

"generally overcast." This did not err on the side of boldness when considered with reference to one of the severest gales of the century.

A Spanish peasant whom I heard of in Andalusia, and who had the reputation of a weather prophet, wisely said, if you want to know the weather for to-morrow, ask me early in the morning. The Indian weather prophets who made a failure had to be silent altogether for the rest of their lives; and this causes us to regret that some of our own seers were not born in that distant land.

As to the so-called weather forecasts, they only come under the title of this paper when they fail, and as eight out of ten are said to be correct, I shall only say that they are honest attempts on the part of civilised governments to warn their people as far as possible against the march of known disturbances. I could wish that the term "weather indications" or "indicated weather" had been adopted, so as to make this plain to all, and that oftener, when the signs were vague, we had the simple announcement of no change indicated.

The director of this system so well known to us, and who is playfully called the "Clerk of the Weather," sometimes receives valuable hints, even from children; and I must quote one such communication.

"Please, Mr. Clerk of the Weather, tell the rain, snow, and hail to stop for the afternoon, and rain in the night."

I may conclude this section by saying that it is a great fallacy to suppose that there is such a thing as a weather prophet. All the great authorities agree that in the present state of our knowledge no human being can correctly predict the weather, even for a week to come.

And now we must consider a class of weather fallacies of which the victims can only excite in a well-regulated mind feelings of sadness and compassion, rather than the ridicule to which at first sight they seem more naturally entitled. I mean those weather prophets in whom the delicate mechanism of the mind is touched by disorder or decay, even if it has not already fallen under the stroke of complete dementia, and who believe that they can not only foresee the weather, but, by an effort of their own minds, control the elements and compel the clouds.

These patients I had hoped only existed in small numbers; but, on perusing the correspondence of a prominent meteorologist, kindly lent me for the purpose, I find that there are many of this class whose name, like that of the ancient wanderer among the tombs, is "Legion," and who still come on, each prepared to drive the chariot of the sun, or by an exertion of his own will, odylize (the word I suppose will come) all the powers of nature.

Dr. Johnson's Astronomer says in "Rasselas":—"Hear me, therefore, with attention. I have diligently considered the position of the earth and sun, and formed innumerable schemes, in which I changed their situations. I have sometimes turned aside the axis of the earth, and sometimes varied the ecliptic of the sun, but I have found it impossible to make a disposition by which the world may be advantaged. What one region gains another loses. Never rob other countries of rain to pour it on thine own."

This type of patient, as well as those who would use their supposed power for the purpose of creating fine weather during the holidays of the people, belong to the more noble sort, but there have been others, like the notorious Friar Bungay, who for sordid reasons have professed to exert a similar power. The only wonder is that anybody ever believed them.

Now, as this malady of the mind is not incurable, I will venture to offer a practical suggestion, and would recommend these patients who have nursed themselves into the belief that they possess the keys of the weather, to seek the hill-top on a summer afternoon—the air and exercise will do them good—and watch the fine fleeces of cumulus cloud as they sail majestically across the sky, each with its attendant shadow below. Let the patient concentrate his attention upon one single feathery cloud, and try by the exertion of his utmost force of will to make it pause for a moment in its career; and, if he fails—"as fail full well he may"—then let him banish from his mind for ever the idea that he can by his own will dominate the whole firmament. And if he has ever gone into print upon the subject, let him go home, and, like Prospero, his prototype, say—

"Deeper than ever plummet sounded,
I'll drown my book,"

and so save the world from the trouble of investigating much pure nonsense. To these sufferers I can only repeat the words of one

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of our own kings to the last man he touched for the evil—"I wish you better health and more sense."

I must be forgiven for having only made a selection from the vast catalogue of fallacies which have accumulated about the subject, and I must continue to regret that there are still people who are ready to believe that the saints' days rule the weather, that the sun puts out the fire, that warm water freezes sooner than cold, or that a man is a prophet because he says so himself.

This Society is clearing the ground of many weeds, and already the fallacy of the "equinoctial" gales has been exploded (by Mr. Scott), while the churchyard ghost of the supposed fatal "green Christmas" has been most effectually laid by a recent statistical paper by Mr. Dines.

Some one may ask, after all this clearing away of fallacies—What have we left? and I would venture to refer him to all the patient work which is being done in various countries, and by which a real Science of Meteorology is being slowly built up, while to the outdoor weather student I would offer this consoling reflection—There is still the sky.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

PROF. A. H. CHURCH AND DR. FREAM have been offered and have accepted Honorary Professorships at the Royal Agricultural College, Cirencester. These gentlemen were both formerly professors at the College, and both took part in the recent jubilee celebrations,

It would be a great advantage to the numerous students of science and technology if the scientific works in all public libraries were arranged in a separate class, and catalogued separately. This has been done for the Central Free Public Lending Library of Nottingham, by Mr. J. P. Briscoe, the librarian, and Mr. T. Dent. All the scientific books in the library have been arranged according to the science to which they refer, and indexed according to subjects and authors. The list will thus be of great assistance to students.

New technical schools, presented to Winsford, in the salt district of Cheshire, by Mr. Joseph Verdin, at a cost of £8000, were opened by the Duke and Duchess of Westminster last week. The money is part of a fund of £26,000, originally intended to compensate property owners from subsidies brought about by brine-pumping. As he was unable to transfer the fund, the Charity Commissioners were applied to, and it was decided that £12,000 should be used in the erection and endowment of technical schools at Winsford and Northwich.

PRECEDING a historical account of the Owens College, Manchester, contributed by Mr. P. J. Hartog to the current *Record* of Technical and Secondary Education, the function of university colleges in technical education is discussed. Mr. Hartog points to a fundamental distinction established by the Royal Commission on Technical Instruction between (1) institutions for the instruction of manufacturers and higher managers, and (2) institutions for the instruction of foremen and workmen engaged in industrial pursuits. He rightly remarks, however, that the distinction is still vague in the mind of the public, and even in that of many educationalists. It has become more vague through the use of the words "polytechnic" and "technical school" to render the German *polytechnicum* and *technische hochschule*, to which they are not at all equivalent. The *polytechnicum* and *technische hochschule* educate managers and manufacturers; our polytechnics and technical schools, with their day-schools for lads and their night-schools for adults occupied during the day, educate foremen and workmen. It is not necessary to insist on the inestimable value of the latter class of school; but it is of the first importance that the public should perceive the distinction referred to by Mr. Hartog, and that they should not think that they are following the example of a country like Switzerland, which eleven years ago was spending over £14,000 a year on the Zürich Polytechnic, when they vote a large sum to one of the many English polytechnics and technical schools, now springing up so rapidly with the help of funds derived from the Customs and Excise duties, while but meagre support is given to the institutions for the training of managers and manufacturers. As Mr. Hartog remarks, the university colleges combine the faculties of a German or Swiss university with those of a *polytechnicum*, but the existence of the technical part of the instruction given is often ignored because it is called university teaching, and not technical instruction, and

because side by side with the teaching of science there is the teaching of the "humanities." The remarks conclude with a statement of the amount allotted from the public funds to university colleges. Out of the sum available under the Local Taxation Act about £600,000 a year is devoted to technical education, but only £23,854 was given to fourteen university colleges in England and Wales in 1892-3 by twenty local authorities, in addition to a sum of £29,550 provided by the Treasury, of which nearly half (£13,306) went to the three Welsh colleges alone. The support certainly seems insufficient for the great services rendered by the colleges to the nation.

THE third Report of Mr. J. A. Bennon, the Director of Technical Instruction in the County Palatine of Lancaster, was presented to the County Council a few days ago. It is clear from the report that every effort is being made by the Committee to expend judiciously the funds at their disposal. A sum of £28,500 was distributed among the urban and rural districts of the county last year. The following amounts were voted for work in special subjects:—Navigation, £250; Sea Fisheries, £300; University Extension Lectures, £500; Horology, £250; Mining, £500; Silk Industry, £500; Plumbing and Sanitary Science, £750; Horticulture and Bee-keeping, £500; Practical Agriculture (including Veterinary Science, Poultry-keeping, and allied subjects), £1000. In addition to the ordinary sums allotted to each district, special grants, amounting to nearly £1000, were made for the purpose of purchasing apparatus and appliances. University College, Liverpool, and the Owens College, Manchester, each received a grant of £400 for the same purpose. Classes in horology are held at Prescott, but they are quite inadequate for the whole county; and do not impart the thorough teaching, either theoretical or practical, that is given on the continent. A deputation from the Committee visited some of the Continental Schools of Horology, and as a result of their inspection they strongly recommended the establishment of a County School of Horology, similar to the school at Geneva. It was afterwards resolved at a large and representative conference that "it is desirable to establish a Technical School of Horology and Scientific Instrument-making, including electrical, optical, and mechanical instruments, both practical and theoretical, for the County of Lancaster." Efforts are now being made to put this resolution into effect. The establishment of a school to afford effective teaching in subjects relating to the silk industry is also under consideration. It is proposed to found the school upon the model of the Seidenweb Schule of Wipkingen, in Zürich. For the purpose of providing instruction in practical agriculture, a farm and farm buildings, covering nearly 150 acres, has been acquired at Hulton, near Preston. A vote of £650 was made to the Harris Institute for special courses to agricultural students; and a number of lectures on subjects relating to agriculture were delivered in various parts of the county, while agricultural experiments were carried on in several districts.

SCIENTIFIC SERIALS.

Wiedemann's Annalen der Physik und Chemie, No. 7.—Absorption spectrum of pure water for red and infra-red rays, by E. Aschkinass. The "extinction coefficients" of water for the various wave-lengths at the red end of the spectrum were determined by the bolometer, and calculated by the formula

$$J' = J e^{-\epsilon d},$$

where J is the intensity of the incident, and J' that of the transmitted light, d the thickness of the layer in cm , e the basis of the Napierian logarithms, and ϵ the "extinction coefficient," which therefore means the reciprocal of the thickness which a ray must traverse in order to be reduced to $1/e$ of its original intensity. Of these extinction coefficients 200 are given, for wave-lengths extending from 0.4500μ to 8.49μ . The minimum is at $\lambda = 0.5375$, being 0.00005 , and the maximum of 2733 is attained at $\lambda = 3.02 \mu$. A second maximum occurs at 6.09μ , but between 6.7 and 8.5 the values of the extinction coefficients vary only between 700 and 900 .—Absorption of radiant heat by liquids, by Charles Friedel. The liquids investigated were carbon compounds contained in cells between an iron block and a thermopile. Among the results obtained are the following:—Whenever, in a chemical compound, H, O, HO, or N are replaced by S or halogens, the transmittance of the solution is considerably increased. In homologous series the transmittance

is regularly changed by every addition of CH_2 , but the direction of this change depends upon the nature of the other atoms contained in the molecule. The absorptive power of a compound does not essentially depend upon the size of the molecule, but seems to be a property of the constituent atoms. The greatest influence is always due to H, N, and also O. In isomeric compounds the diathermancy is different, and the difference is not only connected with the difference of atomic volume of the elementary atoms, but also with the difference of linkage of the atoms amongst each other; in saturated compounds the diathermancy (transmittance) always increases with the atomic volume. The determination of the diathermancy is the most delicate test available for the purity of organic liquids or salts which are soluble in highly diathermanous liquids.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Horticultural Society, June 25.—Mr. McLachlan in the chair.—Mr. Wilson exhibited a pot containing some seedling plants, in blossom, of the North British species *Primula scotica*, which is found in pastures of Orkney, Caithness, and Sutherland. The flowers are homomorphic, not having the stamens and pistils of different lengths as in most other *Primulas*.—Mr. Jackman exhibited small trees of *Fagus sylvatica*, with the leaves small, entire, and round. As the trees exhibited an erect form, with short branches, it would seem to be the result of some check to growth, the form of the leaf representing a less developed state than that of the ordinary type of tree.—Mr. Colinet, of Guernsey, forwarded some hazel wood found in peat near the coast of Guernsey, containing flint implements, stone rings, and pottery, presumably neolithic. No hazel is now known to be indigenous to Guernsey.—Mr. McLachlan exhibited specimens of *Melanostoma scalare* attached to flowering stems of a grass, *Glyceria fluitans*.

July 23.—Dr. M. T. Masters described a curious case of *Cypridium* malformed, received from Messrs. Sander and Co., in which the sepals were normal, but the two petals and lip were absent.—Dr. Masters also drew attention to a peculiarity in the venation of the lobed leaves of *Lavandula dentata*.—Dr. Ch. B. Plowright forwarded specimens of the parasitical fungus *Æcidium nymphaeoidis*, with the following observations:—"This *Æcidium* has been stated by Chodat to be connected with the Puccinia on *Scirpus lacustris*. In November 1877, *Puccinia scirpi* was found floating in the river Ouse at King's Lynn. During the past winter I found it on the bulrushes (*S. lacustris*) in the 'Old Bedford' at Earith, Huntingdonshire. On revisiting the spot this July the *Æcidium* on Villarsia was met with in great abundance." Dr. Plowright also sent specimens of the fungus *Æcidium chenopodii*, with some remarks upon them.—With reference to the specimens of flies attacked by a fungus, brought before the last meeting by Mr. McLachlan, it was reported from an examination made at Kew that "the fungus is *Empusa conglomerata*, Thaxter (a somewhat rare species), parasitic on Diptera, especially the larvæ and imagines of Tipulæ. Distrib.—Europe and United States. This is the first record for Britain."—MM. Letellier et Fils forwarded from Caen some growing plants of thornless gooseberry, from which they have issued four kinds, raised by M. Ed. Lefort, of Meaux, France. The usual triple spines were either quite absent, or represented by mere rudiments only.—Mr. Cannell sent some trusses, with small jagged-edged petals of a crimson colour, approximating the original wild form. They appeared among his long-selected beds of sweet williams, the margins of the petals being rounded and smooth.

PARIS.

Academy of Sciences, August 5.—M. Marey in the chair.—Experimental study of the transverse vibrations of cords, by M. A. Cornu. The complex vibrations of strings produced as in actual musical instruments have been studied. The transverse vibrations of a string, excited in any way whatever, are always accompanied by torsional vibrations, the torsional elasticity of the cord taking effect in the same way as the transverse component of the tension. Not only is the actual vibration complicated by these torsional vibrations, but, in many cases, the transverse vibrations are themselves rendered more complex by the fact that strings are seldom or never symmetrical about their axes. The vibrations have been studied by means of very