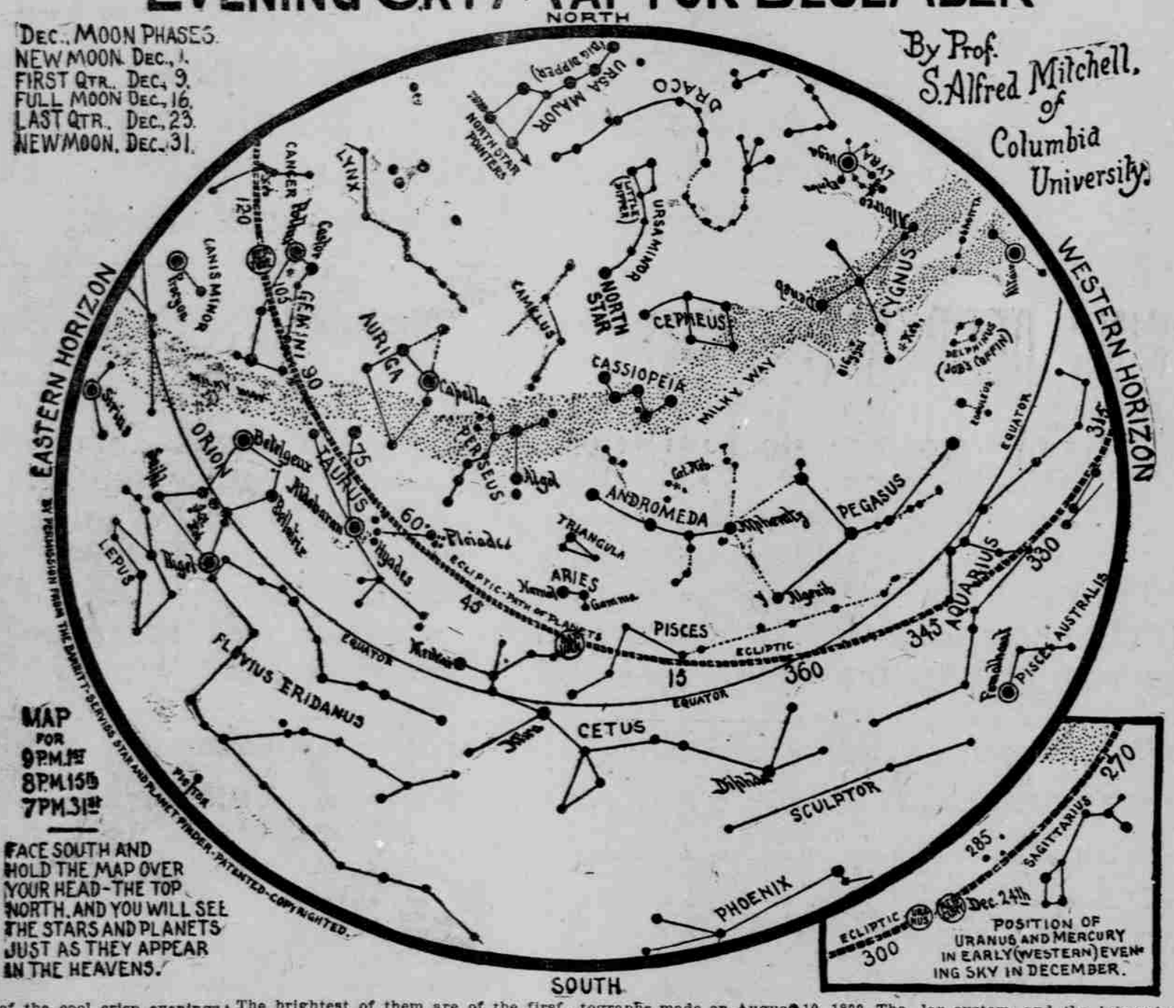
EVENING SKY MAP FOR DECEMBER



ON one of the cool crisp evenings that come at this season of the year, we see the heavens sparkling with countless gems of light, apparently millions in number. Indeed, most people believe that it would be absolutely impossible to count all the stars that can be seen with the naked eye; and throughout all ages of the world's literature, the terms "numberless as the sands of the seashore," and "countless as the stars," have been regarded as synonymous. But to be "like the stars in number," would not necessitate a very great number, if one refers in that, to the stars that may be seen with the naked eye. As a matter of fact, we could not count these stars up into the millions, nor even to hundreds of thousands, nor yet to tens of thousands. At any one time only three thousand stars can be seen without a telescope by any observer, and in the whole heavens there are less than six thousand stars that may be seen with the naked eye.

With a Small Telescope.

Even with a small telescope, the light gathered to fall on the retina of the eye is many times that which falls on the unaided eye, and as a consequence many more stars are revealed. With greater and greater telescopes, there are brought to out ken, fainter and fainter stars. Strange as it may seem, a moderate sized photographic telescope with the modern sensitive plate can portray stars and nebulae which are too faint to be seen by the keen eye of the astronomer using even the great 40-inch Yerkes telescope. It has been estimated that the photographic plate has revealed no less than one hundred million stars. Each of these stars shines by its own light and is, consequently, a sun. How would our own sun compare in size and brilliancy with one of these distant orbs of light? Do some of these suns have planets circling about them? Do any of these planets (if there are such) resemble our own earth? Are they inhabited? These are interesting questions that we can partially answer.

The Darwinian theory of evolution explains the gradual development of life on this mundane sphere of ours. In the heavens, we see abundant evidences of evolution, changes going on with majestic slowness, through eons of time. In the evolution of these hundreds of millions of other suns, it does not seem impossible for some to have developed like our own sun, nor does it seem unthinkable for some of the planets belonging to these solar systems even to be inhabited. Different environments would have made men on these planets different from the average American, but none the less they may be human beings. It seems hardly likely that the vast universe was made solely for our pleasure, with stars and other systems serving no other useful purpose than being mere points of light in the sky.

Sun's Brilliancy.

To compare the brilliancy of our own sun with others, we must know the relative distances and their relative brightness. The brightest fixed star in the heavens is the brilliant dog star Sirius, which is found low down to the southeast in the early evening. The astronomer keeps track of the brightness of the stars by their "magnitudes." The brightest of them are of the first magnitude, those just visible to the naked eye, of the sixth magnitude. The twenty most brilliant stars known to the ancients were regarded as of the first magnitude stars. As science became more exact it became necessary to distinguish between these brighter stars, for some were much brighter than others, and so measures were made to determine the brightness. The stars were compared among themselves or with the light of a standard candle by an instrument called a photometer. A very exact part of astronomy thus has arisen.

Magnitude of Stars.

The magnitude of the stars, as a result of these measures, can be more accurately stated. The brighter a star is, the smaller the number representing its magnitude, and consequently a star of first magnitude is one magnitude brighter than one of the second. And one of the second magnitude is two magnitudes brighter than one of the fourth. In the same way stars brighter than the first magnitude can be represented by numbers smaller than one by decimals, or even by negative numbers. Sirius is of the—1.4 magnitude, Vega of 0.2 magnitude. A star of the first magnitude is five magnitudes brighter than one of the sixth, and it gives just 100 times as much light. The fifth root of 100 is 2.512, and consequently a star of a certain magnitude gives 2.512 times as much light as one of a magnitude fainter. (Those who understand logarithms will see at a glance that log 2.512 is equal to 0.4.)

Our sun is a star of the —26.5 magnitude, and it gives us 10,000,000,000 times as much light as Sirius. If the sun were twice as far away from us as it is, it would give only one-quarter as much light. If it were 100,000 times farther off than it is, its light would be the same intensity as that of Sirius. But even at this enormous distance, the sun would be only about one-sixth as far away as Sirius exactly lies. In other words, Sirius shines with a luster fully 30 times that of our sun.

And Sirius is not a solitary example. The sun looks big and bright only because it is so close, but if it could be put off from us to the average distance of the fixed stars, it would shine with a luminosity just visible to the naked eye, it would be a star of about the sixth magnitude. There are vast numbers of other suns more brilliant and more massive than our own sun.

New Stars.

Another new star has been found at the Harvard college observatory, the third of these bodies in a period of six weeks. When a star suddenly blazes out and increases its brightness in a remarkable manner in a short period of time, it is called a "new" star or "Nova." The brightness usually lasts but a short time, and the star again sinks to its former state of comparative obscurity. During the past 25 years only 17 new stars have been found altogether, of which number no less than 14 have been found at Harvard. The last addition was found by Miss A. J. Cannon, but the interesting part of its life history—the period of maximum brightness—was seen many years ago. The discovery was made in November, 1910, from a study of photographs made on August 10, 1899. The star appeared in the constellation Sagittarius from that date until October, 1901. The star cannot be found in the constellation now. It is very curious that three such unusual discoveries should be crowded into six weeks.

A comet has been discovered with the great 36-inch telescope of the Lick observatory. This is a return of Brook's periodic comet, 1889 V., which revisits the earth every seven years. The comet was found within 30 seconds of arc of its predicted place (one-sixtieth part of the diameter of the moon), but it is unfavorably situated and cannot be seen in small telescopes.

Some years ago Prof. Charles Lane Poor of Columbia university showed that this comet in March, 1883, came very close to the great planet Jupiter. Before this date the comet had a period about the sun of more than a hundred years, but the attraction exerted by Jupiter was so strong that the comet was pulled out of its former orbit, was "captured," and made a permanent member of "Jupiter's family." The comet was observed in 1889, 1896, 1903, and now in 1910. This comet has afforded a splendid example of the manner in which comets are brought into the solar system, and the interest attaching to it is great on that account.

The Planets.

Mercury may be seen in the southwest about Christmas day setting an hour after sunset. Venus is still too near the sun to be visible.

Mars is a moving star rising an hour and a half before the sun, but it is faint and uninteresting.

Jupiter rises two or three hours before sunrise and during the winter will become more and more prominent.

Saturn is still a magnificent object for a small telescope. It rises about sunset and can be readily found by any one, the brightest body last of the meridian. The possessors of telescopes will have continued pleasure in examining it closely. Additional interest is attached to it now, due to the presence of a polar cap discovered at the Lick observatory.

The sun is at the winter solstice on December 22 at 10:12 a. m. This is the "shortest day in the year," the day of least sunlight. By consulting any ordinary almanac it will be seen that the sun does not rise the latest nor set the earliest for the year on this date. What is the reason?

Legume Inoculation Of Soil

By W. L. Rockwell, U. S. Irrigation Expert.

FREQUENT inquiries are made regarding the benefit, if any, to be derived by inoculating the soil for leguminous crops, among which are alfalfa, cow peas, beans, clover, vetch and peanuts, hence a few words as to what inoculation means, and the methods employed in accomplishing same may be of interest.

There are certain bacteria which when present in the soil upon which legumes are being grown, cause the plants to take a certain amount of the the free nitrogen of the air, which nitrogen is deposited in nodules on the roots of the plants, thus adding valuable plant food to the soil, to be used not only by the crop growing at the time, but also by those which follow later. If, however, these bacteria are not present in the soil, the legumes, like other plants, have not the ability of extracting from the air this food element, hence in soils that are not inoculated the legumes as other crops draw their food entirely from the soil, and gradually deplete the store of plant food. Though leguminous crops only are directly benefited by this process, still succeeding crops receive the benefit of the stored food, and the soil is built up and made more fertile and productive.

Two Ways to Do It.

Inoculation is accomplished in two ways, by transfer of soil from a field in which the bacteria are present, and by the use of pure cultures of the proper bacteria. If the former method is employed, care should be exercised that soil is obtained from a field in which there is no foul seed, or disease. Long continued and extensive experiments have proved that there are certain species more nearly adapted to certain legumes, thus one species is adapted to alfalfa, another to cow peas, hence the proper one should be chosen.

Methods of legume inoculation are thus described in circular 63, bureau of plant industry, United States department of agriculture:

The Soil Transfer Method.

"The soil transfer method consists in scattering over the new ground at the rate of 200 or 300 pounds to the acre soil either from a healthy old field of the same crop that shows field of the samec rop that shows abundance of nodules on the roots. To facilitate even scattering the inoculated soil should be thoroughly mixed with several times its weight of ordinary soil, and it may be drilled or broadcasted. If the soil is broadcasted it should be harrowed in immediately, and if possible this should be done toward evening or on a cloudy day, as a bright sunshine is very harmful to bacteria.

Pure Culture Method.

"The method of inoculation by pure cultures depends to a certain extent upon the type of pure culture which may be used. Generally speaking, however, a bottle of pure culture of the proper kind of bacteria is opened shortly before the seed is to be planted and the culture mixed with the proper quantity of water and applied to the seed in such a way that all the seed may be moistened, though not soaked. The seed should be planted as soon as practicable after this treatment; that is, as soon as it is sufficiently dry for convenient handling. Drying may be facilitated by adding dry, sifted earth, preferably from the field in which the leguminous crop is to be grown. It is undesirable to store inoculated seed, as the nodule bacteria often die out rapidly after the seed has been treated with the pure cultures and dried. Inoculated seed should never be dried in the sun. It is also possible to thoroughly mix the pure culture with a considerable quantity of soil, preferably from the field where the legume is to be sown. The treated soil can then be distributed in the same manner as when inoculating by the use of soil from an old field.

The advantages of artificial cultures lie in the greater ease of their transportation and application, as well as in the absence of the danger of introducing harmful weeds or plant diseases, although this method of inoculation, especially in the case of alfalfa, is less certain than the soil transfer method previously described.

"Attempts to secure inoculation either by the use of pure cultures, or by the use of soil from old, well inoculated fields will fail if the crop which is being experimented with is not adapted to the locality or if the climatic conditions during the growing season are not favorable."

Field experiments are being conducted by the bureau of plant industry, United States department of agriculture, Washington, D. C., to determine under what conditions of soil and climate soil inoculation may be successful, and with that end in view limited quantities of cultures will be supplied, requiring only the filling in of blank reports, which are occasionally forwarded

Market Baskets of Regular Size Will Answer the Purpose.

Rib Roast and Corn Have Drop in Price This Week

New Crop Feed Stuff Has Effect on Local Prices.

Milady's market basket this week-end will be about the same as last week, if prices have anything to do about it. A few novelties are in, but the staples hold their own.

With the exception of prime rib roast, which has taken 17½ cents as a bottom, no meats have dropped. Pork, which last week took a tumble, stands pat, while lamb chops are very stiff at 30 cents.

A holiday novelty already on the scene is the "Christmas cantaloupe," a peculiarly shaped melon, which hails from California truck farms. Otherwise, no green stuff has come in, while a few standbys have dropped out of the list.

A large drop is beginning to show in prices of feed. At retail, corn is selling at $1.50, instead of $1.55, and chops as well have dropped 5 cents.

Here is the list of prices, and suggestions:

Fruits.

Fresh cocoanuts	10c each.
Navel oranges	25c to 50c per doz.
Mexican oranges	40c to 50c per doz.
Christmas cantaloupes	25c each
Empress grapes	50c per basket
Fresh Mex. strawberries	15c per box
Japanese persimmons	20c per lb.
Fresh cranberries	15c per qt.
Fresh Mex. pineapples	35c each
Gano apples	3 for 25c—$2.25 box
Winesap apples	3 for 25c—$2.50 box
Blacktwig apples	3 for 25c—$2.50 box
Mexican oranges	40 to 50 cents doz.
Grapefruit	10c, 3 for 25c
Lemons	25c to 30c per doz.
Limes	15c per doz.
Oranges	20c to 50c per doz.
Bananas	25c to 30c per doz.
Pears	$2.25 per box
Tokay grapes	50c basket
Imported Malaga grapes	35c lb.

Vegetables.

Brussels sprouts	20c per lb.
Artichokes	10c each
California green peas	15c lb.
Hubbard squash	4c per lb.
Calif. pumpkins	4c per lb.
California red cabbage	10c lb.
Sweet potatoes	3c lb.
Parsnips	5c per bunch
Cauliflower	15c per lb.
Parsley	5c per bunch
Rhubarb	10c per lb.
Green chili	10c per lb.
Bell pepper	15c per lb.
Christmas cantaloupes	20c to 35c each
Cucumbers (fancy)	1 for 5c
Radishes	5c bunch
Green beans	15c lb.
Beets, valley	10c per three bunches
Cabbage (valley)	5c per lb.
Carrots	5c per bunch
Celery	10c per stalk, 3 for 25c
Eggplants, southern	15c per lb.
Lettuce	10c head, 2 for 15c
Onions, green	5c bunch
Onion, white	5c per lb
Potatoes	25c ten lbs.
Spinach	10c per lb.
Squashes	10c per lb
Tomatoes	10c per lb.
Turnips	5c per lb.
Watercress	7½c per bunch
Okra	15c per lb

Fresh Nuts.

Almonds	25c per lb.
Brazil nuts	25c per lb.
Filberts	25c per lb.
Pecans	25c per lb.
English Walnuts	25c per lb.
Roasted peanuts	20c lb.

Butter and Eggs.

Butter, fancy grade	40c per lb
Eggs, Sunflower	40c per doz
Fresh candled eggs	35c per doz
Eggs, ranch	60c per doz

Cheese.

Pimiento cheese	15c glass
German breakfast cheese	5c a cake
Imperial cheese	15 to 35c each
Holland cream cheese	40c per ½ lb.
Camembert, 35c; imported	50c per can
Cream dairy	25c per lb.
Edam, small	$1.15 each
Neufchatel	10c each, 2 for 15c
Pineapple	65c and 70c each
Roquefort	60c per lb.
Swiss, imported	40c per lb.
Limburger	25c per lb.
Sage	30c per lb.
Circle Brand	10c each
Dutch Girl	40c per can
Brick cheese	25c per lb.

Fresh Fish.

Speckled trout	17½c per lb.
Various Cal. fish	15c per lb.
Salmon	20c per lb.

Beef.

Sirloin steak	20c per lb
T-bone steak	20c per lb.
Round steak	15c per lb.
Chuck roast	10c lb.
Rump roast	15c per lb.
Rib roast	15c per lb.
Prime rib roast	17½c to 20c per lb.
Beef livers	10c per lb.
Corn beef	12½c lb.

Lamb.

Leg	20c per lb.
Shoulders	12½c per lb.
Chops	30c per lb.
Breast pieces	8c to 10c per lb.

Mutton.

Leg	20c per lb.
Chops	25c per lb.
Shoulders	10c per lb.
Neck pieces	8c per lb.
Breast pieces	10c per lb.
Crown roasts	35c per lb.

Pork.

Leg	20c per lb.
Chops	20c per lb.
Steaks	20c per lb.
Sausage	15c per lb.

Delicatessen Prices.

Home cooked tongue	50c lb.
Home cooked ham	60c lb.
Home cooked veal	60c lb.
Home cooked pork	60c lb.
Jellied tongue	50c lb.
Salima sausage, Milwaukee	40c lb.
Cevelat sausage, Milwaukee	40c lb.
Head cheese, Milwaukee	40c lb.
Liver sausage, Milwaukee	40c lb.
Ham sausage, Milwaukee	35c lb.
Blood and tongue sausage, Milwaukee	40c lb.
Brookfield sausage, Swift's	25c lb.
Jones Dairy Farm little pig sausage	35c lb.
Kosher weiner	25c lb.
Kosher Frankfurters	25c lb.
Kosher cooked corn beef	40c lb.
Smoked halibut	40c per lb.
Smoked salmon	40c per lb.
Smoked sturgeon	40c per lb.
Smoked eels	40c per lb.
Smoked white fish	40c per lb.
Smoked bloaters	5c each
Herring milchers	5c each
Anchovies	35c per keg

Feed.

Alfalfa, wholesale	$17 per ton
Alfalfa, retail	$18 per ton
Northern Texas hay	$18 per ton
Corn, wholesale	$1.45 per cwt.
Corn, retail	$1.50 per cwt.
Texas oats, wholesale	$1.60 per cwt.
Texas Oats, retail	$1.70 per cwt.
Chops, wholesale	$1.55 per cwt.
Chops, retail	$1.60 per cwt.
Bran, wholesale	$1.45 per cwt.
Bran, retail	$1.65 per cwt.
Chicken feed, wholesale	$2.25 per cwt.
Chicken fed, retail	$2.50 per cwt.

HODGES MORE SERIOUSLY INJURED THAN WAS THOUGHT.

Tucumcari, N. M., Dec. 3.—Robert Hodges, the workman who was injured by the caving in of the foundation of the new Varenberg hotel, it was discovered on closer examination had his right hip bone fractured and suffered internal injuries. He was removed from the temporay quarters near the Adair garage, where he had been taken, to the Tompson hospital.

The new fixtures for the inside repairs on the First National bank have arrived and will be set into place as soon as the tile flooring can be laid. Business has not been interrupted since the repairs were begun.

AUTO FALLS UPON GLOBE MAN'S NECK

Machine Smashed, But Carr Escapes With Only Bruises.

Globe, Ariz., Dec. 3.—Thrown from his automobile while going 30 miles an hour, due to a broken axle, F. A. Carr's fell upon him and bruised his neck. Two others who were in the auto at the time the axle broke were injured. They were: George Driscoll, arm broken, Dr. J. A. Ketcherside, bruised about head and finger broken. Dr. Ketcherside is superintendent of the Arizona lasane asylum.

The accident occurred on the new territorial highway between the Roosevelt dam and Globe. Carr's escape was a narrow one. Had the machine gone three inches further his head probably would have been crushed. The machine was wrecked.

MINISTER IS ACCUSED OF USING MAILS TO DEFRAUD.

Chicago, Ill., Dec. 3.—Rev. H. C. Scott Ford, pastor of the Hamilton Park Congregational church, was arrested yesterday by agents of the department of justice, charged with using the mails to conduct a fraud. He was released on bonds of $1000. The minister conducted a firm known as the National Patent Investment company. The government claims that the scheme used by the minister was to obtain from the patent office at Washington a list of persons who had received patents, and then mail a card to each, promising to exploit the invention. When a response was received by Rev. Mr. Scott Ford, said the government agents, the investor would be informed that his patent would be described in detail in a publication issued by the National Patent Investment company.

The inventor was then charged $3.50 for a wood cut, which Rev. Mr. Scott Ford is said to have promised would be used in illustrating the magazine article. The federal inspectors charge that Rev. Mr. Scott Ford pocketed this $3.50 and that he issued no publication descriptive of the patents.

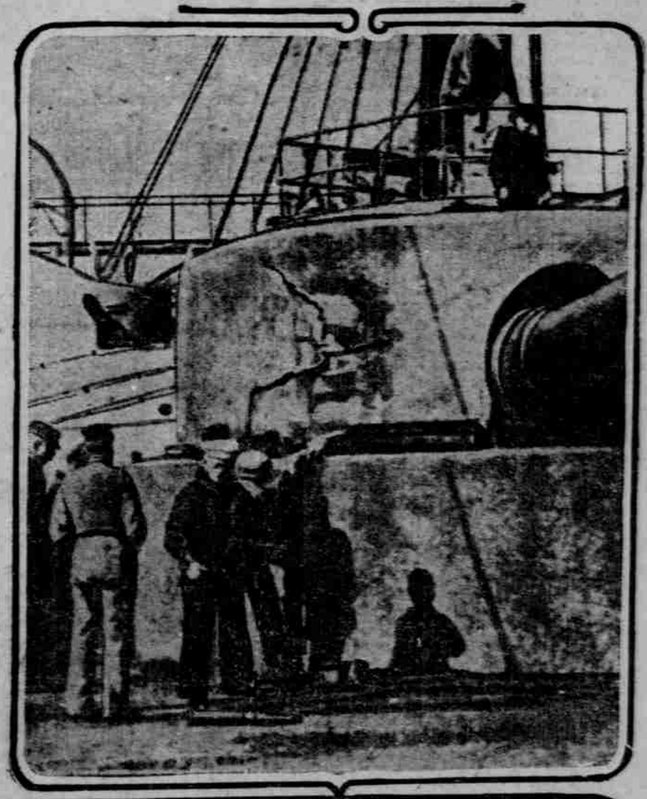
EXPECT TO IRRIGATE BIG TRACT FROM ONE LARGE WELL.

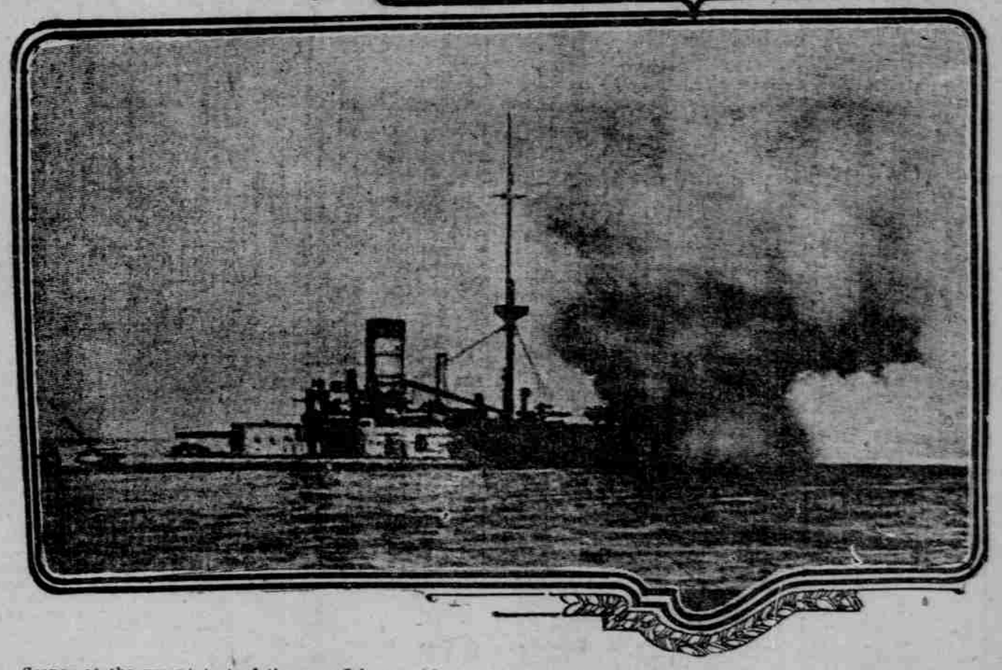
Pecos, Texas, Dec. 3.—Coley & Lane, of Dallas and Houston, are putting down a 14 inch well on section 15, near Pecos. They have already gone down 300 feet and have at present 270 feet of water. The well when completed is expected to water 1200 to 1500 acres of land by the intensive irrigation system.

SELL BROOM CORN CROPS.

Tucumcari, N. M., Dec. 3.—Considerable quantities of brom corn are coming into this market. A. M. Wait, Charles Welch and Morgan Smith have brought their crops to town and disposed of them.

Wrecking A Ship To Test A New Explosive





Scenes at the recent test of the new Isham explosive by the navy department. The above photograph shows a crack in the turret of the United States monitor Puritan, made by the new explosive. Below is a photograph taken as the explosion on board the monitor took place.

The first test consisted of placing 200 pounds of the new explosive, which consists of nitroglycerine, guncotton and marble dust in gelatine, against the starboard side of the after turret. It was fired by means of an electrical apparatus from the berth deck forward, on the Puritan. The second test discharged 200 pounds of the explosive at the belt line of the armor plate. This discharge caused the armor plate to give way and the monitor began to fill. The sinking ship was manned by a crew and rushed to the Norfolk navy yard for repairs. Ordnance experts say the tests were a success, but whether the United States will adopt it for its navy is not known.