Meiaco shima, Lu-Chu, and Linschoten, while the sea to the east, although showing at times displacements to the north-east, is otherwise quite motionless. The supposed constant current of considerable velocity just east of the Lu-Chu Islands does not exist. The Kuro-Shiwo, in the northern part of its course, shows more tendency to break through the island barrier to the east. Its principal outlets in this direction are the Colnet Straits (30° north latitude) and the Van Diemen Straits (31° north latitude). From this point to the meridian of the Kii Channel the current reaches its greatest extent, and flows pretty close to the land in a north-east direction, with a striking bend, under 135° east longitude, to the south-east, resuming as it flows at some distance from the coast up to Yokohama its old north-east direction.

Under the 38th parallel east of Cape Kinkuasan, the Kuro-Shiwo strikes the Oga-Shiwo, i.e., the cold Kurile current from the north. The observations of ships in this region show that often in a few hours the temperature of the water falls 20° and 30°, and the temperature of the air also; the weather becomes cold, muggy, and rainy, and the color of the water changes from the blue or blue-black of the tropics to the well-known bottle green. The boundary line between the Kuro-Shiwo and the Oga-Shiwo, from February to April inclusive, is under 38° latitude and 143° to 145° longitude; in May, under 42° and 147°; in July, under 45° and 150°; and in August, lies north of 50° latitude. The polar current here does not extend at any time below 38°. The analogy between the Pacific and Atlantic in this respect is almost complete. The Oga-Shiwo is the Pacific Labrador current, and Cape Kinkuasan plays the part of Cape Race, except that the latter lies 10° further north than Cape Kinkuasan. After meeting the polar stream, the Kuro-Shiwo turns east, but Dr. Schott does not follow it in its further course. Running parallel and to the east of the Kuro-Shiwo is a second though less important warm stream, called the Bonin current, which comes from the south and flows in a north, north-east, and then east-north-east direction. At 130° east longitude it flows east in a course which former maps showed as the course of the Kuro-Shiwo. The Bonin current does not always flow to the west of the Bonin Islands; its mean axis of movement varies with the season of the year, and at the end of summer lies to the east of the Bonin Islands. In this case also there is an analogy with the phenomena of the North Atlantic, as Krümmel's investigations have showed that east of the Antilles and of the Florida current there flows a broad though not intensive stream in a similar direction. Dr. Schott discusses the influence of the winds upon these currents, and gives some important information with regard to currents in the Straits of Formosa and the Yellow and Japan seas. The second part of his article is devoted to water temperatures in these regions.

THE BOURBONS AND ARCHÆOLOGICAL REMAINS.

IT would naturally have been thought that the Restoration would have made it a special care to restore and preserve the monuments of the past, but it is a remarkable fact that this epoch was the commencement of a system of almost limitless destruction of the edifices which the Revolution had spared, and that the change of dynasty in 1830 has certainly been productive of benefit in this respect at least. In the time of Napoleon the Minister of the Interior, by his circular of June 4, 1810, proposed a long series of interrogatories to all the prefects relative to the actual condition of the old castles and abbeys in their respective departments. These documents are replete with curious and interesting facts. Under the Restoration, M. Simeon, when Minister of the Interior, adopted a similar measure, but it does not appear that any practical results were obtained. The lamentable system of indifference which prevailed on this subject up to 1830, says a writer in *The Architect*, may be inferred from the terms of that ordinance which can never be sufficiently regretted, by which the splendid depôt of historical monuments formed at the Petits Augustins was destroyed and dispersed under the pretext of making restitution to owners who no longer survived, or who did not know what use to make of the objects so restored to them. It is believed that not one of the monuments given back to individual owners has been preserved; and, notwithstanding the notorious difficulty of disposing of these splendid relics, a steady refusal was constantly returned to the reiterated requests of M. Lenoir, the founder of this unique museum, to re-establish his collection with what remained after restitution had been made to every known proprietor. This contempt for and unpardonable neglect of antiquity in a Government whose chief claim to respect was derived from the principle of antiquity, extended even to the Conservatoire de Musique; the curious collection of ancient instruments of music which had been formed there was ordered to be dispersed or sold at a low price. This ruinous system, which prevailed in Paris, was practised on a still more extensive scale in the provinces. It would scarcely be believed that, under a moral and religious government, the Corporation of Angers, which had for its chief a deputy of the extremest ultra-loyal opinions, should have been allowed to convert the Gothic Church of St. Peter into a theatre. It is still more incredible, but not the less true, that the Church of of St. Cesaire at Arles, which the most erudite antiquaries looked upon as one of the oldest in France, was transformed *en mauvais lieu*, without any public functionary protesting against such profanation. Who would think that no effort was made, when the Most Christian King returned to the throne of his fathers, to rescue the magnificent papal palace at Avignon from its military desecration? And who could credit the fact that at Clairvaux, in that celebrated sanctuary which was directly connected with the authority of the State, the exquisite church, so beautiful in its proportions and so complete in its grandeur, which dated from the twelfth century, and was said to equal Nôtre Dame, at Paris, in size, which was begun by St. Bernard, where so many queens, princes, and pious generations of monks were entombed, and where the heart of Isabella, the daughter of St. Louis, was deposited, that this edifice, which had survived the havoc of the Revolution, and the indifference of the Empire, should have been demolished in the very first year of the Bourbon restoration? It was then razed to the ground, with all its projecting chapels, without leaving one stone upon another, or even sparing St. Bernard's tomb, to make room for a square surrounded by trees in the centre of the prison which occupied the site of the venerable monastery. Before leaving Clairvaux, we may as well mention that a prefect of the department of Aube, under the Restoration, actually sold seven hundred pounds weight of the archives of this famous religious house, and which were removed to Troyes; and the Count de Montalembert stated that, when he was at that place, he walked over a heap of parchments strewed thickly on the floor, from which he picked up a bull of Pope Urban IV., the son of a shoemaker of that very city of Troyes, and probably one of its most illustrious children. The same prefect demolished the relics of the palace of the ancient counts of Champagne, of the noble and poetic dynasty of the Thiebauds and Henri-le-Large, because they were in the line of a crescent which his architectural genius had unfortunately devised. The beautiful gate of St. Jacques (constructed in the time of Francis I.) and that of Beffroy suffered the same fate. Another prefect of the Restoration, in the department of Eure and Loire, had no scruple in appropriating to his own use several painted windows of the Cathedral of Chartres to decorate the private chapel of his country mansion. It has been incontrovertibly proved that during the fifteen years of the Restoration more irremediable devastations were committed in France than in the period from 1789 to 1813. This destruction was certainly not enjoined by the Government, but it was done under its eyes, with its tolerance, and without exciting the slightest marks of its solicitude.

ANTIQUARIAN DISCOVERIES NEAR ALEXANDRIA.

IN the London *Times* of Oct. 12 appeared a telegraphic announcement of the late interesting antiquarian discoveries at Abukir, distant thirteen and a half miles by rail eastward from Alexandria.

Excavations are being continued under the direction of Daninos Pasha, a savant well qualified for the work, to whom is due the merit of the discoveries; and if Government will supply the funds necessary to enable him to continue his researches, there are abundant indications that valuable "finds" will be made in a locality

hitherto almost neglected by archæologists, and presenting much that is interesting, especially to students of the Græco-Roman period.

At four to six feet below the surface the diggers found three statues in rose granite, ten feet high, lying face downwards, among the ruins of a temple, of which part of the outer wall with lower portions of columns and several square yards of flooring have been laid bare. The statues had been originally erected at or within the temple, and one of them is lying in front of its pedestal, which is about three feet high. They represent in a group, according to the hieroglyphic inscription, Rameses II. (the Greek Sesostris) and his Queen Hentmara seated. The third statue is of Rameses II. in an upright posture, wearing a pleated tunic, bracelets, military crown, and a girdle bearing the inscription, "Beloved of Seth." At his left side he holds a sceptre, surmounted by the head of his son Menephtah (the Pharaoh of the Exodus), whose cartouch is inscribed on the sceptre. On the plinth at his back, which is of equal height with the statue, is chiselled a bas relief of Queen Hentmara in profile, wearing a pleated tunic and the royal tress. The inscription above her head is "Daughter of the King — beloved of her father — Royal spouse — great favorite Hentmara." On the back of the plinth is carved the royal banner of Rameses II., with all his known titles and appellations. The execution of the three statues is in the plain, vigorous style of the Twelfth Dynasty.

The feet of Rameses, which had been broken off in one piece with a clean fracture, were found at a few yards' distance. The two heads of the group have also been broken off, and are being searched for.

It is surmised that the temple and statues were overthrown after the edict of Theodosius, A D. 380, abolishing the Egyptian religion, but nothing has yet been discovered to identify the temple with any of those known to have existed during the Egyptian or Græco Roman periods.

Dr. Nerutsos Bey's interpretation of the inscription is — Hentmara, daughter of the King, beloved of her father (i.e., the preceding King Osiris Menephtah, who was father of both Rameses and Hentmara), royal spouse (of Rameses II.), the (referring also to Rameses) great favorite of Seth.

The Pharaohs, following the example of Osiris, King of the Gods, and his sister Isis, had the prerogative of espousing their own sisters, and this custom, consecrated by both the civil and religious law, was followed in several instances by the Ptolemies

Dr Nerutsos, who is a well-known Egyptologist, has lately published a work entitled "L'Ancienne Alexandrie," embodying his researches, made during a long residence, and he is perhaps the greatest living authority upon the topography of the ancient city and neighborhood of Alexandria. Referring to the locality in which the above-mentioned antiquities were found, and which abounds with remains of old buildings, he recommends that explorers should seek to identify —

(1) The small Egyptian town Menuth, with its temple to Isis, and subterranean burial-places. Such a place has just been discovered by Daninos Pasha, in the solid rock, entered by a vertical shaft forty feet deep, and a sloping staircase of forty-five steps, terminating at the bottom of the shaft, where a series of galleries commence, extending in length to 170 feet.

(2) The Græco-Roman village Zephyrion, where stood a temple to Artemis Sotera, and numerous country villas.

(3) The headland Zephyrion, on the highest point of which was a temple to Venus Arsinoe, Protectress of Mariners.

(4) The Byzantine monastery of St. Cyr, corrupted to Abba Kyr, whence the name of the present town of Abukir.

The monastery and neighboring buildings were destroyed by an earthquake, followed by a tidal wave, soon after the capture of Alexandria by the Arabs. More than a dozen sphinxes and ruins of massive buildings, submerged by that catastrophe and subsequently, are now plainly visible in the shallow waters of the bay.

THE twenty-third annual meeting of the Ohio College Association will be held in Columbus, Dec. 28–30.

THE FAIRBANKS MUSEUM.

TUESDAY evening, Dec. 15, was a holiday occasion for St. Johnsbury, Vt., for she was at that time the glad recipient of such a Christmas gift as rarely falls to the lot of a community — such a gift as will make her a leader among New England villages in the possession of peculiar educational advantages. Col. Franklin Fairbanks, in fulfilment of his long cherished desire, presented the Fairbanks Museum of Natural Science to the people of St. Johnsbury.

In his address Col. Fairbanks said: "This day, one of the happiest of my life, marks the completion of a plan long cherished; that of erecting a building suitable for the objects in natural science which I have been collecting from my boyhood.

"There is implanted in the breast of every intelligent being a desire for knowledge. Schools are established to develop that desire and expand it into larger fields, fitting us for usefulness in the world, and giving us pleasure and profit. Who has looked through a telescope at the stars, without wishing to know what there is in, or upon them, and desires to look again, hoping to discover something that is beyond? Who has used the microscope to examine the flower or the insect, which is invisible to the naked eye, without longing to know more of what this wonderful instrument alone can reveal? In so far as is possible, this thirst for knowledge should be gratified.

"Those of us who have not had the privilege of a liberal education (so-called) must make up for our loss by the study of objects and beings directly around us, using our eyes and our ears, which may become the windows of our minds, letting in a flood of light and knowledge.

"Life is so short and its limitations are so great, no person can know everything, but each may learn one thing, and learn it well. The child may not be able to calculate eclipses, or understand conic sections, or Greek roots, but he may begin early to learn of the life about him. For this, I have erected this building, and made accessible to you this fruitage of my own observations.

"The collection comprises illustrations in ethnology, ornithology, oology, entomology, zoology, conchology, botany, mineralogy, geology, and palæontology.

"At the laying of the corner-stone of the Museum on the 4th of July, 1890, I told the children that I commenced my collection when a small boy, gathering stones and minerals, because of their beauty. To illustrate, I hold in my hand a grouping of crystals, which I found on the Willey Slide in the White Mountain Notch, when I was about twelve years old. My father was taking me with him on a journey, and we stopped to see the slide which a few years before had buried the Willey family, and this stone attracted my attention, and to-day brings that visit vividly to mind.

"I have been a careful observer, going about with my eyes and ears open. Not a bird comes within my vision but I try to learn its name, its habits, and its uses, and its song if it has any. In the summer time this is a never-ending source of delight, and so I might mention butterflies, beetles, and all insect life; the flowers and ferns and many other objects of study which live and move in great profusion about us all the summer long.

"Now if this collection will create in you a desire to know the facts regarding the life which is around you, and which your eyes see and your fingers touch; in short, if you are thereby induced to study and investigate the things that are nearest you, my aim will be accomplished, and I trust through the aid you may receive in yonder building, you may make far greater progress than I can comprehend.

"A long time since, I asked our architect, Mr. Packard (by whose skill and taste our town has been greatly enriched), to devise some plan by which the collection could be opened for the public benefit, while remaining in my house, but that seemed impracticable, so I abandoned it.

"The building is now complete. It consists of a main hall, with a gallery, for cases and tables. On the first floor of the ell is a curator's office and a class-room. On the second floor and over the class-room and office is a well-ventilated lecture-room. All the rooms are thoroughly equipped for use. In the basement are the furnace for heating, and a large, well-lighted laboratory and taxidermist's room. The whole building is lighted with both

gas and electricity. For a year and a half the curator, Miss Tyler, has been classifying and cataloguing the collection and preparing suitable labels, giving name and location of the specimen, together with a reference to some book where a fuller description can be found, thus making it, not what too many collections are, a dead affair, but really a thing of life, which shall help in your search for knowledge. I hope additions may be made, by those interested in these things, of such objects as shall be worthy and useful in aid of the work in hand. Should persons have in their possession any objects of merit, illustrative of natural science, which they do not care to donate, but would like to loan, they may be shown to the trustees, and, if approved, may find a lodgment in the museum and be marked "loaned," to receive the same care as is bestowed upon the rest of the collection.

"It is my expectation that studies in the natural sciences will be introduced into our public common schools in all grades, from the primary to the senior, and that arrangements may be made between the prudential committees of the schools, the faculty of the academy, and the trustees and managers of the museum, for classes to be held in the class-room of the museum at such times as are best. Objects from the collection may thus be used by way of illustration under suitable and proper regulations. In this way the museum will truly become a factor in the education of our children and young people.

"It is my desire that its usefulness may not be restricted to the public schools or academy of this town, but that it may be open to the inspection and use of any school or class in the county or State. It is my desire that this institution shall take its place with other public institutions, as an educator for the young, lifting all who shall avail themselves of its advantages to a higher and larger knowledge concerning the things of God's creation, which lie all about us, now, practically, for many, a sealed book.

"It is my desire that the museum shall be opened free to all at such times as the trustees may direct, and that the public observe such rules and regulations as seem necessary and wise to be made.

"I cannot let this opportunity pass without grateful mention of the very valuable aid rendered, and advice given, by her who is the sharer of my joys and sorrows, the companion of my home. For years we have worked together in making this collection and in planning for this building, and to her I feel that much of its success is due.

"And it gives me pleasure to say that here is no debt upon the building or land, and that the institution is endowed, with an amount sufficient to maintain it for all time, if the funds are properly invested and the income judiciously expended"

BOOK-REVIEWS.

Fossil Botany, being an Introduction to Palæophytology from the Standpoint of the Botanist. By H. GRAF ZU SOLMS-LAUBACH, Professor in the University of Göttingen. Authorized English Translation by Henry E. F. Garnsey, M.A., Fellow of Magdalen College, Oxford. Revised by Isaac Bayley Balfour, M.A., M.D., F.R.S. New York, Macmillan. 8°.

THE suberb English edition of Count Solms-Laubach's "Einleitung in die Paläophytologie" which the Clarendon Press has recently brought out is now in the hands of paleontologists and botanists. The original German edition, which appeared in 1837, was briefly noticed by the present writer in the *American Journal of Science* for July, 1888 (p. 72), after a careful reading, and the impression which such a reading produced was then recorded. The daily use of the work since that time as a laboratory textbook has somewhat modified that impression, and an English translation of it is, to say the least, a very welcome accession.

The attempt has been several times made to reduce the science of fossil plants to a form adapted to general use. There is no science which is less accessible to the student from the scattered and fragmentary character of its literature, and every effort to collect this and present it in compact form should be thankfully received. Among other works that have claimed to do this should be mentioned the Marquis Saporta's "Monde des plantes avant l'apparition de l'homme" (1879), the late Dr. Schenk's "Fossilen Pflanzenreste" (1888), and Sir William Dawson's "Geological History of Plants" (1888). Of these the first-named realizes much more nearly than any of the others this claim, being popular in its treatment and covering the entire field, both geologically and botanically. The second is a condensation or abridgment of the elaborate treatise on the general subject in Zittel's "Handbuch der Paläontologie," begun by Schimper and finished by Schenk. But the abridgment is carried too far and the mode of presentation can scarcely be called popular. Sir William Dawson's work avoids these defects, but has the more serious one of both geological and botanical incompleteness, making it little more than a popular account of the paleozoic flora of Canada. The present work is open to a similar criticism, as it confessedly takes no account of anything later than the mesozoic, and has nothing to say about the geological history of the type of vegetation now dominant on the globe, viz., the dicotyledons, which, nevertheless, are known to have flourished in earliest cretaceous times, and which of all fossil plants may, at the present time, at least in America, be said to be the most interesting from the botanical, and the most important from the geological point of view.

The merits of this work, therefore, consist neither in its popularity nor in its generality. In what, then, do they consist? To what class is the work useful, and how can it be used? The treatment of the several forms of extinct vegetation which the author has selected is too thorough, minute, and technical for the non-botanical reader to follow. It is of little use to the geologist because, as stated on the title-page, it proceeds from the botanical standpoint. Botanists proper, who ought to profit most by it, are not likely to do so on account of the lamentable divorce of botany from paleobotany, as though fossil plants were not plants, and as such as worthy of study as living ones. If this work succeeds in dispelling to some extent this illusion it will certainly be useful. But dealing wholly with the lower forms, and largely with their internal and minute structures, so greatly neglected by botanists, it is not likely to accomplish this to any great extent.

It is, then, the paleobotanical student who, if any one, is to use this work. If he wishes to cover the whole field he usually has access to most of the literature of the subject, and is already familiar with the sources from which most of the work is compiled. If he wishes to make a systematic review of this literature he naturally goes to Schimper's "Traité de Paléontologie Végétale," and Zittel's "Handbuch der Paläontologie," Abtheilung II., where Schimper, and after his death Schenk, have admirably condensed it, but still have left it much more full than here. If he wishes to acquaint himself with the original investigations thus summarized, he goes to Williamson, Renault, Grand'Eury, Zeiller, Weiss, Saporta, and the rest, who have furnished the facts. In so far as Count Solms has himself contributed in this work to these original investigations, a not inconsiderable part of it, it is useful to this class of students. But unquestionably the most important service which he has here done has been to put on record the matured judgment of a structural botanist of the first rank respecting the probable nature and significance of the many problematical extinct forms of vegetable life that have been found in ancient strata. Whenever one of these problems arises the first question the paleobotanist now asks is, What does Solms-Laubach say? It is true that he entirely omits many such forms, that he frequently contents himself with stating the opinion of others, and that quite as often he declares that the facts do not warrant an opinion. But on many points his mind is made up, and it must be said to his credit that he has not attached himself to any particular school, but appears to be guided entirely by the evidence as he understands it.

It is a great comfort, for example, to know that he regards the Cordaiteæ as gpmnosperms without asserting that they are conifers; that he does not accept the views of some French paleobotanists that the secondary or exogenous growth in Sigillaria, Stigmaria, and Calamodendron necessarily relegate these forms to the phanerogams; that he considers Stigmaria as the roots of Sigillaria, Lepidodendron, etc, and does not admit the two kinds of Stigmaria maintained by Renault; that he opposes the view of Renault that Sphenophyllum is related to Salvinia, and while regarding the