NOTES AND NEWS.

THE excursion committee of the Appalachian Mountain Club, Boston, presents the following preliminary programme for the 1891 excursions, subject to possible changes: Saturday, April 18, mayflower walk, Marshfield; May 9, May walk, Andover, Mass.; May 30. Mount Wachusett; June 17, laurel excursion to either Milford or Mount Vernon. N.H.; about July 1, field meeting at the Catskill Mountains, N.Y.; Monday, Sept. 7 (Labor Day), Bristol, N.H. It is hoped that a camping party to Moosehead Lake may be arranged in August. Members who desire to join the party are requested to notify the chairman of the special committee before July 25. The autumn excursion may possibly be to Mount Chocorua the latter part of September.

— Bulletin No. 72 of the Michigan Agricultural Experiment Station is by W. J. Beal, and is entitled "Six Worst Weeds." Mr. Beal states that some of our most troublesome weeds are natives of the neighborhoods in which they are found, but most of them have been introduced from other portions of our own country or from foreign countries. The seeds of most weeds find their way on to a farm nicely mixed with seeds of grasses, grains, and clovers, which are drilled in or sowed broadcast on fertile soil, where they are afforded an excellent opportunity to grow and multiply. In some instances weeds are introduced as a part of the packing or straw employed to protect castings, marble, crockery, or fruit-trees. Such foreign packing should always be burned at once. By these processes above noticed, the older the country, the more troublesome weeds it will have, as every new intruder usually comes to stay. In most cases a weed becomes well established before it is discovered; and the inquiry comes, "What is it, and how can I get rid of it?" Enclosed in the bulletin were samples of seeds of six sorts which have a bad reputation, and it will be best to watch them. Most of them are already pretty well known by some of our farmers. They are not indigenous, but have all been introduced from Europe. The following rules are worth observing: 1. Carefully examine seeds before sowing, and see that they are clean, and thus prevent the introduction of weeds; 2. Keep a sharp lookout, and exterminate the few first intruders before they spread themselves; 3. Usually, as in all the six cases referred to, perhaps excepting the Canada thistle, one or more so-called hoed crops, like corn, potatoes, or beans, most thoroughly tended throughout a single growing season, or for two seasons in succession, will be a good practice. There is no royal way in which to kill weeds.

— To find a paint of lasting qualities, which will prevent the corrosion of iron due to atmospheric agencies, is a problem with which engineers have dealt earnestly for many years. Until within quite recent years, little has been known in this country of the valuable properties of asphalt, and to many they are still unknown. In the popular mind it is often confused with certain coal-tar products, which, though similar in appearance, differ essentially from asphalt in character. Asphalt oils are of a non-volatile nature, and are therefore permanent, while, on the other hand, coal-tar and linseed oils are volatile, and therefore non-permanent. Herein lies the secret of the paint problem, says *The Railroad and Engineering Journal* for April. In order to prevent rust, some substance must be used as a coating for the iron which is impervious to air and moisture; and it is of equal importance, that it may remain impervious, that it should be unaffected by the heat of the sun and by exposure to the air. It is claimed that there is no other substance in nature which so nearly complies with these severe requirements as asphalt. The so-called asphalt paints which have been commonly used in the past are such only in name. They contain, at best, but a very small per cent of asphalt, which is incorporated in the form of a pigment, and which serves no valuable purpose. Asphalt, on the contrary, should be the main constituent, since the virtue of such a paint depends upon the presence of the permanent asphalt oils. When these so-called asphalt paints are made in light colors, durability becomes subservient to ornamentation. The virtues sought in asphalt are lost by substituting for it the necessarily large quantity of light-colored pigment essential in counteracting the natural dark color of the asphalt.

— The question of the use of special fertilizers under glass is becoming one of great importance, and is attracting much attention among practical gardeners and scientific men. Even the best and most skilled gardeners sometimes find that their soil, made up after the best formulas, fails to give the results expected. The plant-food seems to be unavailable, or the plant lacks the vigor to make use of it, and something more active is needed to give it a start. To determine what special fertilizers will give the best results applied to crops under glass, a series of experiments were started in the winter of 1888–89, at the Massachusetts Agricultural College, under the direction of Samuel T. Maynard of the Division of Horticulture, the results of which are deemed of sufficient value for publication, although a longer series of tests may somewhat modify the results thus far obtained. In it was found, that, of the nitrates, the nitrate of potash gave the best results, but that the sulphate of ammonia gave better results than either, especially in the production of a foliage crop Of the potash salts, the sulphates gave better results than the muriate. Bone-black showed a marked effect in increasing the number of blossoms.

— The director of the Connecticut Agricultural Experiment Station, New Haven, Conn , calls the attention of dairymen to a method of determining fat in milk devised by Dr. Babcock of the Wisconsin Station. Its merits are, that it is rapid; that both the milk and the fat are measured, so that all weighing is dispensed with; and that it is very accurate. It furnishes, he thinks, the most rapid and accurate means of testing milk of individual cows or herds. The apparatus is in daily use at the station. Twenty-three cows are under experiment, and separate fat determinations are made daily in the morning and night milk of each cow; the whole, including the cleaning of the apparatus, being accomplished in two hours by two persons. A considerable saving of time will be secured when power is used for driving the centrifuge. With this aid, a young man or woman could probably do the whole easily in from three to four hours.

— A correspondent of the *Pall Mall Gazette* writes, "I recently witnessed the following little incident on the Thames, near Twickenham, when the river was full of land-water, and therefore very swift and dangerous. Two dogs — one a large animal, the other a little terrier — were enjoying a swim near the bank, but soon the little one was carried out some distance, and was unable to get to shore. By this time the big dog had regained the shore, and, seeing what was happening to his companion, began running backwards and forwards in the most excited manner, at the same time whimpering and barking, and evidently not knowing for the moment what to do. The terrier was fast losing strength, and, although swimming hard, was being rapidly carried down stream. The big dog could contain himself no longer. Running some yards ahead of his struggling friend, he plunged into the water and swam vigorously straight out until he got in a line with the little head just appearing behind him. Then he allowed himself to be carried down, tail first, until he got next to the terrier, this being accomplished in the cleverest manner, and began to swim hard, gradually pushing the little one nearer and nearer to the shore, which was gained after a most exciting time. The fact of this canine hero going so far ahead to allow for the strong current, and the judgment shown in getting alongside, and then the pushing, certainly seemed to me to betoken instinct of a very high order."

— An important communication upon the color and absorption spectrum of liquefied oxygen is made by M. Olszewski to a German periodical, and a brief abstract is published in *Nature* of March 26. Liquid oxygen has hitherto been described as a colorless liquid. In thin layers it certainly appears to be colorless; but M. Olszewski, in the course of his investigation of the absorption spectrum, has obtained a sufficient quantity of the liquid to form a layer thirty millimetres thick, and makes the somewhat unexpected and very important discovery that it possesses a bright blue color resembling that of the sky. Great precautions were taken to insure the purity of the oxygen employed, the absence of ozone, which in the liquid state possesses a deep-blue color, being especially ascertained. Carbon dioxide, chlorine, and water-vapor were also completely eliminated, the oxygen having been left in contact under pressure with solid caustic potash for a week. In view of this fact, that oxygen in the liquid state transmits a preponderating quantity of blue light, M. Olszewski's latest experiments upon its absorption spectrum are specially interesting. In a former paper to the *Monatshefte*, an account of which was given in *Nature*, the absorption spectrum of a layer 7 millimetres thick was shown to exhibit two strong dark bands,— one in the orange, extending from wave-length 634 to wave-length 622, distinguished for its breadth; and one in the yellow, wave-length 581–573, distinguished for its intensity. When the thickness of the layer was increased to 12 millimetres, two further bands appeared, — a very faint one in the green, about wave-length 535, and a somewhat stronger one in the blue, extending between wave-lengths 481 and 478. M. Olszewski now finds that his layer 30 millimetres thick, which possesses the blue color, exhibits a fifth band in the red, corresponding with Fraunhofer's A. This band is rendered still more apparent when a plate of red glass is held between the source of light and the slit of the spectroscope. It is stronger in intensity than the band of wave-length 535, but fainter than the other three bands. This observation of the coincidence of an oxygen band with the telluric band A of the solar spectrum is of considerable interest: for Angström, in 1864 expressed the opinion that this band A was not due to the aqueous vapor of the atmosphere; and Egoroff and Janssen, who examined the spectrum of long layers of compressed gaseous oxygen, were of opinion that it was due to oxygen. In conclusion, M. Olszewski remarks that the color exhibited by his 30-millimetre layer is exactly what one would expect from the nature of its absorption spectrum. He also suggests that the blue color of the sky may be simply due to the atmospheric oxygen, which in gaseous layers of such extent may exhibit the same color as when compressed into a few centimetres of liquid. Apart from the discussion of this debatable subject, the fact is certainly of interest to chemists, that ordinary oxygen and its condensation allotrope ozone, when compressed into the liquid state, are thus related as regards color, the former possessing a bright blue and the latter a deep blue tint.

— Professor Elihu Thomson, according to *Engineering* of March 27, has recently completed some very remarkable experiments on the physiological effects of alternate currents. He finds that the danger of the current diminishes as the number of alternations per second is increased. Thus it took twenty times as strong a current to kill a dog when the alternations were 4,500 per second as when they were 120 per second. When the alternations were 300 per second, the current was only half as dangerous to life as when the alternations were 120.

— Traffic in the Suez Canal continues to expand, and now the gross tonnage of vessels using it is about ten millions, and it is interesting to note that Britain continues to own a preponderating proportion of that tonnage. Last year, according to *Engineering*, 3,389 vessels traversed the canal, and, curiously enough, the numbers were practically equally divided between outward and homeward vessels. At the Port Said entrance 1,694 vessels passed in, while 1,695 entered the canal at Suez. This total has thrice been exceeded. In 1885 the maximum was reached at 3,624 vessels, and has not been equalled; while in 1888 the number was 3,440, and in 1889, 3,425 vessels. The tonnage, however, shows a steady expansion. It is well known that the average size of English sea-going steamers is increasing, and this is satisfactory for the canal authorities. It does not affect the dues paid for transit, and admits of a larger tonnage passing within a given time. It is found, for instance, that while the number of vessels passing in 1885 was 240 more than in the past year, the tonnage now is nearly half a million greater : in other words, the average size of vessels in 1885 was about 1,750 tons, and it is now over 2,000 tons. The transit receipts show clearly the growing popularity of the canal route to the East. In 1869, the first year of the canal, the receipts totalled only £2,076; in the year following they were £200,000; in 1872 they reached £656,300, and five years later this sum was more than doubled. Between 1880 and 1882 there was a great forward movement, the total being increased to £2,421,832. Since then the progress has been neither so steady nor so great But during the past three years the upward movement has continued, the total last year being £2,680,436. Of the total tonnage, Britain owns nearly 78 per cent. There has been a great development in the number of vessels using the canal at night, and navigating by the electric light. Of the total number passing through the canal last year, 2,836 went at night, or 48 per cent. The number per month varied from 276 in December last, to 209 in August. In 1887 the night passages were 395, or 12.6 per cent of the total; in 1888, 1,611, or 47 per cent; in 1889, 2,445, or 71.5 per cent. According to Consul Burrell, from whose report to the foreign office these figures have been taken, the average time of transit has been reduced to 24 hours 6 minutes, against 25 hours 50 minutes in 1889, 31 hours 15 minutes in 1888, and 36 hours in 1886. By night with electricity the passage takes a shorter time than by day, the average last year being 22 hours 9 minutes; in 1889, 22 hours 30 minutes; in 1890, 22 hours 34 minutes. The shortest passage last year was 14 hours 15 minutes by electric light, and the fastest on record. For the transit with electric light the great majority of the vessels obtain the apparatus from different shipping agents at a uniform rate of £10 for the transit.

— We learn from *Engineering* that in a lecture delivered before the students of Sibley College, Mr. O. Chanute, president of the American Society of Civil Engineers, dealt with the question of aërial navigation. Reasoning from the results obtained by Capt. Renard with "La France," he concludes that with a balloon 330 feet long, with a maximum diameter of 55 feet, a speed of from twenty-five to thirty miles an hour might be attained. Mr. Chanute thinks, however, that the problem of flight is more likely to be solved by means of the aëroplane than with the balloon. To obtain a speed of twenty-five miles an hour with aëroplanes, he estimates that 5.87 horse-power would be required per ton of weight. The inclination of the supporting surface should be between one degree and two degrees to the horizon. The great difficulty, Mr. Chanute states, is that of obtaining a light enough motor. The weight should not exceed fifty pounds per horse-power; and the lightest steam-engine he is acquainted with, especially built for aërial navigation, weighed thirteen pounds per horse-power. Mr. Brotherhood has obtained a horse-power with but little over one pound of weight in his three-cylindered engine used in Whitehead torpedoes. These engines work with compressed air.

— We learn from the *Journal of the Society of Arts*, London, that sawdust and shavings, practically waste substances, are turned to account by M. Calmant of Paris for the production of a finely divided vegetable charcoal, which is intended to be applied for the removal of unpleasant flavor in ordinary French wine, otherwise unsalable as wine, although suitable for distillation. The charcoal is also available as a filtering medium, especially in distilleries, where it is said to be capable of filtering forty times its volume of alcohol; whereas the vegetable charcoal of commerce, gradually becoming scarcer and dearer, and which requires grinding and often recarbonization, will only filter about three times its volume. If not already separate, the sawdust of hard and soft woods must be separated, because the former requires a heat of 700° C., whereas 500° C. suffice for carbonizing the latter. Carbonization, which lasts about an hour, is effected in fire-clay, plumbago, or cast-iron retorts, of about 600 cubic inches capacity; but previous to this process, the sawdust must be sifted, first through a coarse screen to remove splinters and extraneous matter, and then through a fine sieve, which only permits passage of the actual wood-dust with the adherent calcareous matter. The product of carbonization must again be sifted to get rid of this calcareous matter which has become detached during the process, when it will, if the operation has been carefully performed, resist the action of hydrochloric acid. Shavings of either hard or soft woods, also kept separate, must be subjected to preliminary treatment (which consists in a beating, to detach the adherent dust, and then a high degree of compression in a hydraulic or other press), when they are carbonized in the same manner as the sawdust, and then ground in a mill to reduce them to the same degree of fineness. Great care must be exercised to prevent the charcoal absorbing moisture from the atmosphere, and with this object it must be enclosed in air-tight recipients until required for use.