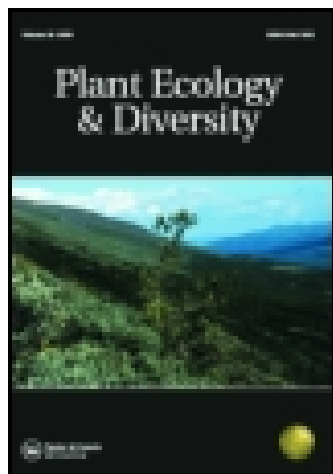


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I. Note on the Practical Application of Meteorology to the Improvement of Climate

Alexander Buchan President

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grostis lanceolata, which he had found last summer growing abundantly on the south bank of the Esk, near Penicuik.

9 Mr John Sim recorded *Butomus umbellatus* as having been found by Colonel Drummond, growing abundantly on the banks of the Tay, near Seggieden, in Perthshire.

10 Dr Stanley Haynes exhibited specimens of ivy stems, showing natural grafting.

11. Mr Hugh Fraser presented a triple spathe and spadix of *Richardia æthiopica*.

12. Mr D. A. P. Watt presented specimens of *Cystopteris montana* and *Botrychium Lunaria*, from Canada.

12th January 1871.—ALEXANDER BUCHAN, M.A President,
in the Chair.

The following Gentlemen were elected Fellows of the Society :—

1. *Resident Fellow.*

ANDREW P. AITKEN, 1 Oxford Terrace.

W. B. BOYD of Ormiston, Kelso.

2. *Foreign Corresponding Member.*

HUGH ALGERNON WEDDELL, M.D., Poitiers.

The following Communications were read :—

I. *Note on the Practical Application of Meteorology to the Improvement of Climate.* By ALEXANDER BUCHAN, President.

Mr Buchan stated that, in the Journal of the Scottish Meteorological Society for April 1870, there appeared a valuable paper by Mr D. Milne Home, on “ Suggestions for Increasing the Supply of Spring Water at Malta, and Improving its Climate,” in which the author shows that plantations would increase the water supply of the island, and ameliorate its climate. This paper awakened the greatest interest in Malta, and a Government Commission,

composed of the principal scientific men of the island, was appointed to report on Mr Milne Home's scheme. The report was entirely favourable, and the Governor, Sir Patrick Grant, has submitted a proposition to the Legislative Council for expending a sum of L.1000 annually for five years to carry out the scheme.

The drawbacks to the climate of Malta are these: During winter and spring the island is swept by cold northerly winds; and during the summer months the heat is excessive, and during all seasons there is a great scarcity of water. These climatic peculiarities, which are deleterious to health and vegetation, may be regarded as mainly arising out of the geographical position of Malta. The winter temperature rapidly falls in proceeding from Malta towards the north-east; thus, while at Malta the mean temperature of January is 56° ; at Corfu it is $49^{\circ}8$; at Belgrade, $30^{\circ}3$; at Kiew, $20^{\circ}4$; and at Moscow, $12^{\circ}4$. Hence, at Malta, northerly and easterly winds are characterised by excessive cold and dryness. On the other hand, proximity to Africa exposes it in summer to scorching blasts of heated air. These drawbacks are felt to their fullest extent, owing to the almost complete absence of trees on the island. The influence of forests on climate has been made a subject of investigation by meteorologists of late years, and though much remains to be done, yet some important points have been established. The highest temperature of the air occurs in summer between 2 and 3 P.M.; but trees do not attain their highest temperature till 9 P.M. Changes of temperature take place slowly in the trees, but in the air they are rapid; hence trees may be regarded like the ocean, as powerful equalisers of temperature—in moderating the heat of the day, and in maintaining a higher temperature during the night.

Since air is heated by contact with the soil, and since trees shield the soil from solar radiation, it is evident that trees diminish the force of the sun's rays, especially in the lower stratum of the atmosphere, which is breathed by man.

Trees exhale moisture, and thus produce cold in the air by the latent heat abstracted from it. From this lowering of the temperature, and from the moisture which is

exhaled, dry winds acquire greater relative humidity, and thus are deprived of much of their noxious influence ; and since trees break the force of the wind, their beneficial influence is greatly augmented.

During the night the process of terrestrial radiation lowers the temperature of a tree at a slow rate. First, the upper leaves are cooled, then those leaves immediately under, and so on until the whole are cooled. Now, in the earlier part of the day, before the tree is heated by the sun, its cool leaves present a very large surface to the air-currents which pass through them. Hence the cooling influence of trees is very considerable, which all must have experienced in the deliciously cool breezes of well-planted parks on a warm summer day. This refrigerating influence of trees is sometimes well seen in the earlier part of the day, when the air is filled with fog. In such cases, heavy drops of water fall from the trees, increasing on occasions to the copiousness of a heavy shower ; and doubtless when the air is saturated, the rainfall will be heavier when the wind advances on a forest whose temperature is several degrees lower than that of the surrounding district where there are no trees. Hence, then, it may fairly be inferred, if it has not indeed been proved, that trees bring about a different distribution of the rainfall, as respects the time of the day and the season of the year.

Trees serve another important use. When rain falls on so dry and bare a soil as that of Malta, it runs off at once, and is lost in useless, if not destructive floods. But since the roots of trees penetrate the soil, and so loosen it and render it porous, much of the rain is not only received and preserved by the trees, but what falls on the ground is allowed to sink into the soil and fill the reservoirs of the deep-seated springs ; and hence, owing to the stillness and greater dampness of the air among trees, the evaporation from forest soil is only about a fifth of what it is in an open country. Woods regulate the flow, and retard, if they do not altogether prevent, the drying up of springs. If the measures recommended by Mr Milne Home be carried out, they cannot fail to result in ameliorating the climate, increasing the productiveness, promoting the healthiness, and adding to the beauty of the Island of Malta.