the volume as a whole, we are driven to one of two conclusions, — either that there is a lack of good editorial judgment in preparing the volume and accepting articles for publication, or else there must be a lack of good articles. That the latter is the case we cannot believe.

Of an altogether different type is the Report of the fish-commission. Its greatest fault lies in the fact that it is extremely bulky, being composed of over eleven hundred pages; but this fault is partly hidden by the value of some of the articles. Among the most valuable contributions contained in the appendices are those by Verrill and Smith upon deep-sea animals, and by Ryder upon the embryography of osseous fishes and upon the development of the oyster. There are other important articles by Collins, McDonald, and others. We notice that in many of these papers there is a decided tendency toward the use of more space than is necessary to set forth the ideas of the author. This tends only to swell to unwieldy proportions an already bulky volume. There are two articles — one by McDonald, the other by Smiley — the value of which we fail to see: they are simple lists of the people who have received carp from the commission. If these had been left out, together with the equally superfluous lists of lakes and rivers of the United States, the report would have been shortened by at least two hundred and fifty pages. The idea of separately paging the different articles, and furnishing them each with an index, is good.

In addition to the report of the secretary, a new and important feature, the report of the assistant director of the National museum, is introduced into the Annual report of the Smithsonian institution. The appendices, which have been introduced in the last three volumes under the title of 'Record of recent scientific progress,' are continued in this report. These are very good summaries, and are written by some of our most eminent scientific men; still we doubt if they are of any considerable value. The specialist in each branch treated must necessarily know as much as is contained in the article upon his own branch, and all are certainly too concise to be of popular interest. The idea, however, is excellent; and if the Smithsonian could each year publish separate bulletins, each one covering one of the branches of natural science, and if each one should be made to occupy several times as much space, and be written in a more popular style, we think that they would soon come to be recognized as the most important publications of the institution by all who are interested in the natural sciences.

The last volume of the Proceedings of the national museum shows a decided improvement over all the others. It is even richer in important articles than any previous one, such men as Smith, Bean, Jordan, Ryder, Gill, and Ridgeway, being among the chief contributors. A noticeable feature of this volume is, that among its list of contributors are the names of two women. This is a comparatively new feature in American science. The chief fault of the volume lies in the appendices, which are entirely out of keeping with the rest of the volume. Such articles as "Brief directions for removing and preserving the skins of mammals," although very valuable to young collectors, are out of place here. The volume for this year shows signs of careful editorial work; but the index could be improved by printing it in treble columns, to bring more under the eye at once.

NOTES AND NEWS.

MR. SIDNEY GILCHRIST THOMAS, whose name is connected with the Thomas-Gilchrist patent for the conversion of phosphoric pig-iron into steel, died in Paris on Sunday morning, Feb. 1. Mr. Thomas, says the *Athenaeum*, was educated at Dulwich college, and was intended for the medical profession; but on the death of his father he entered the civil service. He was excessively fond of chemistry, and devoted all his leisure to the study of that science. In 1878 he read before the Iron and steel institute a paper on the elimination of phosphorus, in which he announced the discovery which he and his relative, Mr. Gilchrist, had made. The dephosphorization or basic process, as it is usually termed, renders available for the production of steel the pig-iron smelted from spathic and less pure ores of England. This process was thought so highly of, that Mr. Thomas was presented by the Iron and steel institute with the Bessemer gold medal. The labors of Mr. Thomas in establishing the basic process in Germany, where it is most extensively employed, in France, and in England, told severely upon a constitution always inclined to be delicate. A voyage to Australia, and a residence for some time in Algeria, appeared to give hopes of his ultimate recovery; but on his return to Paris he became worse, and on Sunday morning (Feb. 1) he breathed his last, at the early age of thirty-six.

— The Académie d'aérostation météorologique of Paris held a celebration, on the 15th of January, of the centennial of the balloon-voyage of Blanchard and Jeffries across the English Channel. On account of an accident, the *fête*, which was held at the seat of W. de Fonvielle, was postponed from the 7th, the actual date of the transit. It is now proposed to hold a celebration in the forest of Guines on the 25th of May, on the spot where the balloon landed, and where a monument has been erected.

— The *Annales industrielles* gives an account of the making of cork bricks, now being employed for coating steam-boilers, ice-cellars, etc. The cork is winnowed from impurities, ground in a mill, kneaded up with a suitable cement, and pressed into bricks; then dried, first in the air, and afterwards by artificial heat. They are not hard, and not liable to decomposition: they keep out moisture, heat, cold, and sound.

— The Russian government is preparing an expedition to western Siberia for the purpose of examining some sulphur deposits recently discovered there. The natives have for many years had knowledge of these deposits, but the government has only recently been made cognizant thereof, through a report by Lieut. Kalityn. The deposits are said to rival those of Sicily. In Russia, sulphur has hitherto been found only at Ichirkota, not far from Petroffsk in Daghestan, which has chiefly been delivered to the powder-mills.

— The Journal of the Iron and steel institute states, that with a view to lessen the noise caused by the trains crossing the railway-bridges in Hannover, Germany, due to the violent vibrations of the rail-joints, the original rails have been taken up, and steel ones, eighty-eight feet six inches long, laid down in their place. The new rails were manufactured at the Osnabruck steel-works, and the result of the innovation is in every way satisfactory.

— In the *Medical chronicle*, Dr. D. J. Leech discusses the properties of paraldehyde, a new stimulating sedative drug which is likely to take a prominent place in the pharmacy of the future. It is intermediate, apparently, between opium and chloral. It is well known that chloral has been freely used as an intoxicant, mainly because it leaves no after-odor, and may be taken without detection. Paraldehyde has the advantage, from one point of view, of presenting a distinct and easily identified smell. Dr. Leech speaks of having employed paraldehyde as an aid in breaking off the habit of opium-taking, and in helping a patient to pass through the miseries which followed the abrupt discontinuance of long-continued and large doses of morphia.

— The exhibition of metal work, to be held at the quaint old town of Nuremberg, is in a sufficiently forward state of preparation to show what it will be like. Berlin exhibits principally vessels, lamps, and bronze figures. England is badly represented, leaving the more space for Austria and France. On the other hand, Spain and Portugal show no modern work at all, but Italy is represented by several towns. America shows only work in aluminium. Japan has sent so much that a special commissioner has come with the goods. The Chinese war has prevented many exhibits from there. Turkey and Persia send a great deal, Greece nothing. Other countries have sent national ornaments.

— Every one has noticed that the sun and moon, in rising or setting, appear unusually large. Paul Stroobant points out (*Bull. acad. roy. belg.*) the absurdity of the vulgar explanation that intervening objects enable us better to estimate the real size of the heavenly bodies, in that the same effect is visible at sea, and indicates the fallacy of several other theories. He believes that there are two real causes of the phenomenon in question, both purely physiological, — one, the greater sensitiveness of the eye to angular magnitudes near the horizon; the other, a direct effect of the feebler light in the enlargement of the pupil, which, it would appear, tends to magnify objects, even when artificially produced. His theories are supported with numerous illustrations and experiments, the most interesting of which are to show that the distance between two luminous points within a room suffers the same apparent change as in the constellations, when, without altering the distance from the eye, the altitude is gradually increased; and the maximum augmentation is estimated in either case as about one part in four.

— It is stated in the Journal of the Iron and steel institute that an accident at a foundry in Melbourne, by which a red-hot iron casting was dropped into water, and was afterwards found to have become remarkably soft, originated a process for annealing chilled and other iron castings, which has just been patented in the United Kingdom. It consists in plunging the metal when it is reduced to a very dull-red heat, and just as the redness is about to disappear, into a mixture of treacle and water having a specific gravity of 1.005. The inventors do not confine themselves to this solution only; but it is found to give better results than any other that they have tried. The process is said to soften castings in such a degree that they can be punched, bored, and tapped as readily as wrought metal.

— W. T. Chamberlain of Norwich, Conn., has invented a cartridge in which the metal shell is filled with compressed air, and attached to the base of the projectile. A valve in the base of the shell permits the air to escape at will into the chamber of the gun, and the bullet is thus projected. He states, that, notwithstanding the imperfection of his apparatus, he has secured a range of half a mile with two hundred pounds' pressure.

— The *Academy* announces that the syndics of the University press (Cambridge, Eng.) have undertaken the publication of a 'History of the mathematical theories of elasticity,' left in manuscript by the late Dr. Todhunter. The work of editing and completing has been intrusted to Mr. Karl Pearson. The history will contain a complete bibliographic account, so far as possible, of all the writings on the subject of elasticity since the time of Galilei, including an analysis of the more important memoirs. The first portion is already passing through the press.

— By reference to the table given below, it will be seen that one of the most noticeable features of the observations made at the Russian polar station at Sagastyr, during the two seasons 1882–83 and 1883–84, was the relative steadiness of the temperature in comparison with other stations in high latitudes. Only in November, February, and March did the means for the two years differ by more than 2° C.

The first year the means diminished to February, and then rose. The second year the change was not so regular. This is in marked contrast to the extreme variations from month to month, experienced on the islands of the European polar sea and their vicinity (Jan Mayen, Bear Island, Spitzbergen, Novaia Zemlia, and Franz Josef Land), as well as in the North-American archipelago. In both seasons the number of auroras increased from September to a maximum in February, and then decreased rapidly.

Mean temperatures (Centigrade) and number of hours of auroras at the Russian polar station of Sagastyr, mouth of the Lena.

	Temperature.		Hours auroras.	
	1882-83.	1883-84.	1882-83.	1883-84.
September	0.1	0.6	13	23
October	—15.1	—14.1	87	69
November	—27.9	—25.7	179	83
December	—33.5	—33.3	191	178
January	—37.2	—35.8	194	151
February	—41.3	—34.0	197	126
March	—31.5	—35.2	137	118
April	—20.7	—21.8	10	8
May	— 8.1	— 9.7	–	–
June	0.9	— 0.2	–	–
July	5.1	–	–	–
August	3.8	–	–	–
Year	—17.1	–	–	–
General mean	. . . .	—16.7	–	–

— We learn from the *Athenaeum* that three new tidal observatories have recently been established in Indian seas, — one at Cochin, and two at Ceylon. There are now, in all, twelve such observatories in those seas, each continuing its work for a period of five years, as tidal observation has this advantage over land meteorology, — that, after a limited time, a particular locality is exhausted, and the instruments can be taken up and moved elsewhere. These observatories have recently absorbed a great deal of the attention of the Indian survey department; although their results bear only in a strictly scientific way upon the operations of the trigonometrical survey, and in helping to correct the charts and tables which are furnished to the practical navigator.

— The *Independent practitioner* for January contains an article by Dr. J. G. Van Marter of Rome, upon evidences of prehistoric dentistry in Italy. In the museum of Corneto-Tarquinius, a city on the Mediterranean coast, the author found two specimens of ancient dentistry, which the mayor of that city certifies were found upon the first opening of the buried Etruscan tombs. Professor Helbig further assures him that these were virgin tombs, which date back four or five hundred years before the Christian era. In one of the specimens the two superior central incisors are bound by a band of very soft gold to the teeth on either side. The artificial teeth are well carved, evidently from the tooth of some large animal. One other artificial tooth was held by the same band, but it is lost. Dr. Van Marter has in his own possession a skull in which the first upper molar on the right side is missing, and which shows plain marks of an alveolar abscess, proving conclusively the existence of toothache among the early Etruscans. As the tombs have been only slightly explored, and as only the noted men of Etruria were embalmed, the rest being cremated, it is not strange that these evidences of dentistry have been so long undiscovered.

— At a meeting of the Society Isis, Jan. 15, Professor Hempel, Dresden, Saxony, made a communication concerning his chemical analysis of the air, especially of the air collected daily by Prof. E. Hagen during his voyage from Liverpool to New York in 1883. The results may be summed up as follows: 1. The quantity of oxygen changes from day to day by one-half per cent; 2. The quantity of oxygen in the air seems to be larger the lower the barometer, and *vice versa;* 3. The air taken on the ocean, compared with the air taken by Professor Hempel the same day at Dresden, shows the same composition. The quantity of oxygen may vary on different days by one-half per cent; but the air from the ocean varied from the air of Dresden only by some hundredth parts of one per cent. Professor Hempel intends to continue his studies, and hopes to receive sets of tubes with air obtained from the meteorological stations nearest the north pole and the equator, and from one between, perhaps from Heligoland. He expects to find variations in the quantity of oxygen in these widely separated places, though they were not found in the specimens obtained in Dresden, and on the voyage from Liverpool to New York, because both are of about the same latitude, and influenced by the same currents of wind. Professor Hempel intends, therefore, next fall to go to New York, *via* Teneriffe, and to collect on the top of the peak, and at the bottom, air from the upper and lower trade winds.

— According to notes made by Mr. L. Belding at Zorillo and other places near La Paz, Lower California, in 1883, the Pericue Indians, the original inhabitants of that region, are now represented by a single individual, — an old woman of about seventy years, who was universally reputed to be a pure-blooded Indian, the last of her race. She was of good stature, robust frame, and dark complexion. The Indians south of 24° 30′ buried their dead in caves, or below shelving rocks, without regard to the points of the compass. The bones which were found were usually painted red. The skeleton of an adult male, found by Mr. Belding, was wrapped in cloth made from the bark of the palm, and bound with three-ply cord, plaited as sailors make sennit, the material being the fibre of the agave. The package, which was about twenty inches long, nearly all the bones having been disjointed, did not appear to have been disturbed since burial, although a femur and some of the small bones were missing. This skeleton was found in a small cave at Zorillo, the floor of which was covered about a foot deep with dry, coarse sand, formed from the disintegrating granite rock.

— This last season a small apple-tree on the shore of Todos Santos Bay, Lower California, blossomed and bore large, perfect fruit on its trunk, about an inch from the ground.

— A Mr. Lorenz of Baden has invented a new compound projectile for infantry rifles, which consists of a steel case with a core of lead. In the experiments made the projectile penetrated three millimetres of iron, twenty-seven centimetres of beech-wood, and forty centimetres of fir-wood; in all, 67.3 centimetres, placed at a distance of thirty paces from the muzzle of the rifle. The projectile was unchanged in shape, and the lead core remained firm.

— Dr. Everest, who crossed the Yukon Portage last summer, reports from Fort Reliance, Yukon River, his safe arrival there July 22, 1884. He found miners on the river seventy-five miles above Fort Selkirk, who reported very rich washings on a bar in the river, the gold-dust being very fine and scaly. He intended to ascend the White River last autumn, and, if possible, to cross to the Copper River this spring, and descend to its mouth. The country seemed to him to resemble northern Idaho, with rolling hills densely wooded with larch and poplar and willows along the river-banks, and luxuriant herbage.

— A course of public lectures has been commenced at San Diego, Cal., under the auspices of the Society of natural history, the proceeds to go toward a building-fund. The first was delivered by Mrs. Elizabeth Surr, lately of London; and the second by Dr. Frank Cowan, during the stay of the surveying steamer Carlile P. Patterson, on which Dr. Cowan was a guest during its voyage from the east, on the way to Alaska, where it is to be stationed.

— In a recent bulletin of the Geological society of France, Oehlert gives the result of an important study of certain imperfectly known types of Devonian brachiopods long since described by D'Orbigny, and which are fully illustrated. The memoir places on a sound basis the section of Rhynchonella named Uncinulus by Bayle, while Uncinulina of the same author is shown to be untenable. The paper is particularly important as a contribution to our knowledge of the Phynchonellidae.

— Dr. Theodore Stein has succeeded in obtaining photographs of the larynx. The throat and larynx are illuminated by an incandescent electrical lamp, cooled by Nitze's system of cooling by water. A small mirror reflects the image on a gelatine-bromide plate in a camera-obscura, and a photograph is obtained showing the organs in health or disease, thus removing all risks of laryngeal diseases by inhaling the breath.

— C. F. im Thurm, the German explorer of British Guiana, has undertaken a new expedition into the interior of this colony, in order to climb Mount Roraima. At a height of 5,600 feet above the sea-level he found a veritable garden of orchids; and, still more wonderful, on his way thither he found a tribe of Indians conducting a Christian service without a missionary among them.

— A cable despatch was received March 7, at the Harvard college observatory, from Dr. Krueger of Kiel, announcing the discovery of a new planet of the eleventh magnitude by Borelly on March 6d.3650 Greenwich mean time; right ascension, 11 h. 6 m. 13.5 s.; declination, + 7° 9′ 17″; daily motion, — 48 s. in right ascension, — 9′ in declination.

— The fourth course of free scientific lectures given by the Cincinnati society of natural history was concluded on March 6. The attendance, in spite of the weather, has been excellent. Among the lectures were 'Water-crystallization,' by Prof. William L. Dudley; 'Ancient vegetation of the earth,' by Prof. Jos. F. James; and 'Diatoms,' by Ex-Gov. Jacob D. Cox.

— The council of the Royal meteorological society was announced to hold at the Institution of civil engineers, on the evenings of March 18 and 19, an exhibition of sunshine-recorders and solar and terrestrial radiation instruments. The society will also exhibit any new meteorological apparatus invented or first constructed during the past year, as well as photographs and drawings possessing meteorological interest.

— Mr. Eugen Himly, in the *Photographic news*, Jan. 2, 1885, describes an apparatus to avoid the brilliant glare of an artificial light in photography. He conceals the light in a case from which the rays are thrown out by reflectors. This diffuser is mounted upon a rail on the ceiling, and can be slowly moved along this during the exposure, thus giving to all sides of the picture an equal brightness.

— At the meeting of the Gesellschaft für erdkunde in Berlin, Jan. 3, Dr. Steinmann read a paper on his journeys in southern Patagonia. In 1882 he went as geological assistant to the fourth German expedition to Punta Arenas, mainly with the object of studying the southern cordilleras. What struck him particularly here was the extraordinary difference in the plant forms to those of the southern cordilleras. While on the western slopes vegetation is rich in forms, the climate of the steppes reigns on the eastern side. From a geological point of view, the southern point of America is extremely simple in its build, but it is of a different character on the east and west. On the east, chalk formations occur almost entirely; while on the west, where there are innumerable islands, there is nothing but granite and crystalline rocks. Although the configuration of the coast has been studied thoroughly by the English, Dr. Steinmann thinks that many important questions have still to be settled; for instance, whether Laguna Blanca, lying to the north-east of the settlement Kyrsing Water, has an outlet to the west. Ultimately, the lecturer reached the laguna of the third settlement of Santa Cruz, of which it may with certainty be said that it was connected, until recently, with the Pacific Ocean. It may also be concluded that at that time the mainland was much more cut up by channels and waterways than it is now. In May, 1883, Dr. Steinmann visited, in the company of Fuegian seal-hunters, the islands south of the Straits of Magellan, including Tierra del Fuego. Ultimately, he made his way from the southern point of America to Bolivia, and here continued his investigations.