

logique for 1875 is enough to show that it more than sustains the high character of the publications of previous years. The thunderstorms and hailstorms of France for 1875 are elaborately and ably discussed, and to these discussions are appended no fewer than twenty-six memoirs on different meteorological subjects, by such well-known meteorologists as the two Becquerels, R. P. Denza, Brault, Crova, Moritz, Belgrande, Lemoine, Raulin, Coumbary, Brito-Capello, and Fron. Several of the more important of these memoirs not yet noticed by us, we shall bring before our readers on an early occasion, particularly those dealing with the climatology of Asia Minor and of Portugal, and with the rainfall of Algiers.

WEATHER MAPS IN AUSTRALIA.—Mr. Russell, of the Sydney Observatory, began a few months ago to issue daily weather maps for Australia. The plan of preparing the maps, which possesses some novel features, is briefly this:—There is a block of type metal with an electro of the coast-line and mountains fixed on it, and at the position of each station there is a slot in the metal block for the placing of the wind and weather symbols and figures which show the force of the wind, height of the barometer, and the temperature. The sea symbols, arrows, curves, words descriptive of the state of the weather, and in short everything which may be required on the map as varying from day to day, are glued on to the face of the metal block and held so fast that printing from an ordinary letter-press may be begun at once. The whole map is prepared in about two hours, and after a few copies are printed off for the use of the observatory, the block is sent to the *Herald* newspaper and by them stereotyped with their other matter. Copies of several weeks' weather maps, thus prepared and printed, have been forwarded to us. A note in manuscript on the map is sent to the *Herald* every day giving remarks on the weather of that day, and forecasts of coming weather. A system of exchange has been already effected with Melbourne, will soon be completed with Adelaide, and it is expected that all the other colonies will join in the effort to make the system as complete as possible so as to secure for this region of the globe effective warnings of coming storms. The colonial governments will no doubt see that this system of weather telegraphy, so admirable in itself and calculated to be highly beneficial to large public interests, will be furnished with the funds necessary for its efficient maintenance and further development.

STONEHURST METEOROLOGICAL AND MAGNETICAL OBSERVATIONS, 1876.—This publication maintains the high character of its predecessors for the care and exhaustiveness with which the results are worked out and detailed in each of the monthly reports, and its value is further enhanced by the notes and tables of agricultural and horticultural results which have now been introduced. We are glad to see that observations of cirrus clouds are sent monthly to Dr. Hildebrandsson, of the Upsal Observatory; and we hope that, from the great importance of these observations in questions affecting atmospheric circulation, Father Perry will be enabled to add them to his future monthly reports. It was pointed out by us last year that in discussing the hours of occurrence of the minimum temperatures, the double inflexion in the curve which was obtained was solely due to the adoption in the discussion, of the civil day, beginning with 1 A.M., and that while the civil day must be employed in discussing the maximum temperatures, the astronomical day must be employed for the minimum temperatures. The minimum temperatures have now been discussed afresh, the astronomical day being adopted, with the result that there is only one inflexion in the time curve of the minimum temperature, the hour of lowest daily temperature falling in the annual curve between 4 and 5 A.M.

CLIMATE AND INFANT MORTALITY IN TASMANIA.—A carefully prepared paper on this subject, by Mr. E. C.

Nowell, Government Statistician, has been published in the *Report of the Royal Society of Tasmania for 1875*, in which the statistics for Tasmania are compared with those for South Australia, Victoria, Queensland, and New South Wales for the five years 1869-73. Among the interesting results arrived at, the most important are these two, viz., first, the average number of deaths of infants under one year to 100 births for each colony was—South Australia 14·24, Victoria 11·86, Queensland 11·07, New South Wales 9·57, and Tasmania 9·45; and secondly, the proportions which the deaths of children under five years of age bore to 100 deaths at all ages were—South Australia 54·17, Queensland 46·33, Victoria 45·50, New South Wales 42·14, and Tasmania 28·08. These interesting and instructive results, showing the advantages possessed by Tasmania in regard to the low rate of mortality among infants and children, Mr. Nowell considers to be chiefly due to the remarkable salubrity of its climate. It is highly probable that it is to the climate that this low infant mortality must be ascribed, seeing that the summer heat of Tasmania is not nearly so great as that of the other colonies, and consequently the mortality from bowel complaints may be expected to be much less, whilst in all these colonies the temperature does not fall so low in the winter months as to prove so seriously fatal to the very young, as is the case in such climates as that of Great Britain. Mr. Nowell would do a very valuable piece of work if he extended the inquiry he has so well begun, in the directions we have indicated, so as to ascertain the particular diseases, the mortality from which is unusually low in Tasmania, and the seasonal distribution of the deaths from different diseases.

ON THE PROPER LENGTH OF THE GYMNASIUM SWING

MANY of the evolutions performed upon the gymnasium swing can be made equally well upon swings of any length; with others it is different. When the evolution is such that the swing in one direction marks a period of exertion, while the return is comparatively a period of rest, then the evolution cannot be equally well performed with swings of all length.

One of the most useful exercises is made as follows:—Reaching up and grasping the rings let the swing be started, and at the beginning of a forward swing the feet are thrown above the head, the legs being flexed. As the forward swing closes the legs are extended and the arms flexed, the body being thus thrown upward and outward. Here, also, by some practice, one learns to accomplish the swing with a minimum of exertion, which a good gymnast always does; nevertheless, the number of swings before exhaustion takes place varies with the length of the ropes, as is shown in the following series of experiments made upon myself:—

Nipher.

<i>l</i>	<i>t</i>	<i>n</i>
12	4·5	10·0
11	4·3	12·2
10	4·1	12·8
9	4·0	15·4
8	3·9	15·2
7	3·8	13·0
6	3·7	10·6

l = distance from point of suspension* to centre of hands; *t* = time of one complete oscillation (forward and back); *n* = No of oscillations before exhaustion.

It will be observed that *n* reaches a maximum where *l* = about 8·5 feet, or where the time of a full swing is between 3·9 and 4·0 seconds.

Another series of experiments was made upon Mr. Cunningham, a young man about 5 feet 2 inches in height, and of light build. The maximum value of n is here reached when the length of the rope was about ten feet, and here the time of a full swing was about 4.1 seconds.

My own height being about five feet eleven inches, it will be observed that these two cases are sufficiently representative.

Cunningham.

l	t	n
12	4.3	14.0
11	4.3	16.3
10	4.1	17.0
9	3.8	14.6
8	3.7	12.6

The swing was shortened by drawing the rings up from the ground, and in the latter table the values of n for short ropes are a little too small, as he seemed fearful of falling. Hence we may affirm that in order that this and similar evolutions may be elegantly performed, the time for the full swing should be four seconds.

The cause of rapid fatigue with long ropes is that the body must be held in a constrained position for too long a time. With very short swings the muscles are forced to work with too great a velocity.

The muscular action is here too complex to allow of any mechanical discussion, but the general results are exactly what the discussions of Prof. Haughton might have enabled us to predict. FRANCIS E. NIPHER
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NOTES

THE demise of such veterans in biology as Von Baer, Ehrenberg, &c., during the past year has left gaps in the lists of honorary fellows of our scientific societies which come to be filled up with men almost of a different generation, yet worthy successors of the great masters departed. We understand the three subjoined *savans* have recently been elected foreign members of the Linnean Society—viz., Pierre Du Charte of Paris, highly distinguished for his researches in teratological, physiological, and other branches of botany; Prof. Carl Gegenbaur of Heidelberg, whose labours in zoology and the comparative anatomy of the vertebrates and invertebrates are acknowledged as of the highest standard; Prof. Rudolph Leuckardt of Leipzig, by whose philosophical investigations into the morphology and physiology of the lower forms of animals and establishment of the group coelenterata, zoologists of all countries are highly indebted.

WE are glad to hear that Dr. Dohrn's Zoological Station continues to make satisfactory progress. The number of naturalists who have availed themselves of the institution, we are informed, has reached eighty, from almost all parts of Europe. The summer dredging with the small steamer will now shortly commence, and we may hope that besides the important physiological work which is there done, that a complete knowledge of the rich fauna of this bay will be a further result furnished by this station. The institution is carried on under the direction of Dr. Dohrn, the detail management being in the hands of Dr. H. Eisig, who is backed up by two assistants. The aquarium belonging to the station has in their hands for some time been the most successful in Europe, and naturalists we do not doubt will find the experience gained by some years working enables their wants to be more readily provided for. A statement has appeared in an English paper which might lead one to think some change had been made, but we are in a position to state

that no alteration has been made, and that with increased opportunity of collecting material the institution will become each year more useful.

ALTHOUGH M. Leverrier's health is so unsatisfactory he continues to attend to his professional duties as persistently as ever. The number of stations organised by him in connection with the international service now exceeds 1,200. He is preparing instructions to be sent to each correspondent on the method of better utilising warnings from the Observatory. He confesses that the agricultural service is in a period of uncertainty, and that some time must elapse before it can render much service to the commonwealth. He urges strong reasons why the service—not conducted by military men, as in America—should be conducted by men accustomed to military discipline.

THE primary clock of the Paris Observatory is now regulating the motion of the clocks of the Conservatoire, St. Sulpice, and the Luxembourg. M. Leverrier proposes to adapt the same system to a number of other public clocks, and even to those which are used in the cab stations. But the application of the system is delayed for want of funds.

PROF. RUPERT JONES, F.R.S., is preparing a new edition of Dixon's valuable "Geology of Sussex" for Mr. W. J. Smith, of Brighton. The work will be brought up to the present state of knowledge. The descriptions and lists of Sussex fossils will be carefully revised in this new edition, and a full account will be given of the Sub-wealden boring and its results, of the Warren-Farm Well, and of the archaeological discoveries at Cissbury and elsewhere in Sussex. It is also arranged that a selection of the original quarto plates of Mantell's "Fossils of the South Downs; or, Illustrations of the Geology of Sussex" (1822), with descriptions according to our latest knowledge of the subjects, shall form part of the new volume.

A NEW application of the principle of the magic-lantern has been lately introduced into London for drawing attention after dark to the names of restaurants and shops. At present it is only used where the establishment has a lamp overhanging the pavement. The lenses are fitted into the bottom of the lamp, the words to be read are painted on the "slide," which has an opaque ground, and thus the advertisement is thrown in letters of light on to the pavement. Ordinary gas lamps are used, and when the apparatus is once fixed the announcement appears every time the lamp is lighted without any further trouble.

THE anniversary meeting of the Geographical Society was held on Monday, and as usual, a large increase of numbers was reported, as well as the prosperity of the Society generally. The president, Sir Rutherford Alcock, reviewed the progress of geographical science during the year, a year remarkable by the return of three important expeditions to England—the *Chal-lenger*, the Arctic, and that under Lieut. Cameron. The medals, the award of which we have already announced, were presented to Sir George Nares, the Punjit Nain Singh, and Capt. Markham. The president, in concluding his address, announced that the Society's African Exploration Fund Committee were about to appeal to the Society and the public for support and co-operation in the prosecution of continuous and systematic African exploration. In view of the interests concerned in this work, the Council felt confident that their appeal would meet with a ready response, not only in the United Kingdom, but in all our colonies.

ON the evening of June 5 the first trial, in this country, of the Jablochhoff electrical light will be made at the West India Docks. The object of this trial is to test the applicability of this new light to purposes of lighting up of docks, warehouses, &c., in order that work may be continued during the night.