

THE CROSS PLAINS REVIEW

VOL. 4.

CROSS PLAINS, TEXAS, FRIDAY, JUNE 27, 1913.

NO. 16

SIX SILOS TO BE BUILT

THE FIRST TO BE ERECTED IN THIS IMMEDIATE TERRITORY—BAYOU STOCKMEN ENTERPRISING

Clyde Gray who was in from the ranch Friday informed the Review that six silos were to be built at an early date in his neighborhood. One each by Oscar Gray, Greer Gray, Billie Henderson, Arthur Young, Tom Colvin, and one and perhaps three by himself and Walter Gray, his brother. Each will have about 200 ton capacity, except one. The silo is fast becoming popular with the stockmen of west Texas, and we are glad to see them tried out near home.

NEW POSTMASTER.

John Hembree Sunday received his commission as postmaster for Cross Plains. He has been expecting the same for some time. He has been working with T. F. Wolf, the former postmaster, familiarizing himself with the work, and Mr. Wolf will reciprocate by helping him for a while.

Red Cedar shingles are the best to cover that house with. Brazelton & Pryor Lumber Co.

We appreciate your patronage at our Soda Fountain and it is going to be our constant effort to meet the discriminating demand for good drinks. We are making a strong effort this season to make more customers by making satisfying drinks. The City Drug Store.

First Oats Marketed Here

Bob Cross who lives south of Dressy marketed the first oats from this year's crop on the streets here Tuesday, bringing 36 and 34c. The market, however, is about 33c.

Notice Singers.

The next session of the U. S. A. will meet July the 12th and 13th, 1913 with the Admiral singing class. All those who are interested in singing have a special invitation, and those who like good singing are welcome to be present by 2 o'clock p. m. at the place designated on the 12th. You will please notice later an advertisement of a special program for the night of the 12.

H. C. Norsworthy, Pres.
Geo. B. Scott, Sec'y.

You are invited to Brownwood, Texas, to the Big Race Meet and Auction Sale of Horses and Mules July 3rd, 4th and 5th, 1913.

Purses: Free for all Pace \$300; Free for all Trot \$200; 2:30 Pace or Trot \$100. Col. O. C. Allen of Hydro, Okla. Auctioneer at Sale. We invite you to be with us. E. F. McAlister W. D. Moulley Mgr. of sale Mgr. of Races

We are requested to announce that May is to have a two days picnic, July 9 and 10, and that you are invited to attend.

Mrs. Georgia Rutherford left Wednesday for Abilene where she visits her parents. Her sisters and some of her grandparents will also be at home.

WHO IS YOUR BANKER?

H. W. KUTEMAN,
Pres.

J. E. SPENCER,
V. Pres

VIRGIL HART, Cashier C. C. NEEB, Asst. Cashier

The Bank of Cross Plains

(UN-INCORPORATED)

Responsibility \$1,000,000

CROSS PLAINS, TEXAS.

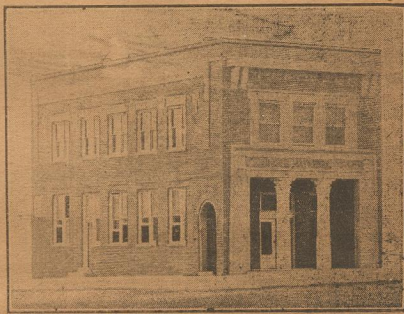
If you use wisdom you will select OUR BANK FOR YOUR BANK. The men who direct this institution are successful business men, and it is wisdom to place your account with us. We are in position to extend accommodations to our customers every day in the year.

Bank with us.

FARMERS NATIONAL BANK

Cross Plains, Texas

Capital
And
Surplus
\$30,000,00



Eight
Years
Steady
Growth

We are Banking on You to Bank With Us.

T. E. POWELL, Pres.

J. A. BARR, V. Pres.
T. B. VESTAL, V. Pres.
J. M. HARLOW, V. Pres.

S. F. BOND, Cashier.
T. BOND, Asst. Cashier.
R. G. POWELL, Asst. Cash.

HURT IN FALLING

Kathalene, the small girl of Martin Neeb, suffered a severe accident Monday night from a fall to the floor in the kitchen at home. She was running or skipping over the floor and fell striking the floor with her head which knocked her unconscious. She remained in this condition until 2 o'clock Tuesday morning. She is doing well at present.

Clyde Gray, Dosh and Jim Watson, and Tom Colvin were Bayou visitors here Friday.

John Carter left Friday for Dallas where he took a position as a traveling salesman. He was this week out on the T. & P. and his efforts are meeting with success.

Joe Shackelford and his sister Miss Wilda, and Miss Ruby Gilbert, left Wednesday for a visit to Woodson.

J. R. Willeford and family of Dressy are to leave the last of this week for an extended visit to Okla.

Dunk Jones of Atwell was buying supplies here Friday.

Mrs. R. M. Neeb is the guest of her husband's parents Mr. and Mrs. Wm. Neeb. Mrs. Neeb lives in Dallas.

W. A. Orr and Bow Baum and families are due to be here this week on a visit from Midway, N. M.

We sell lots and lots of good chewing gum. The City Drug Store.

Sherwing & Williams Paint, as good as the best. Brazelton, Pryor Lumber Co.

Rev. Parks of Sabanna preached at the Baptist church Sunday and at night to appreciative audiences.

Use screens and keep out the flies. We have the screens. Brazelton & Pryor Lumber Co.

W. O. Griffith of Blum is the guest of his sister Mrs. Joe Hitt.

Tommy Greenwood brought a 28 lb. cat fish town Tuesday.

Geo. Lamar who has been a soldier for 13 years is at home on a furlough.

Miss Ophelia, daughter of Mr. and Mrs. J. W. Wesley lately moved here from Burkett, arrived here Monday from Austin, where she has just graduated in the University of Texas. She also held a tutorship or instructorship in one of the schools.

I will preach at the Presbyterian church Sunday night. Everybody invited. Geo. A. Crane, Pastor.

GET OUR PRICES

on hay forks and grain scoops. We will save you money. The Racket Store.

Mrs. Will Cutbirth was in town Tuesday.

Dave Jones and family of Rising Star are the guest of W. A. McGowan and family. Mr. Jones is cashier of the First National Bank of the Star. Dud Hutton brought them over in an auto.

Old paper for sale at this office, 15 cts. per hundred.

Mrs. Jim Newton and Miss Vina Gains of Cross Cut left Tuesday morning for a visit to Okla.

Mrs. E. P. Crawford left Tuesday for an extended visit to her old home in Kentucky.

Miss Kate Chambliss, sister to Mrs. C. E. Alvis and Miss Annie Mae Chambliss, whose guest she has been for two or more weeks, left Tuesday morning for a visit to her sister at Temple, whence she goes to Dallas where she will spend some time in the study of higher music.

Worth Hats for men and boys. Worth \$3.00 at Poydstun's. (adv)

THE HOME OF BARGAINS

Yes, this store is the home of bargains. If it were not so we never could have gone ahead as rapidly as we have. Hundreds of thinking people to whom the saving of a dollar is equivalent to a dollar earned, are taking advantage of these bargains. It will pay you to do the same. The Racket Store.

If you need a good watch and do not care to pay for it just now come in and let us figure with you. We assure you that we are more than glad to assist you in this as well as in other matters that are constantly coming up. The City Drug Store.

Mrs. Bob Owen came in from Rotan Friday. She and Mr. Owen will remain here at least for the present.

REMEMBER THE PICNIC JULY 30TH & 31ST

Sub-committees have been appointed and put to work. Every effort will be made to make this the 1913 picnic the best in the history of Cross Plains.

Jeff Clark and Am Stewart are on a baseball trip through West Texas, with the Baird boys. They have played Big Springs taking two two out of three, and two with Pecos winning one, a 4-1 game pitched by Stewart.

Chase & Sanborn's teas and coffee at B. L. Boydston's. (adv)

For sale or trade: A sorghum mill, no. 2. See R. B. Forbes, with Forbes & Adams.

FARMERS WILL ASK STATE AID

Fort Worth, Texas, June—The Farmers' Union of Texas is going to ask the Texas Legislature at the Special Session to appropriate \$25,000 per annum to be expended under the direction of the State Department of Agriculture in promoting marketing and rural credits according to Peter Radford, president of the Farmers' Union.—Com. Sec.

1913 RAINFALL TO 18TH INST. 13.25 INCHES

The rain gage at Coleman according to the Democrat-Voice registers to 18th of June for this year 13.25 inches rainfall. In all probability the territory immediately surrounding Cross Plains has received a greater rainfall. But if no greater, that alone is ample for the growing of any crop adapted to this section.

The gage also records 5 inches for May, and nearly that amount for the first 18 days of June, which means that the greater part of the fall is during the growing months, the best time it could fall. The possession of a rain gage by Cross Plains is a consummation the Review would like to see.

TO WORK PARK THURSDAY

In order to be prepared for the picnic forthcoming it has been decided to work out the park in the west part of town on Thursday, the 26th (yesterday). If you read this notice in time you are to consider it an urgent invitation to go out and take an active part in the work.

Misses Lillie and Beulah Morrow went Saturday to Sipe Springs to visit their cousin Miss Morris, returning Monday.

Tip Wolf, ex-postmaster, will at an early date go on the road as a traveling salesman for the Arbuckle Coffee people, with headquarters at Waco. He will not move his family from Cross Plains.

Misses Corine Barringer and Cookie Works of Dallas are the guest of Mr. and Mrs. Eldon Boydston and Miss Ollie McGowan.

BASKET PICNIC AT SABAN NO THURSDAY JULY 10TH

You are invited to attend with a well-filled basket our big picnic on Thursday July 10th. Plenty of amusements. A good time promised. REMEMBER THE DATE & PLACE

J. M. Lindsey, known as the fruit man, of north of Cottonwood was in town Wednesday. Mr. Lindsey says that the fruit crop is pretty good.

GRAIN YIELD FAIR AVERAGE

According to the opinion of the best farmers that we have talked to, the oat yield will be between 20 to 35 bushels per acre, and wheat from 8 to 20. Early in the season, prospects were good for a considerably less yield than this, but later, after good rains had fallen, prospects for grain were brighter. The grain crop is a big item in the agricultural output of this country, and the yield is of great importance to the welfare of the community.

Cooper—Delta county has organized twelve good roads associations and each organization is improving the roads in its respective section. The roads are being dragged with a split log drag without cost to the county, by the... along each... See

If you are in the market for Iron Fencing, Tombstones or Monuments, don't fail to see me before buying.
I am agent for the Celebrated Stewart Iron Fencing and the Cisco Marble Works. All work Guaranteed.

BILL GIBBARD

---W. B. WILLIAMS---

Contractor & Builder

Building Designed and Constructed. Reasonable prices and good workmanship. Concrete Side Walks constructed.

Cross Plains, Texas.

Main Street Restaurant

I have opened up a new Restaurant on Main Street, just across the street from Davis-Garner & Co. I serve meals at 25c and all kinds of short orders, Chili, etc. Give me a trial.

Mrs. C. S. Johnson, Prop.

The Crystal Cafe

I am still running the Cafe, and have employed a new cook, the biggest and best one in town. Give me a part of your business.

Tom Henson, Prop.

Saved Girl's Life

"I want to tell you what wonderful benefit I have received from the use of Thedford's Black-Draught," writes Mrs. Sylvania Woods, of Clifton Mills, Ky.

"It certainly has no equal for la grippe, bad colds, liver and stomach troubles. I firmly believe Black-Draught saved my little girl's life. When she had the measles, they went in on her, but one good dose of Thedford's Black-Draught made them break out, and she has had no more trouble. I shall never be without

THEDFORD'S BLACK-DRAUGHT

in my home." For constipation, indigestion, headache, dizziness, malaria, chills and fever, biliousness, and all similar ailments, Thedford's Black-Draught has proved itself a safe, reliable, gentle and valuable remedy.

If you suffer from any of these complaints, try Black-Draught. It is a medicine of known merit. Seventy-five years of splendid success proves its value. Good for young and old. For sale everywhere. Price 25 cents.

DRS. RUMPH & RUMPH
PHYSICIANS & SURGEONS.
CROSS PLAINS, TEXAS
Phone No. 37.
Residence 39

-H. B. PEEPLES-
Gen'l. Blacksmithing
--AND WOOD WORK--
More than 20 years experience. All work guaranteed. Shop just South of W. O. W. Building.
Cross Plains, Texas

Cash coupons are only issued for spot cash.
Carter & Kenday.

NOTICE.

I am in a position to handle a few thousand dollars worth of good vendor's lien notes.

Virgil Hart

Your cash will buy more from us.

Carter & Kenady.

Confine your cash purchases to our store and you will be surprised at the useful articles you will receive FREE.

Carter & Kenady.

I will order you a suit of all-woolen clothes for less money than you can buy the same grade out of stock. Am making especially low prices now on account of its being so late in the season.

T. W. TARTT.

Deafness Cannot Be Cured

by local applications, as they cannot reach the diseased portion of the ear. There is only one way to cure deafness, and that is by constitutional remedies. Deafness is caused by an inflamed condition of the mucous lining of the Eustachian Tube. When this tube is inflamed you have a rumbling sound or imperfect hearing, and when it is entirely closed, Deafness is the result, and unless the inflammation can be taken out and this tube restored to its normal condition, hearing will be destroyed forever; nine cases out of ten are caused by Catarrh, which is nothing but an inflamed condition of the mucous surfaces.

We will give One Hundred Dollars for any case of Deafness (caused by catarrh) that cannot be cured by Hall's Catarrh Cure. Send for circulars, free.
F. J. CHENEY, & CO., Toledo, Ohio.
Sold by Druggists, etc.
Take Hall's Family Pills for constipation.

CASTORIA

For Infants and Children.

The Kind You Have Always Bought.

Bears the Signature of *Wm. D. Mitchell*

FORD CAR MODEL F.

Touring Car \$650.00
Roadster \$570.00

Delivered in Cross Plains

Fulwiler Elec. Co.

Agents

Abilene, Texas.

For First Class

Painting or Paper

Hanging

See

KELSEY.

All Work Guaranteed

HITT & EDWARDS

Barber Shop

Located across street from Post Office

Will appreciate your business

Agents for Crow Brothers

Steam Laundry.

Basket leaves Tuesday

L. P. Henslee

Notary Public

I am Agent for the celebrated Stover Gasoline Engine. I am prepared to install all kinds of Pumping outfits. More than 10 years experience with Gasoline Engines.

DREW HILL

Cross Plains, Texas

J. Rupert Jackson,

Attorney-at-Law,

Baird, Texas.

Office Home Nat'l Bank Bldg.

Virgil Hart

Atty. and Counselor

at Law
Land Titles Examined and Legal Documents Carefully Prepared.

Office At

BANK OF CROSS PLAINS
Cross Plains, Texas

FOR SALE. A life time scholarship in Draughon's Practical Business College at San Antonio. Will sell cheap for cash or good note.

Apply at the Review office.

The City Meat Market
buys hides & cream. (adv)

Cross Plains Review, and the semi-Weekly Dallas News \$1.75

Lodge Directory

Masonic Lodge No 627



Cross Plains, meets on or before full moon in each month at Masonic

over Bank of Cross Plains.



Meets every Saturday night at M. W. A. Hall. Cross

Plains, Tex.

M. C. Baum, Clerk.

W. O. W. Camp No. 778.



Meets every Saturday night before the first and third Sundays, at W. O. W. Hall, south Cross Plains, Tex.

E. T. Bond, Clerk.

I. O. O. F. Lodge No. 171.



Meets every Friday night at 8:30 at the I. O. O. F. Hall.

C. W. Barr, Sec.

M. E. Church, South.

Preaching each 1st and 4th Sundays at 11 a. m. and 8:15 p. m.

Sunday school each Sunday 10 a. m. R. P. Odom, Supt.

Prayer meeting each Wednesday 7:30 p. m.

Woman's Home Mission Society meets Thursdays before the 2nd and 4th Sundays of each month. Mrs. Tyson Pres.

You are cordially invited to attend all our church services.

A. Lee Boyd Pastor.

Presbyterian Church.

Presbyterian church, preaching on 2nd and 3rd Sundays at 11 a. m. and 8 p. m.

Sunday school at 10 a. m. Regular session meeting, Friday, 3 p. m.

George A. Crane, Pastor.

Baptist Church.

Preaching 1st 2nd & 4th Sundays at 11 a. m. and 8:30 p. m. Sunday School begins 10 a. m. Prayer meeting Wednesday night at 8:15. Ladies Aid Mondays 3:30 p. m.

Pastor.

Preaching

At the Christian Church the first Sunday in each month at 11 o'clock and Saturday night before. Sunday School every Sunday at 10 o'clock and a Bible school every Wednesday night at 7:15. All are invited to attend.

I. M. Ussery.

Vendor's lien notes taken up and extended, by the best companies. Plenty of money to loan on land at 8 per cent interest.—Cross Plains Development Company.

Dr. E.H. RAMSEY

DENTIST

OVER FARMER'S NATIONAL BANK

W. A. Petterson

The

Shoe Repair Man.

ALL KINDS OF HARNESS WORK.

Rear Racket Store.

I am prepared to do all kinds of harness repair work. See me in the rear of the Racket Store.

W. A. Petterson.

We are going strong for cash business.

Carter & Kenady

WALL PAPER

DEVOE Paints, Varnishes, etc,
Linseed Oil, Turpentine,
Glass, Screen Goods

Shackelford's Lumber Yard

.....AUTO SERVICE.....

One man to Baird or Cisco	\$5.00
Two men or more each	\$3.00
One man to Putman	\$3.50
Two men or more each	\$2.00
One man to-Rising Star	\$3.50
Two men or more each	\$2.00

.....W. W. HILL.....

Headquarters at Kempers Hotel

THE CENTRAL HOTEL

LOCATED CLOSE IN

MEALS 25c

BEDS 25c

GIVE US A TRIAL

JIM CROSS, PROPRIETOR

Some Real Bargains in our Dry Goods department. See for yourself. Carter & Kenady.

W. F. Griffin and daughter Miss Fredda and Miss Melrose Jones of Cottonwood were here Tuesday.

In the first five months of the present year bonds for good roads to the amount of \$3,960,000 were voted, while bond issues to the amount of \$1,660,000 were defeated, breaking all previous year records for the State.

When you want to go anywhere, whether by auto or horse, be sure to see me. Prices reasonable

S. F. Knight, The Liveryman

Cross Plains Development Co.

Agents for Cross Plains Townsite Company.

LANDS, LOANS and INSURANCE

NOTARIES PUBLIC IN OFFICE.

Office in rear of Bank of Cross Plains.

WANTED-

Bookkeepers

Stenographers

Telegraph Operators

to fill the many calls we are receiving daily. START NOW and get ready for one of these excellent opportunities.

POSITIONS SECURED

OR

MONEY REFUNDED

Contract backed by 24 years success; \$300,000 Capital—48 Big Schools and more Bank endorsements than all other Business Colleges in the United States Combined.

Scholarships purchased in Draughon's San Antonio, College good at any Draughon School.

No Vacation. Enter any time.

Draughon's Practical Business College

San Antonio,

Texas.

WALNUT SPRINGS ANNUAL PICNIC JULY 3rd and 4th.

Good Ball Game, first class Balloon Ascension, lots of music, plenty of ice water and shades, big races and bronco busting. :: :: :: ::

REDUCED RATE ROUND TRIP TICKETS VIA TEXAS CENTRAL RAILROAD

On Sale JULY 3rd and 4th, good for return JULY 7th.

E. BLAIR, G. P. A.

Waco, Texas.

LUMBER

We carry a complete stock of all kinds of building material and invite you when in the market for anything in the building line to call on us and inspect our stock. You will be given courteous treatment and as low prices as is consistent with good business management.

No bill is too large or small for us to figure. We will appreciate a part of you business.

Brazelton-Pryor & Co.

H. A. Bowdoin, Mgr.,

Phone No. 70 Cross Plains, Texas.

ICE! ICE! ICE!

Please phone us your orders for ice not later than 8 o'clock Sunday mornings; all other days we will deliver at any hour—going is our business.

Cross Plains Ice & Bottling Company.

BETTER FARMING METHODS

INCREASED CORN YIELD RESULTS FROM PRIZE CONTEST OF TEXAS INDUSTRIAL CONGRESS.



ALFORD BRANCH "Champion Corn Grower of Texas." 167 1/2 Bushels on One Acre.

Alford Branch is a wide-awake farmer boy living at Overton, Rust County, Texas, who, by careful preparation of his land in the fall of 1911, so that it was in condition for the winter rains to sink in and to be stored for the use of the plant during the following season; who carefully selected the best seed-corn that was grown in his section and by shallow and constant cultivation from the time the corn was a few inches high until it was actually mature, not only kept it free from weeds, but kept the surface for an inch and a half or two inches so finely pulverized that it acted as a mulch and prevented the loss of moisture by capillary attraction, has raised on one acre of second bottom land 167 1/2 bushels of corn at a cost of 13 cents per bushel. Rating the corn at the low price of 70 cents per bushel, there was a net profit of \$95.35 from this acre. Adding to this the \$250 prize money awarded him by the Texas Industrial Congress, makes a total of \$345.35, which is the interest at 6 per cent upon \$5,755.83, and represents the value of an intelligent combination of brains and work.

This young man broke his land in the early winter with a two-horse plow, cutting about six inches deep; followed in the same furrow with a team pulling what is known as a "bull-tongue" that cut ten inches further into the earth, but turned up no new soil, and formed a reservoir to hold the moisture as well as to aerate the land and make more plant-food available. He used five hundred pounds of commercial fertilizer that had been recommended by a reliable house as best adapted to the successful growth of corn upon his black, sandy land, which had been in grass for a number of years and had an ample supply of humus. He used seed-corn that was popular in his neighborhood, known as the "Bloody Butcher." He states that he made as much corn on the one acre by the better methods above-mentioned as his father made on ten acres prepared and cultivated in the old-fashioned way.

The picture below is a graphic illustration of the value of using improved methods.

(19 BU. PER ACRE) 10-YEAR AVERAGE OF TEXAS

(51 BU. PER ACRE) GENERAL AVERAGE OF ALL CONTESTANTS

(62 1/2 BU. PER ACRE) LOWEST PRIZE-WINNING YIELD

(167 1/2 BUSHELS PER ACRE) LARGEST PRIZE-WINNING YIELD

The general average of all contestants was fifty-one bushels to the acre, while the general average for the State in 1912 was but twenty-one bushels. If all of the corn growers in Texas had averaged just what these contestants averaged, at the prevailing price, the crop would have brought one hundred and sixty-odd million dollars more than it did.

In 1911 the average corn crop of Texas was 9.6 bushels to the acre. Seventeen hundred and forty-six contestants for the prizes offered by the Texas Industrial Congress, coming from one hundred and sixty-one counties, averaged 31 1/4 bushels of corn per acre. All of the prizes were won in seventeen counties. In 1912 there were 4,030 contestants from 205 counties. Fifty-five counties won prizes, and 16 of the 17 that won in 1911 won again in 1912. This clearly demonstrates that the work of the Congress is constructive, permanent and cumulative.

The Congress makes suggestions as to preparation of soil, conserving moisture and fertility to make plant food available, as to seed selection and the best methods of cultivation, but all of these are subject to any changes that the contestant thinks best to make; the only object being to offer suggestions that cause the farmer to investigate and with all the information at hand to determine the best methods to adopt.

Our Premium Department is costing us considerably, but our customers get it all. Carter & Kenady.

Spirabone corsets at Boydston's from \$1.00 to \$5.00. (adv)

HOME COURSE IN SCIENTIFIC AGRICULTURE

NINTH ARTICLE—AGRICULTURAL DUTY OF WATER.

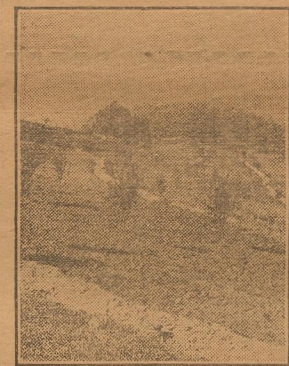
By W. J. M'GEE, Late Soil Water Expert, Bureau of Soils, United States Department of Agriculture.

THE experience of the farm in every country and age has shown that the fruitfulness of soil depends on adequate water supply; no water, no crops, no animals, no human life—indeed, no soil.

Soil is of three parts—one solid, another fluid and the third gaseous. The solid part consists of mineral and organic matter in fragmentary or granular condition. It forms the stable body of the soil. The fluid part is a solution consisting of water carrying mineral and organic matter. It forms the circulatory medium of soil and plants. The gaseous part consists of air (nitrogen and oxygen) mixed with aqueous vapor, carbon dioxide, hydrogen dioxide, etc. It permeates the body of the soil, moving with the movement of the circulatory fluid, changes in temperature and barometric pressure, etc. The three parts are conveniently known as soil body, soil fluid and soil gas.

Much of the substance of plants is taken directly and that of animals indirectly from the soil, and soil grows largely through the return of substances from plants and animals in more highly differentiated or richer form, and the chief source of vital energy in soil (expressed by its own functioning and measured by its fertility) is derived from the growth and decay of plants and animals. Thus potash and nitrates are elaborated and concentrated by plants and phosphates by animals and returned to the soil, which is thereby enriched and rendered more effective in sustaining both plants and animals.

While the interdependence of soil and organisms extends to all the materials and powers of both, it operates



Photograph by Tennessee agricultural experiment station.

DITCHING TO PREVENT WASHING OF SOIL chiefly through the peculiarly potent substance water, of which large quantities exist in the soil and pass thence into the plants and animals, and the vital energy of organisms, like that of soil, is maintained largely by the circulation of their fluid portions, which consist chiefly of water. In most animal genera the circulation is fairly uniform throughout life. Among most kinds of plants it varies widely with the season, while in soil the circulation depends largely on climate and season, especially as these are related to plant growth. Other things equal, the internal work or functioning of soil is determined by its capacity for conserving water and conveying it to growing plants.

The fresh water entering soil is derived from rain or melting snow either directly or through overflow or underflow by irrigation or otherwise. The water within the soil may be or may not be efficient in circulation or in soil functioning, according to its quantity in relation to the soil texture, for with its quantity its condition may be said to vary from, first, static to second, dynamic—that is, it may be either inert or active.

The full capacity of a given soil for water ranges with its texture or porosity from some 30 per cent to over 50 per cent of its volume. This may be denoted the water of saturation. It completely fills the interstices among the soil grains, displacing the soil gas, and ordinarily moves hydrostatically under the impulse of gravitation. It impedes or prevents normal functioning of the soil and remains in a virtually static condition until the excess is removed by drainage, etc.

The water required to form soil fluid (or to furnish the most effective soil moisture) ranges with the texture of the soil body from, say, 10 per cent for sand to 40 per cent for fine clay and much more for muck. The quantity suffices to form a film surrounding each soil grain in such manner as to permit capillarity to act throughout the mass and yet leave space for air (or soil gas) within the interstices.

While ordinary annual crop plants root within the first foot from the surface, the underlying three feet of subsoil forms a reservoir whence they de-

rive much of the moisture required for their growth. Now, the mean moisture of average soil when in good condition approaches 25 per cent, while the mean moisture when plant growth ceases by reason of exhaustion of the soil fluid is probably less than 10 per cent, and the difference measures the store of water additional to the current rainfall on which the plants may draw. This difference (15 per cent of four feet, or 7.2 acre inches—\$16 tons per acre) may be denoted the effective soil fluid of average soil.

The rate of soil plant circulation and the quantity of water passing through soil and plants during the growing season are indicated by the exhalation from growing plants. A grass plant will in the course of a hot day exhale its own weight of water, and a young leaf of wheat or rye exposed to the sun may even exhale its own weight in an hour.

The maintenance of the soil plant circulation required for crop production generally involves repeated additions of water during the growing season, for the effective soil fluid within four feet of the surface would at the observed rate of plant transpiration suffice for but a meager yield even if the entire quantity were utilized. In ordinary farming the water is not fully conserved and applied to plant growth, so that practically the 7.2 acre inches of effective soil fluid growth would not suffice to produce a crop or even permit any yield whatever from most types of soil, though under certain conditions water may be drawn from greater depths in the subsoil than four feet. If properly cultivated and watered the average acre foot of soil, weighing some 2,000 tons (including the contained water, retains efficiency for centuries, but to be even moderately productive this soil must convey to the crop plants fully 1.5 acre feet of water, or an amount equivalent to its own weight, during each growing season.

To become effective in plant growth water must enter the soil body, take up both mineral salts and organic substances in solution and pass thence into the plants and on into the air. This is the normal course of soil plant circulation, and the relative quantities of the solid and fluid parts of the soil involved in plant growth probably correspond fairly with the strength of the solution, or one to several hundred. Pending precise determinations, it may be assumed that the strength of the solution forming the soil fluid and the ratio of the solid and fluid parts required to maintain efficiency are about equal and something like 1 to 1,000.

In nature the flora varies with the rainfall from sparsely distributed cacti and other desert plants to luxuriant forests, and as lands are brought under cultivation the crop yields vary from place to place and from season to season with the rainfall or with the water supplied by irrigation. Generally throughout the United States the actual yield per unit of water is considerably less than the ratio of dry matter to water determined by plant exhalation. A fair to good crop from an acre (i. e., an acre foot) of fertile soil supplied with four acre feet of water during the year may be put at a ton of grain and three tons of stover and stubble, or four tons in all—equivalent to 1-1360 of the weight of the water. With lessening of the aggregate water supply (which of course includes rainfall, accumulated ground water, subsurface flow and irrigation) the yield diminishes more rapidly than the quantity of water, virtually ceasing when the supply falls below an acre foot, while with augmented supply the yield increases more rapidly than the water so long as the tillage and character of crop are adapted to full use of the entire supply.

With present knowledge the ratio is, of course, but a rough approximation. Measurements are vague and experiences variable, soils differ both in composition and in the texture controlling circulation, and the yield of succulent vegetables or of juicy fruits or fresh forage may be several times that of grain, nuts or dry forage, so that it will probably be found needful in time to work out ratios for particular crops, just as it is now convenient to reckon yields per acre in different averages for the several crops.

In the course of his work on irrigation Powell recognized the necessity for determining "the amount of water which is needed to serve an acre of land" and spoke of this service as the "duty" of water measurable in acre feet, and irrigators have frequently applied the phrase to the measure of the water rather than of the service performed by the water—a service susceptible of useful measurement only in terms of what the water does in that production which furnishes food for man and forms the foundation for human industries and institutions. So, pending more precise determinations, the agricultural duty of water may be defined as the production of one one-thousandth part of its weight in average plant crop or one four-thousandth of its weight in grain.

Naturally the coefficient for plant yield will not apply to general farm production, including crops of meat, eggs, wool, hides, etc., for not only do animals drink many times their weight in water annually, but they consume indirectly in their feed the equivalent of that much larger quantity required for the growth of the vegetal tissue of which the feed consists. The human consumption is still larger. The 5,000,000,000 acre feet (or 215,000,000,000,000 cubic feet) constituting the total yearly water supply of mainland United States would suffice for a population of about 1,000,000,000.

In a broad way it may be said that the final duty of water is to sustain a human life a year for each five acre feet used effectively in agriculture.

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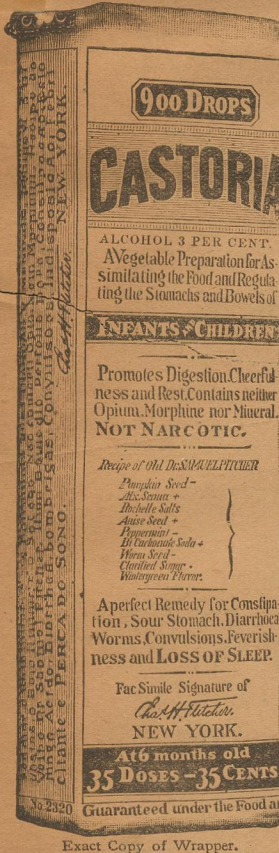
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MULE RAISING AN IMPORTANT INDUSTRY

C. S. News Service.

The Texas mule is gaining in prominence every day in the year, and the raising of these animals is becoming an important industry in Callahan County. It is estimated that twenty per cent of the mules that are being used in the building of the Panama Canal were bred in Texas, and in selecting material for its cavalry Uncle Sam favors the Texas mule.

There are 3,105 mules, on the farms and ranges of Callahan county according to a recent census bulletin and their total value is \$317,815. Of this number 2,595 are mature mules, 379 are yearling colts and 131 spring colts. Besides the mules on the farms of this county there are 68 of these animals owned by the urban population which have a value of \$9,160.

The total mule population of the State is 109,231, divided as follows: 675,558 rural and 33,673 urban. The value of the mules on the farms and ranges of Texas is \$73,979,145 and those in the cities and villages of the State is \$1,123,183.

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