

3000 SCIENTISTS AT WORK ON ONE GREAT PROBLEM.

Increase The Nation's Productiveness, Their Task.

Uncle Sam Maintains Greatest Army of Scientific Workers Ever Under One Command. These Knights of the Test Tube Work for the Benefit of the Ninety Millions. In Their Great Campaign They Conduct Investigations That Are Strange and Curious, Such as Poison Gardens, Bug Farms and Kite Flyers.

BY WILLIAM AHERTON DU PUY.

SHOULD our Uncle Samuel order a "fall in" to three men of science who are employed in his Department of Agriculture, those responding would number an army of upward of 3000.

Were this army to go roving about the world with its microscope in one hand and its test tube in the other, it would find no similar force to do it better. For nowhere else under the sun are so many scientific men banded together in one cause. Nowhere since the beginning of time has so large a working organization of scientists been built up.

Here would be a line of men a mile long, practically all of whom might, with authority, write before their names the handle "doctor." Here would be the greatest collection of B. S.'s and Ph. D.'s, M. S.'s and L.L. D.'s ever shown under one tent. Here would be an array of spectacles that would make a Boston institute for lady teachers green with envy. The dandruff from the coat collars above their rounded shoulders would start a brain storm. Here would be a scraggly line from a military standpoint, yet one that is fighting the greatest battles of them all.

Masters of Strange Sciences.

Here would be found a body of men nearly every one of whom is an authority upon some certain thing that has to do with the well-being of the crops that grow on Uncle Sam's wide acres, and, therefore, with the well-being of the ninety millions. One might be an authority upon the boll weevil that attacks the cotton of the South; another would know of wheat that grows in Siberia; a third could tell how to establish and breed muskrats at a profit; a fourth how to make turkeys busily fat at Thanksgiving; a fifth how to induce the peach to mate with the apricot; a sixth how to distinguish between butter and oleomargarine, and a seventh why the winds blow from Medicine Hat. The gamut might thus run throughout the list, for here are men who know practical science—a science that affects everyday life of all the people.

The Department of Agriculture has been going at a breakneck pace for the years along the line of development. Today it employs nearly 15,000 people. Yet in 1890 there were but 3000 employees of the department, and in 1895 but 1000. Of these 15,000 employees of the present time one in five is a scientist. There are a dozen great scientific bureaus in the department, and the chiefs of these bureaus are the division commanders of a scientific army. The commander-in-chief is a grizzled veteran of soil and science, James Wilson, who bears the title of Secretary of Agriculture.

The biggest division of this bookish fighting force comes under the Bureau of Animal Industry. Most of the scientists of this bureau have laboratory methods of telling when the product of the great packing-house is good or bad, and the great mass of their work



Dr. H. W. Wiley, Division Commander, Scientific Army.

is in connection with the enforcement of meat inspection regulations. In the Bureau of Plant Industry there are 600 scientists whose sole interest is the manner in which plants grow. Over in the Forest Service are 300 degree men, who study the trees of the Nation from every conceivable standpoint, ranging from the little bugs that bite them to the great bridge timbers into which they may be cut. The Bureau of Chemistry has 250 men who are chiefly interested in determining what food is good or bad, and in tying the can to Fido when he masquerades as corned beef. The office of experiment stations has more than 100 scientists, who are tugging the soil of all the states to ascertain what manner of a smile of productivity may result. There are 200 scientists whose business it is to add fuel to that ever-present topic of small talk, the weather. There are scientists studying roads, soils, country life, swamp drainage and the pip. There are scientists devoting much time to research in all manner of things large and small. Their activities may be best understood by taking a look at the tasks they are tackling.

Growing Rank Poisons. There is, for instance, Dr. Rodney H. Trus, whose chief business it is to juggle with those plants that are perniciously poisonous. Dr. Trus has a garden in which he grows scores of plants with medicinal properties. In that garden may be found the big white opium poppy that has degenerated the Orient. This Government does not want opium grown in America, in fact, guards against its introduction, but a few of these poppies are grown for experimental purposes. In a bed nearby is another medicinal plant of the Orient, a sort of first love of the Chinese. This is ginseng. Ginseng is a root plant, a sort of potato, that has always grown wild in the dense, shades of the forest of the Atlantic seaboard. A generation ago the Yankees found that they could pull up these ginseng roots and send them to China, where the millions of



W. J. Spillman, Who Remakes Worn-out Farms.

the pig-tailed kingdom would carry a bit of this root in their pockets and nibble it upon occasion that the inner man might be kept fit. So profitable was this industry that all the ginseng in the United States was pulled up and exported. The supply is now almost exhausted. Dr. Trus is showing farmers how they can go into the cultivation of ginseng and produce a crop similar to potatoes, which sells for \$5 a pound. Golden sea is another drug plant similar to ginseng which may be grown and sold at similar prices. There is the Dalmatian daisy from the stormy Balkans, which furnishes the insect powder of the world. It is being grown in this poison garden. Camphor trees are being raised profitably besides the orange groves of Florida as the result of Dr. Trus's investigation. All manner of herbs and things which have previously been gathered from supplies grown wild in nature are here being domesticated, their secrets ascertained, and they are being handed to the farmers for cultivation as a new industry. Thus is the drug supply of the nation to be put on a more dependable basis than when its raw material is gathered in the wilds.

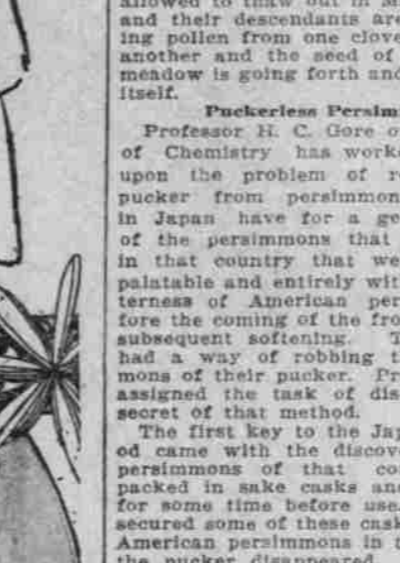
Swapping Insects. There is Dr. L. O. Howard, who is chief of the bureau of entomology. Dr. Howard knows more about insects than anybody else in the world. He knows how houseflies multiply in the Summer time and how to keep them from doing it. He knows how the Texas tick transmits fever in cattle and how to stamp it out. He knows how the Gypsy moth got into New England and he knows other insects that will combat the spread of that pest by eating it up. He knows how the European spruce sawfly is doing in New England by the wholesale and liberating them in the Gypsy moth territory. But most strange of all, he has developed a world-wide commerce in insects, and it has come to pass that this nation is swapping them with other nations the world around. The chief Gypsy moth parasite is a certain fly that is well known in Europe and Japan. Certain of our scientists have gone to those countries, studied these flies, captured them, brought them to America and bred them in great numbers. They lay their eggs in the larvae of the Gypsy moth,



Dr. E. C. Schroeder, Manager of a Rat Apartment.

that the multitude may be prepared for balmy breezes or inclemency. Until recently little was known of temperature, pressure, humidity and wind velocity, except in regions near the surface of the earth. This small layer of atmosphere is most variable and untrustworthy because it is interfered with by every object rising in its path, but upon its condition have had to be based the considerations that have heretofore figured in weather forecasts. Obviously, it is unwarrantable to conclude that the great mass of air is following courses indicated by the strata resting upon the earth. It is now being demonstrated by Dr. Blair that currents of air observed from kites and balloons are entirely different from those observed on mountain peaks or at similar heights. Scientific instruments are sent up in these balloons. They record temperatures and velocities and directions of winds that are very important to the forecaster. Kites that reach four and five miles into the air are by no means the greatest sky explorers. Rubber balloons eight or ten feet in diameter that expand as the air grows rarer, climb to elevations of from ten to 15 miles.

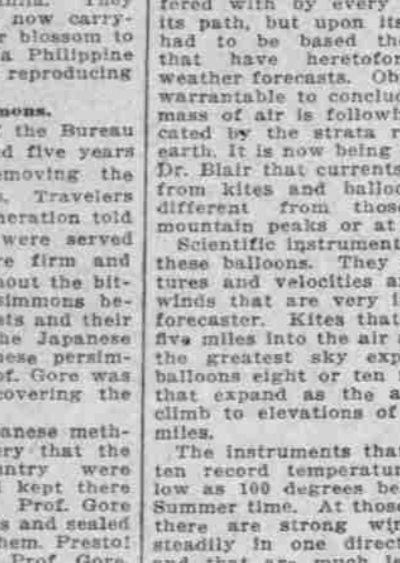
The instruments that they carry often record temperatures that are as low as 100 degrees below zero in the Summer time. At those great altitudes there are strong winds that sweep steadily in one direction or another and that are much less erratic than the surface storms. Under the direction of Dr. Blair a similar work is being carried on in many communities throughout the Nation, and it is expected that before long complete charts of the upper air of the whole country will be in hand.



William R. Blair, Official Kite Flyer.

been in cold storage, which caused them to think it was Winter, to hibernates and remain inactive until they were allowed to thaw out in Manila. They and their descendants are now carrying pollen from one clover blossom to another and the seeds of a Philippine meadow is going forth and reproducing itself.

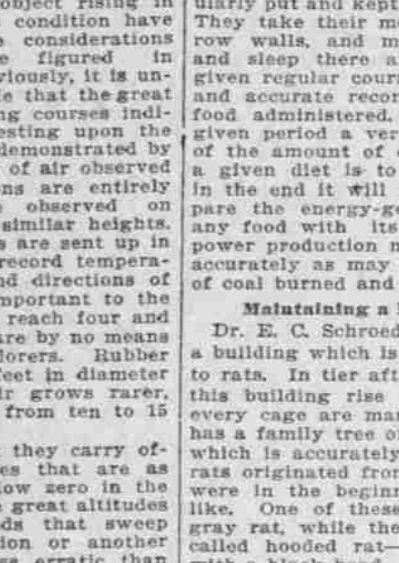
Puckerless Persimmons. Professor C. Gore of the Bureau of Chemistry has worked five years upon the problem of removing the pucker from persimmons. Travelers in Japan have for a generation told of the persimmons that were firm and palatable and entirely without the bitterness of American persimmons before the coming of the frosts and their subsequent softening. The Japanese had a way of robbing these persimmons of their pucker. Prof. Gore was assigned the task of discovering the secret of that method. The first key to the Japanese method came with the discovery that the persimmons of that country were packed in sake casks and kept there for some time before use. Prof. Gore secured some of these casks and sealed the coming of the frosts and their subsequent softening. The Japanese had a way of robbing these persimmons of their pucker. Prof. Gore was assigned the task of discovering the secret of that method. The first key to the Japanese method came with the discovery that the persimmons of that country were packed in sake casks and kept there for some time before use. Prof. Gore secured some of these casks and sealed the coming of the frosts and their subsequent softening. The Japanese had a way of robbing these persimmons of their pucker. Prof. Gore was assigned the task of discovering the secret of that method.



Logan W. Page, Who Takes Good Roads With Him.

and these eggs, hatching into young, devour the larvae. So is the Gypsy moth to be fought. The gaffly is a pest that is known the world around, and its pernicious habit of stinging animals in the heels while inserting its eggs under their skins has resulted in many a mild-faced cow turning her tail over her back and starting at break-neck speed for a water hole. The gaffly attacks the camel a similar way in Africa.

There is a certain digger wasp in Texas that preys upon the gaffly. Texas is exporting these wasps to Africa that the pest may be reduced. Bumblebees carry the pollen from flower to flower and in this way fertilize given flowers that their seed may produce like plants. If this fertilization did not take place the seed would not grow. It would not take place without the bumblebee. When we began to plant clover in the Philippines we found that the seed it yielded would not grow. There had been no fertilization because there were no bumblebees. So Dr. Howard and his assistants set about capturing great numbers of bumblebees and sending them to the Philippines. This occasioned a great deal of difficulty because a bumblebee has a very energetic business end. The question was solved by putting these live bumble-



Prof. W. M. Hays, What Makes Seeds Twice as Productive.

heat. The instrument is so delicate that when a man is lying on a couch within it and raises his hand to scratch his head a change of temperature is registered, the heat causing it having been generated by the lifting of the hand. Now, in this calorimeter men are regularly put and kept for days and weeks. They take their meals within its narrow walls, and make down a couch and sleep there at night. They are given regular courses in various diets, and accurate records are kept of the food administered. At the end of a given period a very accurate measure of the amount of energy produced by a given diet is to be had. Certainly in the end it will be possible to compare the energy-generating power of any food with its competitors. Its power production may be measured as accurately as may that of a shovelful of coal burned and tested.

Maintaining a Rat Apartment. Dr. E. C. Schroeder, the keeper of a building which is given over entirely to rats. In tier after tier the cages in this building rise to the ceiling. In every cage are many rats. Every rat has a family tree of many generations, which is accurately known. All these rats originated from two families that were in the beginning strikingly unlike. One of these was the ordinary gray rat, while the other was the so-called hoodlum rat—one that is white with a black head. These two rats were cross-bred, and the object in maintaining this rat apartment is to ascertain what proportion of the peculiar traits of each occur in the generations that follow. This means that a law of heredity is to be established that will be true in all the animal world. It has already proved that the peculiarities of the stronger member of the cross predominate in the first generation. In the second generation one-fourth revert to the weaker parent. In the third generation certain traits of each of the parents become fixed in the offspring and continue fixed, while certain other traits continue to recur with a certain mathematical exactness. The value of this experiment is in determining the qualities that may be expected in stock breeding, or of even forecasting generations of mankind. The possible recurrence of consumption, of heredity of red hair, might be thus worked out to a mathematical certainty. Logan W. Page, who is at the head of the Government office of good roads, has found out how to take the stickiness out of gumbo roads. He does this by piling the mud up and burning it until it is converted into a clinker, when it becomes as good road material as is made of stone.



Henry Oldys, a Scientist in the Biological Survey.

Henry Oldys is a scientist in the Biological Survey. He is a great authority upon birds. He has gone further than to merely study of red birds, but has feathered creatures; he has specialized upon one thing with relation to them—their song. Mr. Oldys can reproduce the song of almost any of the well-known birds. He can write the music for these songs in such a way that it can be reproduced on the flute or on the piano. He has also written these instrument scientists actually recorded the songs of birds and written them down in such a way that he who will may reproduce them.

Professor Willet M. Hays is the Assistant Secretary of Agriculture and the second in command of this army of scientists. He is in who has had the greatest influence in increasing the productiveness of Western acres by breeding seed to yield greater crops. (Copyright, 1912, by W. A. Du Puy.)

GEORGE ADE'S NEW TABLES IN SLANG. MODELS 1912

The New Fable of the Night Given Over to Harmless Revelry.

ALL those who had Done Time at a certain endowed institution for shaping and polishing Highbrows had to close in once a Year for a Banquet. They called it a Banquet Because it would have been a Joke to call it a Dinner.



who were trying to get a Running Start and at 7:45 a second Detachment was sent out to find the Rescue Party. Finally at 8 o'clock the glad Throng moved into the Main Banquet Hall, which was a snug Apartment about the size of the Mammoth Cave of Kentucky, done in Gold and various shades of Purple, and decorated with the maid's Dream of Paradise. The Style of Ornamentation was that which precipitated the French Revolution.

The Auditing Department of a large Mercantile Establishment. During this Period the Department of Geology in the University was honored by the appearance of a genuine petrified Quail. And the Head Lettuce carried the Personal Guarantee of the Goodyear Rubber Co.



Between the Rainbow Ice Cream and the Calcareous Fromage, a member of the class of '08 who could not Sing arose and did so.

Then each Guest had to take a Tablespoonful of Cafe Noir and two Cigars selected by a Farmer Student who had promised his Mother never to use Tobacco.