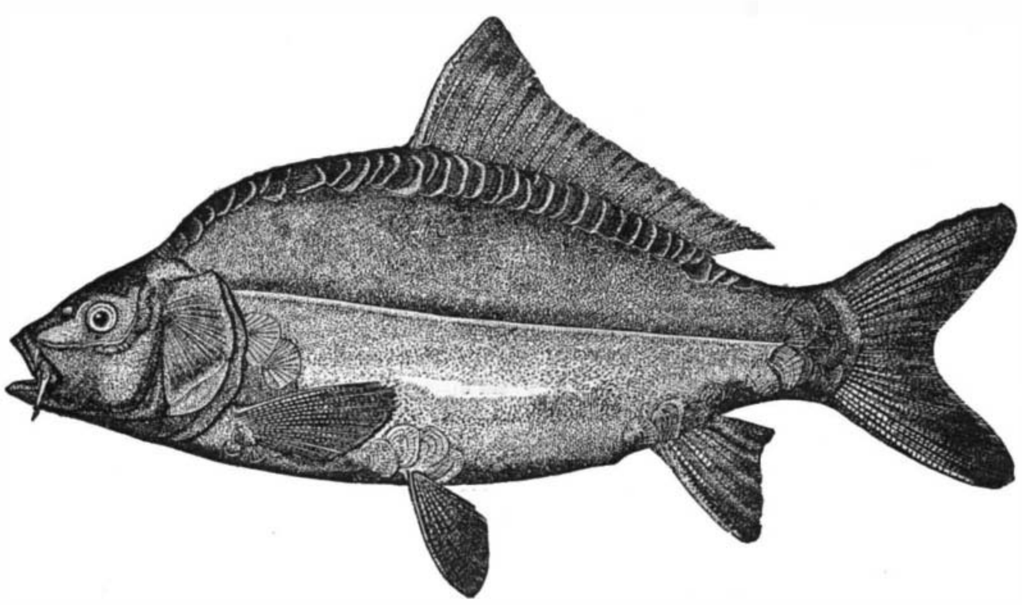
THE LEATHER CARP.

BY A. W. ROBERTS.

The leather carp (*Cyprinus nudus*, Block) is distinguished from the mirror carp by having only a few scales along the back and abdomen, and sometimes none. The intermediate space consists of a thick skin, soft, and velvety to the touch like that of a frog. The general color is a dark olive brown. Its mouth is toothless, but situated on the pharyngeal bones of the throat are three rows of stout teeth. The lips are thick, and on the upper jaw are four barbels, two short and two long.

Carp were first cultivated in Austria in 1227, in the time of Charles IV. At the present time the Princes of Schwarzenberg own ponds comprising a total area of twenty thousand acres. The annual catch of carp from these ponds is five hundred thousand pounds. The leather carp, from the fact of its being scaleless (or nearly so), is a much safer fish to transport and keep than the mirror or scale carp. In transporting fish great danger is always encountered from chafing, bruising, and scaling. As a rule, when a fish loses a scale or is chafed or bruised it seldom escapes being attacked with fungus; on the other hand, the leather carp, having a tough, pliable, and slippery skin, like that of a frog, it will heal more readily, the epithelium covering it immediately the new skin will begin to form. Mr. Rudolph Hessel says he has often seen scars on the leather carp produced from the bite of a heron or pike or some other hurt, but never saw anything of the kind on a scale carp, for if one of these be wounded it almost invariably dies. The scale, mirror, and leather carp will live in either fresh or salt water. They have been found in the Black Sea weighing twenty pounds, also in the Caspian Sea in great numbers. They are capable of living in almost any kinds of water, that of bogs, swamps, etc. In Germany they have been known to live and thrive in water having a temperature of over 100° Fah. I have at the present time a small specimen that has lived in a ditch of brackish water for over two months.



THE LEATHER CARP.

On the approach of winter the carp form into groups of from fifty to one hundred, making a cavity in the muddy bottom, which is called a "kettle;" in this they hibernate till spring, huddled in circles with their heads together, the posterior part of the body held immovably. In this condition they do not take a particle of food, yet during their long winter's sleep they neither diminish nor increase in weight.

The carp leaves its winter home as soon as the water becomes warm. Spawning commences in May and continues through the warm months. Rainy and cool weather interrupts the spawning, which is again continued during warm and clear weather. The male, during the spawning season, displays a number of protuberances on the head and back. The pharyngeal teeth are cast some time before the breeding season; these are renewed every year. As the breeding season approaches the fish become more active, two or three male fish accompanying each female. The female swims more swiftly and keeps close to the surface, constantly followed by the males. This is called running spawning. The male fish follow the females close to the water's edge till there is hardly depth of water to swim in; they losing all their timidity and caution can be easily captured. They lash the water, twisting the posterior of the body energetically, and shoot through the water with short, tremulous movements of the fins. This is the moment when the female drops her eggs, which are instantly impregnated by the milter. As the female drops probably only from four hundred to five hundred at a time in order to gain rest, it will require days and weeks before she has given up her last egg.

The eggs of the carp are adhesive, and adhere in lumps to the object on which they are deposited.

Old carp have been taken in different parts of Europe weighing all the way from forty to ninety pounds. When this fish does so well in Europe, where it is forced to spend many months in its winter's sleep, and where natural food at best is scarce, what may we not expect of this wonderful and useful fish when introduced into the ponds and streams of the Southern States, where they can feed to repletion on the choicest of natural food all the year round, and where they will often spawn twice a year?

In the waters of Central Europe the carp, after its awakening from its long winter's sleep, seeks most diligently for the seeds of the white and yellow water lily, also the *Phellandricum aquaticum, Festuca fluitans*, etc. The waters of the United States abound in all these plants and many others, the seeds of which will serve the fish as food; for instance, the wild rice (*Zizania aquatica* and *Z. flaitans*), also the well known rice or "water oats," with its great riches of seeds, and many others which will yield food profusely, and which European waters do not possess.

Let us once more consider the extraordinary increase of weight of about one hundred per centum in the exceedingly short space of four months, for during the winter time it is banished by nature into its temporary tomb. This fish needs from fifteen to eighteen months of growth, to gain, at a low estimation, three pounds without being fed. There are some culturists who obtain in the same space of time fishes of four pounds weight; but they possess ponds of warm situation, which thaw early in the spring, and perhaps they assist nature by feeding the fish.

Up to the present time of writing over twenty-five thousand carp have been distributed from the Smithsonian carp ponds over all parts of the Union. The carp, being slow and sluggish in its movements, has many natural enemies, such as turtles, large frogs, snakes, eels, mink, and muskrats. Persons having carp ponds should keep a sharp lookout for these pests. Dr. Hessel says that he has seen three year old fish so crowded in ponds in Europe that they were principally head with a small body. Such stunted fish will never recover when placed in roomy ponds. Five hundred fish to an acre of water is about the right proportion; more than that number will not do well.

Some two years ago I received from one of the German steamers, through the kindness of Professor Beard, a number of small leather carp; none were more than an inch and a half in length. These were placed in an aquarium of the proportion of four feet by two, which was supplied with slow running water. The few that are now left are from seven to eight inches in length, and have always been kept in the same tank.

These carp have passed through every conceivable trial. They have jumped out of the tank repeatedly, but have recovered rapidly from the wounds. Fungus has attacked them many times, forming in patches about the head, but it did not seem to make the least impression on their tough skin, and soon disappeared. On one occasion I placed one of these carp in a seawater tank, the density of the water being eleven, to rid him of fungus; but being called away I forgot all about the carp till the next day, and was surprised to find him perfectly at home in his new element. Some "horse leeches" escaping from their tank through the strainers, concluded to settle down for life in the leather carp tank. When I discovered them in the tank, one of the carp (to which was attached a well-filled leech) was lying on its side nearly exhausted. And yet this fish recovered from its injuries.

Having a number of soft clams left over after feeding the fish, I placed them in a pickle of strong brine to keep till next day; but forgetting till the end of the week, they were more like India-rubber than the tender soft clam.

Being anxious to learn the digestive powers of the leather carp, for I had long been of the opinion that they could digest anything they could swallow, and thus far they had swallowed every variety of food, I concluded to give them a feed of the pickled siphons of the clams, of which they partook bountifully. In the next tank were a number of yellow perch, all in fine condition, these also partook of the clams. Well—half the perch died, but the carp are living.

These carp are so tame that they will take the ends of my fingers in their mouths.

I am indebted for much of the information contained in the above article to Dr. Hessel, of Washington, and to Mr. Eugene Blackford, of New York, for living specimens of the fish.

MONSTER BONES (FOSSILS) FROM THE ANCIENT CRETACEOUS SEAS OF KANSAS AND COLORADO.

BY C. F. HOLDER.

Among the recent additions to the geological department of the Museum of Natural History, Central Park, are some bones representing several large reptiles that existed during the cretaceous period of North America. The reader will remember that during this period—the time during which the Dover Cliffs of England and the green sand marl was deposited—the great plains of the West were the bottoms of a vast sea that found its eastern shore near the present site of Fort Riley, Kansas, and beat upon unknown sands far to the north, south, and west. The animals found in this era had arrived at the maximum of physical growth in all time, and the entire age is characterized by the enormous growth of its dependents. All of the species thus far discovered in the sands of Kansas and Colorado—and there are over fifty—have been referred to the reptiles and fishes, and are of the most gigantic proportions.

MONSTER BONES FROM THE ANCIENT CRETACEOUS SEAS OF KANSAS AND COLORADO.

The late Prof. Mudge, of Kansas, has probably done more work in unearthing these extinct monsters than any other scientific man, and the fine collections in the Museum at Yale College and the specimens at the Central Park are legacies of his labor.

The largest specimens have been found near Cañon City, and are known to science as the *Clidastes, Camarasaurus, Amphicœlias*, etc. The first named was a veritable sea serpent of these ancient seas, and the huge bones and almost incredible number of vertebræ show it to have attained a length of nearly two hundred feet. Prof. Mudge states that while riding through the *Mauvaise Terres* of Colorado, he saw from his horse the remains of no less than ten of these monsters strewn upon the plain, their whitened bones bleached in the suns of centuries, and their gaping jaws armed with ferocious teeth, telling a wonderful tale of their power when alive.

Some of the remains were found only partly weathered out, and could often be traced into the bed of a neighboring cliff, and, again, many of the large bones were scattered far and wide, probably by the gigantic sharks that infested the seas at that time. Many of the reptiles were allied to the crocodiles of the present day, and were wont to feed upon the banks of the great shallow seas. The thigh bone of one of these, the *Atlantosaurus*, is on exhibition at the Park, and is calculated to arouse the credulity of the most skeptical. It is over six feet in length, and looks more like a huge column for support than to assist locomotion. By its side is the same bone of a six inches long—of the largest living crocodile of to-day, which rarely exceeds seventeen feet in length. Thus the question presents itself to the amateur restorer: If a crocodile with a thigh bone six inches long attains a growth of seventeen feet, how long would one be whose thigh bone exceeded six feet? The reader can easily surmise that the creature must have been of enormous dimensions, and scientific men have placed their length at over two hundred feet. Imagine an alligator of that length! But this is not the largest. We will place this estimate at one hundred feet; and since the discovery of the *Atlantosaurus* another huge form has been found which possesses a thigh over twelve feet in length, and although it would be obviously incorrect to take such a proportion to *determine* the physical increase, it points to an attainment of size that dwarfs the *heroic*.

Hotbeds made by Ants.

In the State of Colombia there is a large ant (*Atta cephalotes*) which causes a great deal of injury to plantations. It attacks and carries off indiscriminately all kinds of foliage, and no sort of vegetation seems to come amiss to it. The quantity of foliage carried off by these ants is immense; in quality it may be bitter, sweet, pungent, tender, or tough. Her Britannic Majesty's Acting Consul at Medellin, United States of Colombia, was led to mark carefully the uses to which the ants put this mass of vegetable matter which they convey to their nests, and he ascertained that they employ it to make hotbeds, upon which their eggs are deposited to be hatched by the heat produced by the fermentation of the leaves. The ants do not eat these portions for food, and the larvæ are fed upon a carefully selected diet. Once the brood is hatched, the ants clear away the hotbed, carrying out of their nest all the decomposed vegetable matter. This is thrown out in heaps apart, and in the large ant hills these heaps will contain bushels and upward. Many efforts have been made to exterminate these ants, at least in the vicinity of farms or gardens; but where the nests occur in plantings or in uncultivated grounds, all attempts have failed. Our consul, Mr. R. B. White, however, believes that he has discovered an efficaceous remedy, and it was shown to him by a negro. When a plantation or garden is attacked, all one has to do is to procure a quantity of the *débris* from the hotbeds thrown out of an ant hill entirely unconnected with that from which the invading ants proceed. Scatter this around the beds and on the ant roads, and the effect is marvelous. The ants seem seized with a panic; they drop their burdens instantly; the word seems passed along the roads, and empty-handed the whole of the invading army hurries off to its own nest. They will not return to the same place for many days, and even when they do they avoid all spots in which traces of this, to them, offensive matter remains. The smallest quantity will suffice, and a bushel will defend acres of ground. Mr. White, in a letter to the secretary of the Zoological Society of London, which is published in full in this society's proceedings, declares that he has seen this plan tried repeatedly, and it has never failed. The biggest army of ants—pioneers, engineers, directors general, and all—is utterly discomfited by this very simple means of defense. This plan is not generally known, even in the State of Antioquia (where these ants abound), and he thinks that our colonists might profitably be made acquainted with it.

Do Sharks Harbor their Young?

An interesting specimen of porbeagh shark (*Lamna punctata*) was caught recently off Great Neck, L. I. It was a female, and was sent to Mr. E. G. Blackford, of this city, who says: "When I received her she had not been dead more than seven hours. From the immense size of her stomach I though she must have swallowed a barrel or two of moss bunkers, and to gratify my curiosity I opened her. Imagine my surprise when instead of moss bunkers I found ten little sharks, evidently her offspring, and all just the same size—exactly two feet long. I should say they were about six months old, for a young shark when hatched from the egg measures about four inches. It has been a disputed question among fishermen for some time whether young sharks in time of danger do not seek safety in their mother's stomach. I think this case proves that they do, for the little ones were perfectly sound: there was no mark on them as if digestion had begun, and I have not a doubt but that if the mother had not been captured, as soon as the excitement was over the little ones would have worked their way out into salt water again, and in due time been big enough to give some unfortunate fisherman considerable trouble." The specimen measured six feet eleven inches in length, and was captured in a school of moss bunkers or menhaden.

Changing the Color of Flowers.

The natural color of flowers may be altered, according to C. Puscher, by exposing them to the diluted fumes of ammonia. Most of the blue, violet, and light crimson flowers turn to a splendid bright green. Dark crimson clove pinks turn black, other dark red flowers turn dark violet, all white flowers turn sulphur yellow. This change of color is especially beautiful when the flowers are variegated or the single petals possess a different color. As soon as the new color is fully developed, the flowers must be dipped at once in cold water, when they will keep their new shade for two to six hours; by degrees then their natural color returns. If flowers be exposed to the vapors of ammonia for one or two hours they turn a dirty chamois, which is permanent. Blue, violet, and red asters are dyed or turned intense red when they are exposed to the fumes of muriatic acid gas; it takes from two or four hours or more before the shade is fully developed. The flowers are then removed to dark, cool rooms to dry.—*Chemical Gazette.*

Picric Acid and its Adulterations.

Trinitrophenol, usually called picric acid, is a beautiful yellow dye much used in silk dyeing, and is, of course, often adulterated to enable the manufacturer to cheapen it.

Picric acid is slightly soluble in cold water, more so in hot water, and very soluble in alcohol. It melts at 122·5° C. (252½° Fah.). If carefully sublimed it leaves no residue. The most common adulterations are: Oxalic acid, resinous substances, saltpeter, niter, and Glauber salts.

The presence of oxalic acid in small quantities cannot be looked upon as an adulteration, because when picric acid is made by the action of nitric acid upon phenol, indigo, or the resin of *Xanthorrhœa hastilis*, more or less oxalic acid is always formed by the oxidation going too far. In crystalline form the white prismatic oxalic acid crystals are easily distinguished under the microscope from the brilliant yellow scales of picric acid. If it is in a powder, a solution is made, ammonia added, and then chloride of calcium. A white precipitate indicates oxalic acid.

Resinous substances are not directly and intentionally adulterations, as they are often present when the preparation is not very exact and careful, but they are injurious in dyeing, and the consumer must take the following precaution: The picric acid is dissolved in hot water and 1 part of chemically pure sulphuric acid added for every 2,000 parts of picric acid, stirring until completely dissolved. If resin is present it will separate; it is then filtered and sulphuric acid again added, which precipitates the last trace of resin. After a second filtration it is perfectly pure, and may either be used in solution or left to crystallize out. By this method Winkler found from 0·01 to 0·03 per cent of resin in different kinds of picric acid.

Potash and saltpeter are detected in different ways. First, by means of the microscope; secondly, by the blue cobalt glass: potash salts imparting a violet color to the colorless flame, soda a yellow. The third and best test is to put the picric acid in a test tube and add absolute alcohol. On shaking and slightly warming, the picric acid dissolves, but saltpeter does not.

Glauber salt is easily detected in the same manner as any other sulphate. The picric acid is dissolved in warm water, some chemically pure hydrochloric acid added, and then a solution of chloride of barium. A white precipitate of sulphate of barium shows the presence of a sulphate, probably the sulphate of soda, Glauber salt.

The above tests, by Dr. H. Kraetzer, are so simple that every dyer can repeat them for himself.

What the Atmosphere Contains.

M. Gaston Tissandier, of elevated ballooning notoriety, says a correspondent of the *Kansas City Review*, has revealed many interesting facts on atmospheric dust, its connection with cosmical matter, and the important role it plays in fermentation and decomposition. As the air is purer after being washed by rain, so in dry weather, and especially in cities, the atmosphere is a veritable dust bin. We are sensible to the existence of these particles of attenuated matter; in breathing them they disgust us, and in falling and remaining on clothing and furniture they demonstrate not only their presence but their plenitude. Admit a sunbeam into a darkened room and the molecules will be revealed like nebulæ; yet the numbers we perceive are perhaps but the minimum of what exists, for after the naked eye and the microscope there are minutiæ which dance still. Much of this atomic *débris* is of inorganic origin, and a great deal is derived from animal and vegetable sources. The renowned experiments of M. Pasteur have demonstrated that among these atomies which live, move, and have their being in the air, are germs or spores of fermentation and decomposition, that is to say, the seeds of disease and death. Showers of dust impalpable as flour, and sometimes red as blood, have fallen in several parts of the world, astonishing or frightening, as the populations are superstitious or cultivated. These showers are simply silicious particles whipped up to the superior regions of the atmosphere, and driven along by aerial currents. Such particles have been lifted in Guiana and showered on New York, the Azores, and France, as Ehrenberg detected therein animalcula and shells peculiar to South America. Over the summits of the high mountains of the latter country the atmospheric currents are ever charged with silicious powder, and in parts of Mexico the crests of mountains act as veritable bars, and compel the deposition from these air streams of the dust, and which accumulate in the valleys to the depth of ninety yards. Geology recognizes these atmospheric deltas.

The foam of waves as they dash against the coast is pulverized into feathery pellicles, which float skyward with a trace of saline matter and that a sea breeze carries far inland. Space contributes as well as earth and ocean to the production of aerial dust. When meteorites and falling stars are rendered luminous and incandescent by their rubbing against strata of air in their vertiginous flight, they part with quantities of their metallic elements in the form of powder, iron, nickel, and cobalt, substances that Nordenskjöld has gathered on the virgin snow of the Polar regions. When atmospheric dust, whether collected directly on a sheet of paper, or from the sediment of snow and rain, is probed by a magnet, the tiny particles of iron attracted have all a spheroid family likeness, resembling furthermore iron filings if melted in a flame of hydrogen, or the extinguished sparks that fall on striking an ordinary flint and steel. Nay more, similar atoms of meteoric iron have been traced in the Lower Lias formation, geology thus affording evidence, that as now, so before the appearance of man on earth, atmospheric dust existed.

The air is a vast storehouse of animalcules. Expose a solution of some organic substance to the atmosphere for twenty-four hours, it will be speedily inhabited by myriads of infusoria, rolling and tumbling, yet so small that hundreds of them if placed in a row would not form a line in length. These worms resemble little eels. Analogous animalcules induce decomposition and fermentation, for the latter cannot take place unless the organic matters be in contact with the air, to receive the seed of the leaven, which by cellule propagation leavens the whole mass.

It has lately been shown that the process of nitrification in certain soils is due to a peculiar ferment, that is to say, to a spore floating in the atmosphere, and finding its conditions for action stops and operates.

Marsh fever is due to cellules or spores existing in a bog neighborhood. The same spores have been detected by the microscope in the expectorations of the patient, in the dew that was examined, and on the surface of the peaty soil where they were generated. This is simply poisoning. To a like cause is due the fell disease known as hospital gangrene; the germs in the polluted ward atmosphere enter the wounds, induce putrefaction and death. Hence the importance of washing the affected part with carbolic acid or other antiseptic; then dressing it with a wadding that will intercept, by acting as a filter, the germs to be deposited, from being sown.

In many factories workmen become victims to the dust, generated by their special industry, entering and saturating the lungs. On dissecting old colliers, their lungs, after forty years' respiration of dust, instead of being rose colored as in health, were as black as the coal itself. The dust in this impalpable form is often the cause of accidents; it can take fire and blaze like alcohol. Witness the catastrophe at the Minneapolis flouring mills; the confined air highly charged with the flour became on a par with ether or alcohol, awaiting only ignition from the heated millstone to burst into flame and explode.

The Treatment of Burns.

Service of Dr. George F. Shrady, at St. Francis' Hospital, New York.—A number of cases of more or less severe burns have been treated very successfully by an application of a gum dressing, which consists of a paste composed of gum acacia, ℥ iij.; gum tragacanth, ℥ j.; carbolized water (1–60), 1 pint; and molasses, ℥ ij. It is applied to the burned surface with a broad flat camel's hair brush immediately on admission to the hospital, and dries in the course of an hour or two. The dressing is then renewed at suitable intervals, until a firm and unyielding scab is formed. Generally four applications are necessary for this purpose. The molasses appears to prevent the contraction of the covering, while the carbolized water destroys any odor.

The application is not attended with any pain to the patient, and effectually excludes all air to the burned surface, thus avoiding subsequent smarting. The scab cracks and peels off in the course of a fortnight, either leaving a mere rubefaction or a healthy granulating surface. If pus accumulates in the mean time under the scab, the latter is either punctured or gently lifted, giving exit to the discharge. No other dressing is required. Although forming a rather unsightly scab, the dressing is really a cleanly one. This plan of treatment is substantially the same as that advocated by the late Dr. Gurdon Buck, and, all other things being equal, is considered to give the best results. Its special advantages are its ease of application, the small amount of subsequent dressing required, and the freedom from pain. The granulating surfaces are treated with either simple cerate or the white oxide of zinc ointment, according to indications.

Genuine Hall Marks on Spurious Plate.

The rage for antique silverware in England has developed an ingenious method of swindling, which has just been discovered by the Goldsmiths' Company of London. The fraud is effected by cutting out genuine hall marks from small but antique articles of silverware and inserting them on large pieces of wholly modern plate. Thus the bottom of a salt cellar, say of Queen Anne's time, is dexterously removed and worked into the fabric of a tankard, a soup tureen, or some equally massive object in silver recently manufactured, and the sham antique—the authenticity of its hall mark defying all the ingenuity of experts—thus passes muster as having been made one hundred and eighty years ago, and commands a corresponding enhancement in price. One dealer of this sort has lately been convicted and sentenced to a heavy term of imprisonment.

Our Cows and their Value.

At the late convention of the American Butter and Cheese Association, the President of the Northwestern Dairymen's Association, Hon. G. P. Lord, of Elgin, Ill., read a paper in which he estimated the number of milch cows in the United States at over 13,000,000, requiring the annual product of 52,000,000 acres of land for feed, giving employment to 650,000 men, and requiring the labor of 866.600 men. Estimating the cows at $30 each, the horses $80, and land at $30 per acre, together with $200,000,000 for agricultural and dairy implements, and the total amount invested in the industry is $2,219,280,000. This is considerably more than the amount invested in banking and the commercial and manufacturing interests of the country, which is $1,800,964,586. The cattle and horses will require two tons of hay annually or its equivalent. If it is estimated that 5,000,000 cows are fed with grain for winter dairying, and that the horses daily require six quarts of oats or corn during the year, they will consume 28,383,300 tons of hay, 84,380,000 bushels of corn meal, 84,370,000 bushels of oat meal, 1,250,000 tons of bran, 30,000,000 bushels of corn, and 300,000,000 bushels of oats, of a total value of $384,459,400. To this should be added the labor of 650,000 men at $20 per month, $156,000,000, making the annual value of $504,459,400, or an average of $38.80 per cow.

Accepting 12 cents per gallon as a basis for computing the value of the milk product, and 446 gallons the average yield per annum (this being the average in sixteen States in 1860), the 13,000,000 cows produce annually 5,798,000,000 gallons of milk, worth $695,760,000. Analysis shows that 3½ pounds of milk contain the same kind and amount of nutrition as 1 pound of boneless beef. The total weight of the milk product is 50,732,600,000 pounds, equal to 14,495,000,000 pounds of boneless beef. About 50 per cent of a fat steer is boneless meat, so that it will require 20,650,000 steers of 1,400 pounds weight to produce the same amount of nutrition as the annual milk product. Such fat steers would sell at $4.50 per cwt., or $63 each—a total of $1,300,950,000; deducting for hide and tallow, $260,190,000, leaves the meat value $1,040,760,000. This gives the food value of the milk product in the United States annually. Willard, in his "Practical Dairy Husbandry," says that milk at 24 cents per gallon is equivalent in value to boneless beef at 9 cents per pound." It is false economy, therefore, that substituted meat for milk as an article of food.

The same authority (Willard) states that 50 per cent of the milk is used in making cheese and butter, and 41 per cent is consumed in a liquid state. The Department of Agriculture, 1877, estimates there are 1,000,000,000 pounds of butter and 300,000,000 pounds of cheese made annually in the United States. At 27 pounds of milk for 1 pound of butter, and 9½ for 1 pound of cheese, the total amount of milk used would be 29,950,000,000; add 41 per cent of the product for consumption, the total production is 50,752,325,000 pounds, within a small fraction of 1 per cent of the estimate made.

The caseine in the milk used for making butter, if utilized for cheese, would produce annually 1,890,000,000 pounds, and besides there is annually run off in the skimmed milk, buttermilk, and whey 200,000,000 pounds of milk sugar, which, if saved, would have a market value greater than the entire annual sugar crop of Cuba.

New Jersey Scissors in Sheffield.

A correspondent of the Portland (Me.) *Advertiser* relates as follows his experience in looking for a proper souvenir of Sheffield, England, famous for its cutlery:

"Every other shop in the place seemed to be a cutler's shop—and into one of the best of these I ventured, requesting to look at scissors. It is a hobby of the English shopkeeper to show his cheapest goods first, no matter who his customer may be. Enter a shop in pursuit of something really good, for which you are willing to pay, and it generally takes three or four strong efforts to obtain it—he will persist in showing you all the cheapest grades first. So tray after tray of common cheap scissors was displayed on the counter. "Have you nothing better than these?" I asked, at last. "I am buying these scissors for Sheffield's sake, and I want a good pair." Out came another case, still in no way fine goods. I had already looked at five or six grades. "If these are your best," I said, "I will look further on." "Oh," said the shopman, "we have one more kind—very fine goods indeed, the best in the shop, but they are quite expensive," and he unlocked a drawer and took out a tray of really good scissors. I took up a pair to examine them, and read, stamped on the blade, "Newark, New Jersey!" As I could not reconcile myself to take a pair of New Jersey scissors as a souvenir of Sheffield, I was obliged to leave the disgusted shopman to lock up his precious scissors again, probably more than ever grounded in his belief that the high price of his goods was my reason for not purchasing.

Pennsylvania Tanneries.

The largest hemlock tanning in the world is now done between Sterling Run and Warren, Pa., along the line of the Philadelphia and Erie Railroad. The district includes thirteen tanneries in Cameron, Elk, McKean, Forest, and Warren counties. Large tracts of land in these counties are covered with a dense growth of hemlocks. Little clearings are made in the wilderness, a tannery is erected on some splendid trout stream, and an unpainted village springs up within a few months. The thirteen tanneries have facilities for tanning 775,000 hides a year. This would produce 1,550,000 sides of sole leather, averaging 17 pounds to the side, and aggregating 26,350,000 pounds of leather a year. At a fair average, the hides weigh 21 pounds a piece; so that the 775,000 go to the tanneries with an aggregate of 16,275,000 pounds, and emerge in the shape of sole leather weighing 26,350,000 pounds. This gain of 10,075,000 pounds is made in the face of fleshing, hair scraping, and trimming. It is made by the absorption of the tannin leached from ground hemlock bark.

These tanneries almost exclusively use South American dry hides, worth, on an average, 23 cents a pound. The 775,000 hides, therefore, cost $3,742,250. The leather averages 25 cents a pound, and the hides that cost $3,742,250 turn out leather that sells for $6,587,500, the gain in value being $2,845,250. All this, however, is not net profit. It represents the labor of nearly 1,500 men at an average of $1.25 a day for 312 days a year, and the value of 155,000 cords or 340,000,000 pounds of hemlock bark, worth from $4 to $4.50 a cord delivered. The aggregate of the cost of labor is $585,000, and that of the cost of the bark $658,750, a total of $1,243,750. This leaves for the tanners $1,591,500, out of which come taxes, cost of acids, wear and tear of machinery, fuel, lights, insurance, and other incidental expenses, leaving a fair profit at the bottom. The bark runs 2,200 pounds to the cord, and a cord will tan about ten sides of leather.—*New York Sun.*

The Silvering of Mirrors.

The methods of silvering mirrors, as practiced in Europe, are described as follows by Mr. C. Colné in his report upon glass at the late Paris Exhibition:

Silvered plate glass is produced by causing a slight coating of mercury to adhere to the glass. To obtain this result mercury must be retained by a metallic medium; it is, therefore, amalgamated with tin. Mercury, owing to its power of reflecting light very brightly, has been chosen as the best medium.

The operation of silvering is briefly as follows:

Upon a very smooth stone table a sheet of very thin tin is spread very carefully, so as to prevent all wrinkles. Upon this sheet mercury is rubbed all over, then as much mercury as the sheet will retain is poured over it. The glass plate is now carefully slid over the edge of the stone table, as near as possible to the mercury, and lowered on it. All the parts previous to this operation have been carefully cleaned, and the plate is handled with pieces of tissue paper to prevent the introduction of dirt. The plate is now covered with a cloth and loaded with weights to expel the surplus mercury. When the plate has been so weighted, the table is slightly inclined, and gradually increasing the inclination from time to time, until the mercury has been sufficiently drained; this generally requires twenty-four hours. The plate is now carefully taken up and carried over to an inclined wooden table, which is depressed gradually more and more to finish draining the mercury until the plate is supposed to be dry.

This is the process which has been heretofore followed altogether, but of late plates have been silvered with a dissolution of silver. Mercury has deplorable effects upon the health of workmen, as they are exposed to its dangerous emanations; these are rapidly absorbed by the skin and produce the well known and terrible mercurial poisoning. It is hoped, therefore, that mercury will be abandoned, and the new silvering process described below will be adopted in its place. Several methods have been proposed for silver dissolutions, all springing, however, from the discovery of Liebig, that aldehyde (produced by a partial oxidation of alcohol) when heated with nitrate of silver, the metal revivified, covers the glass over with a brilliant metallic coating. It is not our purpose to trace the different improvements made by Drayton and Pettitjean, but we will briefly indicate the process of the latter, which is now altogether used by the St. Gobain works with perfect success.

The operation is very similar to silvering with mercury. The table, instead of being a stone, is a hollow sheet iron table, made quite smooth on its upper surface, and containing inside water heated by means of steam, to bring the temperature to 95° or 104°. Preparatory to silvering the glass it should be thoroughly cleaned. The table being ready, a piece of oilcloth is spread over it, and upon this is laid a piece of cotton cloth. The plates are now put upon these cloths, and the following solutions are poured over them:

Liquor No. 1.—Dissolve in a liter of water 100 grammes of nitrate of silver; add 62 grammes of liquid ammonia of 0·880 density; filter and dilute with sixteen times its volume of water. Then pour in this liquor 7·5 grammes of tartaric acid dissolved in about 30 grammes of water.

Liquor No. 2.—This liquor is precisely the same as the other, with the exception that the quantity of tartaric acid is doubled, say 15 grammes.

First pour of liquor No. 1 upon the plates as much as will remain upon the surface without running over. The heat of the table is now increased gradually to 95° or 104° Fah., and in about thirty minutes the glass is covered over with a metallic coating. The table is now inclined and the plates washed with water, which carries off the surplus silver. The table is again raised, and liquor No. 2 is now poured over. In about a quarter of an hour another coat is deposited, which covers the glass completely. The plates are again washed; then they are carried to a slightly heated room, where they are gradually dried.

This operation, as will be seen, is quite simple, and is generally performed by women. The silver carried off in washing and that contained in the cloths is recovered again. Since glass silvered by this process is liable to be altered when exposed to the air, and the coating may become easily detached if not covered over with a protecting coat of paint, the silver pellicle is covered with an alcohol copal varnish, put on with a brush, and when this is dry a coat of red lead paint is put on.

Plates silvered by this means have more brilliancy than with mercury, but as there is a slight tinge of yellow given to objects reflected by these mirrors, they were at first objected to. This objection has passed away, however, to a great extent, and the yellow reflection has been obviated by giving a slight coloration to the glass. I have not been able to get positively the relative costs of both processes; it is said, however, that by the new process the cost price is about 36 cents per square meter. Owing to the fact that such works as the St. Gobain have adopted it, and as the terrible disorders caused by mercury have been avoided, there ought to be no hesitation in adopting this new process everywhere.

The Use of Salt in a Dry Time.

A correspondent in the Chicago *Times* gives the following account of his experience with the use of salt in the garden and orchard. Young fruit trees can be made to grow and do well in places where old trees have died, by sowing a pint of salt on the earth where they are to stand. After trees are set I continue to sow a pint of salt around each tree every year. I set twenty-five trees in sandy soil for each one of seven years, and only succeeded in getting one to live, and that only produced twigs a few inches long in nine years. Last spring I sowed a pint of salt around it, and limbs grew from three to three and a half feet long. In the spring of 1877 I set out twenty-five trees, putting a pint of salt in the dirt used for filling, and then sowed a pint more on the surface after each tree was set. All grew as if they never had been taken from the nursery. Last spring I set thirty more, treating them in the same way, and they have grown very finely. The salt keeps away insects that injure the roots and renders the soil more capable of sustaining plant growth.

In 1877 my wife had a garden forty feet square. It was necessary to water it nearly every day, and still the plants and flowers were very inferior in all respects. In 1878 I put half a barrel of brine and half a bushel of salt on the ground, and then turned it under. The consequence was that the plants were of extraordinarily large size and the flowers of great beauty. It was not necessary to water the garden, which was greatly admired by all who saw it. The flowers were so large that they appeared to be of different varieties from those grown on land that was not salted.

I had some potatoes growing from seed that wilted down as soon as the weather became very hot. I applied salt to the surface of the soil till it was white. The vines took a vigorous start, grew to the length of three feet, blossomed, and produced tubers from the size of hen's eggs to that of goose eggs. My soil is chiefly sand, but I believe that salt is highly beneficial to clay or common prairie land.

[The above makes a very nice story; but one of our correspondents, a lady, tells us that she lately tried the salting plan on her flower beds, and in a few days all the plants were dead. The use of salt for killing weeds is well known. —EDS. S. A.].

Dr. Unger's Cure for Drunkenness.

The claims of Dr. Unger for a remedy for curing intemperance would seem to be justified, if we may rely upon as good authority as the Chicago *Tribune* for the evidence. Mr. Joseph Medill, the editor, is said to be a strong indorser of the new remedy, and from the editorial commendations of it in the columns of the *Tribune* we conclude the remedy has produced some benefit to the community already. It is claimed that the doctor has cured 28,000 persons of the worst form of intemperance with it, and that this is the first remedy ever discovered that kills the disease and the inclination to drink at one and the same time.

Remedy.—Take one pound of best, fresh, quill red Peruvian bark, powder it, and soak it in one pint of diluted alcohol. Afterward strain and evaporate it down to half a pint. Directions for its use: Dose—a teaspoonful every three hours the first and second day, and occasionally moisten the tongue between the doses. It acts like quinine, and the patient can tell by a headache if he is getting too much. The third day take as previous, but reduce the dose to one-half teaspoonful. Afterward reduce the dose to fifteen drops, and then down to ten, and then down to five drops. To make a cure, it takes from five to fifteen days, and in extreme cases thirty days. Seven days are about the average in which a cure can be effected.

A Treasure Wagon.

The removal of the Bureau of Engraving and Printing, at Washington, to a building half a mile from the Treasury has made it necessary to provide new arrangements for the transfer of money and bonds between the two establishments. The department has had constructed a heavy, van-like wagon, a sort of vault on wheels, built of iron and steel, and arranged internally like a bank vault with a sheet iron lining. The doors are fastened with tremendous bolts, and the locks are of the combination order. The body of the vehicle is painted an olive color with gilt ornamentation. When drawn through the streets by two immense horses it attracts considerable attention, especially as it is always accompanied by five armed agents of the Treasury Department, two guarding the front and three the rear.

Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although merely approximate, they are sufficiently accurate to enable the ordinary observer to find the planets. M. M.

POSITIONS OF PLANETS FOR AUGUST, 1880.

Mercury.

On August 1 Mercury rises at 5h. 44m. A.M., and sets at 7h. 6m. P.M.

On August 31 Mercury rises at 4h. 10m. A.M., and sets at 5h. 59m. P.M.

Mercury is at inferior conjunction on the 5th, and at greatest elongation on the 21st, rising before the sun, and some five degrees north of sunrise point. Mercury is in perihelion on the 29th.

Venus.

Venus keeps so nearly the path of the sun in August that it is not likely to be seen.

On the 31st it sets after the sun, a few degrees south of the point of sunset.

Mars.

On August 1 Mars rises at 7h. 19m. A.M., and sets at 8h. 36m. P.M.

It may still be seen early in the month. It moves from Rho Leonis toward Tau Leonis.

Late in the month Mars sets before the sun. The crescent moon will pass south and east of Mars on August 8.

Jupiter.

On August 1 Jupiter rises at 10h. 6m. P.M. On August 31 Jupiter rises at 8h. 7m. P.M.

Jupiter will be so brilliant this autumn, as it approaches perihelion, that the most careless observer cannot fail to notice it in the evening sky.

If we take the hour from 9 to 10 P.M. for observing Jupiter, an ordinary telescope with an object-glass only two inches in diameter will show the satellites and their changes of position.

On the 23d the first satellite will disappear by going into the shadow of Jupiter, as the moon goes into the earth's shadow in a lunar eclipse.

On the 24th the same satellite will be invisible when Jupiter rises, because it is moving across the face of Jupiter. It will be seen to come off on the left or preceding limb of the planet.

On August 31 the same satellite will be seen between 9 and 10 P.M. moving toward Jupiter and entering upon the disk of the planet. A telescope with an object-glass of five inches diameter will enable one to see the dark shadow of these satellites pass across the face of Jupiter, as the shadow of the moon passes across the earth in a solar eclipse.

Jupiter will be about seven degrees south of the waning moon near midnight on August 23.

Saturn.

Saturn rises on August 1 at 10h. 34m. P.M. On August 31 at 8h. 36m. P.M., following Jupiter after nearly half an hour. The two planets separate a little in declination, Jupiter moving south a little faster than Saturn.

Like Jupiter, Saturn increases in brilliancy, and although far less conspicuous than Jupiter, will make the evenings of August very beautiful.

The waning moon rises nearly with Saturn on August 24.

A telescope of a few inches aperture will show Titan, the largest moon of Saturn, and the motions can be followed around the planet. A glass of five inches aperture will show Rhea, and on rare evenings, and when Saturn is on the meridian, Tethys may perhaps be seen.

Uranus.

Uranus rises and sets so nearly with the sun that it is useless to attempt to observe it in August.

Neptune.

On August 1 Neptune rises at 11h. 11m. P.M., and on the 31st at 9h. 13m. P.M.

It cannot be seen with a disk without the aid of a powerful glass.

South American Glaciers.

The English mountain climber, Mr. Whymper, writes to his friends that his last ascents in South America have been the mountains of Cayambe, Saraurcu, and Cotocachi. He has found very extensive glaciers on all these mountains, besides having previously discovered others on Chimborazo, Sincholagua, Antisana, Cotopaxi, Illiniza, Carihuairazo, and Quilindaña. How little is at present known of the Andes of Ecuador, the *Pall Mall Gazette* remarks, may be judged from the fact that in the edition of the "Encyclopædia Britannica" now appearing, in the article on Ecuador it is stated that the crater of the mountain Altar is remarkable as containing "the bed of the only real glacier known to exist in the Ecuadorian Andes." Mr. Whymper says that there are no glaciers upon Corazon, Imbabura, or Pichincha, but that among those upon the mountains which we have enumerated above there are many glaciers which are as large as the largest Alpine ones, and that the upper four thousand feet of Cayambe, Antisana, and Chimborazo, are almost completely enveloped by them.

Extensive Electric Light Experiments.

We learn from the *Paper World*, published at Holyoke, Mass., that Mr. H. C. Spaulding, of Boston, who was at first going to put his plans into effect in that city, has gone to Holyoke on account of the cheap power, and has made arrangements with the Water Power Company to put a wheel into their new pit expressly for his use. To make the experiment which he will attempt will require 150 horse power, enough to run a paper mill. A tower about 175 feet high will be built and surmounted by an immense lantern of such power, says the enthusiastic editor, as to put all former electric lights completely into the shade. Mr. Spaulding will put up this tower and apparatus at his own expense, but he hopes to succeed so well that the city will adopt the system. His idea is that by filling the atmosphere above the city with light from several such electric towers he will get the same effect that we do from the sun and its reflected light, and that the shadows will be no darker than are those made by the sun. His idea is to fill the stratum of atmosphere just above the city so completely with light that it will permeate spaces which no direct rays reach, just as the sun's light does immediately after the sun has set.

The light which he expects to throw out from one lantern will be equal to 300,000 candles, while the largest electric light yet attempted by any one else has been of but 10,000 candle power. The estimated cost of the apparatus is $15,000, irrespective of any investment for power, but after the system is once in operation the cost of running it, aside from the power, will be small. The expense of lighting Holyoke at present, public and private, is estimated at $100,000 a year, and for about that amount the seven towers which are proposed could be set up and the lights put into operation.

The Air Breathed in Leadville.

Dr. H. Steinau, of Leadville, Col., sends to the *Medical Record* an interesting article upon the above subject. It has been asserted that the atmosphere of Leadville, which is 10,500 feet above the level of the sea, is poisoned by the smoke and gases from the numerous smelters, of which there are about twenty, in the neighborhood of the city. Dr. Steinau has examined into the question, and comes to the conclusion that the amount of deleterious vapor, though large, is quantitatively insufficient to produce any poisonous effects. The gases from which danger is to be apprehended are those containing lead, sulphur, chlorine, and arsenic. Estimating that each of the twenty furnaces around the city consumes thirty tons of ore per day, he finds that about ten ounces of chlorine, eighty pounds of sulphurous acid, and eighty ounces of arsenious acid would be given off every minute of the twenty-four hours. Most of the chlorine, however, unites to form solid chlorides; more than half of the arsenious acid fails to escape into the air, but is found in a solid condition in the speiss. The sulphurous acid is so diluted by the air that its presence is scarcely noticeable. The lead vapors are the most harmful, but their amount is small, and they can easily be prevented from escaping into the air. The conclusion, then, is that the furnaces are not sources of danger from their poisonous emanations. This conclusion is confirmed by practical experience, as no cases of lead or arsenic poisoning have been found.

Dr. Steinau is of opinion that Leadville is in much greater danger from its neglect to care for the drainage of the city and the disposal of filth. Nothing, he thinks, but the great natural salubrity of the place, with the high percentage of ozone in the air, has prevented an epidemic from occurring already.

Poisonous Effects of Alcohol.

We often hear it stated that pure liquors are much less injurious than those which are adulterated, and that much of the injury caused by alcoholic liquors is due to impurities. M. Dujardin has carefully determined by experiment the quantity of the various alcohols and similar substances, which are formed by fermentation or during distillation, required to produce death within twenty-four to thirty-six hours after injection. It will be seen that ethyl alcohol (or common alcohol) and glycerine are the most harmless, while amyl alcohol, the principal constituent of fusel oil, is the most deleterious. Glycerine differs from alcohol, in that it increases the bodily temperature, while alcohol lowers it. The results are given in grammes per kilo of the animal.

Classification.	Name of alcohol or derivative.	Pure.	Dilute.
Formed by fermentation.	Ethyl alcohol	8·00	7·75
	Acetic aldehyd	—	1 to 1·25
	Acetic ether	—	4·00
	Propyl alcohol	3·90	3·75
	Butyl alcohol	2 00	1 85
	Amyl alcohol	1·70	1·50 to 1·60
Non fermented alcohols.	Methyl alcohol, pure	—	7·00
	Common wood spirits	—	5·75 to 6
	Aceton	—	5 00
	Œnanthic alcohol	8	2·50
	Caprylic alcohol	7 to 7·50	2 to 2·25
	Cetylic alcohol	—	—
Isomeric.	Isopropylic alcohol	—	3·7 to 3·8
Triatomic.	Glyerine	—	8·5 to 9

The contamination with higher boiling products, and the consequent injuriousness, increases in this order: 1. Brandy from wine. 2. Brandy from pears. 3. Brandy from apples. 4. Brandy from sugar beets. 5. Liquor from grain. 6. Liquor from beet sugar molasses. 7. Potato spirits. The brandy made from wine contains almost pure ethylic alcohol, and is therefore least injurious.—*Ding.*, *p.* 406.

Courage Necessary to Success.

As the St. Louis *Journal of Commerce* pertinently says, a great deal of talent is lost in the world for the want of a little courage. Every day sends to the grave a number of obscure men, who have only remained in obscurity because their timidity has prevented them from making a first effort, and who, if they could have been induced to begin, would in all probability have gone great lengths in fame. The fact is, to do anything in the world worth doing, we must not stand back shivering and thinking of the cold and danger, but just jump in and scramble through as well as we can. It will not do to be perpetually calculating risks and adjusting nice chances. It did very well long before the flood, where a man could support his friends upon an intended publication for a hundred and fifty years, and then live to see its success afterward. But at present a man waits and doubts, and hesitates, and consults his brother, and his uncle, and his particular friends, until one day he finds he is sixty years of age; then he has lost so much time in consulting his first cousin and particular friends, that he has no time to follow their advice.

The Manufacture of Resin and Turpentine.

The turpentine and resin industry carried on at the South is much larger than probably most persons are aware. From the *Manufacturer and Builder* we glean the following account of the collecting of the gum and its conversion into a merchantable commodity

From Wilmington, N. C., southward, and nearly all the way to Florida, the pitch pine trees, with their blazed sides, attract the attention of the traveler. The lands for long stretches are almost worthless, and the only industry, beyond small patches for corn or cotton, is the "boxing" of the pitch pine trees for the gum, as it is called, and the manufacture of turpentine and resin. There are several kinds of pine trees, including the white, spruce, yellow, Roumany, and pitch pine. The latter is the only valuable one for boxing, and differs a little from the yellow pine, with which it is sometimes confounded at the North. The owners of these pine lands generally lease the "privilege" for the business, and receive about $125 for a crop, which consists of 10,000 "boxes." The boxes are cavities cut into the tree near the ground, in such a way as to hold about a quart, and from one to four boxes are cut in each tree, the number depending upon its size. One man can attend to and gather the crop of 10,000 boxes during the season, which lasts from March to September. About three quarts of pitch or gum is the average production of each box; but to secure this amount, the bark of the tree above the box must be hacked away a little every fortnight. Doing this so often, and for successive seasons, removes the bark as high as can easily be reached, while the quality of the gum constantly decreases, in that it yields less spirit, as the turpentine is called, and then the trees are abandoned. The gum is scraped out of the boxes with a sort of wooden spoon, and at the close of the season, after the pitch on the exposed surface of the tree has become hard, it is removed by scraping, and is only good for resin, producing no spirit. The gum sells for $1.50 a barrel to the distillers. From 16 barrels of the crude gum, which is about the average capacity of the stills, 80 gallons of turpentine and 10 barrels of resin are made. The resin sells for from $1.40 to $5 per barrel, according to quality, and just about pays for cost of gum and distilling, leaving the spirit, which sells for 40 cents a gallon, as the profit of the business. Immense quantities of resin await shipment at the stations along the line, and the pleasant odor enters the car windows as you are whirled along.

After the trees are unfit for further boxing, and are not suitable for lumber, they are sometimes used to manufacture tar; but the business is not very profitable, and is only done by large companies, who can thus use their surplus labor. The trees are cut up into wood, which is piled in a hole in the ground and covered with earth, and then burned the same as charcoal is burned elsewhere. The heat sweats out the gum, which, uniting with the smoke, runs off through a spout provided for the purpose. A cord of wood will make two barrels of tar, which sells for $1.50 per barrel, and costs 37½ cents to make. The charcoal is then sold for cooking purposes.

Medical Lakes of Eastern Washington.

In the neighborhood of Silver Lake, and about sixteen miles southwest of Spokane Falls, Washington Territory, are two small lakes, known as the medicated lakes, which are likely to become a great resort for invalids.

One lake is a mile and three-quarters long and three-quarters of a mile wide; the other a trifle smaller. They are about a mile apart. For ordinary bathing they are said to be delightful. The water invigorates and refreshes the whole system and leaves the skin soft and oily.

An analysis of these waters, by Dr. R. G. Rex, of Portland, Oregon, shows the following constituents:

Granite Lake.—Solid matter, 256 grains to the gallon, consisting of carbonate of soda and potassa, 160 grains; chloride of sodium and potassium, 64 grains; organic matter, silica, alkaline sulphates, etc., 32 grains.

Medical Lake.—Solid matter, 192 grains to the gallon; carbonate of soda and potassa, 120 grains; chloride of sodium and potassium, 48 grains; organic matter, silica, alkaline sulphates, etc., 24 grains.

Tall Sugar Cane.

The New Orleans *Times* has lately received from Ruatan three stalks of sugar cane measuring respectively 17 feet 9 inches, 16 feet, and 16 feet. The first had 57 joints, the other two 53 each.