course of a hundred or two hundred miles; so that they cannot be regarded as individual clouds, whose meeting produces the funnel.

[Continued on p. 316.]

NOTES AND NEWS.

ANY one interested in the sick benefit, funeral aid, and death-beneficiary associations of the United States can help make the statistics of their organizations for the forthcoming census more complete, and disseminate the knowledge of the good work they are doing, by sending the names of such societies as they may know of, and the addresses of their principal officers, to Mr. Charles A. Jenney, special agent of the Eleventh Census, 58 William Street, New York City.

— Professor S. T. Maynard, in the April bulletin of the Hatch Experiment Station of the Massachusetts Agricultural College at Amherst, states that the fact that healthy and vigorous peach-trees can be grown to the age of six to ten years in New England needs no demonstration, but that we seldom find healthy trees of a greater age on account of the destruction resulting from the cold and by the disease called the "yellows." While we do not know the exact nature of the disease called the "yellows," and cannot wholly control the atmospheric causes, the other causes, says Professor Maynard, we can largely control; and by careful cultivation in the spring and early summer only, by the use of complete fertilizers in the fall or early in the spring, we can largely prevent this destructive disease. It may not be profitable to try to save diseased trees, and it would be advisable to destroy them as a matter of safety, although there is no evidence that the disease is contagious: for upon the college grounds more or less diseased trees may be found at all times; and young trees are planted where old trees have died, and, with an abundance of plant-food, have grown in perfect health for six years.

— Experiments in the cutting of seed-potatoes after various methods have been carried on each season since the organization of the Ohio Agricultural Station. In 1889 the work was carried on upon a larger scale than formerly, and with a greater number of varieties, the object being to test the validity of conclusions drawn from the results of former experiments, also to compare varieties. There is sufficient uniformity in the results of different seasons to warrant the following conclusions, says Professor W. J. Green, the horticulturist: 1. Other conditions being the same, the larger the cutting, the greater the total product; i.e., the total product varies in about the same ratio as the size of the cutting. 2. The marketable product also increases as the size of the cutting is increased, but does not follow the same ratio as the total product, the rate of gain being less. 3. The increase is found in both the large and small potatoes, the greater portion being in the latter. 4. A crop grown from whole potatoes matures at an earlier date than one from small cuttings. 5. Small cuttings require soil that is more highly enriched and thoroughly prepared than large cuttings and whole potatoes, in order to secure a good stand and to produce a profitable crop. 6. The question of relative profit, as between the use of small cuttings and whole potatoes, depends upon the cost of seed-potatoes, the date at which the crop is to be harvested and sold, and the condition of the soil at planting-time. 7. In ordinary practice it will usually be found that neither extreme, as to quantity of seed used, will be found to be profitable. The safest plan is to use large, well-matured, healthy potatoes, and cut to two and three eyes.

— Much discussion having been provoked relative to the results of experiments at the Massachusetts Agricultural College, Amherst, Mass., with steam and hot water for heating greenhouses (reported in Bulletins Nos. 4 and 6), especially as to the accuracy of the results, Professor S. T. Maynard has the past winter made a careful repetition of the experiments to correct any errors that might be found, and to verify previous results. The boilers having been run with the greatest care possible from Dec. 1, 1889, to March, 1890, and every precaution having been taken that no error should occur, he finds the total coal consumed between those dates, for the hot-water boiler, to be 6,598 pounds, the average daily temperature for the time being 49.74°; and for the steam-boiler the total coal consumed in the same time was 9 734 pounds, the average daily temperature for the time being 48.39°. The following criticisms have been made by parties not conversant with the facts of the case: 1. That the piping and check-valve were not arranged so as to get the most perfect circulation of steam without a great loss of fuel. 2. That the flues from the two boilers entered the chimney in such a way as to give a better draught to the hot-water boiler. 3. That the exposure of the two houses was such that the house heated by hot water received more sun-heat than the one heated by steam. These criticisms Professor Maynard thinks can be answered to the entire satisfaction of all fair-minded readers. By numerous test examinations he found that the circulation of steam through all the pipes, above the water-line of the boiler, is perfect whenever there is fire enough to create steam in the boiler; that the check-valve must consequently work easily; and that there is never any standing water in the return-pipes above the water line of the boiler. The flues are arranged so as to give as nearly equal draught to the boilers as is possible and have them enter the same chimney, and enter at the same point; and if there is any difference in the draught of the two, it is in favor of the steam-boiler. It was suggested by the late Mr. George Hills of Arlington, that perhaps from their location the steam-heated house received less sun-heat than that heated by hot water. To test this matter, two standard thermometers were placed in each house, so that the sun's rays should fall upon them equally in both houses at the same time, — one on the eastern, and one on the western exposure. Records were made three times each day for twenty days, ending March 18. Of these twenty days, about eleven days were cloudy and nine clear, and probably the period of time under observation was long enough to show that the amount of sun-heat received by each house is so nearly equal as to in no way change the results given in the temperatures of each house.

— In the *American Chemical Journal* (vol. xii. No. 4) Mr. H. J. Patterson of the Maryland Agricultural Experiment Station, Agricultural College, has an article on "The Use of Animal Charcoal in the Determination of Fat (Ether Extract) in Feeding-Stuffs." His conclusions are, that the use of charcoal results in a closer approximation to the truth than any other method in use, though absolute accuracy is not claimed. The following points may be claimed in favor of the use of animal charcoal in the determination of fat (ether extract) in feeding-stuffs: 1. That the product obtained is nearly pure fat or vegetable oil. 2. That the product obtained gives a more correct idea of the physical nature of the fats from various substances. 3. That slight quantities of water that may exist in the substance and pass out with the extract will be removed by the charcoal. 4. That soluble acids of the plant, or acid which may be formed by the continuous distillation of ether, in connection with some constituents of plants, will be partially, if not wholly, removed by the animal charcoal. 5. That the animal charcoal will partially obviate, if not wholly remove, the difficulty of change in the amount of ether extract (which generally increases) with the aging of the sample.

— The April bulletin of the Michigan Agricultural Experiment Station is on "Foul Brood," by A. J. Cook. By special request of several bee-keepers, Professor Cook issues the bulletin upon the most serious malady that ever attacks bees in this or any other country. The problem of safe wintering, once so important, is now solved, and the intelligent apiarist feels no longer any dread of winter's cold. Foul brood is now the bee-keeper's terror. Like the cholera — a disease which is close akin to foul brood — among our own kind, so this disease comes into the bee community like a terrible scourge; and if the bee-keeper is ignorant, incautious, or indifferent, it abides with him till it starves for want of bees on which to feed. Terrible, and terribly fatal, as this disease is known to be, experience has proved, certainly, that with full knowledge, and as great care, it can be kept in check and wholly cured, and that with not very serious labor and expense. The minute ovoid spores are brought to the hive probably in honey fed to or brought in by the bees. It is easy to see how honey in a diseased colony of bees would receive these spores. It is diffi-

cult to see how it could be free from them. The spores might also be introduced by giving combs containing the disease brood, or which had previously contained it, to the bees, and so now would have the dormant bacilli or spores. Undoubtedly foul brood is usually first introduced through the honey, while it is often spread rapidly by an exchange of combs in an apiary where only a few of the colonies are affected. While the bacillus cannot develop in the honey, very likely the honey serves admirably to hold and preserve the spores. When the larval bee is once affected, it is disturbed, lies differently in the cell from the healthy larva, soon turns yellow or straw color, then to brown, while the skin seems loose and flabby. Later the mass becomes thick and viscid, and turns dark brown, the color of coffee before any cream is added to it. It now dries up, and at last forms a thin layer over the bottom of the cell. While in the putrid coffee-colored state, if drawn out from the cell by inserting into it a pin-head, it is stringy; and if it fails to hold to the pin, it will fly back. This brown, stringy, elastic mass, with no resemblance to a larva or pupa, is a sure proof of the presence of the dread malady. The larva may never be capped over, but, if attacked late in its development, it usually will be. This cap, however, will appear sunken or concave, instead of being convex or rounding out, as the cappings of brood always do when the brood is healthy. These sunken caps are always suspicious, and should always lead to close investigation. Little irregular holes in the cappings are often seen, which also should awaken suspicion. Another indication not always marked in the early stages is a rank smell, which has been compared to the odor of old glue, and which is not very unlike the odor of decaying brood that has been chilled. Often this odor, in severe cases, is very marked, and can be detected while the hive is closed, and several feet from the one perceiving it. Mr. Cheshire thinks that the mature queen, workers and drones, are also subject to attack, and frequently succumb to the disease. For the remedies we must refer to the bulletin itself.

— Within the past few years much complaint has been made by bee-keepers of a disease among bees which not only depleted the colony, but was made manifest by the appearance of the diseased bees. They look black because of loss of hair, much as do robber bees, or old bees in spring, and frequently make strange motions in front of the hives, as though dancing or in convulsions. They are frequently dragged out of the hives by the other bees. This, like foul brood, is supposed, says Professor A. J. Cook, to be due to fungoid attack. In this, only the mature bees seem to become victims, though the inoculation appears to come through the queen. Thus it is found that superseding the queen with a healthy one cures the malady. It is also reported that abundance of salt water placed close by the hives, where the bees can gain ready access to it, will cure this "nameless bee-disease." It would seem that this malady is the same that has received attention in Europe, and which Mr. Cheshire has said was due to the attack of *Bacillus Gaytoni*.

— The March bulletin of the Agricultural Experiment Station of Cornell University is devoted to "Growing Corn for Fodder and Ensilage," by Messrs. I. P. Roberts and Henry H. Wing. Not all the points given below are based upon the experiments detailed in the bulletin. Some are drawn from work done elsewhere, and some from unpublished results of their own. First, they wish to emphatically repeat the recommendation of last year, that, in growing corn for ensilage, care should be taken to select the largest variety that will fully mature before frost in the locality where grown. Special attention is called to the fact that heretofore it has been a common practice to sow or plant corn for fodder and ensilaging entirely too thick. Starch and sugar are not fully developed without an abundance of sunlight. Immature plants are likely to contain a very large per cent of water. It will readily be seen that twenty-five tons of green corn, containing ninety per cent of water, gives but five thousand pounds of dry matter; while twelve tons, containing seventy-five per cent of water, gives six thousand pounds of dry matter. In the latter case a thousand pounds more dry matter is obtained, and less than half the weight of gross material has to be handled and stored; while the corn will still have sufficient moisture to give the resulting silage that succulence upon which its value for feeding as compared with dry forage largely depends. While the percentage of nitrogen grows less as the plant approaches maturity, a much larger proportion of the nitrogen in the unripe material is in the less valuable form of amides than in the mature plant, so that the less percentage of nitrogen in the riper product is compensated for in its increased nutritive value. So far, all the experiments go to show that the effort should be made to raise the largest yield of grain irrespective of stalks, no matter what purpose it is intended for. If one variety gives an equal yield of grain and a greater amount of stalks and blades, then of course it should be preferred, for fodder and ensilage purposes, to the variety that gives the less stalk and blade; but it will be found that as a rule the larger the yield of grain, the larger will be the yield of stover. Finally, the fact should not be lost sight of, that wood and water alone are not good foods for animals, and that they are expensive products to handle.

—The May bulletin of the Michigan Agricultural Experiment Station is an essay on the English sparrow, by C. B. Cook. Seven States legislate against the English sparrow. Of these, four simply except it from the protection afforded other birds, New York makes it a misdemeanor to harbor or protect them, while Michigan pays a bounty of three cents for each sparrow's head. Over twenty of the remaining States give the English sparrow the same protection that is offered to other birds. The remaining States have no laws on the subject. The first thing that should be done to check the sparrows' increase, says Professor Cook, is the repeal of all laws offering them protection. Doubtless many who would turn their hands against the sparrow are prevented from doing so by bird-laws. As recommended by Mr. Barrows, it may be best that one able man should be employed in every town and city to superintend a systematic warfare against the English sparrow. No matter how much farmers and gardeners desire to destroy these birds, it will be of comparatively little avail so long as the sparrows are permitted to stay in their great breeding-haunts, the cities, unmolested. The alarming rate at which the sparrows have increased during the past few years shows only too clearly that some action is necessary. No doubt a bounty helps to lessen their numbers; but it is a question if this is the best way to exterminate the English sparrow. This method has been employed in Michigan since 1887, and has been found an expensive method of lessening their number. The greatest objection—that other species of birds are killed by careless persons for English sparrows—would apply as well to any other means of destruction. The scheme for offering liberal prizes for the greatest number of birds killed in any given territory is worth considering. If the prizes are sufficiently large, many persons will compete, and great destruction to the sparrows would result. Whatever means are employed, it is of the greatest importance that all States and Territories infested be united in their efforts, and all employ some good means of eradication. One or two States alone can accomplish but little, as the sparrows are spreading so rapidly that the birds would migrate from other States near by as fast as those within the State limits were destroyed. No one should receive sparrows on a bounty or prize that has not thoroughly studied th bird. Far too many of the town clerks in Michigan do not know the English sparrow's head from that of a linnet or thrush. As a result, a great many birds that have been sent in for a bounty are the most beneficial birds. Thus many heads have been sent to this station, on which a bounty was claimed, of such valuable birds as the song-sparrow, red-polled linnet, and evening grossbeak,—birds that the laws protect by a fine of five dollars against their slaughter. Michigan has a good law against destroying native birds, and every person presenting such a bird to the town clerk's office should pay the penalty, which is a fine of five dollars.

— The picture of Ruwenzori (identified by Stanley with the Mountains of the Moon), which will appear in the June *Scribner*, was drawn from Stanley's own sketch made at the time of the discovery. The race of pygmies discovered by Stanley in Africa were photographed by him, and one of the pictures will be reproduced in his article.