tember 4 he was in long. $155^{\circ} 28' W.$, lat. $8^{\circ} 20' N.$, sailed from Fanning's Island three days before. At 5 p.m. noticed strange appearance in the sun, which was greenish. Strange colours over the west and around the sky at sunset. The sun was green at setting. Thought bad weather was portended. Never saw such appearances before.

Both parties are positive that the schooner was *three* days out when their fears were thus excited. She sailed September 1. No entry in ship's log of the above phenomena.

Honolulu, February 20

S. E. BISHOP

ANOTHER note relative to these phenomena:—"August 20, 1861.—Earthquake at Naples. At Castellamare the water is so discoloured, that although the calm has been complete, we fear some subterranean perturbation. The heat is intense. At the same time the atmosphere presented a very peculiar appearance. There are no clouds, and during the whole week a thick mist has enveloped the city and coast, and the sun when setting is as red as blood."—(*Moniteur* du 29 Août, 1861.)

J. P. O'REILLY

Royal College of Science for Ireland,
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Meteorological Bibliography

I REJOICE to see the well-earned tribute which you have paid to Dr. Hellmann's excellent "*Repertorium der Deutschen Meteorologie*," and as a worker in the same field I trust that you will permit me to add that I agree with every word which your reviewer has said as to its excellence.

My object in writing is merely to point out that, thanks to the liberality of the United States Government, we may hope soon to have, not a perfect catalogue, but one which will be extremely useful, especially if, as I hope, the United States Government adopt my suggestion and endeavour to arrange with Dr. Hellmann for the incorporation of the first part of his "*Repertorium*" with the materials already forwarded to them.

Your reviewer is perfectly right in urging the absolute necessity of steps being taken to index and classify the multitudinous publications now appearing. Dr. Hellmann in his "*Repertorium*" says that 800 publications upon meteorology appear annually, or more than two each day, hence the impossibility of any one keeping abreast of the entire literature.

As regards the catalogue which I had the pleasure of sending to the United States last autumn, I annex an abstract of the description which I gave at the Southport meeting of the British Association in case you may think it of sufficient importance to be worthy of a place in *NATURE*. Dr. Hellmann's "*Repertorium*" only reached me just before my catalogue was shipped, hence the absence of reference to it in the annexed paper.

62, Camden Square, N.W., April 4

G. J. SYMONS

On the Completion of the European Portion of the Preliminary Meteorological Catalogue, by G. J. Symons

The author commenced by giving a few illustrations of the large amount of time and energy which has been wasted by meteorologists, owing to their not knowing what had previously been done, sometimes even in their own country, but most frequently in other parts of the world; and he pointed out that with the modern development of meteorological work and of meteorological literature, some effort, upon a large scale, to deal with this evil was imperatively necessary.

Mr. Symons described the catalogue which he had formed during the last twenty or twenty-five years, by extracting (from many thousand catalogues issued by dealers in second-hand books in most of the capitals of Europe) all the titles of works on meteorology or kindred subjects. He also described the important publication, by the Royal Society, of its "*Catalogue of Scientific Papers*," and showed wherein the two agreed, and how largely each supplemented deficiencies in the other.

He then explained the steps which Prof. Cleveland Abbe had taken in preparing his card catalogue, and the arrangements whereby a copy of Mr. Symons's catalogue was to be prepared and forwarded to the United States for incorporation with Prof. Abbe's.

Mr. Symons then stated the additions which had been made to the original proposal, and that the following catalogues had been subsequently incorporated, each giving *approximately* the number of titles set against it, viz. :—

Prof. A. Poëy's	...	MS.	...	6000
Ronald's	...	Printed	...	3000
Struve's Pulkova	...	Printed	...	3000
Meteorological Society	...	MS. and printed	...	2000
Houzeau's Belgian	...	Printed	...	2000
Soc. Météor. de France	...	MS.	...	1500
Royal Observatory, Greenwich	...	MS.	...	500
Fineman's Swedish	...	Printed	...	500

Total about ... 18,500

Of course a great many of these were duplicates, but every catalogue contained titles which were not in any of the others, and altogether they have undoubtedly added very largely to the value of the work; it is impossible to state how largely, nor is it material in a case wherein the assistance rendered has been almost as great as the catalogue, and as diverse as the languages dealt with.

The precise number of titles forwarded is not known, but is probably about 20,000. Prof. Abbe's catalogue is understood to contain about 10,000, but probably there will be a few thousand common to both catalogues, and therefore the preliminary catalogue, which the United States Signal Office, under the direction of General Hazen, will proceed to prepare for publication, will probably contain the titles of more than 25,000 books and papers upon meteorology.

Mr. Symons remarked, in conclusion, that the catalogue must not be regarded as complete. It was impossible to make it perfect—it could not be perfect as regarded the past until every public and private library in the world had been searched. It could not be perfect for the present, because every day new works appeared in different parts of the world, and all could not be simultaneously inserted. Nor would his part of it bear bibliographical criticism, for he was not a bibliographical expert, and his chief aim had been to give information useful to working meteorologists.

Ice Volcanoes—Mountain Rainbow

THE past winter has been unusually cold and stormy in Ontario, and, as a result, an uneven strip of ice 100 to 200 yards wide has accumulated along the lake shore, sometimes forming mounds twenty or thirty feet high. Many of these mounds are conical, and have a crater-like opening communicating with the water. In stormy weather every wave hurls a column of spray and ice fragments through the opening. The ejecta freeze fast as they fall, and add to the height of the cone. In high winds the coast seems fringed with miniature volcanoes in active eruption. After a time the crater becomes clogged with ice, and the volcano may be looked on as extinct. Often a second crater is formed just to seaward of the first, and growing upon its ruins.

Mr. J. A. Fleming mentions in your issue for January 31 (p. 310) a circular rainbow seen from a hill-top against mist. I saw the same phenomenon three years ago near the Lofoden Islands, as a fog was breaking. It was noticed and admired by other passengers on the steamer also. Each saw his shadow enlarged upon the mist, and with the head surrounded by a brightly coloured halo or rainbow. The beautiful sight disappeared after a few minutes as the fog thickened again.

A. P. COLMAN

Faraday Hall, Victoria University, Cobourg, Canada

Thread-twisting

IN reply to "*Cosmopolitan's*" question in *NATURE* (vol. xxix. p. 525), I have been many years in Orkney, but do not remember to have seen the women twisting thread with "the palm of the hand on the thigh," but the fishermen there twist the short lengths of horsehair line called "snoods," which when united together form fishing lines of different strengths, in this manner.

The women of the North-American Indians always twist the short threads of sinew with which moccasins and leather clothes are sewn in this way: The sinew is torn up or divided into thin filaments slightly moistened by being drawn between the lips, then twisted between palm and thigh.

J. RAE

Kensington, April 5

IN reply to "*Cosmopolitan's*" query as to the occurrence of the habit of thread-twisting with the palm of the hand on the

thigh in other lands than India, I may say that I have observed the same mode of operating upon paper in Japan very frequently. The paper used there is tough and fibrous, and a Japanese is never at a loss for card to tie a parcel with if he has paper beside him. I have seen the spindle-whorl in actual use in upland districts, and it was employed even in Tokio very recently.

HENRY FAULDS

Laurel Bank, Shawlands, Glasgow, April 7

Colony of Cats

It may interest those of your readers fond of cats to know that a colony of cats live and breed under the wooden platform of the Victoria Station of the District Railway. They may be seen crossing the rails right in front of trains, and considering the enormous traffic, and the consequent noise and vibration, it certainly does seem remarkable that such naturally timid animals as cats should live amidst such unnatural surroundings. It may tend to show the plasticity of the animal creation generally in adapting itself to surrounding conditions. A female cat may have taken refuge there originally, and hence the railway domestication of the animals.

GEORGE RAYLEIGH VICARS

London

Earthworms

SEEING the correspondence on this subject, I am led to give the following fact, which affords a further proof of the necessity of a vegetable deposit being formed previous to the existence of earthworms as stated by Mr. Melvin (vol. xxix. p. 502). A field two years ago was converted into a garden, and on account of bad cultivation, and by reason of each crop being altogether removed for several years in succession, no worms were there, but after the application of a large quantity of stable manure worms have appeared by hundreds, and their castings after rain afford ample proof of their activity. TRANSFORMATION of vegetable mould combined with animal refuse into available food for plants is here made evident.

J. LOVELL

Driffeld, April 7

"The Axioms of Geometry"

PROF. HENRICI, in NATURE, vol. xxix. p. 453, considers Hamilton's proof of Euclid I. 32 invalid; and asserts that from his reasoning it would follow that the sum of the three angles of a spherical triangle equals two right angles. I venture to differ from him for the following reason:—The only thing which Hamilton requires to be granted is that when a moving *straight* line slides along a *fixed* straight line its *direction* is unchanged. This axiom will, I suppose, be granted by every one. Of course it is not true that in every case rotation is independent of translation. But Hamilton's proof does not require it to be true in every case, but only in the case of a *straight* line. Hence I maintain that Hamilton's reasoning is perfectly correct, and his proof valid.

ELWARD GEOGHEGAN

Bardsea, March 26

GEOLOGY OF CENTRAL AFRICA

THE following extract from a letter received by Mr. Geikie from Mr. Henry Drummond, who is at present exploring the Lake region, may interest our readers:—

"Maramoura, Central Africa, November 1, 1883

"I have now completed a traverse from the mouth of the Zambesi, by way of the Shire highlands, in a north-west direction, until the line joins Mr. Joseph Thomson's route, about half way between Lakes Nyassa and Tanganyika. I have filled in the geology so far as is possible in a single survey, and hope thus to be able to extend the sketch geological map, begun by Thomson, for some distance south and west. I may still further extend this by an expedition to Lake Bangweolo, after the rainy season, but there are circumstances which may make it necessary for me to leave for home in February or March. Perhaps the most interesting thing I have to note is the discovery here of a small but rich bed of fossils. The

strata alluded to consist of light coloured limestones and shales, with beds of fine gray sandstones, and the fossils include plant, fish, and molluscan remains. Plants are the most scarce, but fish-scales and teeth exist in vast numbers. Unfortunately whole fish are extremely rare, and after three or four days' search I have only succeeded in securing two or three indifferent specimens. The mollusks, on the other hand, are obtainable in endless quantity, and are in fine preservation. Indeed there is one small bed of limestone entirely made up of these remains, all, however, belonging to a single species. From the general character of the beds I am inclined to think they are of lacustrine origin. These fossiliferous beds are the only sedimentary rocks I have crossed between the mouth of the Shire—say 130 miles from the coast—and the centre of the Nyassa-Tanganyika plateau. At the point where I crossed them they are not more than a couple of miles in breadth, and are flanked on either side by granite and gneiss. They lie at a short distance from Lake Nyassa, and are probably part of the Mount Waller series. This series stretches for some short distance along the north-west shore of the lake, but is apparently of no great extent. These deposits may possibly throw some light on the problem of the lake.

"As regards the controversy between Mr. Thomson and Mr. Stewart about (1) the Livingstone Mountains, and (2) the bed of iron between the lakes, I should say that on both points both explorers are right from their own point of view.

"Mr. Stewart had only been dead a few days when I reached the north end of Nyassa. It was a great disappointment and blow to me, as I looked forward to much help from him. No one living possesses anything like his knowledge of the physical geography of this part of the interior."

CHINESE PALÆONTOLOGY

PALÆONTOLOGY is not a study that commends itself to the attention of Chinamen. With archaeology the case is different. That is a pursuit which within historical limits the Chinese follow with enthusiasm. Every one who possesses any pretensions to culture, and who can afford to indulge the inclination, collects all that is old from cracked china to coins. So prevalent is this taste, and so keen is the competition for objects bearing the stamp of age, that a flourishing trade, such as rivals the celebrated traffic in "antiquities" carried on at Jerusalem, exists in fabricated antiques for the benefit of inexperienced native collectors and foreign purchasers. But natural antiquities are, speaking generally, left unnoticed, or if thought of for a moment are hastily explained by random conjectures. Topsy's celebrated explanation of her existence is about on a par with the guesses which are hazarded by the most learned Chinamen to account for palæontological phenomena. Science has always a borderland of unsolved questions, but in China this borderland exceeds in extent the territory of knowledge in the possession of the people. They have no aptitude for palæontology, and few writers make any reference to it. Among the rare exceptions to this rule is Chên Kwah of the Sung Dynasty (A.D. 960-1127), who, in an interesting work entitled "Notes from a Dreamy Valley," has collected a number of facts on natural antiquities as well as on other matters. His knowledge is not deep, but when we remember that Voltaire accounted for the presence of marine shells on the top of the Alps by supposing that pilgrims in the Middle Ages had dropped them on their way to Rome, a great deal may be forgiven a Chinese writer of the eleventh century.

The Chinese have so completely lost sight of the possibility of the existence in China of any civilisation but their own that when they meet with traces of earlier man they attribute them either to blind chance or to