UPPER AIR STRATA ARE GREAT AID TO WEATHER BUREAU

Delicate Recording Instruments Sent Up by Kites or Balloons Secure Valuable Information.

[This is the fourth of a series of articles on the making of weather forecasts and observations, prepared exclusively for The Sunday Journal by Edward L. Wells, meteorologist, United States weather bureau, Portland.]

By Willis Ray Gregg
Meteorologist, U. S. Weather Bureau, Washington, D. C.

From the earliest recorded times mankind has always been intensely interested in the weather, and the literature of all peoples is rich with weather proverbs, many of which are based on actual observation, although many others are largely the result of superstition. Probably the meteorological elements to which most attention was given were wind and clouds, particularly the latter, thus showing a very early interest in the conditions of the upper air. Frequent descriptions, together with interpretations of clouds, are to be found in the Scriptures, in the writings of the Greeks and Romans and even on some of the recently discovered Babylonian tablets. Naturally these descriptions are confined almost entirely to the form and direction of movement of clouds and of course to their connection with rain.

Clouds can be observed from the earth's surface, but there are other upper air conditions which cannot be so observed. Of these the most important are atmospheric pressure, temperature, humidity and wind. Pressure always diminishes with altitude and is of interest chiefly because its measurement enables us to compute any altitude reached. Temperature and humidity usually decrease, whereas wind velocity in general increases with altitude, but there are many exceptions to this statement. For example, on a very cold morning we almost always find a temperature considerably higher at a height of 200 or 300 feet than at the earth's surface. In fact, on such occasions during the winter if we could elevate our houses a few hundred feet we would find our coal consumption materially reduced. On the average, however, there is a drop in temperature of about one degree Fahrenheit for every 300 feet increase in height.

HIGH VELOCITIES RECORDED

On the average wind blows twice as hard half a mile above the surface as it does at the surface, but again we find many exceptions. During the summer there is frequently no wind at all up to four or five miles above the surface, whereas in winter we occasionally observe velocities not far above the surface of 80 to 100 miles an hour, and we have one record of 185 miles an hour.

Years ago observations of these elements were made by men in large balloons, but this method was altogether too expensive for general use, and self-recording instruments, known as meteorographs were therefore devised for the purpose. These instruments are made of aluminum, for the most part, and include a windmill type of anemometer, a metallic thermometer, a hair hygrometer (all contained in a horizontal ventilating tube); also an aneroid barometer and a clock-driven cylinder to which is fastened a sheet of graduated paper. On this paper recording pens connected with the different elements continuously and automatically indicate the changes in weather conditions at successively higher and higher altitudes. This is the type of meteorograph that is used in most of our work, but when it is desired to reach heights greater than 5 or 6 miles we use a lighter instrument having the same general features except that the record is made on an aluminum sheet that has a coating of soot from gum camphor. Metallic points, instead of pens, make the record, and afterwards this is made permanent by dipping the sheet in a solution of shellac and alcohol.

KITES ARE USED

The heavier meteorographs are lifted into the air by means of kites of the box type. These kites are about 7 feet square and about 3 feet high and are made of spruce framework covered with a good quality of cotton cloth. They are attached to piano steel wire of small diameter but high tensile strength and this wire is paid out from a steel drum on which there are usually as much as 8 to 10 miles of wire. The kites can be flown best in winds of from 10 to 30 miles an hour, but occasionally successful flights have been made with a velocity as high as 60 to 80 miles an hour. They are used in tandem, sometimes as many as 8 or 10 being on the wire at one time. Occasionally the pull exerted by these kites is sufficient to break the wire and it then becomes necessary to organize a searching party for the purpose of finding the kites and bringing them back to the station. On one occasion the distance traveled by the kites was about 300 miles. Ordinarily the height reached by the kites is from 1 to 3 miles, the average being about 2 miles, but in a few cases an altitude of more than 4 miles has been attained.

Another method of obtaining measurements of wind conditions at various heights consists in sending up very small rubber balloons and observing them through a theodolite. These balloons are originally from 6 to 9 inches in diameter, but are filled with hydrogen until they have a diameter of about 30 inches. They are then set free and ascend at a rate of 600 to 800 feet a minute.

RESULTS SURPRISING

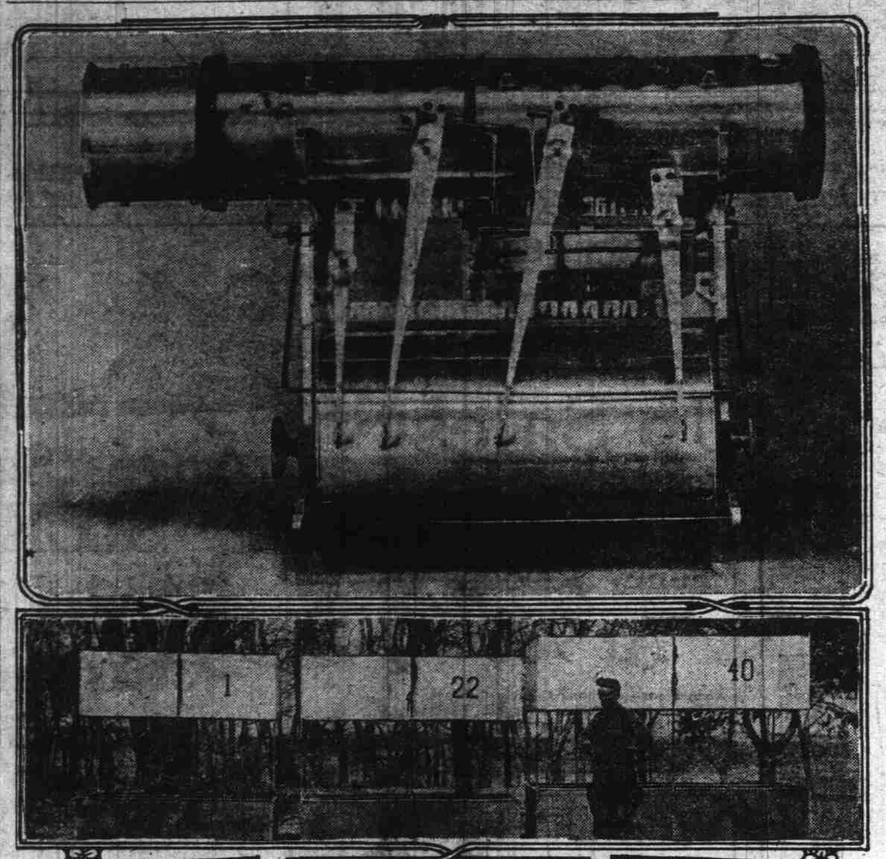
The theodolites through which they are watched consist principally of a telescope and two graduated circles by means of which the balloon's distance away and its position with reference to a north and south line are accurately determined. With these data at hand, we can quickly compute the wind direction and velocity at various heights. The results are at times quite surprising. In addition to showing high velocities above the earth's surface, they also indicate in many instances a marked difference in wind direction at the earth's surface and at various levels above it. It is not uncommon, for example, to find a westerly wind above an easterly wind, and, in fact, as a rule, winds from a westerly direction prevail at all altitudes greater than a mile above the earth. Observations with pilot balloons are now being made twice daily at about 22 stations in this country.

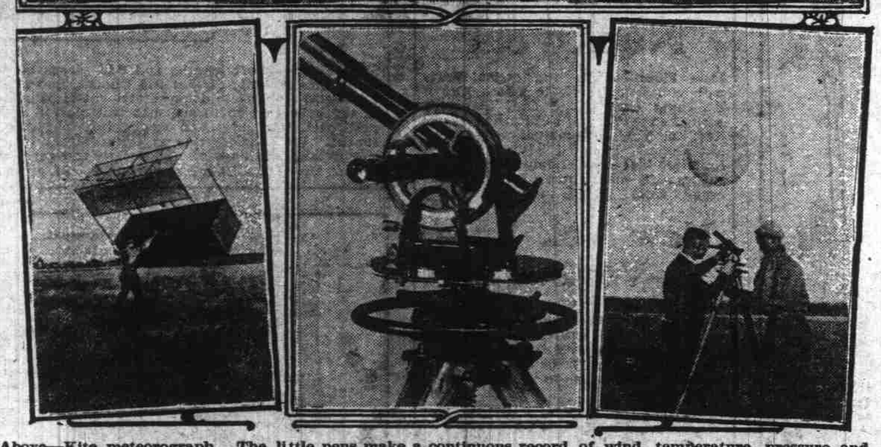
At the present time more is being done in upper air investigations than ever before, and plans are being made for greatly increasing the number of stations at which observations with kites and balloons can be made. The data now being obtained are telegraphed daily to Washington, where they are carefully charted and studied. Forecasts based thereon are then furnished to the aerial mail service, to the army and navy aviation services and for the benefit of such other aviation enterprises as are from time to time undertaken.

POSSIBILITIES LOOM LARGE

The possibilities in the development of commercial aviation loom very large and it is altogether probable that in the not distant future the traveler, if a quick journey is necessary, will look up his aerial schedule and make his reservation accordingly. To insure a safe journey the pilots of the aircraft will need to know what are the wind and weather conditions along their course, and these the weather bureau should be able, and proposes, to furnish.

INSTRUMENTS MAKE RECORDS IN UPPER AIR





Above—Kite meteorograph. The little pens make a continuous record of wind, temperature, pressure and moisture at different heights up to 4 miles. Center—Weather bureau box kites used to carry recording instruments into the air. Below, left to right—Launching a kite at Groesbeck, Texas; Theodolite—The small rubber balloons are followed with this instrument, and thus the wind at various heights is quickly measured; observing balloon's ascent at Broken Arrow, Okla.

Cigar Lighters Are Given to Devil Dogs Of Second Division

Washington, Aug. 27.—Twenty thousand "cigar lighters" or "telephone cords," as the A. E. F. knew the fourragere of the French army, have been received at the headquarters of the marine corps for distribution among members, past and present, of the Fifth and Sixth marines and the Sixth machine gun battalion of the marine brigade of the famous second division.

As the A. E. F. rechristened the canned meat from the Argentine as "monkey meat," so they rechristened the glorious fourragere from its striking resemblance to the cigar lighters in vogue with the pollus, and its resemblance to that part of the prosaic telephone with which central plugs in to get the wrong number or the always "busy" individual.

Men who have passed out of the ranks of the marines into civil life, and the next of kin of those who were killed will receive their decorations through the marine corps recruiting service.

16 Divorces a Month Granted in Winnipeg

Winnipeg, Man., Aug. 21.—Canada's first divorce court, established here last September, heard 152 applications and granted 127 decrees in the first eight months of its existence. Divorce in Canada formerly was a luxury, obtainable only by the expenditure of about $5000, as every case had to go before the federal senate. When the privy council of the empire decided that Manitoba's court of king's bench had the right to adjudicate divorce cases, fear was expressed that Winnipeg would become the Reno of Canada, and it was believed there would be a rush of unhappy couples to the divorce courts. But the average number of decrees granted a month in the first eight months was only 20. It has since declined to 16 a month and lawyers predict it will soon fall below five a month.

German Ingenuity Said Not Dormant

London, Aug. 21.—(I. N. S.)—England is finding that German ingenuity in peace pursuits was not dormant during the war. An immense number of applications for patents, following reopening of diplomatic relations, reveals the German inventive genius as active as ever. Among the patent applications from across the Rhine are 90 from Krupps for war materials and instruments. Toys run the heaviest, however.

O. A. C. Looking For Applicants For a Rhodes Scholarship

Oregon Agricultural College, Corvallis, Aug. 21.—Applications for Rhodes scholarships, of which O. A. C. may have four, are desired by the committee of selection for Oregon, writes Professor C. H. Gray of Reed college, secretary, to President W. J. Kerr of O. A. C. Application should be made before September 1, he says.

Applicants must be between the ages of 19 and 25, on October 1, 1920. They must possess qualities of leadership, scholarship and physical fitness.

Juniors, seniors and graduates meeting these conditions and desirous of securing the Rhodes honors are being sought by the college. The scholarship carries with it $1500 a year for three years.

"Dead Men's Club" May Be Organized

Indianapolis, Ind., Aug. 21.—The formation of a "Dead Men's club" out of the 2000 ex-service men who, while living, are officially listed as killed in action, is a probability, it was learned at national headquarters of the American Legion. William Wart of Akron, Ohio, one of the "casualties," who was gassed and left on the field in Picardy, has suggested the formation of such an organization.

Columbia University To Get Oregon Man

University of Oregon, Eugene, Aug. 21.—Victor P. Morris, instructor in the university model high school during the past year and a member of the faculty of the school of education, has received a scholarship at Columbia university and expects to work for a degree of doctor of philosophy at that institution during the next two years. Mr. Morris was graduated from the University of Oregon in 1915 with a degree of bachelor of arts.

Teachers at Idaho School Want Homes

Moscow, Idaho, Aug. 21.—That the University of Idaho is confronted with danger of losing several new members of its faculty because they cannot find homes to rent in Moscow, was stated by Dean F. J. Iddings, head of the department of agriculture in the university, recently, at the Chamber of Commerce luncheon. Dean Iddings said he had canvassed the town and found only one home to rent, and that was only for a period of six months. He urged the chamber to take action and try to secure residences that can be rented.

AMERICAN LEGION TRIES TO LOCATE MISSING SOLDIERS

Strange Cases of "Dead Men's Return" Are Related; Want Information in the Search.

The American Legion is carrying on the search for solutions to more than 2000 individual death and disappearance mysteries among soldiers and sailors of the American expeditionary forces. These are cases where official action has run its course and terminated with the always brief and sometimes conflicting reports of "missing in action," "killed in battle" or "presumed to be dead." In each case it is claimed that definite or detailed information has not been received by the family of the soldier or sailor in question.

CASES ARE CITED

How many more than 2000 such cases there may be is not known, but the American Legion weekly has received that number of letters from the kin and friends of missing men. There are instances where it appears that men sailed for France and straightway disappeared from the face of the earth. No conclusive word ever has been received of their fate. There are cases by the score of men reported "wounded" or "slightly wounded" and no other word, until, months later, perhaps, the curt official announcement of "presumed to be dead." Cases are reported of men reported dead, then wounded, later missing, later "returned to duty." But the men have not come home. There are cases where men have been reported dead on a certain date, but members of their families received letters written by their soldier kin's own hand at a later date. There are cases where families have received unofficial report that their soldier kin was seen alive after the date of his official demise.

By far the largest class of letters, however, are those from gold-star mothers seeking word from a comrade who was with her son when he fell. The war department—which, considering everything, has been remarkably accurate in accounting for casualties—has reported the date and place. Mother desires simply such details as will enable her to reconstruct in her mind—so many write—the scene in which her boy made the great sacrifice.

ITEMS OF INTEREST

The "roll call" department in the American Legion weekly, where these communications are published, is the most poignant personal column in the world. Every item carries its burden of human sorrow or breathes a hope that will not die. It is a column which, in bald brevity, sums up the heroism of the manhood of America and the trials of those who stayed behind and day by weary day carry on the search for those who did not come back. The greatest human interest stories in the world are told in scant paragraphs such as these:

94th Aero Squadron—Homer Key, box 116, Holdenville, Okla., would like to hear from someone who knew Lieutenant Raymond J. Saunders, and who could give details relative to his death in France and where he was buried. Last seen in combat with 12 enemy planes over Breuilly, about 15 miles northwest of Verdun, October 22, 1918.

John W. Hotz, formerly 86th company, 152d depot brigade, Camp Upton, N. Y. Who knows whether he went to France and was killed or pulled through? Address Miss Gertrude Hotz, 435 Second street, Brooklyn, N. Y.

Missing in Action—Private Leonard Delbert Phile, 95th company, Sixth marines. Reported wounded in Soissons drive, July 19, 1918. In September, 1919, mother received notice that "Philo Lionard" had died and was buried in France. She does not believe it is her boy. Comrades are reported to have seen him alive and well in the fall of 1918. Address his sister, Mrs. H. W. Johns, 107 Glenwood avenue, Battle Creek, Mich.

309th Infantry, Company M—Lieutenant Duncan Campbell, wounded November 1, 1918, died November 4; no news after leaving first dressing station. Information wanted by wife, Mrs. Campbell, 19 West Ninth street, New York city.

104th or 194th F. A., Battery F—If the parents of Joe H. Johnson will communicate with I. M. Adams, 19 East Verona avenue, Pleasantville, N. J., they may receive a Testament and three snapshots belonging to Johnston, which were found on a battlefield in France.

358th Infantry, Company M—Will the soldier who was with Sergeant John W. Smalley when he charged a machine gun nest and was killed near Vilcey, France, September 12, 1918, write Florence E. Berney, 404 Walnut street, Alexandria, Ind.?

126th Infantry, Co. I—Will the sergeant who was saved by Private Homer Whisler on October 9, 1918, at Romagne, write to Whisler's mother, Mrs. Mary E. Whisler, Hillsboro, Ohio, R. F. D. 11? Information concerning her son's death wanted by Mrs. Whisler.

356th Nurses Unit—Ruth G. Morgan; last heard of on way to France, August, 1918. Information of her fate desired by E. B. Bauman, box 364, Flemingsburg, Ky.

Missing in Action—Private Arthur Hill, 361st infantry, wounded in October in Argonne and seen walking off the field. A buddy saw him in a hospital in France. Since then nothing has been heard of him. Family fears he is in a mind case in some hospital and his heard rumors that he is under treatment in the United States. Address, cousin, W. R. Cawthra, 10 Clay street, Worcester, Mass.

109th Infantry, Company B—Private Charles James Hunt, wounded, gassed, captured and reported died of wounds. Mother would be grateful for any particulars of the engagement in which her son was wounded and taken. She also wants to know what kind of gas it was and how it affects men. Write Mrs. John L. Hunt, Route Box 29, Mount Union, Pa.

Fifty-ninth Infantry, M. G. Company—Private Raymond M. Schmidt, reported wounded October 8 or 4, 1918, and died October 8 at fourth field hospital, Cussey, France. Mother wants to hear from anyone who saw her boy shortly before he died, and knows whether "he said anything on his deathbed." Address, Mrs. Matthew Schmidt, 507 Rush street, Dubuque, Iowa.

U. S. S. Otranto—Private Clyde Mott went down with this vessel when she sank in a storm off the Irish coast. His parents want information about his death from survivors. Write his brother-in-law, John G. Doolittle, Savannah, Ga.

103rd F. S. Battalion, Company C—Otis Lyle Canady, gassed and died later in hospital at Cuincy, September 9, 1918. On way to hospital he gave his personal effects to Sergeant Tracy in charge of ambulance to be mailed to his father. Sergeant Tracy gave them to a Y. M. C. A. worker to attend to it. Anyone knowing this "Y" man write to his father, C. M. Canady, 618 Park road, Ambridge, Pa. Will the nurse or doctor with Private Canady when he died also write?

Twenty-third Infantry, Company I—Private Floyd Holt, died July 29, 1918, after having been wounded at Vaux, July 1. Government bureaus can furnish no other information. His mother died last November while mourning for him. Details of his death are sought by sister, Mrs. Florence Tiviss, 83 Bridgeport avenue, Devon, Conn.

Series of Sermons At Christian Church

"The Romance of the Ages" is the title to a series of sermons which the Rev. R. H. Sawyer, pastor of the East Side Christian church, is preparing to deliver in his church on Sunday evenings. These discourses will provide the foundation for a book soon to be published in England. A moonlight launch party will be given Tuesday evening by the Loyal Bereans of the church. A delightful evening is promised by the committee, which consists of Miss Crofoot, Miss Hoff, Mr. Moore and Mr. Protzman.

Negro's Spirit Walked at Night

True Story Told of Southland

By Frank A. Clarvoe

In the first place, I want it distinctly understood that I have seen a ghost. The statement may cause smiles among sundry callous individuals, but it is none the less true. While not exactly superstitious, still there are some things of a superstitious nature that appeal to me strongly, and while a graveyard or a dark corner holds few terrors in the dark of the moon, I would scarcely be true to my salt if some ghostly character had not held a role at some time or other upon the stage of my existence.

I saw the ghost, and as far as I know there has never been any physical or atmospheric explanation for the phenomenon. And don't say that you don't believe in ghosts, either, for—

Haven't you awakened in the dead of night to see some filmy wraith pursuing his solitary way past your window, or standing in some remote corner of your room? Haven't you ever, on a dark night, with the moon behind clouds and a threatened electrical storm coming like Lochinvar out of the West, seen some flitting white form dodge along the road ahead of you, or slip silently from tree to tree, or something else like that?

The folk lore of the Southland is replete with hair-raising tales of spirits who return again to earth; and any negro "mammy" can tell weird tales of such things, can sit before a smoldering fire and repeat story after story of ghosts who come to tread the paths of the living.

Near the little town of Mayodan, N. C., a thick growth of pines covers an acre of ground used in the long ago as a negro burying ground. The pines cast thick shadows even on the brightest day; ivy and Virginia creeper form heavy carpets over the sunken graves, and what rays the moon is able to cast through the heavy foliage fall fitfully upon rough-carved headstones and old bits of iron railing. It's a gruesome place, even in the daytime.

GHOST LIVED THERE

A ghost lived there. In one of those graves the departed spirit of a negro blacksmith had his home. It was his headquarters when conducting his mysterious wanderings. I saw this ghost. Coming home from town one night, long after the time when I should have been in bed, I trod the cinder walk past the gloomy place with my heart in my mouth and crawly chills playing havoc with my peace of mind. Suddenly from the deepest depths of the pine thicket came the sharp ringing of blows of metal struck on metal. As if two pieces of steel rod had been clashed together, the three strokes came with startling reality from among the ivy-covered mounds and depressions. I literally froze in my tracks. The wind swayed the trees with that mournful swishing sound so peculiar to evergreens, and a pale moon shed a ghostly light among the underbrush. This much I noticed, for I had seen it many times before. But not that ringing stroke of the iron.

After the last stroke, there was a pause, and then there came three more from a point a trifle more distant than the first series. I was in a condition, as I look back upon it now, eminently suited to the needs of a heart specialist. When I could at last tear my feet from the spot and turn to run a rather wobbling course, a white object arose from the ground and silently made its way back into the woods. I covered my face with my arm at this last sight and made for home with all speed.

FOLKS WERE INCREDULOUS

My people were incredulous, but I finally found sympathy, and a suggestion that I make "Nigger Town" a visit the next day for the purpose of having a talk with old Jim Johnson. Jim was blind, but he was the seer of the countryside for the colored people. Many came to Jim with their troubles, and scores claimed that he held nightly intercourse with the dead. Naturally, Jim was exactly the person to see.

The next day saw me, scarcely recovered from the effects of the night before, at the cabin of the colored prophet. He was on the point of going out to work (wood-sawing being his means of livelihood), and his granddaughter was leading him by a leash as I entered the yard. I broached the subject, asked him what the strange sight might be, and he forgot work for the time being while he sat down on the woodpile and proceeded to relate the tale of the blacksmith. And this was the tale:

ALL CAME TO FUNERAL

When Jim was a boy, and while he still had the use of his eyes, the burying ground in question was the center of social negro activities, being slightly more popular than the baptizin' pool, and decidedly on a higher social plane than the church. Jim was 10 years old the day Ephraim Snow was buried, and the whole countryside had turned out to do Uncle Ephraim honor. Colored people came from far and near, and the festivities were great. The main portion of the ceremony being accomplished to the satisfaction of all, lunch was being served on the grass near the hitching posts. The grave diggers were filling the grave, and near the tossing dirt stood Ed Ashby, the negro blacksmith from near Madison. Ed's duty it was to build a low railing around the grave to keep the piles of flowers from being blown away, and as he waited for the grave diggers to finish their labors, he leaned near the brink of the hole, hammer in one hand and the rods that would later be driven into the ground in the other.

The unexpected happened, as sometimes it does. Widow Snow fainted, and all hands went running to the place where she was lying on the grass, fanned vigorously by a committee of her peers. Even the grave diggers forsook their toil for the purpose of beholding the unconscious widow. When quiet had been restored and they once more took up their shovels, Ed had disappeared. Thinking that he had gone away for a moment, they finished filling the grave, trimmed it carefully and laid the flowers on the mound, sans railing, for Ed had not returned. Nor was he ever seen again in the flesh.

"And is that Ed's ghost that lives in the pine woods?" I was eagerly curious, and instead of fearing the worst, I welcomed it.

"Sho's yo bawn, hit was!" said Jim. "Folks heahabouts figger dat Jim fell in de grave, faintin' fit or sumfin', and dose fool niggers handlin' de shobels didn't hab de sense to look in de grave when dey got back!"

JIM JOHNSON BELIEVED

Was it as Jim had said? Had Ed fallen into the open grave, been knocked unconscious and been buried in that state? And when he fell, did he take his hammer and material with him, and now nightly go about fixing railings with his ghostly hands?

Few white people have seen the ghost I beheld on that eventful night, and none would believe that I myself had seen it. But Jim Johnson saw it—before he went blind—and also he saw it since, he declared to me. Other negroes had seen it, and they avoided the thicket after nightfall—avoided it like the plague.

The negro burying ground in the course of time was moved elsewhere—probably because the living could not fancy associating after death with a sprite they had seen while living; but, for all I know, the graveyard is as ghostly and desolate as ever. I sometimes wonder if Ed's ghost still haunts the scene of his familiar labors, or whether he has moved on before the onrush of civilization.

Do you believe in ghosts now?

U. of O. Graduates Will Have Chance To Study in Paris

University of Oregon, Eugene, Aug. 21.—An opportunity for graduates of the University of Washington to continue advanced study in the large universities of France will be offered in the future by the Society of Field Service Fellowships for French Universities. The fellowships for the coming year will be of the value of $200, payable before the student selected leaves, plus 10,000 francs payable in France. The fellowships are tenable for one year, but may be renewed upon application, providing circumstances warrant.

Two members of the Pacific states division of the advisory board of the society are from the state of Oregon, Wells Gilbert of Portland and Professor Warren D. Smith of the University of Oregon.

4000 FARM LOAN ASSOCIATIONS ARE TO BE ORGANIZED

Move Made to Put Cooperative Farm Borrowers of U. S. Into One Great Voluntary Group.

(By United News)

Washington, Aug. 21.—The latest move in the rapidly developing effort to organize farm groups was made known today by the national board of farm organizations, which proposes national organization of 4000 farm loan associations, already organized as units under the federal farm loan act with total membership of 130,000.

The national organization would be distinct from the federal farm loan board, and is urged for the purpose of putting cooperative farm borrowers of the United States into one great voluntary self-government, according to the announcement.

W. W. Flannagan, until August 7 secretary of the farm loan board, has been put in charge of the organization work. Flannagan does not agree with some policies of the farm loan board. It was stated today by Charles A. Lyman, secretary of the National Board of Farm organizations, that "the movement to organize has arisen out of the crisis facing the federal farm loan system, whose activities are now paralyzed because of a suit to test the constitutionality of the act now pending in the supreme court. The farm loan system has had great opposition from private farm mortgage bankers."

Charges are made that the federal farm loan board has not followed a policy of making its loans through the 4000 farm loan associations, but wants to make loans through its own agents.

The announcement today emphasized present activity of farm representatives in promoting various national organizations. Washington has recently established headquarters for the American Farm Bureau federation, representing county farm bureaus, the National Grange, the National Board of Farm organizations and the Farmers' National council, an organization made up of leaders urging more radical changes in government than the old established political parties. The other three groups work on a non-partisan basis with the regular parties.

Rhodes Scholarship Applications Are to Close September 1

Applications for Rhodes scholarships are due before September 1, C. H. Gray of Reed college, secretary of the committee on selection, has announced. Appointments will be made September 25. The Oregon committee of selection is composed of President P. L. Campbell of the University of Oregon; A. C. Newill, a graduate of Oxford, member of the Portland school board and president of the Oregon Civic league; J. B. Harrison of the University of Washington and C. H. Gray, both former Rhodes scholars.

The Rhodes scholarship this year will be open to a great many more men than usual, because of the removal of the Greek requirement. Hitherto the authorities of the English university required every candidate to have had at some time a knowledge of the Greek language, which closed the university to many would-be students. The authorities last spring removed these restrictions.