit cannot be necessary, for even in the cities, the trees—the ailantus, for example, with its winged seeds—give evidence of it. The fantastic and seemingly senseless whirling, rolling, and bounding of the tumble weed, when understood, tell the story of a unique plan for distributing seed.

The Plumbers in Luck.

The sanitary boards in cities and towns, a class of persons denominating themselves sanitary engineers, and a few weekly and monthly journals devoted ostensibly to sanitary subjects but really conducted in the interest of plumbers and dealers in plumbers' supplies, seem to be creating unnecessary alarm in the public mind by their frightful reports of defective plumbing, and the consequent danger to health. There is no doubt but much good will result from the awakened interest in the subject, but there is a likelihood that a great many will go to great expense, and subject themselves to a great deal of annoyance, in having their plumbing arrangements changed when there is no real necessity for it. A recent number of the *Builder and Wood Worker,* referring to sewer gas, while admitting its poisonous qualities, and that it spreads disease and death in our dwellings, does not believe that this deadly agent is as rampant as some writers would have us believe. "In fact," it says, "we are confident that half the ailments attributed to this source do not result from it at all, but from other causes. While we admit that the evil is great, and that thousands suffer from the effects, we are disposed to the opinion that the terms 'sewer gas' and 'malaria' are employed to cover the inability of the M.D. to properly diagnose his patient's complaint, and that attributing the ailment to the mysterious agency of this subtile gas serves the dual purpose of giving an air of smartness to the physician and covers his retreat from a position which he is unable to cope with. The presence of sewer gas may always be detected in an office, room, or bath if the woodwork has been painted with white lead, as the sulphureted hydrogen, or sewer gas proper, attacks the lead and turns it black almost at once. When painted work in a room turns black or gets a leaden color, then beware, for a deadly foe is at hand, and the sooner you annihilate it the better for your peace of mind. A little watching will soon convince you whether sewer gas is present or no. If it is, discoloration of painted work will rapidly take place and hoist the signal of danger; if not, then the paint will retain its original color, subject only to the darkening process which comes of usage and exposure."

The Pestered Man of Earth.

As if the actual suffering of mankind from the various diseases common to the lot of all, was not sufficient, the *Hahnemannian Monthly,* of Philadelphia, enumerates the following possible cause for many mysterious complaints which baffle the skill of the most experienced physicians to cure, and enough in number to frighten a well person into a nervous fever: Commencing at the mouth, the virulence of human saliva seems to have been proved. It is supposed to be due to micrococci. The human mouth is a culture chamber, which is maintained at a constant temperature, and is furnished with a constant supply of pabulum, namely, saliva. These circumstances are highly favorable to the sustenance and multiplication of the micrococcus. If, now, it is asked why every man does not suffer from auto-inoculation, it may be answered that micrococci may kill an herbivorous animal, a rabbit for instance; but cannot destroy a carnivorous or omnivorous animal as man. (See Philadelphia *Medical Times,* September 9, 1882.) Most earnestly do we urge vegetarians to take timely warning! But what is to become of the genus *homo,* anyhow? Vibriones tickle his nose into hay fever, the Bacillus typhosus gnaws at his bowels, the micrococcus diphtheriæ swells up his throat or clogs his larynx with fatal croup, sarcinæ invade his stomach, and micrococci envenom his saliva. If he eats a bunch of grapes, he must needs crunch the parasitic saccharomyces adhering to the skins; and if he inadvertently exposes the contents of his pantry to the open air, a blue green mould from the Penicillium glaucum spreads itself over the best preserves; bubbles line the glass jars, and wriggling organisms and motionless forms looking like beads on a string, sour his milk. The greed of the yeast plant for oxygen is the cause of the raising of his bread, and the same craving on the part of the Mycoderma vini, supplies him with wine. But if he does not carefully watch these results of fermentation, mould gathers on one, and the other falls a victim to the spores of the viscous ferment and becomes thick, ropy, and unpalatable.

If he indulges in pork, trichinæ nestle cosily in his tissues, or the Cysticercus cellulosus develops into twenty feet of tænia to the discomfort of his alimentary canal. In infancy and childhood, thread worms and lumbricoides disturb his sleep and torture him with colicky pains. Disease germs expose him to whooping cough and mumps, and threaten him with a long line of exanthemata; and when, the gauntlet run, he comes into youth, that fell destroyer, consumption, fed, if Koch is to be believed, by bacilli, leaves him but six out of seven chances of ever reaching the period of maturity.

If, by good fortune, he escapes this danger, others meet him at every step. Through the parsimony and dishonesty of city officials, streets are filthy and sewers are imperfect. If he flies to the country, perchance a dry summer and an open winter permit the generation of miasmata. And even if he seeks the salubrious atmosphere of a sea resort, defective sanitation poisons his bedroom or permits the discharges from a drain to empty a few yards from his bathing place.

And finally, when he falls a victim to disease fungi, or, happily escaping them, dies of good old age, his mortal remains are no sooner consigned to the grave than a host of maggots and kindred scavengers complete the work of devastation, and thus does the man of earth become converted into the numerous bodies of his numerous destroyers.

W. H. Mallory.

Colonel W. H. Mallory, inventor of the screw steering propeller which bears his name, died in Bridgeport, Conn., November 8. He was born in 1840, was graduated at Trinity College, Hartford, Conn., in 1860, and earned his military title in active service with Duryea's famous Zouaves. Besides the steering propeller, which is employed on the United States torpedo ram Alarm, Colonel Mallory made several inventions which brought him considerable profit; and at the time of his death was engaged in perfecting a torpedo.

How Cable Messages are Received.

Until the forepart of November the French cable, having its terminus at North Eastham, Mass., employed the flash system of signaling. Now the cable is worked duplex on the Sterns system, using an automatic recorder by which the messages are received in ink on a narrow strip of paper.

By the system which has been displaced the messages were spelled out by flashing a ray of light back and forth across a standard line, the right and left flashes corresponding with the dots and dashes of the ordinary telegraphic alphabet.

In this system the light is flashed by reflection from an extremely light mirror which is turned to right and left by the opposing influences of positive and negative impulses. This system has the advantage of being operated with very slight electric impulses, but also the disadvantage of leaving no permanent record.

To secure the latter very important end the recording instrument has been adopted. The press dispatch announcing the change states that in the new recorder the ink is discharged by the agency of electricity and "not by capillary attraction as in other cable recorders." This statement is incorrect, electricity being now similarly employed in the recording instruments used at Heart's Content, the Newfoundland station of the Anglo American Company's cables.

A recent visitor to Heart's Content describes as follows the method of receiving messages at that point. The recorder is a horseshoe magnet, electrified by the usual circles of fine wire, and attracting a small metallic coil. The coil is hung between the magnetic poles, and by a light lever and a thread almost as fine as the strand of a cobweb, is connected with a delicate siphon hung in a little reservoir of ink. The ink is electrified, so as to produce a repulsion of the particles, making it flow more readily through the siphon, which outside is about the size of a darning needle, and the interior tube scarcely larger than a hair. The lower end of the siphon rests against a paper tape playing perpendicularly through rollers. The whole machine is almost of gossamer fineness and flexibility, so as to minimize the electric strain necessary for working the cable.

Let us imagine now that a coming message has been signaled from far across the ocean at Valentia. The operator at first opens the simple machinery that works the brass rollers. On the center of the tape, as it passes between the rollers, the siphon at first marks only a straight line. Suddenly the line swerves to the right or left. The message has started, and the end of the siphon has begun its record. Worked by two keys, and positively or negatively electrified, the coil swings the siphon point now to one side, now to the other, along the tape. Responsive to the trained hand of the operator, the filament of ink marks out one notch, two notches, three notches; then suddenly it may be a high elevation or depression until the delicate line traced on the tape looks like the tiny outline of a mountain range. But it is a range whose every hilltop, peak, and valley means an alphabetical symbol to the telegrapher's eye. The recorder is the invention of the famous electrician Sir William Thomson. How delicate an interpreter it is may be inferred from the fact that ten jars work 1,800 miles of cable between Valentia and Heart's Content, while twenty-five jars of the same electric power would be needed to work 350 miles of land wire; in other words, the recorder is more than twelve times as efficient for its purpose as the ordinary Morse instrument. The recorder traces its characters on the tape about as fast as a slow penman copies a letter. Besides its delicacy of work, the recorder, as its name imports, has the merit of leaving the record of the message.

Dyeing Leather.

In the glove trade the leather has hitherto always been dyed by brushing on the dyes by hand. The defects of this method are: its slowness, the occurrence of large, soiled edges on the fleshy side, and, notwithstanding every care being taken, the uneven character of the dye produced. To avoid these, Joseph Kristen, of Brünn, has a process in which even dyeing is obtained by the application of centrifugal force. The skin to be dyed is fixed on the center of a horizontally rotating disk; the color is also fed on to the center, and by the rapid revolution of the disk, is spread equally over the whole surface. The color is forced on to the disk by means of a pump, or it merely flows from a reservoir standing at a higher level. The excess of color driven off at the edges of the revolving disk is collected and used over again, until the skin is fully dyed. To dye one skin by this method takes from ten to fifteen minutes. A single color pump may serve for at least five machines, which would require only one attendant, so that, by the above arrangement, one man could, in twelve hours, easily dye 150 skins, possessing great evenness of dye and free from spotting.

Large Sailing Ships.

The Cyrus Wakefield, one of a number of large wooden ships lately built in Maine, was in this port recently. The vessel is handsome as well as large—about 265 feet long over all; 44 feet beam; draught when loaded, about 24 feet; and capacity for about 3,000 tons dead weight. She is 2,013 tons register.

A still larger ship is now in process of building in Maine. It is to be 2,400 tons register. The largest sailing vessel afloat is the American ship Three Brothers, formerly the steamer Vanderbilt. She is 2,935 tons, 320 feet long, and 48 feet beam.

Fresh Water from the Sea.

Owing to the peculiar nature of the fresh water supply in Egypt, and to the fact that it lay practically at the mercy of the enemy, extensive preparations had to be made for the condensing of salt water, in order that there might be no danger of a serious want of this necessity of life. The London *Times* gives a memorandum which was drawn up by an officer of the fleet on the subject of the arrangements which were made at Alexandria for condensing and supplying the condensed water, from which we make the following abstract:

It was decided to fit the large premises of the Alexandria Cotton Pressing Company, at Gabari, as the principal condensing establishment, with another in the Arsenal, utilizing there the boilers of some engines which had been employed for pumping out a dock now filled with water and no longer used. The Gabari establishment was very conveniently situated as all the troops landed there, and close round it were grouped barracks, the headquarters of the Transport, the Commissariat, and Military Hospital. It was about 300 yards from the harbor, and about 35 feet above the water level. The premises were very large, with broad streets on two sides and a courtyard. It was two stories high, and had a convenient fitting shop in the building. There were five large boilers in excellent condition. To enable these premises to be adapted to their new purpose the following work was done: Four out of the five boilers were disconnected from the engines, and pipes were fitted to conduct the steam to two iron reservoirs already on the premises, which were fitted as condensers. The fifth boiler was reserved for working the lathes, etc., in the fitting shop, and the auxiliary engines, feeds, etc. These condensers were iron tanks of about ten tons capacity. In one of these was placed three coils of 1-inch iron piping, 600 ft. in total length; in the other two coils of 2-inch piping, total length 240 ft. The circulating water was thrown up from the harbor by a 4-inch centrifugal pump worked by an 8-horse power portable driving engine, 2½-inch iron gas piping being used. On trial it was found that owing to the length of piping the centrifugal was unable to throw a sufficient quantity of water to the required height on upper floor of the building. It was accordingly led into a tank placed in a cellar, and a donkey engine, already there, was utilized to throw the water the required height. This was found to answer, a sufficient quantity of circulating water (about 40 tons an hour) being obtained; and the condensers were able to supply 30 and 40 tons of water respectively per diem, the larger piping giving the best results. It was found, however, that the boilers were capable of generating a larger quantity of steam, and accordingly, a third condenser was built of wood by the carpenters of the fleet, and in it were placed two coils of 2-inch piping of a total length of 416 ft. An independent supply of circulating water was obtained by means of a 6-inch centrifugal pump driven by an 8-horse power portable engine and 4-inch iron piping. An ample supply of circulating water was thus obtained from near the locks at the entrance of the canal, a distance of 220 yards. This condenser was never used to its utmost capacity, which was certainly at least 60 tons per diem (or 360 barrels, or 1,500 gallons).

For storing the water three large open wooden tanks were made by the carpenters of the fleet, each capable of holding 12 tons of water and ten old wooden tanks that had been used in Abyssinia, of a capacity of about 4½ tons each, were sent from Malta. These were raised well above the floor of the building and connected with each other. Pipes were led from the condensers along the floor overhead and discharged their water into a zinc-lined box thickly perforated and placed over one of the open tanks; the water while falling into the reservoir was thus broken up, cooled, and aerated. These reservoirs (containing an aggregate of about 80 tons of water) were connected by pipes with two large iron troughs outside the building, placed high enough to discharge the water into the military water carts, and were fitted so that twelve or thirteen carts could be filled at the same time. Pipes were also led from the reservoir to fill wooden horse troughs, placed round the courtyard before mentioned, at which about forty horses could be watered together. Some iron tanks of a total capacity of 22 tons were also placed on the ground floor in immediate communication with the condensers, from which the men were to draw their drinking, cooking, etc., water in kettles. The work in this establishment was in charge of Mr. Welch, engineer of the Helicon, and the great success attained was largely due to his great zeal, ability, and intelligence. It was an exceptionally economical condenser, nine tons of water being made for a ton of coal, without including the driving engines (including everything, about eight tons of water was made per ton of coals), or eight pounds of fresh water per pound of fuel. An entirely different plan was carried out at the arsenal dock condenser. In this case the boilers were about twenty-five yards from the dock which was used as a condenser, the steam being conveyed thither from the boilers by three 3-inch iron pipes (a single large pipe would have been better probably, but it could not at the time be obtained). Two donkeys had to be fitted for feeding the boilers, each having a 3½-inch plunger and 7-inch stroke. The arrangements for condensing the steam were as follows: On reaching the dock the steam was again subdivided, three 1½-inch pipes being fitted to take the steam from each of the three main steam pipes. These smaller pipes were bent, and laid about, on an average, five feet under water along dock and raised at the other end so as to discharge their water into an iron receiving tank placed at the side of the dock, the total length of piping being 900 ft. This receiving tank was placed in connection with five other iron tanks, fitted with cocks for drawing off the water and connected with large iron troughs for filling carts ten at a time, as at Gabari, an overflow pipe being led into an iron lighter capable of holding about 120 tons of water, and fitted as a tank. At first three coils instead of nine separate pipes were tried, but the result was disappointing. Only about 45 tons of water could be made per diem, and a considerable pressure of steam was required, which was objectionable, as the boilers were old, and no one could be found who knew anything about them. The alteration above described increased the output of water to about 70 tons and required only a very low pressure. It was never an economical condenser, 5½ tons of water only being made to a ton of coal; or 5½ pounds of fresh water per pound of coal; but on the other hand, having no auxiliary or driving engines, less supervision was required. The large consumption of coal was due entirely to the boilers being of very old pattern. This establishment and all the work done there was under the personal superintendence of Mr. Swinney, engineer of the Tamar, and I cannot speak too highly of his services there.

The Malta condenser was put together on the Arsenal jetty by Mr. Rigler, engineer of the Invincible. It requires careful watching and is fairly economical, seven tons of water being made with one ton of coal. Being quite complete in itself it would be most useful in any out-of-the-way place. It took about a week to remove it from the vessel that brought it and to get it erected and in working order. The arrangement for supply of the water was similar to that at the Arsenal Dock condenser. A vessel that had been originally chartered to take refugees to Malta, called the Maulkins Tower, being available, I had her surface condensers fitted for distilling water for issue, and placed her in a convenient position alongside a wharf near the native quarter. She has ballast tanks capable of holding over 300 tons of water. These were thoroughly cleaned and then filled with fresh water, which could be supplied by her pumps directly into tanks alongside. She was capable of distilling at least 70 tons of water per diem at a cost of a ton of coal for about 6½ to 7 tons of water. She was originally intended to supply the native population, but as they never felt the scarcity of water she was very useful in completing the transports and supplying the troops stationed at Meks. I made arrangements with His Highness the Khedive that his splendid yacht, the Mahroussa, should supply with her surface condensers all the water required at the palace, where a very large number of people (2,500) were constantly maintained. The yacht, with her numerous boilers, was capable of turning out 250 tons a day, but it was not intended to draw on her for the public unless required by urgent necessity. The sum of all these arrangements, it will be seen, provided for a supply of fresh water of 330 tons per diem, or nearly 70,000 gallons, without counting the Khedive's yacht. This would have fully met the requirements of the population estimated to be in Alexandria when the scarcity of water seemed imminent. Mr. Felix Foreman, chief engineer of the Bittern, was in charge of the whole work.

The Utilization of Smoke.

A company at Elk Rapids, Mich., which manufactures fifty tons of charcoal iron a day, formerly allowed the smoke made in burning the coal to go to waste. Now the smoke as it is formed is delivered into stills charged with lime and surrounded by cold water, the result of the condensation being, first, acetate of lime; second, alcohol; third, tar; the fourth part produces gas, which is consumed under the boilers. A thousand cords of wood are converted into charcoal daily, yielding 2,800,000 cubic feet of smoke, from which are obtained 12,000 pounds of acetate of lime, 200 gallons of alcohol, and 25 pounds of tar. The alcohol has been contracted to a firm in Buffalo, N. Y., the *Trade Review* says, for five years, they furnishing the packages and receiving it at the works at 80 cents per gallon.

The gases usually wasted when iron is produced with stone coal or coke are now, in some European establishments, made to give up the tar, ammonia, etc., which they contain. *Engineering* reports that this is effected at the Gartsherrie Works without disturbing the smelting process and without materially lessening the value of the gases for heating boilers and similar work. A similar process has lately been introduced in the coke trade of South Durham, and at some of the coking collieries of France, the waste gases being used in the production of commercial ammonia.

Boiler Explosion in Cincinnati.

If the press reports are true, the disastrous boiler explosion which occurred in the Forest City Iron Works, Cincinnati, Ohio, November 13, cannot properly be called an accident.

The boiler, 28 feet long and 4½ feet in diameter, stood in the center of a large brick building in which three hundred and fifty men were employed. The boiler was old, patched, and is said to have exploded once before.

That such a boiler should be the occasion of a great disaster is less remarkable than that the number of killed should be limited to half a dozen and the wounded to perhaps a score. The building was wrecked, and fragments of iron work, masonry, and human bodies were scattered over a wide area. At long distances from the center of the explosion men were killed by such missiles.

Disasters of this character are not accidents; they are crimes. And owners of the building destroyed should be held to rigid responsibility.