

A VISIT TO UNCLE SAM'S SCIENTIFIC STATION ON THE TOP OF THE BLUE RIDGE.

Its Laboratories and Their Wonderful Instruments-Worked by a Woman's Hair -Where Horses Must Go Barefoot-Kite Investigations of the Upper Air-The New Physical Laboratory and Some of its Machines-Testing Temperatures Below Ground-Observations of the Sun-A Word With Professor Moore About His Weather Predictions.

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OUNT WEATHER, Va.-I am at Uncie Sam's scientific weather station on the top of the Blue Hldge mountains. It

es near the northern houndary of Virgina and within simost a stone's throw of the West Virginia line. At my left I can see the Maryland hills which look down upon Harper's Ferry, and just to the west of them is Charlestown, where John Brown was hung. Right in front of me is the Loudoun valley, famed as the home of the Lees and Fairfaxes, sith the Bull Run mountains bounding is horizon; while at my back lies the valley of Virginia with the Shenandoah sinding its why through it and with winchester and the scenes of Sheridan's Winchester and the scenes of Sheridan's pise in plain sight, not more than 26 siles away. I am just about 60 miles hem our national capital, and so high for our national capital, and so high that, by standing on the roof of the administration building here, I can se the white shaft of the Washington second kiesed by the rays of the proument kissed by the rays of the

setting sun.

ABOVE THE CLOUDS. That shows how clear today is. To-

errow we may be shrouded in mist so morrow we may be surrounded in mist so thick that one can see but a few feet, The weather station is often hidden in the clouds, and the clouds come and the clouds, and the clouds come and go wrapping it as in a blanket and then assing on. I have a summer home on a neighboring peak and know the region well. We have here all the cloud region well. We have here an the cloud effects of the Himalayas or the Alps. Is midsummer we are often above the clouds, and the Shenandoah valley is a clouds, and the Shemandonh valley is a sea of fleecy wool, rolling in billowy naves to the mountain range on the op-posite side. We can see the storms coming and going. The hills clap their hands as the thunder reverberates inrough them, and the gods of the lightning give us fleeworks more grand than any ever conceived by man. We are high up in the skies, in the very beart of the weather, and often above are high up in the sales, in the very bart of the weather, and often above is and in one of the best places on with to study and investigate its phe-

inmeria. WHY MOUNT WEATHER WAS CHOSEN.

A location like this is indispensable to s station such as Uncle Sam has here. We have more than 200 weather stations sattered over the United States, and ve spend almost a million and a half colars annually in forecasting the weather. They foretell the storms, the heat and cold, and are worth to Ameri-ran industries at least \$50,000,000 a year. Those stations are, however, mere working stations; they apply the scieninc principles already discovered, and have neither time nor the machinery and surroundings to make further instigations and studies.

This station at Mount Weather has the to do with our daily reports. It will be devoted entirely to research. Its entists will investigate the laws govming the atmosphere, the earth and forces electrical and otherwise coneted with them, in order to improve a weather forecasts of the future. To this they must have the finest of mehinery and also a location absolutefree from disturbances of any kind. ame of the instruments here are so nicate that they would be affected by te electrical current of a street car pasing the door, and others in the

the rocks of the neighborted datained iron or certain other THEFT For the reasons this place in the wild of Virginia, on the top of the Elle Rige mountains, six miles away mm t milead station, was chosen. of # was decided upon the rocks had to be analyzed, and in making certain of the buildings copper was used in place of iron, and the horses, which did the hauling about the prunds nearby had their iron shoes [moved before being put to work. The same care has been taken as to erry condition connected with Mount father, and the machinery and midings are, as far as possible, absoely perfect of their kind.

owrright, 1906, by Frank G. Carpen- ing the different conditions at every altitude. The instances which measures the humidity of the alr is one human hair, and that the fine, sliky hair of a woman. The hair has been so treated that its oily particles are removed, and it records the changes in moisture by its ex-pansion and contraction. The thermometer which records the differences in temperature is a little metal bow, with a liquid inside, which also expands and contracts, and all the in-struments of this kind are such that they must work in temperatures which vary from 100 degrees below zero to 100 degrees above it. As the kite goes up into the air it soon reaches the freezing point, and the atmosphere grows colder and colder as it rises. The ink must be such that it will not freeze, and the oil must work down to 100 degrees of cold. In the shops here I saw instruments for testing such machinery down to 100 degrees below zero. One, I remember, was great can of about the size of half a flour barrel, with a coil of copper pipes inside it, and good arrangements for packing. By putting liquid air in the pipes the temperature is reduced to the desired point.

WHERE IT IS ALWAYS CALM.

In striking contrast with these great changes are the conditions found in-ide the magnetic laboratories. These buildigs are so made that throughout the year the temperature chages no more than one-tenth of one degree The buildings have triple walls, with dead air spaces between them. One of them has no windows, and the rays of the sun never penetarate it. Both buildings were constructed with-out the least bit of iron or any other metal except copper, and the machin ery within them is the finest for mag netic observations and study that the world can furnish. I went through them with Prof. Miller, who has charge of this department of physical research, but his conversation was too scientific for popular reproduction.

A SCIENTIFIC WORKSHOP. Indeed I am surprised at the extent

and equipment of Uncle Sam's workshops which have so recently been put up here on top of the Blue Ridge. When Prof. Willis Moore, the head of the

Prof. Willis Moore, the head of the weather bureau, presented the project, through Secy. Wilson to Congress, he was told to go ahead and spend what was necessary to carry out his plans. There was, I believe, no restriction on there was, I believe an or estriction for the weather bureau appropriation. So far he has expended only \$125,600, and he tells me that when the entire equipment, buildings and all, are completed ment, buildings and all, are completed, which will be within the next three or four years, the cost will be not more than \$250,000. For the sum already spent he has here 90 acres of ground, right on top of the mountain, fenced and cleared, and a part of it laid out in walks and drives. He has put up eight different buildings including stables

different buildings, including stables and wagon house, quarters for his mer an electrical power plant and machine shops, several laboratories and a large administration building. The latter is of stone, with walls two and one-half feet thick, with wide porches and comfortable rooms for the scientists who are to stay here. The power plant has a 35-horse-power gasoline engine and an electrical machine which decompose air so that the hydroger gas can be taken out, compressed and shipped to the different stations all over the country for use in balloons. The idea is that when a great storm occurs at a given moment each of the



THE ADMINISTRATION BUILDING.

Specially Photographed by Frank G. Carpenter for the Deseret News,

atories of the world for studying the

ionization of the air upon the precipi-tation of rain or snow. By ionization is meant the broken up atoms of gases

which are supposed to form the nucleii or centers of condensation of raindrons. He will also investigate the reation of the dust motes of the air to the same problem. He will measure the changes in the electrical potential of the earth and air, and endeavor to learn something more definite about the forces operating in thunder stornis. He will study the chemical composi-tions of air taken from various portions of large cities and elsewhere, and also from the plain in front of the laband oratory and the Loudoun valley below. He will also have his seismic instruments, and instruments for measuring the heat of the sun and for the investi-gation of other interesting problems that concern the practical meteorologist.

EARTHQUAKE MACHINES.

The instruments in the physical laberatory will be quite as remarkable as any I have mentioned. Some to be used recording the vibrations are so dellcate that they would record the impres-sion or dent made in the earth by a person stepping on the ground floor of the laboratory or walking by outside. The instruments now used by the station will register the minutest vibrations of the earth, thousands of miles away. They recorded the earthquake at San Francisco a few seconds after its oc-currence. Indeed, it is said that the best of the seismic instruments of today have recorded earthquake waves have gone clear around the This was so in the Osaka obworld. servatory of Japan as to the Indian car quake of 1905. The waves, which ed Japan, passed on across the Pacific ocean to America and Europe, and finally returned to Japan, having completely encircled the globe. The time required was two hours, three minues and 35 seconds. Similar instruments

will be installed here at Mount Weath-

KITE FLYING IN WET WEATHER. In company with Prof. Moore, chief of the weather bureau, I watched the fly-ing of one of the large box kites which sent up to a height of several miles above the earth to get records of the air. The kite, which is about 10 feet n length, is made of two boxes, co taining square cells upon a wooden tramework fastened together by wires Tied upon it was one of the recording instruments which I have already de-

scribed.

The kite was sent up from the revolving kite house. This is about 30 feet high and it looks for all the world like a Dutch wind-mill without the arms. The whole side of it can be opened, and is arranged so that it can be turned around to have the door in the proper wind direction for flying the kite. The which direction for hying the kite. The kites are sent up fastened to a steel wire as fine as a plano string, and so strong that a single strand of it will support 200 pounds. Notwithstanding this it is not as thick as a darning needle. The kites are recled and un-recled by means of an electric motor, and I was told there were four which and I was told there were four miles of wire on the reel today when the kits was let out. It ascended to a distance of perhaps a mile and a half. At the present time, kites are flown on the first Thursday of every month at a large number of weather stations in different parts of the world, and the records of the upper air thus gotten will be sent here for scientific study and deduction.

ong age

of the atmosphere straight up in the air as high above Mount Weather and higher than the highest Harvard instruments in Peru, and that not only here but at other places throughout the United States. Indeed, the arrangements at this station for studying weather phenomena, both on the earth and above it, are not surpassed any where in the world TEMPERATURE BELOW GROUND.

As I walked with Chief Moore about the grounds at Mount Weather, he mentioned some of his plans for future

experiments. Said he: "We want to investigate the changes of temperature below the earth's surface in order to study them in relation to the changes in the air above. You know that after one goes down a short distance the earth becomes rapidly distance the earth becomes rapidly warmer. The increase is one degree for every 40 or 50 feet. You soon reach a point at which one could boll eggs, and down 30 miles or so come to a heat great enough to reduce everything to great enough to reduce everything to a molten mass were it not affected by other forces. We expect to bore wells 100, 200 or 200 feet deep, here on top of the mountain; and it may be also n the Loudoun valley, 1,200 feet below. We shall place automatic recording thermometers, 10 feet apart or less, all the way down to the bottom of such a well, and will have arrangements by which we can know the changes at each depth, at all times, OBSERVATIONS OF THE SUN.

"Will you make much study of the sun's heat e shall use the bolometer and va

for the purpose. We are also studying , how to better record the lightning, and in short, are making a large number of investigations which are practical

as well as scientific The conversation here turned to the present efficiency of the weather bureau, and I asked Dr. Moore what pertentage of its predictions turned out

to he true "We are right about 88 times out of every hundred," was the reply, "This has been the average during the past five or ten years, and I believe it is about as well as we can expect to do with our present knowledge and ma-hinery. We hope to learn things here which will better our forecasts.

"Is the value of your work increas-

iyan dalaman da

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glasses.

Eyes tested free for

"Yes. The reports of the weather bureau are now annually worth mill ions to the people of the United States Indeed, they are so valuable that the maritime, agricultural manufacturing interests will not per-mit them to be curtailed in any way, We have demande for new station daily and, as it is, I cannot recommer the establishment of one in every 5 of the applications I receive. At pres ent the increase in the bureau is not more than 4 per cent a year. We be-lieve that it should have a slow and bealthy growth, and it is upon that basis that we are extending it as fast as we can.

FRANK G. CARPENTER



74 S. Main St.





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FORKED BY A WOMAN'S HAIR. indeed, I despair of being able to ments already installed. Take for insance the automatic recorders, which en sent a mile or so up in the air inside box kites to chronicle the temstature, humidity and other condi-tions of the atmosphere, as well as to inte down the velocity of the wind on time to time. The aluminum box from time to time. containing these instruments is so that put it in your y is such that it st: but its machinery Lorps & reev all these and other

stations within a certain radius of the storm may send up balloons. Each balloon will contain an apparatus which will make automatic records of the aerial conditions through which it passes. As each balloon reaches a certain height, the machinery is such that it will explode, and this apparetus folls should to be seen and the apparetus falls slowly to the ground under a parachute.

The apparatus will have a card attached to it, offering a reward for its immediate delivery to the nearest weather station. Such widespread reports have never been attempted else-where, and it is thought that the facts gathered in this way from all parts of a storm region, may be of great value. Prof. Moore tells me that the ordinary illuminating gas, now used, is totally unfit for balloon purposes, and that it

is only by this means that the proper gas can be economically supplied.

NEW PHYSICAL LABORATORY.

One of the most interesting of the scientific workshops here will be the new physical laboratory which is now building. This will be under the direct charge of Dr. William J. Humphreys of Johns Hanking, minuscription of her Johns Hopkins university and late professor of physics in the University of Virginia, who is also the chief of the scientific station here. Dr. Humphreys is noted as a physicist, and he will have here one of the finest laborPoliticians' and Other Bibles.

'You bibliophiles talk about the 'Breeches' Bible, the 'Bug' Bible, the 'Politician' Bible, the 'Vinegar' Bible, on-what do these names and so mean

"Til tell you," the collector answered, "Take, first, the 'Breeches' Bible. It is so called becaused a typographical error in it causes the garments made by Adam and Eve out of fig leaves to be termed breeches instead of aprons. "In the 'Vinegar' Bible of 1807 the word 'vineyard' is misprinted 'vin-

egar," "The 'Printer's' Bible, 1702, makes the 'Printers have persecut-

Psalmist say: Printers ed me without a cause. "The 'Religious' Bible, which was printed in 1637, puts' religious' for 're-

observatory at Arequipa, Peru. That institution is situated in the Andes at about a mile and a half above the sea. and it has in addition a recording station, with automatic instruments, on the top of Mount Misti, which is almost four miles high. By means of these kites our weather scientists will be able to make records of all the conditions

We shall use the bolometer and va-rious forms of the perhyleometer for measuring the quantity of heat receiv-ed from the sun as distinct from the temperature of the air. We expect to make apparatus for more exactly reg-istering the beginning and ending of precipitation. Dr. Oliver L. Fassig, who has charge of our processite exact who has charge of our upper air experi ments, has partly worked out a device

inent judge of Baker City. Ore., says of "TRIB." "There given your TRIB' a fair trial and followed directions fully, and now desire to tender you my unsolicited word as to its efficiency. Let me truthrully say that I feel entirely different in every way. It seems strange, indeed, to me to be ready and waiting for three square meals a day, good sound, pleasant, refreshing sleep, no nervous hightmares and a de-gree of self-reliance that used to require more than one cocktail to induce. I did not take "TRIB" from a moral standpoint, but it was a choice between liquor, the pine box and "TRIB." and "TRIB" won out in a fair contest. I positively have no appetite for intoxicants and to judge others by myself, anyone can de-rive the same benefit. "TRIB" has made many happy homes." Investigate this remedy while we are investigate this remedy offering an absolute guarantee with every treatment. Price per treatment, \$12.50. Doull Drug Co., F. C. Schramm Cor. 1st So. Main Sts. Owl cother. door to new Post office.

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Capt Pershing was for some time governor of the More country in Mindanas, and he was unusually successful in maintaining peace there. But hoverer meritorious he may be, there is naturally much disappointment on the part of the officers who have been "jumped."