SCIENCE

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ARCTIC WINDS AND POLAR EXPEDITIONS.

DR. A. SUPAN discusses, in *Petermann's Mitteilungen*, Bd. xxxvii., No. 8, the movements of the air in the Arctic regions. His results are obtained from a study of Dr. Buchan's charts annexed to the "Challenger" report. Dr. Supan divides the year into three parts: the first extends from November to May; the second from June to August; and the third consists only of the months of September and October. During the first of these a belt of high pressure runs from the Asiatic to the American coast and divides the Arctic basin into two parts. On the east the air flows to the Pacific, and on the west to the Atlantic, low-pressure centre. The middle line of this ridge Dr. Supan calls the Arctic "wind parting" (*Windscheide*). But during the period in question, this wind-parting undergoes great changes in position, approaching the Behring Straits during the months of November and December, and in February beginning a rapid retrogression, which carries it past the Pole and almost to the Atlantic threshold of the Arctic regions. In summer the belt of high pressure disappears, and instead a feebly-developed anticyclone is formed somewhere in the neighborhood of the Pole, whence winds flow outwards towards the continental borders. These winds must, in such high latitudes, be diverted considerably to the east by the rotation of the earth. Lastly, during September and October, a deep barometric depression passes from the Atlantic Ocean along the northern coast of the Old World towards the New Siberia Islands. On the northern edge of this depression easterly winds must prevail. The drift of the "Jeannette," as recorded in DeLong's log-book, is a proof of the correctness of the preceding conclusions, for it must be remembered that the ocean currents are mainly directed by the wind. The vessel advanced or receded, along with the ice in which it was imprisoned, in general, at those times when, according to the foregoing theory, the wind-parting would lie to the east or west of it, respectively. Hence it is evident that vessels entering the Arctic Ocean from the Atlantic have to struggle, for the greater part of the year, against the stream, while those that enter from Behring Straits swim with it. Dr. Supan considers, in the next place, the time that will probably be required by Dr. Nansen's expedition to perform its journey across the Pole. The ice-block which transported the articles belonging to the "Jeannette" expedition covered a distance of 3,300 miles in 1,100 days, or about three miles a day. This is a rate never surpassed by the "Jeannette," except in her last forward drift, and, therefore, it may be assumed that the ice-block did not retrograde so rapidly and for so long a time as the ship. During the changes of the position of the wind-parting it may have always remained in the region of the Atlantic current. It may also be inferred from the drift of the "Jeannette" that the non-periodic displacements of the wind-parting are most marked in the neighborhood of Behring Straits, so that Dr. Nansen is likely to make rapid progress after passing the New Siberia Islands. Five years, then, may be considered as more than ample allowance for the duration of the voyage.

While Dr. Nansen's route is undoubtedly the best for vessels, the Pole may be reached with sledges by other routes. M. H. Ekroll, a Norwegian, has designed sledges, according to the *Scottish Geographical Magazine*, which may be combined to form a boat. His expedition is to consist of six members, and the sledges are to be drawn by a large number of dogs, so that the speed may be increased and the supply of provisions requisite reduced. Being able to travel over sea or ice, the expedition will, to a certain extent, be independent of wind and weather. From the eastern island of Spitzbergen, somewhere about Cape Mohn, to which place the expedition will be conveyed by ship in June, 1893, Herr Ekroll will make for Petermannsland, in order to avoid the ice drifting to the west and north-west. To the north of Petermannsland he hopes to find more compact ice, and to be able to travel direct to the Pole. Should mishap occur, or the movement of the ice be too rapid, he can retreat on Spitzbergen, where a depot will be formed, but, under favorable circumstances, he will return from his furthest point to the east or west coast of Greenland, where also depots will be formed. The success of the expedition depends in great measure on the condition of the ice and the progress that can be made against the wind, for in all probability the wind will be adverse. Dr. Supan estimates the distance from Cape Mohn to Petermannsland at about 435 miles, from Petermannsland to the North Pole at about 590, and thence to Fort Conger at 515. This distance of 1,540 miles would be traversed at the rate assumed by Herr Ekroll, 11 kilometres or about 6.8 miles per day, in 226 days. Herr Ekroll has yet to find funds for his expedition. His country cannot be expected to contribute more to such undertakings, and he will, therefore, have to look for aid elsewhere.

FUNGI INJURIOUS TO FRUITS.[1]

AT the close, a thought presses upon me that is the outgrowth of observations in the field, especially during the past two years. Your attention is called to the idea, that healthy plants of strong stock, well-fed and not overworked by undue cropping, are the best able to withstand the inroads of enemies of every sort. There may be exceptions to the rule, but so few, that it can be acted upon with profit. The half-starved plant is no better able to struggle among the vicissitudes of life than the ill-fed and half-sick man. Blights overcome the one as scurvy does the other. Therefore the best conditions for the production of profitable crops are the same as those that will most assist in warding off its fungous enemies. Let the seed, soil, and surroundings be the best and a fungicide, so to speak, has already been used when it will do the most good and render the application of others, when needed, all the more profitable. In short, strive to do the best for the fruit-tree, or shrub as such, and a long step will be taken toward overcoming the enemies that break down the weakest hosts first, because they are weak, and gain thereby strength to overcome the strong. Having done this, we are ready to take up the direct fight of the fun-

[1] From a paper, by Byron D. Halsted, before the Ohio State Horticultural Society.

gous foes with the long end of the lever. It must be a good, promising crop that will warrant the expense of fungicidal applications, and the larger the promise the greater the profit.

One other thought that follows upon this, and the end of this paper is reached. When a house or a community is afflicted with some contagious malady, pains are taken that the germs of the disease shall not remain lurking in out-of-the-way places, and assert themselves in the future. The carpets, and even wall-paper, are removed and the whole house fumigated or otherwise treated with some germ destroyer. While as thorough a cleansing as this is not possible in orchard, vineyard, or garden, there are some measures that could be taken with profit. If weeds are left to mature and scatter their seeds, weeds are expected to follow. In like manner, if all diseased leaves, stems, and fruit are allowed to pass the winter undestroyed, the chances are that the biblical injunction will not be overturned — concerning sowing and reaping. There is a legitimate and therefore profitable amount of soil-sanitation to be done, which comes under the head of cleaning up after crops. The burn-heap is to be a potent factor in future horticulture. If we continue to scatter the seeds of fungus decay, of that sowing we shall reap corruption.

It is a law of plant culture that the continuous growing of any one crop upon a given area of soil, tends to the concentration of the enemies of that crop — whether of insects or fungi. With annual crops, like most of those of the garden and grain field, the remedy is more easily applied, than in the case of fruits. There is a strong inclination to grow the crop for which the soil is naturally best fitted. Thus the onion grower desires to keep his best onion land continuously in onions, and the smut finally increases and ruins his crop and future prospects. Sweet potatoes can be grown to greatest profit only upon a special soil, in limited areas, and constant cropping has permitted the soil-rot to increase to such an extent that the crop is often a failure. The same is true of clover and other crops, but more particularly of those that are susceptible to some root disease. It therefore follows that in the serious consideration of our subject, the importance of a judicious management of crops should never be overlooked, and a system of rotation adopted that will bring the greatest health, other things remaining reasonable and satisfactory.

This continuous change of crops, united with full rations of available plant food, and proper sanitation, will do much to lighten the labors of the fungicidal applications, and render all such when found necessary of the greatest benefit.

Let the spraying of crops with compounds of copper, etc., come after the fair thing has been done for that crop under the head of farm or garden management. Here, as elsewhere, the ounce of prevention is worth a pound of cure, simply because it is prevention, and if we look at fungicides carefully, it will be found that they are preventions, after all.

Do not let me be misunderstood in this matter, for I am a full believer in the virtues of fungicides. There are many places where they pay and pay well, but they cannot do everything. They may ward off destructive diseases, as the copper salts for the black-rot of the grape, but they alone will by no means bring a profitable crop. Everything else needs to be done for the vines that will bring a full fruitage, and then it will pay to save the crop from premature decay. And finally, to carry my point one step further, when the plants have been surrounded by the best sanitary conditions, it is possible that the application of fungicides may be sometimes omitted. However, it will be a long time before all these points are settled, and in the mean time nothing is lost by turning them over in our minds.

ASTRONOMICAL NOTES.

A PLANET of the twelfth magnitude was discovered by Borrelly at Marseilles, France, Nov. 27. The position of the planet was in R.A. 4 h. 6 m. 6.7 s, $\delta + 33° 32' 58''$. The motion was -1 m. in R.A. and $-7'$ in declination.

The following ephemeris will assist those who desire to make a search for Winnecke's periodic comet, mention of which was made in a recent number of *Science*. The epoch of the ephemeris is for Berlin midnight.

1892	R.A.			Dec.	
	h.	m.	s.	°	′
Jan. 1	12	17	12	+13	2
2		18	15	13	4
3		19	17	13	7
4		20	18	13	9
5		21	20	13	12
6		22	20	13	15
7		23	20	13	18
8		24	20	13	21
9		25	19	13	25
10		26	17	13	29
11	12	27	15	+13	33

The following is a continuation of the ephemeris for Wolf's comet. The epoch is for Berlin midnight.

1891	R A.			Dec.	
	h.	m.	s.	°	′
Dec. 27	4	14	22	−14	37
29		14	19	14	26
31		14	33	14	16
1892 Jan. 2		14	33	14	5
4		14	51	13	53
6		15	15	13	39
8		15	45	13	25
10	4	16	22	−13	16

An interesting fact connected with the movement of this comet through the heavens, as seen from the earth, is that on the 6th of next February it will occupy almost the same position in the sky that it did on Nov. 12 last. This is also true of Nov 14 and Feb. 8; Nov 16 and Feb. 10. G. A. H.

NOTES AND NEWS.

THE *Pintor* or *Aguaje* is a singular phenomenon observed in the Bay of Callao during the summer months, from December to April. It consists of emanations of sulphuretted hydrogen gas, accompanied by changes in the color of the sea-water. The name "Painter" is given to it because it gives white paint a blackish tinge. Its occurrence is not confined to Callao, but is observed at various points along the coast from Payta (5° 5′ 30″ south latitude) to Pisco (13° 42′ 42″ south latitude), and at Pacasmayo (7° 24′ 30″ south latitude). The gas proceeds from the black mud which covers the bottom of the bay, and the reddish discoloration of the water is due to the presence of infusoria brought in from the open sea. It is not, however, definitely decided why the phenomenon occurs only in the summer and at certain points of the coast. According to Raimondi (*Bull of Amer. Geog. Soc.*, Vol. XXIII., No. 3), the waters of the Rimac are prevented from escaping from the Bay of Callao by the Humboldt current, which flows past the entrance, and, with the solid matter held in suspension, are exposed to the full force of a tropical sun. Where there is no river, or no current running along the coast, the "Painter" is not observed.