of large bodies of troops, which has necessitated, with the hurried organization of the volunteer service, retaining the old regimental medical staff; but, with the present availability of Red Cross aids, it is believed most of the defects inherent thereto will be obviated.

The United States army ambulance is a model in its way, consisting of a body 48 × 90 inches, protected by a canopy top and movable leather curtains, mounted on four wheels by platform springs. With the seats in, it carries eight persons; with seats stowed, it admits two litters, side by side, the handles of which rest on and are secured to brackets; or one litter can be entered, and yet space reserved for four persons in sitting posture. Lockers at the sides and under the box seat afford storage for supplies and the appliances essential to "first aid," while beneath the box are two water tanks. Formerly a two-wheeled ambulance also received official sanction, of the same capacity as regards litters, but admitting of but four passengers in sitting posture. For the campaign in Cuba, it is understood mule litters have been provided for use in such localities as cannot be reached by wheeled vehicles, and the French cacolet—two chairs, resting pannier fashion on a mule's back, with a hooded shelter—has been advised.

The Red Cross ambulance, as recently adopted, differs slightly from that of the United States army. Constructed in much the same way, it admits of a second pair of stretchers being inserted half way between the first and the canopy top: and the water tanks, beneath the driver's seat, are arranged to be surrounded by ice: the top and curtains, moreover, are of canvas instead of leather; but leather padded litters replace the canvas stretchers of the army department.

No hard and fast rules can obtain, however, to any ambulance service. Both the character of the vehicles and the scope of their usefulness are necessarily modified by conditions and surroundings, and to meet the demands of military operations. Undoubtedly the present conflict will lead to many changes in medical military service and in medical organization, and such may entail a material modification of the ambulance and field hospital system. One of the great steps in advance, dictated by the exigencies of the present war, is the establishment of the hospital ships, such as the government steamer "Solace" and the Red Cross steamers "Relief" and "Red Cross."

One notable feature of Red Cross work brought out by the present war is the number of societies that have sprung into existence as auxiliaries. Every city and almost every town or village of considerable size possesses at least a "branch." Some of these, too, have greatly lightened the work of the Central Committee, by taking upon themselves certain lines of work. One of the greatest drawbacks, usually, to work of this character is the miscellaneous assortment of supplies forwarded, the useful often being neglected for the æsthetic, the amount in one line being greatly in excess of demand on one hand, on another equally deficient. Thus, one organization devotes all its energies to supplying a hospital launch, another to the procuring of hospital clothing, another to the forwarding of hospital delicacies, another to the furnishing ambulances, etc. Consequently, the supplies that reach the wounded and the hospitals are suitable to, and in consonance with, the demand. Far from being a charity, miscellaneous in its garnerings and applications, the Red Cross has assumed the character of a self-imposed, cheerful, definite taxation.

Waterproof Placards.

Mix glue water with zinc-white, chalk or barium sulphate and paint the paper with this liquid. As soon as dry, apply another layer of soda waterglass with a little magnesia, and finally expose the paper for some days to a temperature of 25° C. The sheets thus prepared may remain under water or be exposed to dampness for a long time without any part of the writing or drawing becoming blurred.—Die Werkstatt.

A RAILROAD ATTACHMENT FOR BICYCLES.

The invention which forms the subject of the accompanying engraving seeks to provide a simple attachment by which an ordinary bicycle can be used upon a railroad track, the bicycle running upon one rail, means being provided whereby it is held in position.

A RAILROAD ATTACHMENT FOR BICYCLES.

Below the front wheel of the bicycle, a frame is suspended from a forked brace fastened to the bicycle frame and from a bar running from the axis of the front wheel. On the lower portion of this suspended frame rollers are journaled to engage the track and the adjacent portion of the tire. At the rear of the wheel, about midway of its height, two additional rollers are journaled in the forked brace already mentioned, and engage the bicycle tire for the purpose of relieving the lower rollers of undue strains. The axes of these latter rollers are perpendicular to the periphery of the bicycle-wheel.

Beneath the rear wheel of the bicycle, a somewhat similar arrangement is employed. In this case the frame carries but a single roller and is suspended in position by a supporting brace attached to the bicycle frame and by a bar running from the bearing of the rear wheel. As in the device used on the front wheel, so here, the roller engages the inner side of the rail and the adjacent portion of the wheel.

In order to keep the bicycle in position on its track, a lateral frame is fastened to the lower brace and is provided at its outer end with a flanged wheel running upon the rail opposite that upon which the bicycle is mounted. The flange of this wheel is opposed to the flange devices on the bicycle, so as to keep the latter in position on the track.

The attachment in itself is lightly constructed. It can be removed from a bicycle and easily applied, and, moreover, can be packed in a case carried on the bicycle. A rider is thus enabled to use his wheel not only on ordinary roads, but also on railway tracks.

The attachment is the invention of Henry J. Otto and Arthur E. Wielsch, of Butte, Montana.

RECOVERY OF GOLD FROM LOW GRADE ORES.

In the southern part of California mining is a familiar topic of the day among all classes. The wealthy are turning to this industry as a means of increasing their revenues, and the poor are engaging in it with the hope of becoming rich. The study of mineralogy, with the technicalities of mining, is the most popular of the many branches taken up by the Los Angeles Y. M. C. A. educational course this season. It is the first class of the kind conducted by this organization.

A large proportion of the 3,800 mines in Southern California, which yielded $1,360,000 in gold last year, are on the great desert lying just west of the Colorado River. The region, as large as several Eastern States put together, is full of resources that are yet unknown to the general public. The most promising mining district in California—the Rand, discovered two years ago—is in the heart of this desert, and already the towns of Randsburg and Johannesburg are thriving and comparatively comfortable places. Life here is infinitely preferable to the conditions on the Klondike, and if gold nuggets are not picked up so freely as in the Arctic region, neither is the search for them so hazardous or costly.

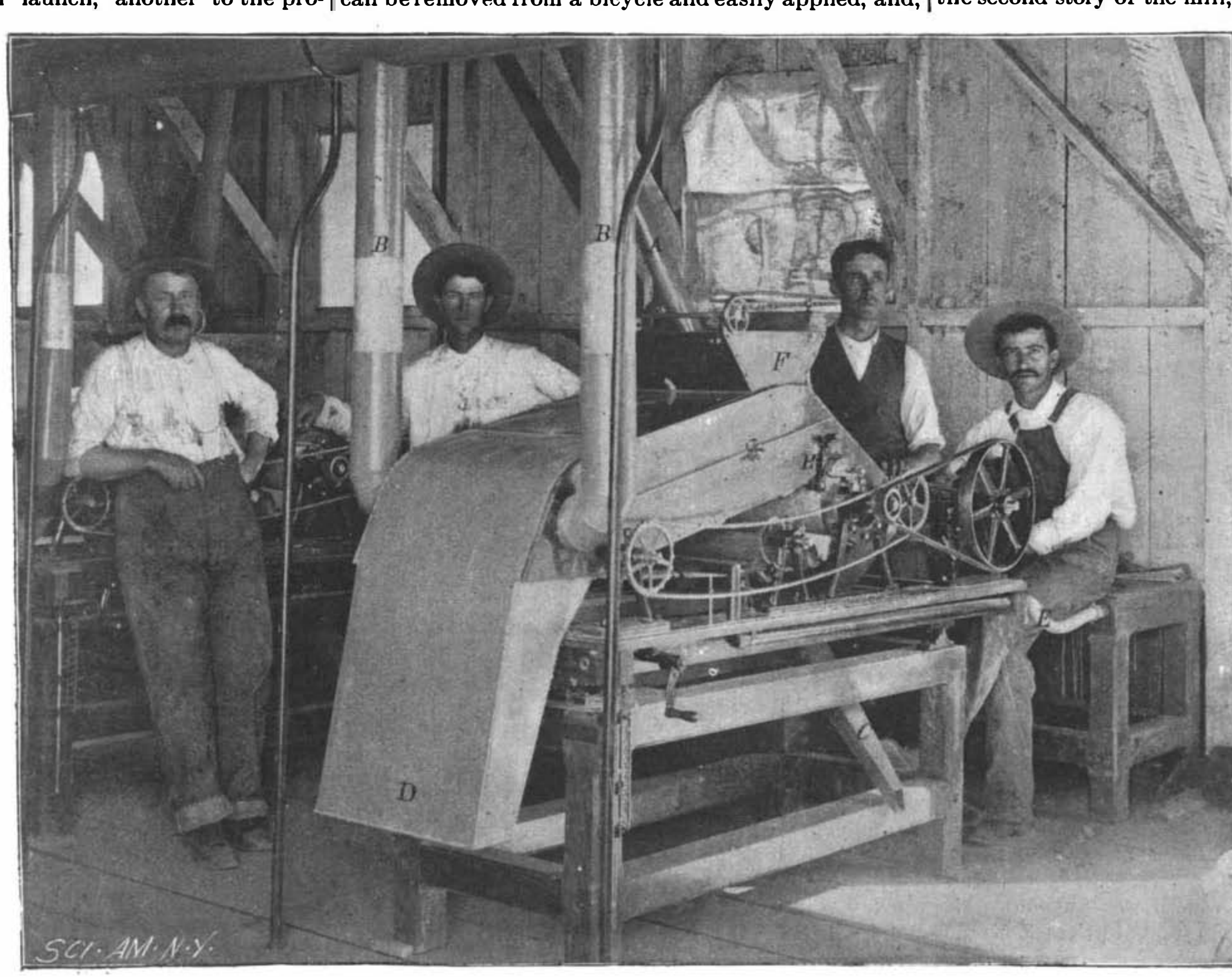
Scarcity of water and fuel, with the cost of transporting ore to mills and smelters remote from the mines, are drawbacks on the desert. More water will ultimately be discovered and developed; meanwhile, a dry process of treating ores would be of great value to this section and to all other arid mineral territories. Especially is some method needed by means of which low grade quartz may be made to yield a percentage of concentrates which will be profitable in bulk.

Such a process has recently been successfully tested in the Rand district, with new concentrating machines invented by an Eastern man, who has been in the habit of spending his winters in California, and was advised, when in Los Angeles last winter, to turn his attention to something which would benefit the mining interests of this section. He saw the difficulty, chiefly resulting from a lack of water, of handling the vast bodies of low grade ore which are found on the desert, and began to experiment with the dry concentrating process.

After the machines were perfected, they were viewed with approval by numerous mining men; and, in September, a plant was erected at Johannesburg, on the Alameda mine, where tests were recently made which gave excellent results.

Rock which had been cast aside, on the Alameda dump, as unprofitable to ship to a stamp mill, was put through a rotary crusher and reduced to what is known as "pulp" in mining parlance. It was then elevated by a conveyor to an inclined screen located in the second story of the mill, directly above the concentrators.

The screen is octagon in cross section, covered with fine wire, and divided into four mesh spaces running from 100 to 40. It receives the pulp at the upper end, and as it slowly revolves, the crushed rock is thrown from one flat surface to another, gradually reaching the lower end, where all that passes over is returned to the mill to be ground again. The screened pulp is supplied to the concentrators in the room below through pipes, A, which lead down to a hopper, F, on the top of each machine. From the hopper the pulp falls upon an endless traveling screen, the upper half of which is inclosed in a rectangular box as shown in the illustration. Here it encounters two currents of air which are delivered by a rubber tube, E, and are admitted



NEW METHOD OF CONCENTRATING GOLD BY THE DRY PROCESS.

at opposite ends of the box, one near the point marked H and the other at the lower end of the machine. The currents meet each other at right angles and the resultant wave-like action of the air separates the gold and the heavier portions of the pulp from the dust and lighter matter. The former settle on the slats of the screen and are carried around to the underside, where they fall off by gravity, or are detached by a light stroke on the screen arranged to fall automatically about twenty times a minute, as the screen slowly revolves. They are run off by spout, C, into a box, and form the concentrates. The rejections or tailings are delivered through the spout, D, at the rear of the machine, and fall upon an endless belt which carries them out to the dump.

The dust, which contains some gold in an extremely fine state of subdivision, is carried up by the pipes, B, B, to a larger transverse pipe which leads into a separate building of perfectly close construction. Here the dust settles and is subsequently subjected to a special treatment for recovering the fine gold which it contains.

Each concentrator has a capacity of ten tons a day. They are operated by Foos gasoline engines, a machine requiring one-eighth of a horse power. All the bearings are boxed and dustproof, and the parts are so well adjusted that but little friction or noise is created by their operation.

The best result was obtained from ore which assayed only $1.25 a ton in gold.

It yielded concentrates to the value of $879.17 a ton, a second test corroborating the first. This is a concentration of 700 to 1.

Another lot, assaying $1.90 per ton, produced concentrates which would amount to $87.80 a ton.

In this condensed form, the gold can be shipped away for final treatment without difficulty, and many mines which do not rank high enough to pay when the ore is passed through a stamp mill can be worked by this process.

Artesian Irrigation.

The results of irrigation the past season in South Dakota have been very gratifying, and demonstrate that the semi-arid portions of the State by this means can be made as productive as any part of the Northwest, says The Chicago Record. There are two distinct methods of irrigation in South Dakota—canals which receive their supplies of water from the spring freshets and from the overflow of rivers and canals, whose water is obtained from artesian wells.

The artesian basin underlies nearly the whole of that portion of South Dakota lying east of the Missouri River, and hundreds of artesian wells have been sunk throughout this vast region. In the southern part of eastern South Dakota there are numerous 2-inch and 3-inch artesian wells, which were sunk at nominal cost. Many of them are from 100 to 400 feet in depth. From 100 to 400 feet in the southern part of the State, the depth of the artesian basin varies to 1,000 or 1,200 in the northern portion. Some of the 2-inch and 3-inch wells in Hutchinson and other counties in that section cost less than $100, and furnish sufficient water to irrigate large tracts of land.

Further north it is necessary to go deeper to reach the artesian basin, and in consequence the wells are of greater diameter, varying from four to eight inches. Brule county has thirty-five such wells, whose combined flow aggregates many millions of gallons in twenty-four hours. A number of wells were sunk by the townships to supply water for stock, and cannot be used for irrigating purposes without the unanimous consent of the taxpayers of each township. The surplus of water is carried away in ditches and affords an abundance of water for cattle, sheep, horses, and other farm animals. These ditches of running water, aggregating several hundred miles in length, extend to practically all parts of the county. Other wells are used for power purposes, while still others were sunk for irrigating purposes only.

This season about 10,000 acres were irrigated in the county. Among the notable irrigated farms in Brule county are the Carpenter farm, belonging to W. O. Carpenter, a Chicago capitalist, and containing more than two sections of land, and the J. M. Greene farm of 640 acres. The owners are well satisfied with their success thus far, and next season will engage in irrigation on a still larger scale. The pioneer irrigated farm in eastern South Dakota is the Hunter-Salzer farm, which has been raised to a high state of perfection.

The farm contains 800 acres of slightly rolling prairie land. The artesian well has an 8-inch pipe down to sand rock. There the diameter was reduced, and a 6-inch pipe reaches to the artesian basin, 1,000 feet below the surface. The normal flow of the well is 1,200 gallons a minute, sufficient to irrigate a tract of 1,200 acres. As a matter of precaution, the well is not permitted to flow its full capacity, being reduced to a flow of 780 gallons a minute. The well was put down six years ago, and cost $3,500. At present prices it would cost not more than $3,000.

Adjacent to the well is a circular reservoir covering five acres. It is constructed on the highest point of the farm, at an elevation of 2½ feet. Three feet to the mile is found to be a sufficient fall for irrigating. The banks of the reservoir are formed by earth, thrown to a height of 5½ feet—22 feet wide at the bottom and 5 feet wide at the top. The inside of the wall thus formed has a slope of 2 feet to 1. The inside of the reservoir is riprapped with stone. The original cost of the reservoir, all work by the day, was $650. The cost of riprapping was about $600 in addition, as the stone had to be shipped in. Where the stone can be obtained on the farm or on adjoining land, an expenditure of $300 would suffice.

The openings from the reservoir into the ditches are two feet square. Each of the ditches follows ridges or slight elevations and the fields on either hand can flooded without difficulty. The ditches are 6 or 7 feet wide and 2 feet deep. When irrigation was in its infancy in this State, it was thought best to keep the ditches full of water all the time, but experiments on the various farms have proved this to be not only unnecessary, but detrimental to crops, the seepage furnishing too much water. After the adjoining land is irrigated, the water in the ditches must be kept below the level of the field.

The mode of irrigating which experience has demonstrated to be the best is to divide a field by throwing up lateral ridges. A break is then made in the main ditch opposite the land to be flooded, and sufficient water is permitted to run over the tract to thoroughly soak it. Then the break in the ditch is repaired and another made opposite the land embraced within the next set of lateral ridges, and so on. These ridges are low enough not to interfere in the least with the proper cultivation of the land. The principal thing is volume of water, and this is the chief advantage of the reservoir system.

One of the ordinary artesian wells, such as can be struck anywhere in the central portion of the State, east of the Missouri River, will fill a five-acre reservoir in eight days. During the irrigating season the reservoir would be emptied in about thirty-six hours. Still, the average well would irrigate from 1,000 to 1,200 acres, because it is customary to thoroughly soak the land in the fall, and when it is once saturated it takes very little water to keep it moist.

The ditches, when all the work is hired, cost about 35 cents a rod, but when once constructed it requires very little expense to keep them in good condition. On the farms under irrigation there are usually four of these ditches to each quarter section of land. The cost of the ditches would be about $224 for a quarter section or $896 for a section of land. The cost, where a farmer does the work himself, is very slight. Small ditches are used only when an odd-shaped piece is to be irrigated, or when the tract is detached or cut up by "draws" or lake beds. The small ditches are easily made, being a matter of plowing two straight furrows.

When the soil is once saturated to the blue clay, moisture will come to the surface fast enough to furnish plant life with all necessary sap. Too much water is fully as disastrous as none, and extreme care is taken not to injure land by wetting it too much. By the reservoir system one man, after he has become familiar with the topography of his fields, can irrigate twenty acres in five or six hours. If the ditches have to cross hollows, the low places are graded up and the water is carried along the top.

The benefits of irrigation are shown by the fact that in the central part of the State, wheat, without irrigation, yielded an average of ten bushels to the acre, while on irrigated fields it yielded from twenty to thirty bushels an acre. In the western part of the State, notably in Fall River county, where irrigation is carried on by means of canals with rivers as their source of supply, wheat averaged about twenty bushels an acre, while without irrigation it probably would not have yielded more than five bushels to the acre. Other crops have yield in proportion, and next season will witness a marked increase in the number of acres which will be irrigated.

New Devices for Deep Submarine Operations.

Hitherto the capacity of a diving dress for resisting the pressure of the superincumbent water has been the limit of man's activity beneath the surface of the ocean. This limit is about fifty yards, so that ships which have sunk in deeper water have had to lie unreclaimed with such treasure as they may have contained, because there existed no method by which a man could go to them. True, diving bells were available, but diving bells, even when made of timber and steel, are crushed out of all recognition of their original shape when let down a greater depth than that in which they are intended to work. Only a little while ago one of these structures was sent down in the waters of Lake Michigan for experimental purposes; and, when brought up, it was found that the steel work was bent out of all relation to its former form. Previously some of the timber of which it was in part composed had been splintered and rose to the surface of the water, the metallic mass remaining below. With a view, however, of resisting this pressure, some machines have recently been constructed to aid the submarine diver, and to enable him to go down to depths which he would not dare attempt in a diving dress, and could never expect to reach in a diving bell. Only a little while ago one of these structures was designed by M. Peatee del Pazzo, who has given his invention the name of the "Travailleur sous Marin," or "Submarine Worker." It consists essentially of a huge sphere of cast iron. On the top of this is a hand rail, in the center of which is a trap door, large enough to allow the workers to enter the bell. It is covered with oilcloth three inches thick, to adequately resist the pressure, so that it can sink to a distance of about five hundred and fifty yards, instead of the ninety which has hitherto been the limit imposed on an ordinary diving bell. The inside of the "submarine worker," which, it need hardly be said, is absolutely airtight, is the room in which the men live, and it is hermetically closed by means of screws before it is lowered beneath the surface. In front of this sphere is placed a powerful lens, enabling the operators to view the surrounding water. This lens is lighted by means of an enormous electric light stationed in immediate proximity to the bell and, like it, suspended from the ship above. This machine can be moved or shifted from one place to another by means of three screws regulated by the rudder, just as a ship is steered on the surface of the water. Furthermore, it is furnished with shovels, pincers and steel hooks fixed to the outside. These are all manipulated by the men inside, who can thus grip or seize any object and take it to the surface, and can even grapple with wrecked ships or parts of them.

It would, of course, be impossible for them to attempt to work outside in these great depths, for the pressure of the water would crush them as flat as the traditional pancake.

In order that the people in the "submarine worker" may be able to communicate with the outside world, a cable is attached to the bell. Along it run fine electric wires connected with a telephone, and this cable also serves to bring the bell to the surface when necessary. If, however, the cable were to break, no serious consequences would occur. The men inside the bell would neither die of asphyxiation after using up their supply of compressed air nor would the bell remain at the bottom of the ocean, or sink thither. All the men have to do would be to detach some bags of ballast with which the machine is furnished for the purpose of keeping it steady, when it would rise of its own accord to the surface.

Entirely different from this is the idea of a Swedish engineer. His apparatus consists of what may be described as a submarine telescope of gigantic porportions or a diving chimney—which latter is perhaps the better description, for it is a chimney which goes down into the water instead of up into the air. The resemblance to the telescope is, however, readily appreciated when it is stated that the chimney is made up of pieces which fit into one another, exactly in the same way as do the sections of a telescope, and it is lengthened in precisely that manner. Each section is about twenty feet long, and the largest, which is sunk to the greatest depth, has a diameter of fifteen feet. These sections diminish gradually upward until the smallest is only about half this diameter, and to it is attached an inverted bell-shaped mouth, which forms the entrance into the long tube. It is made of the strongest aluminum bronze, and of such a thickness that it can withstand a pressure of four hundred pounds to the square inch. The bottom section, which is, naturally, closed, is supplied with windows all round the circumference at intervals of about two feet, so that it offers opportunities for perfect examination of everything in the neighborhood on all sides. On each side of each window are attached rubber arms enabling the workmen within to fix grappling hooks and chains round about a sunken ship, for the chimney is designed especially for the purpose of enabling wrecks to be raised to the surface. Indeed, the passenger steamer "Soedra Scerige," which was sunk a couple of years ago in three hundred feet of water off the Swedish coast, has been recovered by the possibilities which the diving chimney has introduced, and she is now once more sailing on the surface of the ocean, none the worse for her submersion.—Pearson's Magazine.

THE Hospital extols the virtues of hot oil as more efficient than boiled water in sterilizing instruments, especially syringes. Olive oil at a temperature of 320° to 356° F. acts very quickly and with great power. To obtain complete sterilization of the instruments, it suffices to dip them for an instant into the hot oil, and in the case of syringes it is sufficient to fill them twice with oil at the temperature mentioned. The temperature of the heated oil may be determined by a thermometer, which certainly is the scientific way, but Prof. Wright, of the Netley Hospital, in England, suggests the very crude but rough and ready method of dropping a bread crumb into the oil, which becomes brown and crisp as soon as the required temperature is obtained.

Fluctuations in Rainfall.

A correspondent, in a recent communication to Nature, pointed out that the statistics of rainfall which have been collected in various parts of England for many years past show that there is a regular recurrence of cold and wet periods every thirty-five or thirty-six years, measuring from the centers of each period. The correspondent adds: "Curiously enough, other observations show the same rule to apply to many distant parts of the world as well. On the assumption that these fluctuations may be depended upon, the center of the next wet period should occur in the second decade of the coming century, but in the immediate future we should have a preponderance of dry years for some years yet to follow."

The subject being called to the attention of Prof. Draper, who has charge of the meteorological observatory in the Central Park Arsenal, he said he believed the statement made by Nature's correspondent to be at least approximately correct, and hazarded the guess that the correspondent is Mr. Symmons, who has charge of the British rain records, and receives results from 2,500 rain gages in the British Isles.

Prof. Draper produced records of the rainfall in New York from 1836 to 1886, and a chart which he had prepared from them. This chart shows a well-defined wave, beginning in 1836 far below the mean rainfall and rising slowly (with one violent fluctuation) year by year until it crept above the mean line. It continued to rise for a number of years, and then began to fall, going again below the mean line and remaining there more than ten years. The violent fluctuation spoken of was one from a total rainfall in 1836 of 27·57 inches—the lowest recorded—to one of 65·51 inches in 1837, the highest recorded.

Prof. Draper also has like charts of the rainfall at Washington, Philadelphia, and Providence, R. I., extending through a long period of years, which show results differing only in degree from those obtained in New York, and lead to the conclusion that the fluctuations vary with localities. He said that he had examined the French records for two hundred years and found only three decided fluctuations in that time.

The reason for these fluctuations in the rainfall, Prof. Draper said, is not known to man.

The Temperatures of Animals.

A number of interesting observations on the temperatures of animals in relation to the temperature of the air or water in which they live are described by Mr. Alexander Sutherland in the latest volume published by the Royal Society of Victoria. It is well known that the temperature of the human body in health is 97° or 98° Fah., and this is the same within a degree both in winter and summer. The average body temperature of what are known as warm-blooded animals is a little higher than this, being 100° Fah., and except in constitutional disturbances, this does not vary more than three or four degrees at any time of the year. No mammal, indeed, seems in good health to be warmer than 104°; scarcely any descend lower than 98°. The warm-blooded animals are thus animals whose temperatures, whether the weather be hot or cold, are practically uniform. On the other hand, cold-blooded animals have no proper temperature of their own; they are warm in warm weather and cold in cold weather. A fish, a snake, a frog, or an insect, when at rest, is rarely more than two or three degrees warmer than the air or water in which it is living. Mr. Sutherland placed some lizards in cold water, which was then gradually heated, and he found that in all cases the lizards became warmer as the water was warmed and cooler as the water was cooled—in other words, they depended upon external circumstances for their heat. But this is not absolutely true, for when angry, cold-blooded animals, like human beings, become hotter than usual, even a fish rising several degrees above the temperature of the water when it is exasperated. Under normal conditions, however, fishes and reptiles have practically the same temperature as the medium in which they live; when it is warm, they become warm and active, and when it is cold they lose their bodily activity and become torpid. The animals which are active in all weathers are those which are self-supporting as regards heat, and whose body temperatures vary very slightly. An interesting point brought out by Mr. Sutherland's observations of the temperatures of Australian animals is that the mammals which are classed lowest from considerations of body structure are not only of the lowest temperature, but also of the greatest range of variability, being most affected by the temperature of the air or water surrounding them.

THE MIRACULOUS WINEGLASSES.

BY W. B. CAULK.

As a rule, magicians are very generous fellows, always ready to give their audiences something, such as coins and handkerchiefs, but just when one thinks they have the gift safely in their grasp, it mysteriously vanishes. However, there are a few exceptions to this rule, one of whom is a very popular English performer.

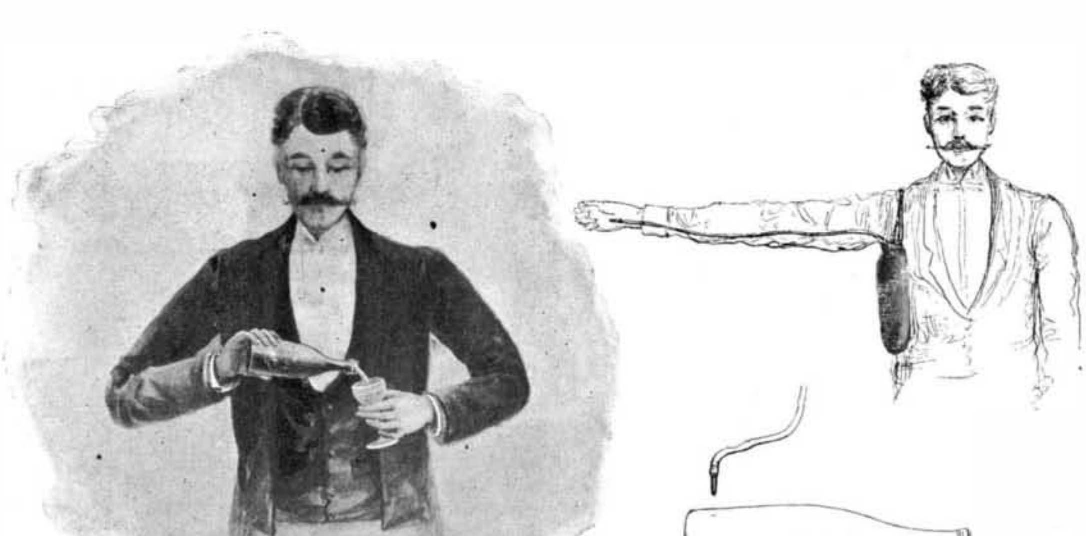
THE MIRACULOUS WINEGLASS.

This magician goes among the audience and borrows a gentleman's handkerchief, and immediately produces from it a glass filled with sherry. This he offers to the ladies, then, shaking the handkerchief, he produces a second glass full of port for the gentlemen, next one of ginger beer for the younger members, and one of milk for the very young, but there being present one or two teetotalers, he next produces a glass of water, and lastly a glass of stout for himself. All of these are pronounced by the audience to be excellent.

THE GLASS COVERED WITH RUBBER.

The glasses are of the small stem wineglass pattern. On both sides of the magician's coat, inside, of course, are large pockets, and in each pocket is placed in a prearranged form three of the glasses. To prevent a possible spilling of their contents (and, as each glass is filled to the brim, this would be very difficult), there is fastened over the mouth of each glass a thin soft rubber cap or cover, as shown in the small engraving.

To produce the glass, the performer spreads the borrowed handkerchief, which should be a large one, over his breast in such a manner that one hand is concealed under it, and with this hand he reaches in the pocket and brings forth the proper glass, removing the rubber cover and leaving it in the pocket. This move is repeated until all the glasses have been produced. After producing three of the glasses with say the left hand, he must spread the handkerchief so as to cover the right hand, leaving the left one free to manipulate the handkerchief, as it would be most awkward to try and produce the glasses from both sides of the coat with the same hand.



THE MIRACULOUS WINEGLASS.

This trick is a most effective one, as the spectators cannot understand how it would be possible for the performer to conceal a glass filled to the brim, as these are, about his person.

After distributing the glasses, and offering an apology for his inability to treat all present, he pretends to overhear a remark that his audience is not satisfied, and that many think they have been slighted. He states that he will endeavor to comply with the demands of his thirsty audience, and retires to fetch a bottle. Off the stage he removes his coat and places under his right arm a rubber bag filled with wine. To the bag is attached a rubber pipe with a small metal point, which pipe he holds next to his right arm and replaces his coat, leaving the metal end just within the cuff.

The bottle has a small hole in the side, near the bottom, of such a size as to fit the metal point on the rubber pipe. In rinsing the bottle the performer keeps one finger over the hole, thus preventing the audience discovering that the bottle differs from an ordinary one. In rinsing the bottle the outside has become wet, and in drying it with a cloth the performer places the metal point on the rubber pipe in the hole in the side of the bottle, thus making connections with the bag of wine. By holding the bottle well down toward the neck, and close to his wrist, he can venture among the audience without fear of detection.

By pressing the right arm against his side the bag is compressed, forcing the wine through the pipe into the bottle.

The glasses are of special make and of very thick glass, making quite a bulky appearance, but of very limited capacity. An assistant carries a tray containing one hundred of the glasses.

Material from Space.

Recent researches have gone far to render possible the assertion of Nordenskjöld and others that a large portion of the earth's constituents may be of cosmic origin—that, in other words, in the course of ages the distant stars and other heavenly bodies may have contributed of their substance to thicken the crust of our world. For example, at various times and in various places there has been collected from the snow a black powder containing metallic iron, and in some instances cobalt and nickel, while on the "inland" ice which covers Greenland a peculiar mineral powder, named kryokonite, mixed with grains of metallic iron, has been detected.

This dust consists of small, angular, double refracting crystal fragments, without any mixture of particles of glass, and is, therefore, very different from the glass dust that is commonly ejected from volcanoes. From these and similar data Nordenskjöld ventures on the assertion that not improbably, if this dust falls in an equal amount all over the globe—and though the snow enables it to be detected more easily than on earth, there is no reason for supposing that it does not—something like half a million tons drop from the celestial spaces in the course of a year. The shooting stars must discharge an immense quantity of those luminous particles. For hours at a time we see them falling; and when we remember that this has been going on during unnumbered geological ages, it is not impossible to regard it as an important factor in the history of our planet. In brief, it may be found that "a considerable quantity of the constituents of our sedimentary strata, especially of those that have been deposited in the open sea far from land, are of cosmic origin, and will throw an unexpected light on the origin of the fire hearths of the volcanoes and afford a simple explanation of the remarkable resemblance which unmistakably exists between plutonic rocks and meteoric stones, namely, by showing that the principal material of the plutonic and volcanic rocks is of cosmic origin, and that the phenomena of heat which occur in these layers depend on chemical changes to which the cosmic sediment, after being covered by thick terrestrial formations, is subjected."

Without quite homologating this idea, it is certain that meteoric or native iron is and has from the remotest ages been falling on the earth's surface from the immeasurably distant regions outside of our atmosphere.—Our Earth and its Story.

THERE were in 1801 only twenty-one towns in Europe with a population of over a hundred thousand.