

runs towards the north-east; in all this course it is impelled by the rotation of the earth with a force corresponding to a fall of from nine to ten feet, and rises from left to right about 1'2 feet.

From the Bay of New York the Gulf Stream runs eastward towards the shores of Europe, and, throughout the passage, obeys the impulse of the force of rotation, which raises it from left to right by a total elevation of about one foot. Having reached the neighbourhood of Europe, the current divides into two nearly equal branches, one of which, under the influence of the diminished force of the action of the earth's rotation, runs in a south-easterly direction towards the coast of Africa, with an elevation from left to right. The other branch, meanwhile, is forced to skirt the coasts of Great Britain, taking a more northerly direction on account of the resistance it meets with from the land, the action of the force of rotation causing it to advance in its northerly course with an elevation from left to right facing the land of one and-a-half feet. If we try to estimate the influence which the earth's rotation exercises upon the Gulf Stream from St. Augustine to the 60th degree of N. latitude, we find that the force is nearly the same as that which would act upon the current, if, between these two points, a distance of about 950 miles, the Atlantic showed a difference of level of twenty-five feet. When the Gulf Stream has passed the northern extremity of Scotland, the resistance which obliged it to take a more northerly direction disappears, and, from this time, the principal current inclines more to the east towards the coast of Norway, which it then skirts to the north-east, sloping towards the land on account of the earth's rotation. Another branch of the Gulf Stream is arrested by Iceland in its course to the north, and turned to the north-west, striving against the earth's rotation, which elevates it towards the south and south-west coast of the island just mentioned, it ought consequently to present a slope towards the north-west as far as the polar current.

(To be continued.)

#### SCIENCE IN GERMANY\*

IN his address at the opening of the present University Session at Berlin, the out-going Rector quoted some interesting figures showing the effect of the recent war on the activity of the University. In October 1870 there matriculated in all the faculties 1,236 students, while the number of entries for the winter session of 1869 was 2,421. Of the 1,236 students who entered their names in October, only 904 continued their attendance throughout the winter. The actual number of medical students last winter was 173, while in the previous winter session they amounted to 550. The falling off in numbers extended about equally to all the four faculties; but it appears that none of the theological students who entered at the beginning of the session were required to break off their studies. The courses of lectures, public and private, that were announced amounted to 366, and of these 271 actually came off. Forty students took their degrees—8 in jurisprudence, 19 in medicine, and 13 in philosophy. The number of deaths, so far as was ascertained, amounted to 32. The University seems now to have returned to its full activity, to judge from the crowded state of many of the class-rooms. A few of the students are to be seen wearing the ribbon of the Iron Cross.

Two ladies from America have applied to the Berlin University authorities for permission to attend the medical classes. One lady, a Russian, is studying chemistry in Prof. Hofmann's laboratory. An American lady has been studying medicine at Breslau, and has sent to an American newspaper a glowing account of her friendly reception at the Silesian University. Another pioneer of the same sex is studying engineering at the Polytechnic School of Aix-la-Chapelle; and two ladies recently joined the University of Prague, where they are studying under the professor of history. During the past summer a solitary American lady, M.D., attended the clinics at the Vienna General Hospital, and appeared to suffer, to the full extent, the inconveniences of being in so considerable a minority.

The autumn season on the Continent, as in England, is marked by the occurrence of various scientific gatherings. At several of these, Prof. Virchow has been receiving invitations, which the Berlin newspapers have chronicled from time to time. At the Assembly of German Naturalists and Physicians, held at Rostock, his speech was the great event of the meeting. During the Bologna Conference of Archæologists, he was entertained at

a banquet by the Italian dignitaries and men of science; and at a scientific assembly held in Rome, the audience rose to their feet to welcome the celebrated Berlin professor, who made them a speech in French. In his address to the Rostock Conference, Virchow made some remarks upon the nature of annual scientific gatherings, of which he himself is an assiduous frequenter. "It was a matter of encouragement to me," he said, "when I read in the proceedings of the recent meeting of the British Association, in the opening address of its renowned President, Sir William Thomson, that Brewster, in his letter by which he called the Association into existence, expressly stated that he was led to this step from considering the great and beneficent results that the German Naturalists' Association (*Naturforscherversammlung*) had achieved during its nine years' previous activity. We were the first to advance among all nations; the English followed, and the number of these associations has gradually increased. They have, by degrees, extended into every possible province of human activity, and we have thereby become accustomed, by the co-operation of the many, to define more clearly the common objects at which the whole has to aim." And again, speaking of the results of these meetings, he says: "Not only the pleasures of fellowship, which are inseparable from a great congress of individuals; not only the amenities of personal acquaintance, which cannot be too highly valued; the forming of friendly ties, where perhaps, under other circumstances, harsh and even bitter opposition would have sprung up; the reconciling of many controversial antagonisms through personal intercourse—all this is the smaller result. There is yet a greater—the communication of knowledge, the explanation of methods, the clearing up of the directions in which research should be undertaken—and these are things which can be nowise better told than by word of mouth." The main subject of Professor Virchow's address was the part that science would have to play in the new national life of Germany. Their work, he held, was to introduce into the popular life of the nation the great and all-pervading idea of evolution. Space will not permit even to give an abstract of his views.

Among the books that have issued from the German press within the last month or two are—the new edition of Virchow's "Cellular Pathology," much improved and enlarged; Professor Traube's "Contributions to Physiology and Pathology," in two bulky volumes, one containing experimental and the other clinical researches; a new instalment (the fifth) of Stricker's "Handbuch;" a treatise on Leuchæmia, by Professor Mosler of Greifswald; and an elaborate work with plates, by Barkow of Breslau, on "Dilatations and Tortuosities of the Blood-vessels," with special reference to aneurism of the aorta in its various sites.

#### SCIENTIFIC SERIALS

THE fourth number of the *Zeitschrift für Ethnologie* for the present year begins with Dr. A. Erman's concluding part of his "Ethnological Observations on the coasts of Behring's Sea." He draws attention to the bold and often successful surgical treatment which was found to have been practised by the Aleutians when they were first visited by Europeans. The influence exerted by the Russians on these primitive people has tended to make them conceal, or even gradually relinquish the practice of many of their old national habits, and, amongst other usages, they have almost wholly given up their heroic surgical operations. Dr. Erman met, however, with one skilled Aleutian operator, from whom he learned many particulars in regard to the native practice of his art. It would appear that their variously-sized lancets are formed of finely-polished and sharply-edged flakes of obsidian. With these instruments bleeding in the leg as well as the arm is performed, and incisions made in various parts of the body, including the thoracic walls, for the purpose of removing blood or pus, in cases of their effusion into the cavity of the pleura, or in pulmonary disease. But although we are told that this practice is not found to be attended with any dangerous results, we are not informed how the injurious effect of any possible admission of air into the chest is guarded against. The Aleutians exhibit great dexterity in removing various parts of the bodies of whales, and of sea-lions and other seals which they have killed, as, for instance, the mucous membrane of the neck, without in any way injuring the contiguous parts. And they show wonderful skill in fabricating from such membranes thoroughly water-proof and highly elastic coverings for the feet and legs, as well as those invaluable rowing dresses known as "Kamlejkjes," which, when drawn over the head and upper part of the body and fastened

\* From a Correspondent of the *British Medical Journal*.

down to the rowing seat, enable the Aleutian in his one-holed *baidurka* to bid defiance to the fiercest storm and roughest sea. Unlike their neighbours, the Kamtschadales, who, in their aversion to come in contact with a corpse, throw their dead to their dogs to be devoured and removed from sight, the Aleutians devote much time and care to the preservation of the body after death. This they do so effectually that they can keep the corpse in their dwellings for more than a fortnight without causing injury or annoyance to the living, while long after death the features and external appearance of the deceased remain unchanged. Dr. Erman supplies us with many valuable additions to our knowledge of the social habits, taste for ornamentation, traditional lore, language, &c., of the Aleutians. In counting the Aleutian employs 20 as his highest numeral, making all larger quantities dependent upon that number; thus, 40, 60, &c., are respectively 2, 3, &c., twenties.—In the second paper of the *Zeitschrift*, Dr. Robert Hartmann continues his careful summary of the remains of Swiss Lacustrine dwellings, passing in review the principal mammals represented in the deposits, and entering fully into the often-discussed question whether the diluvial Cave bear (*Ursus spelæus*), is identical in species with our common bear (*U. arctos*) or whether and to what extent it differs from it. Dr. Hartmann seems disposed in this inquiry to regard the question of identity as possessing strong claims to probability, although there may not be sufficient ground at present to answer it affirmatively.—“The Nirvana and Buddhistic Morality” forms the title of a very comprehensive paper by A. Bastian, which treats very fully of the principles on which the faith of Buddha is based, the ideas underlying the various forms which it has assumed, and the special phases of human thoughts and feelings to which it more particularly addresses itself.—In a paper by G. Rohlf, entitled “Henry Noël, of Bagerni,” the writer gives an account of the kingdom of Bagerni, which is situated on the N. E. of Lake Tsad, in Central Africa. The Bagerni people are a pure Ethiopian race, who, in point of moral and intellectual capacity, may be said to form the link between the most highly-developed negro kingdoms, and the numerous small negro states, lying to the S. of them, of which we do not even know the names. The King and Court of Bagerni, after a temporary adhesion to Islamism, have relapsed into their old Fetish worship, in which trees appear to form the principal objects of adoration. The practice of taking sisters and daughters in marriage prevails in the reigning family; but, while the rich indulge extensively in polygamy, poor men take only one wife.—Dr. Behrmayer, of Dresden, gives a *résumé* of an official paper by the Assistant-Resident, Herr J. Riedel, of Batavia, on the geographical, topographical, and geological character of the districts of Holontalo, Limceto, Bone, Boalemo, and Katingola or Andagile in the Celebean Isthmus of the Eastern Archipelago. To this is appended much useful information in regard to the statistical, historical, and social condition of these countries, from which, however, we are not led to form a favourable opinion of the character, either of the Aborigines or of the Chinese and other foreign settlers. There are different grades of nobility, and till lately slavery and the slave-trade were allowed. Opium is undermining the health and vigour of the upper classes, and the poor are sunk in misery in the midst of an abundant vegetation, and with numerous sources of wealth around them; the mountains and river beds being rich in minerals. On the banks of the river Lonoco lumps of gold have from time to time been found as large as a hen's egg.—The last paper in this number of the *Zeitschrift* that we can notice is one by Herr Neumayer on the intellectual and moral qualities of the native Australians.

THE *American Journal of Science and Arts* for October. The first paper in this number is “On the Connecticut River Valley Glacier, and other examples of Glacier Movement along the Valleys of New England,” by James D. Dana. In former papers by the author he has pointed out the existence of a Connecticut valley glacier in the glacial era, understanding by this expression that the under part of the great continental glacier, lying in the Connecticut valley, moved in the same direction. In the present paper the evidence with regard to this movement is gone into more fully, and further evidence is given to show that other large valleys of Central and Western New England had, in the same sense, their valley glaciers, that is the valleys determined the direction of the ice that lay within them.—Mr. R. Pumpelly follows with a second contribution “On the Paragenesis and Derivation of Copper and its Associates on Lake Superior.” He gives a number of observations as to the minerals

occurring with copper in various mines. In many of the cases in which calcite crystals are found enclosing copper, it is difficult to distinguish as to the relative ages of the two. The author has, however, conclusive proof that each of the following cases occur:—(1) that the copper was present before the calcite began to form and became enclosed in the growing crystal; (2) the crystal of calcite was partly formed, then became incrustated with copper, and was finished by a new growth of calcite over the metallic film; and (3) the copper has entered the calcite crystal since its growth was finished.—A valuable paper follows, “On photographing Histological Preparations by Sunlight,” by J. J. Woodward. The arrangement which is found most suitable is to place the microscope at the window of the dark room, the body being horizontal, the achromatic condenser is then illuminated by a solar pencil, which is reflected from a heliostat on to a movable mirror. Between this mirror and the achromatic condenser there is placed a 2-inch lens of ten inches focal length, at such a distance that the solar rays are brought to a focus, and begin again to diverge before they reach the achromatic condenser. When a photograph is to be taken, a cell containing ammonia-sulphate of copper is placed between the lens and condenser, working with a power of 500 diameters; the time of exposure was but a fraction of a second. By allowing the solar rays to come to a focus before reaching the achromatic condenser, the heat rays may be separated from the light rays by so adjusting the condenser as to bring the light rays to a focus, while the heat-rays, after passing the second lens, became parallel, or even divergent according to the position of the achromatic condenser. The author finds that a right-angled prism may be used instead of the heliostat, and in working with low powers a piece of plain unsilvered plate-glass is sufficient instead of the mirror.—The concluding original paper in this number is “On the Discovery of a New Planet,” by Dr. Peters, which will probably receive the number 116 of the asteroid group. The elements of the 114th asteroid have been computed, and are given, which show that this planet is not so small as was supposed. It is found to be now in the remotest part of its orbit, near its aphelion.

## SOCIETIES AND ACADEMIES

### LONDON

Royal Society, November 16.—General Sir Edward Sabine, K.C.B., president, in the chair.

“Contributions to the History of the Opium Alkaloids.—Part III.” By C. R. A. Wright, D.Sc.

“On a Periodic Change of the Elements of the Force of Terrestrial Magnetism discovered by Prof. Hornstein.”

“Corrections and Additions to the Memoir on the Theory of Reciprocal Surfaces, Phil. Trans. vol. clix. (1869).” By Prof. Cayley, F.R.S.

“Corrections to the Computed Lengths of Waves of Light published in the Philosophical Transactions of the year 1868.” By George B. Airy, C.B., Astronomer Royal. The author, after adverting to the process by which in a former paper he had attempted the computation of the lengths of waves of light, for the entire series measured in the solar spectrum by Kirchhoff, from a limited number of measured wave-lengths, and to the discordances between the results of these computations and the actual measure of numerous wave-lengths to which he subsequently had access, calls attention to his remark that means existed for giving accuracy to the whole. The object of the present paper is so to use these means as to produce a table of corrections applicable through the entire range of Kirchhoff's lines, and actually to apply the corrections to those computed wave-lengths which relate to spectral lines produced by the atmosphere and by many metals. Adopting as foundation the comparisons with Angström's and Ditscheiner's measures given in the former paper, and laying these down graphically, the author remarks that in some parts of the spectrum the agreement of the two experimenters is very close, that in some parts they are irreconcilable, and that in one part (where they agree) there is a peculiarity which leads to the supposition that some important change was made in Kirchhoff's adjustments. He then explains the considerations on which he has drawn a correction-curve, whose ordinates are to give the corrections applicable to his former computed numbers. A