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POREST GROVE, OREGON Best art, vial teeth \$5.50 perset. Cement

and Amalgam fillings 50 cents each. Gold fillings from \$1 up. Vitalized air for pain-tess extraction. Orrics: three doors north of Brick;
c. Office hours from 9 a. m. to p. m.

Easiest of access among all the Canons of Colorado, being situated on the main line of the Denver & Rio Grande between Canon City and Salida in the front range of the on the cover. Rockies, is the most specular, aweinspiring and magnificent. Down this mighty cleft in the heart of the cautiously take off the cover. The granite rock-barrier rush the raying ants will immediately swarm over waters of the Arkansas River, lashed into foaming fury and deshed into spunning spray by its swift descent; through the tortuous defile. So a arrow is the passage at one point able that in less than ten minutes that there was no room for both the some of them will find the opening road and river, and therefore a cur- into the artificial nest and at once beiously constructed bridge of steel had gin excavating it. to be thrown lengthwise of the Inside of one day they will have an stream, suspended from iron sup- elaborate nest dug, with its main ball ports mortised into the canon walls and long tunnels, and will be theron each side to the right and teft. oughly established in it. And right here can be seen the citmax of all the canon's grandeur, that a broad knife blade, take it up a little which has been aptly called "The at a time, carefully pick out any larvæ Royal Gorge." For two thousand (little white grubs) or pupe (cocoons) six hundred feel the solid monoliths that the ants have not already resoar upward-five times as lofty as moved, place them near the mouth of the Washington Monument, the the nest and throw the dirt away. highest permanent structure reared. The nest should now be covered with by the hand of man. No words can adequately describe the magnificence and a sheet of pasteboard to keep out the light, which the ants dislike.

By removing the pasteboard at any of the scene. Only those who have time you will be able to watch these beheld its giories can appreciate little creatures in their new home.

er on the Denver & Rio Grande book

World." this most delightful trip to the East, fruit, honoy, sugar, etc.

4and, Oregon.

# Home Study Course

Self Education Through the Medium of Specially Prepared Articles by Prominent Instructors

# Little Creatures About Our Homes

By LE ROY WELD

XII.—What Experiments With Ants Teach Us.

HE study of ants is fascinat ing and profitable recreation for the long summer months. How to begin may be learned what follows, and once started you will need no further directions. In the first place, it will be necessary to induce a colony of ants to build their nest in a place so situated that you can readily observe them at any time. Fortunately this is a very easy matter, and if you observe carefully the following instructions you will have no trouble:

Get two pieces of window glass about 10 by 12 inches and four strips of wood about half an inch wide and an eighth of an inch thick, two of them being half an inch shorter than the length of the glass, one as long as the wilth of the glass and the fourth about two inches shorter than the width of the glass.

These strips may be obtained by splitting up the bottom of a peach basket. By means of some good glue cement these strips firmly to the surface of one plate of glass around the edges and then cement the other plate down upon them.

plates of glass about 9 by 11 inches and an eighth of an inch high, inclosed all around except about an inch at one

When the glue has thoroughly hardened, the space between the plates must be filled with very fine, dark earth, which should be sifted if possible. This may prove a long and tedious process, and it may be better to leave out the shorter strip along then be placed in, however, in order to keep the dirt from drying out. This apparatus is to be the artificial nest of the ants.

Before introducing the colony into this nest it is necessary to provide some means of confining them. There are various ways of doing this, the best one being to surround the nest with water by laying it on a piece of inch board, setting the board in a shallow pan and pouring a little water around if. Great care must be taken not to get water in the nest.

New to introduce the colony get a large tin can or a tin pail with a tight cover and a trowel or spade. Go out and look until you find what appears to be a thrifty nest in the ground. Open your tin can, dig up the nest, ants and all, with one dip of the spade, thrust it into the can and clap

Carry your prize home, set it on the glass nest, surrounded by water, and everything as far as the water, and you must take care that none gets drowned during the excitement.

Very soon, however, they will become more calm, and it is very prob-

You should now dump the dirt from

You can learn more about their mode This is but one of the many won- of living by observing them for a few ders of nature revealed to the travet- days than could be written in a whole Railroad, "The Scenic Line of the warm, light place, preferably before an open window, and the ants should For detailed information about a small grubs, insects, bits of ment,

Address J. D. Mansfield, The nest should not be shaken or dis-Gen. Agt., Rio Grande System, Port | turbed in any way, and the pasteboard should be kept over it when you

re not looking at it. Before saying anything about the ses and powers of these insects let us examine the structure of their tiny bodies. Much may be learned by simply looking at them, especially if they pelong to one of the larger species.

A glance will show that the three divisions of the body-head, thorax and abdomen-are quite distinct and that the abdomen is fastened to the thorax by what looks like a short stem with a knot in it. Under a small magnifier the hend is seen to be provided with a pair of powerful pinchers, or mandibles, a pair of feelers, or ap-

tennæ, and a pair of compound eyes.

There are also three small, simple eyes in the top of the head. Close study with a powerful microscope reveals the fact that there are in the tips of the feelers organs that seem to be designed for ears, and it is also thought that the sense of smell is located in these feelers, as will be seen presently.

The scientist who has probably studied the habits of ants more patiently and carefully than any other is Sir John Lubbock. The results of his many experiments to determine something of their senses and intelligence are truly marvelous. He made extensive tests of their senses of sight smell and hearing and of their powers of communication and recogn each other, some of which will be briefly described

It is very evident that ants have a more of less definite sense of sight. However, it is probable that they cannot see objects distinctly at any great distance, from the fact that they apparently take no notice of things going on around them, except those in their immediate vicinity, within a few

One thing which Lubbock clearly proved is the fact that ants have the power of distinguishing colors and also that bluish and violet colors are not agreeable to them. He did this mainly by laying pieces of colored glass over the nest in broad daylight and watchdifferent colors.

The sense of smell is also highly developed in ants. This is shown by the fact that they will go directly to honey, sirup, etc., in the dark and will even crawl through narrow, indefinite cracks and openings to get into the sugar box, as we all know.

Lubbock made some experiments which lead us to believe that the sense of smell is located in the antenne. He accustomed the ants to walking over a strip of paper to get their food and then hung a camel's hair brush dipped in musk, peppermint or other strong scent directly over this paper. The ants would often stop and turn back on smelling the perfume, indicating that it was disagreeable to them. On slowly advancing a feather dipped in perfume toward an ant that was at rest the ant drew back the antennæ, whereas an unscented feather had no effect.

No such results, however, were obtained by Lubbock in his experiments on the sense of hearing. In fact, all of his experiments had decidedly negative results, and scientists generally accepted the apparent fact that ants cannot hear. But Lubbock carefully avoided concluding that ants are really dear, and some experiments made by the author several years later seem to point to the opposite conclusion.

One experiment performed on several nests containing different species may be described as most significant. The ants in a nest all being perfectly quiet, a shrill note was blown on a whistle near the nest, great care being taken that the ants should not be disturbed in any other way. Immediately there were confusion and alarm, the ants running excitedly hither and thither, carrying their eggs, grubs and cocoons which were usually piled at one side of the main hall of the nest, off into the long passages, evidently endeavoring to hide them. This was the invariable result whenever the experiment was tried.

Strange to say, these same ants were even picked it up and handled it. Many experiments with single ants resulted in the insect wildly waving its antennæ when compelled to listen to shrill sounds, thus indicating the location of the sense of hearing in these organs.

The author would be much pleased

to receive communications relating to further experiments along this line, and many young people throughout the country might make themselves useful to the scientific world in just this way.

Sir John Lubbock made some in

Continued on Second Page,

Tendency of the Times.

The tendency of medical science is toward preventative measures. The best thought of the world is given to the subject. It is easier and better to prevent than to cure. It has been fully demonstrated that pneumonia, one of the most dangerous diseases that medical men bave to contend with, can be prevented by the use of Chamberlain's Cough Remedy. Pneumonia always results from a old or from an attack of influenza (grip), and it has been observed that this remedy couneracts any tendency of these diseases toward pneumonia. This has been fully proven in many thousands of cases in which this remedy has been used during the great prevelance of solds and grip in recent years, and can be relied upon with implicite confidence. Pneumonia often results from a slight cold when no danger is apprehented until it is suddenly discovered that there is fever and difficulty in breathing and pairs in the chest, then it is announced that the patient has pocumonia. Be on the safe side and take Chamberlain's Cough Remedy as soon as the cold is contracted. It always cures. For sale by Delta Drug Store.

### Better Than Gold.

"I was troubled for several years with chronic indigestion and nervous debility," writes F. J. Green, of Lancaster, N. H., "No remedy helped me until I began using Electric Bitters, which did me more good than all the medicines I ever used. They have also kept my wife in excellen health for years. She says Electric Bitters are just splendid for female troubles; that they are a grand tenic and invigorator for weak, run down women. No other wedicine car take its place in our family." Try them. Only 50c, Satisfaction guaranteed by Bailey's Pharmacy.

### Fscaped an Awfull Fate.

Mr. H. Haggins of Melbourne, Fla. writes, "My doctor sold me I had ensumption and nothing could be done for me. I was given up to die. The offer of a free trial bottle of Dr. King's New Discovery for Consumption, imluced me to try it. Results were startling. I am now on the road to recovery and owe all to Dr. which empties in the Willamette ing the behavior of the ants under the King's New Discovery. It surely saved my life," This great cure is bia." Price 50c & \$1.00. Trial bottles free

The scratch of a pin may cause the oss of a limb or even death when land at its very door. Washington blood poisoning results from the injury. All danger of this may be avoided, however, by promptly applying Chamberlain's Pain Balm It is an anticeptic and quick healing its location is the key that is aiding liniment for cuts, bruises and burns. For sale by Delta Drug Store,

# Mysterious Circumstance.

other fresh and rosy. Whence the products and return the same day, difference? She who is blushing of the northwest makes Washington with health uses Dr. King's New county an ideal field for farting N Life Pills to maintain it. By gently fruit and livestock productions arousing the lazy organs they compel good digestion and head off constipation. Try them. Only 25c, at Bailey's Pharmacy.

The peculiar cough which indicates croup, is usually well known to the mothers of croupy children. No has received more universal approval than Chamberlain's Cough Remedy. Do not waste valuable time in experrecommended, but give this medicine as directed and all symptoms of croup The Delta Drug Store.

# Nearly Forfeits His Life.

A runaway almost ending fatally, started a horrible ulcer on the leg of J. B. Orner, Frankfin Grove, Ill. For four years it defied all doctors not apparently much alarmed when said all remedies. But Bucklin's any one tapped on the glass nest or Arnica Salve had no trouble to cure him. Equally good for Burns, to the enterprise of each individual Bruises, Skin Eruptions and Piles. farmer so he will resp. The Wash-25c at Bailey's Pharmacy. . .

# A Mother's Recommendation.

I have used Chamberlain's Cough Remedy for a number of years and have no hesitatancy in saying that it family. I have not words to express my confidence in this remedy,-Mrs. sale by Delta Drug Store.

# WASHINGTON COUNTY, ORE.

Hillsboro, the county seat Washington county, 17 miles west of Portland on the line of the S. P. Railroad, with a population of 1500 is the chief city of the county, while the county contains over 50 postoffices and trading points. Hillsboro owns its own electrics plant also its water works, it is but a matter of a few years until Hillsboro becomes the ome of hundreds of Portland business men, in fact, all the details such as right of way, city franchises, permanent surveys etc., for an electric railway from Portland to Hillsboro have just been completed and active constructive work will be commenced in a few weeks, and happy will be the farmer who flinds himself in possession of one of our beautiful farms. Hillsboro has two flouring mills, machine shops, foundry, and bank, and is the business center of the county, while its morality is vouched for when we state that there are five church edifices of the leading lenominations, and its beneficiary organizations are second to none in he state, it was the home of our late and much lam nted Congressman Thomas H. Tongue, Our county court-house occupies a well kep block or square in the business center of the town. Hillsboro maintains : Board of Trade composed of the lead ing business men of the town, its officers are, President, Senator Weh-rung; Secretay, F. M. Heidel and Treasurer, W. V. Wiley, it also sustains a well kept and fully equipped fire department and many of its tulldings are of substantial brick construction. Hillsboro is surround-ed by the most delightful part of Washington county. "The North Plains" on which fields of waving grain reach from the city limits for

niles and miles to the rugged slopes of the Pacific Coast range of moun-Washington county, situated in the north west part of the Williamette valley, is one of the finest agricult tural and dairy sections in this grea-Pacific Northwest. Washington county is located in a large basin, that, in pre-historic times, was an arm of the "Grand Old Pacific" thus seing a filled in or an illuvial formation of soil, which accounts for Washington county's great fertility and productive qualities; on the east it is bordered by the Portland range of hills, the Chebalem on the south and the coast range on the west and north, forming a basin about 25 miles cross, watered by the Tualitin river. which is fed by a thousand springs on every side of the basin and which irrigate every portion as they flow down and mingle together and form the Tualitin, a navigable stream river about fifteen miles from its merchants in the true sense of the confluence with the "Mighty Colum-term. The firm is eligibly quartered gueranteed for all throat and lung with Washington county in its pro-diseases by Bailey's Pharmacy. ductiveness, and there are thousands Price 50c & \$1.00. Trial bottles from of acres of this rich land yet to be No like area can compare in its commodious and substantial

made productive; with a constantly growing urban population to accelerate the market together with Portcounty gives better promise for the tarmer, the market gardner, fruit raiser, the dairyman and he who seeks a surburban and profitable home than any other county in the state; in unlocking is greatness: Hear what the Oregonian, the greatest paper in the northwest, says: "Loca-tion is the great secret of the present and future of Washington county, nore than one half of its farmers can One was pale and sallow and the drive to. Portland with a load of

Washington county's climate, of which if the truth were spoken many would be loath to believe: Washington county is situated forty-five mile east of the Pacific ocean and is proected from its dampness and fog by the Coast Range, yet, is sufficiently near to partake of its gentle, balm influence bereft of that great ocean scourge "fog." It is true the Oregon time should be lost in the treatment rains are a little disagreeable to the of it, and for this purpose no medicine eastern people in the winter months matized, its rai s are moderate and gentle and not of the Eastern "down pour" kind, indeed it seldom rains imenting with untried remedies, no to prevent the farmer from habi untly matter how highly they may be going about his work; but it is the source and foundation of our wealth good crops, therefore is welcomed

will quickly disappear. For sale by and is on a solid financial basis, each year's tax pays the current expenses, which the state's secretary's report show to be less than all other counties in the state, being only \$1.60 per capita. We are not weighed and borns down by that barnacle of industry Interest

Washington county's grains: It is the natural home of the grains, in fact such is our soil and climate that it will profitably respond to almost any amount of cultivation, according ington county grain received first premium at the 1902 State Fair at

Washington county's dairying has made wonderful strides the past few years; good creameries are now located in every nook and corner of

HILLSBORO, COUNTY SEAT OF grasses are the pride of the state of well arranged for "man's best friend." Oregon, grass grows and cattle fatten without the aid of man, and owing to this spontaneous growth of the wild grasses and the abundant crops of the tame grasses our country ranks

first in its dairying possibilities. Washington county fruits, which, include almost all the known kinds thequality, quantity, flavor, size and variety of Oregon's fruit is surpassed by none. Washington county took first premium on Oregon fruit at the

Washington county hops: This is one of our most renumerative crops, and are famed far and wide; many who on account of this year's high

supplies us with this great and useful ommodity in such immense quantities that the world is looking longingly forward for a share of its sup ply, which is now being opened up to commerco.

### Heidel & Wall, Real Estate.

In compiling and presenting the bove descriptive article on Hilisboro and Washington county we have been turnished much information and many facts by Mr. F. M. Heidel of the firm of Heidel & Wall; Hills boro's principal real estate firm, which is much interested in Hillsooro and identified in an active way with the growth and development of this promising community. Heidel and Wall are thoroughly versed in the real estate and land values of Washington county and are agreeable and retiable gentlemen with whom to deal; and home seekers or investors will find the firm ever ready to advise or assist them. They will be pleased to furnish for the asking—any information wanted. Besides the Hillsboro office, a branch office is maintained at 330 Stark street, Portland, where is exibited a collection of Washington county products.

among whom is H. Wehrung & Sons we I known to the trade as general general stock, the cardinal lines being weeks, a grocery department, a dry goods, notions, shoes and furnishing goods department, and another, a complete men's furnishing department clothing furnishings, shoes, asserts unmistakably the versatility and alertness of the suave management in meeting the wants of the housewife, rancher and townsman in a general way, for the past twenty the business principles of H. Wehrung & Sons.

# Tilbury & Whitlow, Meat Market.

To be accessible to a well ordered narket in all respects is a source of inviting and well kept Central Meat Market conducted by Tilbury and Whitlow, showing the choicest and most toothsome fresh and cured meats, home rendered lard and kindred supplies. Tilbury and Whitlow have been swinging the cleaver and saw in the interests of the town's people here since November last, succeeding J. D. Housley, and are ever assiduous and civil in handling their fast growing business as dealers in live stock and dressed meats, and as butchers.

# A. C. Archibald. Hardware.

The above named gentleman is ent utilizing a neat substantial and with merchantable and cosmopolitan of strict integrity. lines of general hardware, mechanics tools, stoves, ranges and house furnshing goods; also pipings and plumbing supplies. A. C. Archibald is abreast of the times as the general the recipient of a goodly share of the

It is doubtful if any branch of business is of more importance or more welfare of any town or city than that of a well ordered or well managed the county, also two extensive Milk livery, from either a business or is the best remedy for coughs, colds Condensing factories; with the Tuati- pleasure standpoint. A fivery, sale and feed stable of this calibre is do-ing business in our midst under the direction of its owners. Redmond & and croup I have ever used in my tin river and a thousand of other and feed stable of this calibre is dosprings watering its nearly 500,000 ing business in our midst under the acres within its bountiful borders, direction of its owners, Redmond & my confidence in this remedy,—Mrs.

J. A. Moore, North Star, Mich. For the none in the state; indeed Washing by Delta Drug Store.

Sappington, The City Livery Stable from Michigan.

Sappington, The City Livery Stable from Michigan.

In the state; indeed Washing in a most creditable way, with a barn of the public in a most creditable way, with a barn of the control of the public in a most creditable way, with a barn of the control of the public in a most creditable way, with a barn of the control of the public in the control of the contro

This stable maintains some steppers" and speedy driving animals and attractive and appropriate vehicles for all uses for business or pleasure service. This phase of Hillsble and experienced hands.

### J. P. Magruder, Druggist,

An intelligent public will quickly oncede the importance of being in close touch with a reliable and well appointed drug establishment, that's under capable and painstaking management. We lay claim to such an one here under the censorship of J. are the Washington county farmers P. Magruder but under the caption of the Delta Drug Store, that has prices have cleared and banked from been fulfilling its mission to the satis \$5,000 to \$10,000 on their 1902 crop faction of an appreciative clientele of hops and many are the premiums since 1896, always handling a stock that the Washington county hops have been awarded at the State Fair.
Washington county onlons: "Beave and chemicals including his Delta erdam" the very name signifies Cough Syrup, a specific for coughs, wealth, many are the weird stories colds and lung troubles, and his of the great productiveness of which Delta Anodyne Liniment and Exter-we will quote one, J. C. Hare, one of nat Panacea, both of which he has our progressive farmers raised from large sales on, and sundries and the one acre of this beaverdam land 722 many dainty articles for the lady's sacks of onions and received for the toilet case. The Delta Drug Store is same \$1,414, this of course is very tendered an especially liberal share exceptionable, the average being of the prescrption work from a public-Washington county's timber: ance that's maintained behind the Nature with its bountiful hand did case. The general tone of the place not forget us along this line, but she at once attest to its progressive man-

### J. A. Kremis, Grocerer

What an intelligent public is quick to see, and readily responds to the merchant, or firm that identifies itself with its better interests, is well told in the favor and patronage that's tendered J. A. Kremis, our live groceryman and purveyor to the farder. The exceptionally neat and inviting premises are ever replete with a wholesome, full and varied assortment of "good things to eat," groceries, provisons and table delicacies, Queensware crockery, notions, field and garden seeds; where maid or matron get the same courteous and prompt attention. J. A. Kremis maintains a vigilant free delivery service and affords the public every advantage to be had in good busin methods. He has been doing busi-ness here since Oct. 10th, succeeding

### O. M. Pope, Photographer.

Possibly it may appear that as every photographer uses the same general methods and operates with similar appliances that all are alike skillful. But this is no more true In the ousiness areas of Hillsboro are some active, conversant and well facilitated merchants conspicuous than that pen, ink and paper make the same author. The artistic specimens shown at gallery and studio of photographer O. M. Pope is illustrative of the possibilities of the gifted artist. Of course experience and merchants in the true sense of the equipment are vital ingredients that success in portrait photography requires. But more than these is the appearance in every way, of a and it is this faculty of likeness makmodern merchantile house. Here is ing that has brought Pope into good fisplayed year in, and year out, a repute. A special discount will be wholesome and up-to-date made on all frames for next two

### F. R. Dailey, Bicycle Dealer. The bicycle dealer like the bicycle

is a product of modern times, and like all modern vocations it takes and has for the masculine sex. The men of a higher order of business range of the cosmopolitan stock tact to win. The sale, of up-to-date makes and models of wheels including Ramblers and sundries from leading American manufacturers, are looked after here by our well versed dealer, F. R. Dailey-handling guns, years or over. Probity and conser- firearms, ammunition, bicycles and valive effort have ever characterized sundries—who has for three years enjoyed a reputation for showing each season's best productions—s well as a reputation for reliability and civil and agreeable dealings with the people and it is on these bases that F. R. Dailey has built up much satisfaction. The neat and and maintained a splendid patronage as repairer and dealer.

# W. C. Donelson, Furniture.

Pleasantly located in well lighted premises is W. C. Donelson, an exponent of fainiture and house furnishing goods, etc; where is handled a varied stock that is up to a good standard comprising all the requisites that it takes to furnish "a home complete" from top to bottom. W. C. Donelson is accorded a volume of business that only comes to the man or firm whose efforts are energetic and whose agalings with his fellow man are straight-forward; hence it is that this furniture house is a much sociated with the trade of hardware prized factor in supplying the wants has as a live, staunch and old expon-of an appreciative public. As an ent utilizing a neat substantial and undertaker and funeral director Mr. very suitable building that is stocked Donaisen is no less known as a man

# U. S. Gardner, Blacksmith.

The business public fluds in the general blacksmithing shop operated by U. S. Gardner-a place where it the stock at once suggests. He is gets good workmanship, prompt serof general blacksmithing, horse-shoeretail trade coming to this point or ing, carriage and wagon work and from this part of the county.

Redmond & Sappington, Livery. up shop where he has good facilitie-at hand and is handling a liberal part indispensible to the convenience and of the business in the several departments that comes from all points of the compass. Horse-shoeing is an important feature and receives the most vigilant care from a class of

To be Contined next week,