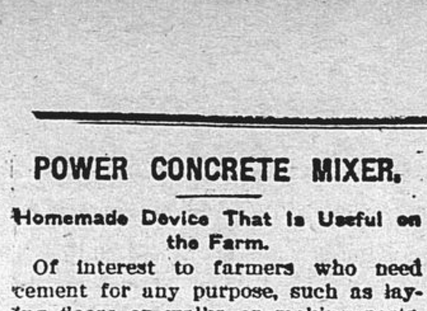
POWER CONCRETE MIXER.

Homemade Device That Is Useful on the Farm.

Of interest to farmers who need cement for any purpose, such as laying floors or walks or making posts, is a bulletin issued by the Colorado experiment station which tells of mixing concrete by machinery and prints the accompanying illustration of a homemade mixer, which is described thus:

Two pieces of 4 by 6 form the sills. Upon these two, uprights about three feet high are fastened. A one and one-half inch pipe passes through holes bored in the top of the uprights. Upon this pipe the mixing box is turned, and through the pipe the water is added to the mixture at the desired time. The water is poured in at the top of the upright pipe and flows down and out through holes which are drilled in the lower side of it. The other end of the pipe is closed by a wooden plug.



POWER CONCRETE MIXER.

The ends of the box are made of pieces of 2 by 8 bolted together. A hole bored in the center of each end forms the bearings. The sides of the box are made of one inch lumber and are simply nailed to the ends with twelvepenny nails. One-half of the box is made so that it can be detached and lifted off when the mixer is to be filled or emptied. The detachable half is secured to the other half by means of strong hooks so placed that by slipping this half about an inch to one side all of the hooks are loosened at once. After it is in position the removable portion is held in place by means of a barn door latch.

The driving gear is simple, but very effective. It consists of the rim taken from the wheel of an old rubber tire buggy. With the tire removed the grooved rim makes a very satisfactory wheel upon which to run a three-quarter inch rope belt. The belt is driven by a small sheave pulley, which is fastened to the countershaft. A belt tightener is used upon the rope, and by using a very loose belt the tightener is made to act as a friction clutch. This particular mixer is driven by a two horse gasoline engine, which is belted to the countershaft. The engine runs continuously, and the mixer is started and stopped by means of the belt tightener.

Many other systems of driving might have been used in place of the rope belt. The main gear of an old self binder makes an excellent gear for a mixer. An old mower gear may also be put to good use in this connection. It is not necessary to have the mixer driven by an engine or horse power. A crank may be attached and the machine turned by hand. Many prefer turning such a machine rather than mixing the concrete with a shovel.

CITY MEN FOR FARMS.

Many Would Make Good Hired Hands if They Had Chance.

Many farmers throughout the country find it a difficult matter to get hired hands, while in the great cities there are thousands of men out of work. The problem of inducing some of the down and outs of city life to go out on the farms is claiming the attention of social students.

A commission of the New York legislature recently has been making an inquiry into the matter, though it has not taken up the subject exhaustively. John Mitchell, the noted labor leader, was present at one of the sessions and made suggestions.

The chief trouble seems to be that those in the cities who are always deep in poverty know nothing of country life, seldom if ever having seen the green fields. They were born to their conditions and know nothing else.

Thousands of these men, no doubt, if they should be taken out and given jobs on farms would return to the city as soon as they earned money enough. That is because the city sights and sounds have become second nature to them. They would pine for the filth and furore of their native element.

But, on the other hand, there is no doubt that many men in the cities would welcome a chance to get away to the country for themselves and their families and would develop into excellent farm hands. The problem is to put these men in touch with farmers who need them.

Diseases of Fowls.

Most of the diseases that afflict fowls are the result of carelessness and indifference on the part of the owner as regards the surroundings and conditions of his poultry. No poultry will show to advantage on the credit side of the cash account unless they are healthy and well cared for. How to prevent disease should be the watchword rather than how to cure disease.

THE MICROBES.

But For Them All Green Plants Would Vanish From the Earth.

Few persons can realize at first what an immense number and variety of microbes there are not only around us in the air and dust and water, but also in us and on us and in and on every living thing. The work, the huge system of chemical change and the circulation of the elements—carbon, oxygen, hydrogen, nitrogen and sulphur—which they carry on is incessant, varied and complex. Those five elements are the main and essential constituents of all living things. Supposing there were no microbes, there would be no putrefaction, no breaking down of the dead bodies of animals and plants which were once alive into gas and substances soluble in water.

They by a series of steps in which different kinds of bacteria or microbes are successively concerned convert the proteids and the fats and sugars of dead plants and animals into less elaborate bodies, organic acids, aromatic bodies and other compounds (some highly poisonous to man), and at last, when what were highly complex combinations of hundreds of atoms in each molecule have been reduced by the action of first one and then of another kind of microbe into comparatively simple substances of twenty or thirty atoms to the molecule, the coup de grace is given by certain special microbes, which convert these later compounds into still simpler combinations—namely, ammonia and nitrates, which are fairly stable, so that the whole elaborate chemical fabric of living matter in a few hours or days after death is broken down until it reaches the stable "mineral" condition, practically carbonate and nitrate of ammonia—smelling salts.

If there were no microbes this would never occur. The earth would be cumbered with the dead bodies of past generations of animals and plants—undecomposed. And very soon all the organic elements, all the carbon and nitrogen, if not all the hydrogen and oxygen, on the face of the earth would be fixed in these corpses, and the green plants would perish from the whole world for want of sustenance, for it is the green plants which feed on and absolutely must have as their food the carbonic acid, ammonia and nitrates into which the microbes resolve all living things when dead. It is the green plants which from those simple compounds build up again the more complex molecules, the sugars, fats, albumens and proteids and provide for the nourishment and increase of the most complex of all—the living matter hidden in protoplasm.—Sir Ray Lankester in London Telegraph.

The Perverse Comma.

That curious and now stereotyped blunder of punctuation which gives us "God rest you, merry gentlemen," as an inferior substitute for the quaint old greeting, "God rest you merry, gentlemen," turns up regularly every Christmas. It is a pity for the ancient formula to be thus perverted since "God rest you merry" or "Rest you merry" was a recognized form of salutation in Elizabethan days and may be found in the works of Shakespeare and of many contemporary writers, while for the modernized form, which obscures the original sense of the phrase, there is, of course, no authority whatever. If any one will have the curiosity to look up the old Christmas carol which begins with the words in question he will find them correctly punctuated.—London World.

Alaskan Glaciers.

An interesting fact about Alaskan glaciers is that some are "dead" and others are "alive." Davidson glacier, which is really a tongue of the Muir glacier, has been ascended by travelers for a number of years. It is a dead glacier, having a moraine of several miles between it and the sea. Looking at it from the boat, it represents a kaleidoscopic appearance as the sun shines upon it, and the surface seems scratched with tiny pin lines. These are in reality deep crevices, which must be approached cautiously, for they are lurking pitfalls for the unwary.—Vancouver Providence.

A Man of Straw.

Many years ago in England men could easily be found to give any evidence upon oath that might be required, and some of these persons walked openly in Westminster hall with a straw in one of their shoes to signify they wanted employment as witnesses. This was the origin of the saying, "He is a man of straw." But the custom has high antiquity. A writer in the Quarterly Review says that such were common in Greece.

One on Him.

"Pardon me," said a gentleman at the entrance to a downtown restaurant. "I have something on you."

"And may I ask what it is?"

"My hat."—Birmingham Age-Herald.

His Point of View.

"What part of the railway train do you regard as the most dangerous?" inquired the nervous man.

"The dining car," answered the dyspeptic.—Washington Star.

ON THE WITNESS STAND.

The Right of a Witness to Qualify His Answers.

Like Stevenson's child, as a rule, the witness should speak only when he is spoken to. He should not volunteer anything except that when he is asked a question which with apparent innocence could really be answered "Yes" or "No" he has a right to qualify a plain "Yes" or "No." This of course happens most often in the case of experts. The "Yes, but I will explain," and "No, but I will explain," of one of the distinguished expert witnesses for the commonwealth in the case of commonwealth versus Quay, which was tried before Judge Biddle in the court of quarter sessions of Philadelphia county several years ago still linger in the writer's memory.

It is a mistaken notion that a witness is bound to answer "Yes" or "No." It is surprising that such should have ever been the received theory, but then the hunting down of witches and the expounding of the doctrine of witchcraft were regarded as proper judicial functions only a century or two ago. The theory as to categorical reply was completely exploded by the gentleman who propounded the question, "When are you going to stop beating your wife?" and demanded a categorical answer. If the lawyer attempts to tell you that you must answer "Yes" or "No" you have the right to say that the question is one which is not susceptible of a categorical answer. This should floor counsel for the moment.

Mannerly behavior on the part of witnesses includes keeping one's temper under almost all provocations. Cross examination for the purpose of testing your memory is not intended to be and should not be regarded as insulting. It should therefore not be resented. If the cross examination transcends all bounds and your patience is exhausted a sharp retort will not necessarily injure your testimony with the jury. The jury sympathizes with the witness more than with the lawyer, and, while mere smartness for the sake of being smart or because of a too expansive personality is to be deplored, you will be sure of a sympathetic audience if you are in the right and counsel in the wrong.—Ira Jewell Williams in Green Bag.

UNDER AN UMBRELLA.

An Expensive Adventure of a Famous Parisian Wit.

Romieu, the famous Parisian wit, was one day caught in a shower and forced to seek refuge in a doorway of the opera house. It was 6 o'clock already, and he had an engagement in the Cafe de Paris for that very hour. The rain fell in torrents. There was no carriage to be had. He had no umbrella. What was to be done? While he was lamenting his bad luck a gentleman with a large umbrella passed by. Romieu was seized with a sudden inspiration. He rushed out and grasped the stranger by the arm and gravely installed himself under the protecting umbrella.

"I am overjoyed to see you," he immediately began. "I have been looking for you for two weeks. I wanted to tell you about Clementine."

Without giving the stranger time to express his surprise Romieu rattled away with gossip and anecdote until he had led the unknown companion to the door of the Cafe de Paris. Then he glanced at him with a face of well feigned astonishment.

"Pardon, monsieur!" he cried. "It seems I am mistaken."

"I believe so," said the stranger.

"Good gracious!" added Romieu. "Be discreet. Don't repeat what I have told you."

"I promise you."

"A thousand pardons!"

Romieu hastened within the cafe and amid great laughter told the adventure to his friends. Suddenly one of them said:

"Your cravat is rumpled."

Romieu put his hand to his neck and turned pale. His pin, a valuable sapphire, was gone. On further examination his purse and watch were found to be gone. The man with the umbrella was a pickpocket.—London Tit-Bits.

An Italian Superstition.

There is an Italian superstition that whenever a king belonging to the house of Savoy dies a huge eagle is to be seen crossing the Alps over the valley of Aosta in the direction of Savoy, and the conviction prevails among the inhabitants of Aosta that this eagle guides the soul of the dead sovereign to join those of his ancestors in Savoy. When King Charles Albert died at Lisbon, King Victor Emmanuel died at Rome and King Humbert was assassinated at Monza in 1900 the eagle was seen winging its way across the Alps. All other eagles crossing the Alps don't seem to count for much.

Ancient Ropes.

Ropes made of various kinds of fiber and leather are of very ancient date. Ropes of palm have been found in Egypt in the tombs of Beni-Hassan (about 3000 B. C.), and on the walls of these tombs is also shown the process of preparing hemp. In a tomb at Thebes of the time of Thothmes III. (about 1600 B. C.) is a group representing the process of twisting thongs of leather and the method of cutting leather into thongs.

LIGHT AND THE EYES

We Do Not Always See Things as They Really Are.

COLORS WE CANNOT DISCERN

Normal Vision Is Not Able to Penetrate to the Regions Beyond the Violet—Some Results That Have Been Attained With the Camera.

Those of us who are fortunate enough to possess normal eyes are apt to feel instinctively that we see things as they are. This is a mistake. The appearance of the world at large is merely the result of the circumstance that the human eye perceives only a comparatively small part of the total radiation which comes from the sun or is given out by a lamp.

To make this a little clearer we may consider one of the oldest experiments in optics, the passage of a ray of light through a prism.

When a beam of sunlight passes through a prism of glass such as is often found on old fashioned chandeliers the rays are spread out, forming a spectrum, which we see as a rainbow colored band upon the wall. The colors of the spectrum merge into one another by insensible gradations, though the older physicists were in the habit of recognizing seven—red, orange, yellow, green, blue, indigo and violet.

These colors which the eye perceives are by no means the only ones present in the spectrum. If we perform the experiment in a dark room and place a photographic plate in such a position as to receive the image of the spectrum we find that it extends to a considerable distance beyond the violet.

In other words, there is a region beyond the violet which the eye cannot see, but which the sensitive plate is able to photograph. This region is termed the ultra violet, and the light from virtually all sources contains a greater or less amount of this ultra violet light.

The only difference between this ultra violet light and ordinary visible light is in the length of the wave, which is, in fact, the only difference between the different colors of the visible spectrum. If, instead of using a glass prism for forming our spectrum, we use one cut from a quartz crystal we find that the ultra violet spectrum is very much longer, which shows us that the shortest waves of light are not transmitted even by the clearest glass.

If your eyes were sensitive to this region of the spectrum instead of to the other the appearance of things would appear black, our windows would be as opaque as sheets of iron, and polished silver would resemble anthracite coal. In other words, things appear as they do merely from the circumstance that in the process of evolution our eyes have developed a sensibility to a certain region of the total spectrum of the light which comes to us from the sun.

If we have used an ordinary photographic plate in our experiment we shall find that it has received no impression from the red and yellow parts of the spectrum and very little from the green. The plate therefore suffers from the same defect as our eye. It is sensitive only to a limited region. Recently, however, means have been found of rendering plates sensitive to the entire visible spectrum and to a certain extent to the infra red or the extension beyond the red analogous to the one beyond the violet.

With a photographic plate rendered sensitive to the entire spectrum we could obtain an idea of how things would appear if our eyes were sensitive to regions other than the one adopted by nature by excluding from the lens of the camera all rays other than the ones with which we wish to operate. This is done to a limited extent every day by all photographers who employ color screens in their work, and it is well known that increased contrast can often be obtained in this way.

If, for example, we attempt to photograph white clouds against a blue sky without the use of such a screen we get scarcely any trace of the clouds at all, whereas if we place a yellow glass in front of the lens the clouds come out snow white on a very dark background.

We can see this same effect by viewing the clouds first through a piece of deep blue glass, which is what the photographic plate "sees," and then through the yellow plate.

At my laboratory at East Hampton, N. Y., I have pushed this principle to the extreme and have obtained photographs both by the infra red and the ultra violet invisible rays.—Robert William Wood in Century.

Beef and Dairy Cattle.

When a dairyman has faced the actual practice of selling cows from his herd for beef he will not feel encouraged over the outlook of combining beef and dairy qualities in the same herd. There is a popular prejudice against eating beef from an old, played out dairy cow, and there is no advantage in trying to combine the two qualities in one animal.