they can be completed and perfected. This immediate publication likewise removes any cause for discontent on the part of the officers whose labours might be withheld from the public, while at the same time the consciousness that their work will at once be exposed to criticism must naturally act as a stimulus to care and accuracy. Mr. Medlicott adds: "I see no compromise but the one I adopted, and to which I adhere. The risk it obviously implies—the exposure of faulty work—falls upon our own heads. The minor evils it involves are no greater than those it removes, and the smart of public criticism is more wholesome than the heart-burning of official suppression." His efforts at conciliation and usefulness, however, have landed him in another dilemma. Of course he is compelled to make corrections of the publications of the Survey; but the wielding of his editorial pen seems to be now and then resented by some over whose lucubrations it has been displayed. And thus the injured writers, proud of their flowery periods or of their inaccurate geology, rush off to newspaper editors and pour forth their complaints in angry letters! Would it not sometimes be the most fitting punishment to publish the lucubrations just as they are put into the superintendent's hands? One or two glaring cases of this kind would possibly cure the evil, unless the burning sun of India makes a geologist's hide thicker than is usual in our colder clime.

American Geological Surveys.—Though the various independent geological surveys under different departments of the United States administration were abolished by Act of Congress in June of last year, certain provision was made for the publication of their results. Among the corps embraced in the demolition was that which, under Capt. George Wheeler of the Engineers, had done much good work. From a document just issued, and forming part of the Annual Report of the Chief of Engineers for 1879, we learn that Capt. Wheeler's geologists stuck to their ground almost up to the very day when their appropriations expired. They took the field on May 20 of last year in Colorado and New Mexico, and after a month of hard work the party was disbanded on June 24, six days before the end of the financial year. Prof. J. J. Stevenson of New York, who has been in charge of the Engineer geological explorations in that area, has published a preliminary report in anticipation of the final memoir. It shows that he has accomplished much interesting detail, particularly in regard to the succession of the coal-bearing Laramie series. We trust that he will be able to give satisfactory sections of the Sangre de Christo range, particularly with reference to the structure and age of its metamorphic rocks. He alludes to them in this preliminary report as "archæan." In Hayden's Report of the United States Geological and Geographical Survey of the Territories for 1875 (p. 208) Dr. Endlich concludes that these rocks are metamorphosed Silurian strata; and in the Report of the same Survey for the previous year he presents a similar conclusion with regard to the granite of the San Juan country. Detailed and accurate information on the true stratigraphical relations of the so-called "archæan" rocks of the Rocky Mountains and western ranges of North America are much needed. While referring to American official geological publications we would point out the absolute necessity of reference to the labours of previous explorers. We could pick out not a few otherwise excellent reports which are disgraced by an utter obliviousness of the existence of any earlier writings on the areas described. Without warning or explanation new names are given to formations which had already been named and described. If the original names and descriptions are defective or inaccurate let that be stated. But in common fairness to fellow-labourers, not to speak of duty to the reading public, let us know distinctly whether we are perusing an account of ground that has never been described before, or whether we are merely getting a new rendering of facts already familiar to us. When the history of geological exploration in Colorado comes to be written how many different and rival expeditions will have to be enumerated, and in how many cases will it be found that they have recognised each other's existence!

Imperfection of the "Geological Record."—Geologists and those who take interest in the literature of Evolution will find some curious papers by Th. Fuchs in recent numbers of the *Verhandlungen* of the Geologische Reichsanstalt of Vienna—apparently the first of a series in which he proposes to demolish Darwinism by accurately compiled statistics. He contends that the assertion of the imperfection of the "Geological Record" rests for the most part on gross exaggeration of the facts. He holds that instead of being, as Darwin and his followers maintain, full of gaps, the record of the older faunas and floras of the earth is extraordinarily perfect. He contends that Palæontology as it now stands is able, with a properly directed criticism, to afford a perfectly satisfactory basis on which to discuss with confidence the biological questions involved in Darwinism. He points out that in such a discussion it is needful to keep clearly in view a twofold series of animal remains. 1. Those which on account of their fragility, habitat, or habits can only be exceptionally preserved, such as medusæ, ascidians, insects, birds, small mammals, and tender plants. 2. Those with enduring hard parts, which, in consequence of their habitat and habits, are necessarily, in the regular progress of sedimentation, inclosed in new formations, such as corals, echinoderms, molluscs, &c. Admitting the exceptional preservation of the first series as fossils, he maintains that the entombment of those of the second series, so far from being exceptional, is now, and always has been, part of the daily and necessary *régime* in the formation of sedimentary accumulations, and that in this way the geological record of the past is remarkably complete. To prove or illustrate this contention, he gives a few examples of the kind of "statistical data" on which he relies. For example, in an up-raised bed of marine clay near Messina about 100 species of organisms were found, nearly all still living in the adjoining sea, but including a few that were not known in the existing fauna. Further search of the sea-bottom, however, detected these forms also. "In this case, therefore," says Herr Fuchs, "the fauna of Messina Harbour was more completely known from the fossil than from the living fauna." Again the Tyrrhenian Sea has yielded 337 species of conchiferous shells; of these 300 are found in the quaternary deposits of Leghorn; therefore the fauna of that sea could be with great completeness made out from fossil forms! In a subsequent number of the same journal Herr R. Hoernes has shown the fallacy of this reasoning; but Herr Fuchs has evidently laid in his store of ammunition, and does not mean to be disturbed until he has fired it all off. He continues his broadside in the number of the *Verhandlungen* just received, where he has a paper "On some Fundamental Phenomena in the Geological Development of the Organic World."

GEOGRAPHICAL NOTES

According to the last news received from M. Prjevalsky, he reached, on September 12, the boundary of Southern Tsaïdam, and thus entered the great highway which leads from China to Tibet. Detailed information as to his journey of last year from Kami to Sha-jeu, appears now in the *Izvestia* of the Russian Geographical Society. Khami is at the extremity of the sandy steppe described as the Mouschoun Gobi; it is a desert, nearly quite deprived of vegetation. For fifty miles are seen only immense spaces of clay covered with gravel; the temperature at the beginning of June reached as high as 38° Cels., and the soil had sometimes a temperature of 68° Cels. Journeying must be done in the night. No large animals, except the antelope and the wild camel, which comes from the deserts of Lob-nor, were seen. M. Prjevalsky crossed this desert in a south-eastern direction for 232 miles, and reached the oasis of Sha-jeu, a very fertile one, being the best tract of Central Asia, after Kulja. A high ridge of mountains covered with snow, the Altyn-tagh of Lob-nor, here joins the Nian-shan of Koko-nor. Thus the question as to the junction of these two systems of mountains is solved definitely. M. Prjevalsky stayed for a month in Sha-jeu, seeking for guides to Tsaïdam, and finally he found in the mountains three Mongols who agreed to serve as guides, so that he could reach Tsaïdam, going first south-west to Lake Serten and thence to Lake Koko-nor.

The last number of the Russian *Izvestia* contains an interesting paper, by M. Oshanin, on the upper parts of the Muk-su River, a tributary of Surkhab. These tracts were not previously visited, only one point in the valley of Muk-sou being known to Russian travellers, namely, the grave of Altyn-mazar, situated at the confluence of the Sel-su, Suk-su, and Kainda Rivers. Very high peaks inclose this deep valley, the bottom of which is no less than 8,000 feet above the sea-level. The Sandal peak, which is in the middle of the chain, reaches to no less a height than 25,000 feet, and two other peaks, Shelveli and Muz-jilga, are situated beside it. They are covered for two-thirds of their height with snow, and immense glaciers flow from their wide amphitheatres into the valley of Sel-su and of its tributaries. They form together a glacier which descends very low, its lower extremity, one and a half miles wide, being met with at a distance

of fifteen miles from Altyn-mazar. The length of this glacier is not less than twenty to twenty-five miles, and it is fed with several other glaciers of very large size. The oscillations in its length have a great importance, as sometimes it advances so far into the valley as completely to bar up the valley of the affluent of Sel-su, the Baland-kiik; this last thence forms a wide base which afterwards cuts through a passage in the ice and inundates the main valley, destroying the forests; now the glacier is once more in advance, and has nearly barred up the valley of the Baland-kiik. M. Oshanin proposes to give to this glacier—probably the second or third in size in Central Asia—the name of "Fedtchenko-glacier." As to the vegetation of its neighbourhood, it is very poor, the bottom of the valley being covered only with brushes of *Tamaris* and *Atraphaxis*, whilst the lateral valley of the Baland-kiik, although far higher than that of Sel-su, is covered with rich forests and grass. The season was too late for affording opportunities to collect insects, but M. Oshanin observed immense quantities of the *Microplax interrupta*, Fieb., in the neighbourhood of Altyn-mazar. This *Oxycerenina*, which is characteristic of the southern parts of the paleoarctic region in Europe, reaches in Central Asia such heights as in the Alps and Pyrenees are occupied with representatives of the Arctic zone. After having uselessly attempted to penetrate further into the high regions at the sources of the Baland-kiik, M. Oshanin was compelled to return, having thrown but a glance on this region of glaciers.

NORDENSKJÖLD has met with a warm reception at Lisbon. We have already spoken of the honour done him at Naples, and the honours which await him in France. Amsterdam has invited him, Copenhagen will intercept him on his way home, and in Sweden he will doubtless receive a worthy reception. What is our own Geographical Society to do? We hear of no preparations being made for the reception of one of the greatest and most modest of explorers. Wherever he has touched, Nordenskjöld has had honours showered upon him by the governments of the country; but we suppose it would be "bad form" in an English government to show anything like enthusiasm on behalf of science; though there is no saying, the Swedish explorer may, after all, become the fashion for a week.

AT the meeting of the Geographical Society on Monday next, Mr. E. Hutchinson, the Lay Secretary of the Church Missionary Society, will read a paper on the ascent of the Binué branch of the Niger, by the missionary steamer *Henry Venn*, in August of last year, supplementing his account of this exploration by remarks on the systems of Rivers Shari and Binué.

WE understand that the Free Church of Scotland have received from Mr. James Stewart, C.E., of Livingstonia, an account of his recent exploratory journey from the head of Lake Nyassa, to the south end of Lake Tanganyika, where he arrived on the afternoon of November 5. Great interest will attach to this report, as we believe that for two-thirds of the way Mr. Stewart's route was considerably to the westward of Mr. Thomson's, and that he met with much less difficult country, and which had, in fact, a very gradual rise and descent. This, no doubt, will account for the erroneous statement first received by telegram from Mozambique, that Mr. Thomson had found the country level between the two lakes.

THE principal original paper in the new number (85) of the *Zeitschrift* of the Berlin Geographical Society is the interesting journal of the late Dr. Erwin von Bary, kept during his journey from Tripoli to Ghät and Aïr. There is a fine new map of the Fagüm, by Dr. Schweinfurth, after the survey of Rousseau Bey, in 1871; Dr. Schweinfurth promises a paper discussing several points connected with the geography of the district. In No. 27 of the *Verhandlungen* Dr. Rohlfs furnishes an account of his recent journey to the Oasis of Kufra; a series of barometrical measurement of heights, of Col. Prjevalsky, in Central Asia, is given.

WITH the current number of *Les Missions Catholiques* is issued an interesting map of a portion of Eastern Equatorial Africa, which has been prepared by Père F. Charmetaut, who went to Africa to organise the first Algerian missionary expedition to the lake region. The features of the country between the coast and Lake Tanganyika are shown in considerable detail, and the routes followed by the Algerian missionaries to Ujiji and Lake Victoria are also laid down. Père Charmetaut bases his map to some extent on special information which he claimed to have obtained in Africa.

WE regret to hear that Père Ruellan, who was a member of the second Algerian missionary expedition to East Central Africa, died at Tabora, on November 24, of typhoid fever. Before leaving for Zanzibar last summer, Père Ruellan, with one of his colleagues, was sent to Paris to the Natural History Museum, and the Montsouris Observatory, in order to take lessons in practical geography, astronomy, natural history, &c. Père Ruellan promised to be an energetic geographer, for on the journey to Mpwapwa his first thought on arriving in camp was always to determine the position of the locality, and he looked forward to being able to render useful service to the science of ethnography in Eastern Africa.

DR. MATTEUCCI, the well-known Italian traveller, who recently left Rome on a journey of exploration in Africa, in company with Prince Borghese, has arrived in Cairo, where he has had the good fortune to meet Mgr. Guillaume Massaja. From Mgr. Massaja's long practical knowledge of Abyssinia and the Galla country, Dr. Matteucci would, no doubt, obtain from him much valuable information respecting those regions, which Italian travellers are beginning to affect as their own particular field of exploration.

FROM the *Colonies and India* we learn that a scientific survey of the district of the Chaudière River, in Canada, is about to be made in search of the deposits of gold which are said to have been found on both banks of the river. The country is chiefly forest land, and some of the timber-getters there have met with nuggets of gold. The River Chaudière rises some 120 miles south of Quebec, and empties into the St. Lawrence, nearly opposite that city.

THE January number of the *Boletin* of the Madrid Geographical Society is largely occupied with three *Memoirs*, accompanied by two excellent charts of the Passage Islands, in the West Indies, two of the *Memoirs* being devoted to the Island of Culebra.

ON THE BAROMETRIC SEE-SAW BETWEEN RUSSIA AND INDIA IN THE SUN-SPOT CYCLE

IN his Report on the Meteorology of India in 1877, Mr. Eliot drew attention to the fact that throughout that year the pressure of the atmosphere, as shown by the barometric registers of all parts of India, was more or less in excess of the average; at some places absolutely without intermission (on the means of the several months), at other places with slight and comparatively insignificant interruptions. He also pointed out that this condition was not restricted to India, but appeared to have prevailed also in the distant regions of New South Wales and Victoria, where, however, the oscillations were greater and its continuity more interrupted.

In point of fact this condition of excessive pressure lasted not less than two years in the Indian region, having set in between May and August, 1876, and continued to between May and August, 1878, after which for many months the pressure was as persistently and strikingly below the average as it had exceeded it during the period in question. It included two years of serious failure of the rains, first in the Peninsular and afterwards in the Gangetic provinces. Further examination has shown that the condition of excessive pressure prevailed over not only the Indo-Malayan region and Eastern Australia, but also the greater part if not the whole of Asia, probably the whole of Australia and the South Indian Ocean (at least as far as the Mauritius), but in the extra-tropical regions of both hemispheres it was subject to considerable variations, which were but faintly reproduced in the tropics. As the result of an inquiry into the characteristic features of this widely extended atmospheric condition, pursued back into past years, I have been led to some preliminary conclusions which seem to me of much interest, not only in themselves, but also as opening up a field of research which may be profitably extended to other quarters of the globe. It may be stated at the outset that as regards the Indo-Malayan region, and perhaps also South-Eastern Asia generally, the excessive pressure of 1876-78 was in part the maximum phase of a cyclical oscillation; but that as regards Northern Asia, and probably also Australia, it was anomalous and apparently non-periodic, and even in the Indo-Malayan region, it was probably to a considerable extent of this character also.

With respect to the cyclical oscillation, which appears to