

added another object glass to his equatorial. What he has done has been to employ a twin cell in which the glasses have been placed; the whole is then hung on an axis fixed rigidly to the side of the telescope tube so that by a simple rotation each glass, whether for photographic or for visual purposes, can be brought to the centre of the front of the tube. In order to make use of that objective which is not temporarily required for the main instrument, a tail-piece near the eye-end is also mounted, thus completing another telescope, only without a tube. One great disadvantage of this arrangement would be the difficulty of centring the lenses after each change, but this is not so as we are informed, no difficulty at all being experienced. In *Astronomy and Astro-Physics* for August, there is shown a picture of Mars emerging from occultation on July 11, taken without the tube. In the original photograph, which is about  $\frac{1}{32}$  inch in diameter, the polar caps on the planet are clearly shown together with some of the other markings on the surface.

**JUPITER.**—During the next two months the planet Jupiter will be in a very good position for observation. This year he is as much as 5° to 8° north of the equator, being situated now in the constellation of Pisces, just north of the two stars  $\mu$  and  $\nu$ . The next opposition occurs on the 12th October.

**NOVA AURIGÆ.**—In a communication to the *Daily Graphic*, the Rev. A. Freeman gives the results of some observations of the revived new star in Auriga, made by him on Sunday, August 28. Adopting Mr. Stone's values for the magnitudes of the neighbouring stars, the nova would appear to have then been a trifle brighter than mag. 10.3, but decidedly fainter than 9.7. By comparison with the zone star +30° 924, the nova was rated at mag. 10.1. As Mr. Espin estimated it to be 9.2 on August 21, it is probable that the star is again waning.

From the Astrophysical Laboratory at South Kensington we have received the following:—There was no opportunity of observing the nova here until 1.30 a.m. on Thursday, September 1, and it was then too dim to be readily seen with the 10-inch refractor. A photograph of the region was taken with the  $\frac{3}{4}$ -inch portrait lens, the exposure being thirty minutes, but this failed to show the nova, although clearly showing stars of the 10th magnitude.

**COMET SWIFT, MARCH 6, 1892.**—The following is a continuation of the ephemeris for Comet Swift, which we take from *The Edinburgh Circular*, No. 29:—

1892.	R.A.	Decl.	log. $\Delta$ .	log. $r$ .	Br.
	h. m. s.	° ' "			
Sept. 8	0 32 27	+51 56.5			
9	31 8	51 48.8			
10	29 49	51 40.7	0.2751	0.4085	0.073
11	28 30	51 32.1			
12	27 10	51 23.2			
13	25 50	51 13.9			
14	24 30	51 4.1	0.2788	0.4164	0.069
15	23 11	50 54.0			

Brightness at time of discovery is the unit of Br.

*The Edinburgh Circular*, No. 30, announces the discovery of a comet by Mr. Brooks, at Geneva, U.S., at midnight on the 29th ult. The comet was then in R.A. 6h. 20min. and declination 31° 48' north, its daily motion being +1min. 44sec. and 2' south. The same comet has also been observed at Kiel on the 31st inst. at 12h. 32.2min.; its place then was found to be R.A. 6h. 5min. 59.1sec. North declination 31° 42' 27". Whether this comet is a new one or not cannot of course be said yet for certain, but it is neither Brooks' 1886 IV. nor Tempel 1867 II. if we can depend on the two search ephemerises we have at hand, for their declinations in both instances should be at this time over 30° south.

**GEOGRAPHICAL NOTES.**

**MONTENEGRO**, though one of the smallest, is certainly one of the least known countries in Europe. Dr. K. Hassert, who has already made important journeys in the less known parts of the Balkan peninsula, is this summer travelling through Montenegro, and describes the scenery as in many places of very great beauty. The frontier river Cijevna flows through a steep-sided gorge, the height of the precipices bordering which he estimates as over 3000 feet, while in its appearance it rivals the cañons of the Colorado. The traveller in this part of the country runs considerable risks from the predatory Albanian tribes.

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*THE Times* publishes a telegram from Captain MacDonald of the Mombasa-Victoria-Nyanza Survey, announcing that the Survey had found a good route for a railway to Sio Bay on the Nyanza, and had returned to Kikuyu on August 8. The Survey work has been carried on rapidly, and, which is more important, without any fighting.

**RAILWAYS** in tropical Africa may ultimately derive more revenue from native passengers than might be anticipated. The railway from St. Paul de Loando is being pushed forward to Ambaca, and now nearly reaches Casengo, where there are flourishing coffee plantations under Portuguese management. Until this point is reached the revenue from goods cannot be large, but the natives having speedily got over their distrust of the innovation, now travel freely by rail in large numbers.

**PROF. POUCHET** has this summer succeeded in visiting Jan Mayen Island and Spitzbergen in the French gun-boat *La Manche*. Jan Mayen, on which a landing had not been made for ten years, was visited on July 27, and the vessel proceeded to Spitzbergen, where a fortnight was spent. The west coast was followed up to 78° N., and some excursions made on foot into the interior. Glacier phenomena were studied, and collections of native fauna and of fossils made. The sea was found to be entirely free from ice.

**NEWS** has recently been received in Copenhagen of the safety and success of the East Greenland Expedition, which left Denmark in June 1891 under Lieutenant Ryder. The expedition passed the winter on the Greenland coast in Scoresby's Land at a point in 70° 27' N. Important scientific results have been obtained, but the expedition is not yet over, Lieutenant Ryder intending, after a short visit to Iceland, to make an attempt to trace out the hitherto unvisited coast-line between 70° N. and the Arctic circle.

**THE** first chart on which the American continent appears is being reproduced in facsimile for the approaching Columbus Exhibition in Madrid. The following details are given in a Reuter telegram from Madrid. The work, which is now approaching completion, is being done by Señor Canovas Vallejo, a nephew of the Spanish Premier, and by Prof. Traynor. The original chart, which was traced in the year 1500 by the famous navigator and cartographer Juan de la Cosa, who acted as pilot to Columbus in more than one of his voyages across the Atlantic, has been since carefully preserved in the Naval Museum in Madrid. The chart presents some most interesting features, displaying, as it does, the extent of the knowledge of the best-informed geographers of the day. On it are depicted the West Indies and a small portion of South America—namely, the north-eastern section lying between the River Amazon and Panama. To this land the general name of Tierra Firme is given, to mark the contrast between the continent and the Antilles. Here and there are traces of modern names, such as Venezuela, Maracaibo, and Brazil. The chart even comprises some particulars of the discoveries made in Northern America by Sebastian Cabot in 1497, and such titles as these:—"Sea discovered by the English," "English Cape," "Lizard," and "St. George." La Cosa has also clearly depicted Cuba as an island, whereas Columbus died in the belief that it was a continent, and it was not until eight years later that the correctness of La Cosa's chart was in this respect finally established.

**AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.**

**ROCHESTER MEETING.**

**THE** forty-first annual meeting of the American Association for the Advancement of Science was held at Rochester, New York, August 17-23, Prof. Joseph Le Conte, of California, the well-known geologist, presiding.

Rochester is one of the most beautiful of American cities, being laid out quite on the *rus in urbe* principle, so that each residence is generally surrounded by grounds, instead of being built in a solid block. It is pre-eminently a city of freeholders, as appears by the fact that a recent census showed more land-owners than voters in the city. It is moreover situated in the beautiful and picturesque region of western New York, within a very short distance from numerous glacial lakes, as well as the

Falls of Niagara. The fertile valley of the Genesee was long ago renowned for its wheat as it now is for its fruit and flowers, and Rochester, formerly called the flour city, is now known as the city of flowers. The river flows through the city, falling in pretty cascades to a wild glen, and furnishing the water power which is utilized in flouring mills and other manufactures. Lake Ontario is a few miles distant, but yet it is so far away, and the navigation of the Genesee is so restricted, that Rochester is considered an inland city, and it is the largest inland city in the United States, having a population of 144,000.

The meeting of the Association coincided in time with the railroad strikes at Buffalo, some seventy miles distant, where several regiments of militia were stationed at that time to protect the railroads from mob violence. The sense of insecurity doubtless deterred a few members from attending, though the attendance was above the average.

For the last few years, specialists have shown a growing tendency to organize special societies outside of, though affiliated to, the general Association. This year the larger meeting was preceded by meetings of the American Microscopical Society, the Geological Society of America, the Society for the Promotion of Agricultural Science, the Association of Economic Entomologists, and this year was organized the American Association of State Weather Services. The latter is composed of weather observers from the several States of the Union. Every State now has a weather-observing station, and an observer co-operating with the general government.

The first day of the meeting was taken up with opening general exercises, organizing the sections, and addresses by the retiring president, Prof. Albert B. Prescott, of Ann Arbor, and the presidents of the several sections, namely, mathematics and astronomy, J. R. Eastman; physics, B. F. Thomas; chemistry, Alfred Springer; mechanical science and engineering, J. B. Johnson; geology and geography, H. S. Williams; biology, S. H. Gage; anthropology, W. H. Holmes; economic science and statistics, Lester F. Ward.

The remaining days of the meeting were given to reading of papers in the various sections, after a brief business meeting in general session. The general business included a division of the biological section into Section F, zoology, and Section G, botany, the former Section G, microscopy, having been abolished years ago. The biological section has long been overcrowded.

The preservation of forests has been and is one of the most important economic matters of our age. Reckless and wasteful methods have prevailed to such an extent that many fine forests have been ruined, and others are rapidly going to ruin. The large areas still owned by government are subject to the double peril of robbery and fire. Mr. Fernow, chief of the Bureau of Forestry, in a paper before the economic section, stated that the annual loss to the government by thieves is 10,000,000 to 15,000,000 dols., while that by fire is probably twice as much more. To protect the twenty thousand square miles of government forest land, a paltry force of twenty to twenty-four watchmen is employed, and even these are not clothed with sufficient authority. They are barely able to reclaim some 100,000 dols. worth of timber annually from depredators, which only suffices to repay the expense of maintaining the service. Proper protection would require an annual outlay of 2,000,000 dols. to 3,000,000 dols., and would preserve 20,000,000 to 50,000,000 dollars' worth of property in each year. The section recommended a resolution favouring suitable legislation, such as is embodied in the bill introduced by Senator Paddock, and the resolution was unanimously adopted in general session.

Much interest was manifested in the approaching World's Columbian Exposition at Chicago. Prof. F. W. Punam, permanent secretary of the Association, is also chief of the department of ethnology, &c., at the Exposition. In a paper before the anthropological section he detailed plans adopted for taking anthropometrical measurements of native American tribes, also of children in public schools, both white and others, as well as children in the Indian schools. An exhibit of special interest will be a collection of representatives of all the native American tribes, including a family from each tribe, engaged in native industries. This will require the gathering of at least five hundred aborigines, and probably more than that number, and it will be the last opportunity when such an exhibit can be made, since the extension of railroads and other appliances of civilization is rapidly subverting aboriginal methods and conditions; the tribes are becoming disintegrated and amalgamated, and machine-made articles are supplanting those by hand.

Committees were appointed from each section to co-operate with other organizations having similar aims, in holding joint meetings during the Exposition. By resolution in general session the Secretaries of the several sections were appointed a committee to co-operate with the World's Congress Auxiliary in securing space for each section for the entire time of the Exposition in which to register as headquarters for that section, and similar organizations, both foreign and domestic.

Thursday evening was occupied with a reception by the Women's Reception Committee of the Local Committee at the Powers Art Gallery. This is by some considered to be the finest art collection in America, including pictures by Diaz, Corot, Millet, Verboeckhoven, Gérome, Munkacsy, Doré, Bonheur, Vibert, Bougereau, Zimmerman, Cooman, Leloir, Hagborg, Schreyer, Henner, Le Rolles, Knaus, Jackobides, Delregger, Daubigny, Rousseau, and other foreign artists, besides works of the best American artists, and copies of Rubens, Titians, Raphael, Correggio, and others.

Besides the annual address of the retiring President, Prof. Prescott, only one other address was made in general session. This was by Dr. Joseph Jastrow on Friday evening on "Hypnotism and its Antecedents." In the first part of his lecture he gave a historical sketch of the development of hypnotism, and described various procedures in which it is involved. The careers of Messmer and other early hypnotists were sketched, up to the time when it obtained scientific recognition about fifteen years ago through the efforts of Charcot and Richet. The second part of the lecture described the chief phenomena of modern hypnotism as revealed and recognized during the last score of years. The lecturer illustrated the illusions of sense in various ways, and described in detail the methods of inducing the state. In some instances, it was stated, the subject may not lose control, but simply finds it impossible to resist the demands of the operator. For instance, upon being told that he cannot open his eyes, he finds it impossible to do so, though perfectly conscious; a cane placed in his hands he is unable to drop, and fingers set in motion he is powerless to stop. Many interesting phenomena were cited. One of the most curious of these is what is termed the post-hypno suggestion. While the subject is asleep it is suggested that he shall perform some act at a certain time after awakening. These acts are performed by the patient, sometimes even when the time set to elapse has been a year. But perhaps the most surprising of all the phenomena cited was the control of the patient over involuntary powers. Upon being told that a postage stamp placed on the arm is a plaster which will raise a blister, the effect is actually accomplished. Sometimes the mere tracing of a line upon the skin has produced the same effect. In some cases rigidity of the muscles is induced, so that the arm may be kept extended or the body may be rigidly supported, with the head on one chair and the feet on another, for a long time. Important legal questions may be raised as to the responsibility of hypnotized patients. Crimes may be committed at the instigation of the operator. It has long been known that petty crimes could be so caused. It is found also that the gravest crimes are equally controlled, as shown by repeated instances where the patient was given a dagger and told to stab a person lying on a certain cot in the hospital, which the patient did, though the person stabbed was only a straw figure, but so covered as not to be recognized as such. The control over the nervous system renders hypnotism a valuable remedial agent in paralysis, aphasia, tetanus, and many other diseases controlled by or specially related to the nervous system.

Another lecture, which was practically tantamount to a public address before the Association, was that of G. K. Gilbert, President of the Geological Society of America, before the Rochester Academy of Sciences, on "Coon Butte and Theories of its Origin." This extinct crater, located in Eastern Arizona, is unique in showing no signs of lava or scoriae, and also in the fact that meteoric iron is found abundantly near it, numerous specimens, one of them over 600 pounds in weight, having been picked up here. This suggested to Prof. Gilbert the hypothesis that the crater may have been caused by the impact of a larger meteor, sufficient to make such a hole three-quarters of a mile in diameter, just as a cannon ball fired into a target would do, especially as the general appearance of this crater is remarkably similar to that of some results caused by projectiles. To test the correctness of this theory, he caused a careful magnetic and geodetic survey to be made to determine whether any large mass of iron was buried beneath the crater, and also whether

the rim exceeded the crater in bulk sufficiently to indicate a mass of matter in the rim larger than would be caused by the displacement of the material removed from the crater. Both these surveys, however, gave negative results. The magnetic survey indicated that if any considerable mass of iron exists there it is buried at least fifty miles deep, and a comparison of the quantity of matter in the rim shows no more than would fill up the space of the crater. He was compelled, therefore, to abandon the meteoric theory, notwithstanding that the chances of the fortuitous concurrence of such a crater accompanied by such a meteoric downfall is only one in five thousand. The origin of the butte must therefore be an explosion of steam.

The president elect of the Association, Prof. William Harkness, of Washington, was born at Ecclefechan, Scotland, in 1837, where his father, Rev. James Harkness, resided till 1839, when the family removed to America. The father was for a while pastor of a church at Rochester, where the son was educated, after having spent part of his college life at Lafayette College, in Pennsylvania. He graduated at the University of Rochester in 1858, and received from the same university the degree of doctor of laws in 1874. It was, therefore, peculiarly appropriate that he should be elected to the presidency at the Rochester meeting.

Prof. Harkness studied medicine, and practised as an army surgeon in 1864; but, with the exception of a short time in the army, he has been employed by the Government as an astronomer for about thirty years. During the total eclipse of 1869, he discovered the 1474 line of the spectrum of solar protuberances. He became prominent in observations of the transits of Venus.

It is difficult to select the most important and valuable papers from the whole number of 182 read before the several sections, but a few abstracts will be subjoined which appear to merit notice.

George E. Hale, of Chicago, read a paper before the astronomical section on "The Spectroheliograph of the Kenwood Astro-physical Observatory, Chicago, and results obtained in the study of the Sun." He described the ingenious apparatus which he had invented and perfected for photographing the faculæ and protuberances of the sun. This apparatus gives by far the most perfect pictures ever taken, and is the first which has successfully photographed the bright spots, showing faculæ which the eye cannot detect. Means were devised for taking on the same plate at one exposure both the faculæ and the protuberances, and Prof. Hale exhibited the first complete picture of the sun ever taken. Comparison with the best plates made at the Lick Observatory showed the great superiority of the work at Chicago. An observation of unusual interest was made on July 15, 1892. A photograph of the sun showed a large spot. A few minutes later another photograph was taken, which, when developed, showed that the bright band had appeared since the last exposure. Twenty-seven minutes thereafter another photograph showed that almost the entire spot was covered with brilliant faculæ, which by the end of an hour had entirely disappeared, leaving the spot as at the first exposure. This indicates an eruption proceeding with indescribable and inconceivable velocity. This disturbance seems to be connected with magnetic disturbances and the brilliant aurora noted the next day. The section, with much enthusiasm, passed a vote of thanks to Prof. Hale for his researches.

Edwin B. Frost read a paper on "Thermal Absorption in the Solar Atmosphere." Among the interesting phenomena observed were some cases where the umbra of sun spots radiated more heat than the neighbouring photosphere, indicating either that the dark spot is at a higher elevation than the surrounding photosphere, and consequently loses less heat by absorption of the sun's atmosphere, or that it is attended by an invisible facula.

Prof. R. S. Woodward described the iced-bar base apparatus lately devised by him for the Coast and Geodetic Survey. This is a line measure, micrometer microscope apparatus. The measuring bar is of steel, five metres long, and its temperature is kept constant by a packing of melting ice. The use of thermometers is thus avoided entirely. From results submitted by the author it appears that the total probable error of one measure with this apparatus of a distance a kilometre or more in length will not exceed one part in four to five millions.

One of the most important uses to which Prof. Woodward has applied the iced-bar apparatus is that of showing that long steel tapes, when properly handled, will give from one measure

the length of a line, a kilometre, or more long with a probable error not exceeding one part in a half-million. Considering that this can be done at the rate of two kilometres per hour with a 100-metre tape, it would seem that such tapes must soon take high rank amongst apparatus for measuring bases.

Prof. W. A. Rogers read two papers before Section D, the first of which was a description of a standard yard and metre upon polished steel. The standard, which was exhibited, had upon one edge a metre subdivided by 20 millimetres and 40 inches subdivided to tenths of inches. Both are standard or 62° Fahr. It appears from an investigation of these standards that 772 of the separate millimetres have errors not exceeding one mikron, and that of the 400 tenth-of-inch spaces 280 have errors not exceeding one-twenty-five-thousandth of an inch.

Prof. Rogers read a second paper on an investigation of a 21-foot screw. This screw was made by the Pratt and Whitney Company for R. Hoe and Co., of New York. It appeared from this investigation that the pitch of this screw was very regular in its character, but that the linear error amounted to nearly one-hundredth of an inch in 21 feet. A part of this is undoubtedly due to flexure, but a part is due to changes of pitch in the screw itself.

In the section of anthropology Permanent Secretary F. W. Putnam gave an interesting talk on "Copper Implements and Ornaments in the Ohio Mounds." He emphatically denied the statements that these copper instruments were fashioned by white men and given to the Indians in trade. "It must be," said he, "that these implements were made by the native Americans. In all cases where implements and ornaments are found in these mounds there are found also on the altars nuggets of copper. So it is with the silver implements and those made of meteoric iron. Now, is it likely that the trader would furnish the Indian with nuggets of the natural material? There is conclusive proof that the original settlers of the Ohio Valley worked the metal into these implements and ornaments. Again, many of these mounds have trees growing on them that are between 400 and 500 years old. This carries them back beyond the time of trading." Prof. Putnam explained that holes could be cut in the sheet copper which had been hammered out by the Indian by simply placing the sheet of copper on the trunk of a tree and pounding into it one end of an oak limb squared. He was unable to describe the probable mode adopted by the Indians in cutting edges shaped like the teeth of a saw, but thought it was done by the use of an instrument made of meteoric iron.

In the section of biology, C. V. Riley read a paper on "Fertilization of the Fig and Caprifigation." In the production of the best Smyrna figs certain minute insects perform an essential function in fructifying the fig. The process is called "caprifigation," and has been performed by the aid of fig-growers ever since the time of Aristotle. The cultivator is accustomed at a certain season to place the fruit of the "caprifig," which contains these insects, on the fig tree which contains the edible fig. The caprifig does indeed produce a fig, but it is small and insipid. The tree which produces the edible fig does not yield fruit of fine flavour unless it is thus fertilized by the aid of these insects, the scientific name of which is *Blastophaga psenes*. The absence of these explains the insipidity of figs raised in California. There are, indeed, a dozen species of *Blastophaga* found in America, but it is improbable that any one of them is adapted to the fertilization of the Smyrna fig, which grows there are trying to cultivate. The caprifig, however, is already well established, and the desideratum seems to be to introduce the insects. This, Prof. Riley thinks, can be done by gathering the fruit containing them in Smyrna and rapidly transporting it to California, which, he urges, should be undertaken by the Government. An attempt was made last summer by J. Shinn, of Niles, Alameda County, California. The fruit containing insects was gathered at Smyrna in the last days of June and received at Niles on July 23, within twenty-five days, but it is not known whether the experiment was successful.

In the section of physics, several valuable papers were contributed by G. W. Hough, A. E. Dolben, W. L. Stevens, E. L. Nichols, B. W. Snow, and others. One of the most interesting papers giving results of original research was by Edwin S. Ferry on "Persistence of Vision."

Prof. Frank P. Whitman, in a brief paper on the "Magnetic Disturbances caused by Electric Railways," gave the following results of recent observations:—"No magnetic instruments dependent on the earth's field can be used for reasonably accurate work at less than 1500 feet from an electric railway, and the

distance must be made greater still if the building in which the instrument is placed is fitted with a system of iron pipes. Minor galvanometers must use iron shields and artificial fields, while earth indicators and other similar methods of finding the constant of a ballistic galvanometer must be abandoned. Experiments are under way for providing the thinnest shield of soft iron which will serve as complete protection to magnetic instruments under such conditions as just mentioned."

The preliminary meetings of affiliated societies drew off much material which would otherwise have been presented to the chemical and zoological sections.

Prof. Robert T. Hill read to the geological section a paper on "The Volcanic Craters of the United States," in which he said:—"At the present moment, when many of the great volcanoes of the world are in activity, Vesuvius and Etna in Europe, others in the Australian region, and Colima in Mexico, I thought it a good idea to review the many beautiful volcanic craters found in our own land. The great cinder cones of New Mexico, Arizona, California, and Oregon are among the most interesting. The most eastern crater in the United States is Mount Capulin, a vast mountain in New Mexico. This is composed of volcanic cinder, which looks very much like that which comes from a locomotive. It rises 2750 feet above the plain on which it stands. It is twelve miles in circumference at its base. Were it situated in the eastern part of the United States it would be considered one of the greatest objects of natural interest, but in the West, where the phenomena are so abundant, it is hardly noticed and it has not found a place on the maps. In Arizona and New Mexico over 300 old volcanic necks or 'pipes' are found, and there are 20,000 square miles of lava which has flowed from them. The recent earthquakes in California were shown to have been produced by the terrific volcanic disturbances in Western Mexico."

Prof. Hill thinks it probable that the extinct volcanoes in the United States may again become active. The volcanic region has only been known about fifty years, and experts say that appearances indicate eruptions within two hundred years past.

The next meeting of the Association will be held at Madison, Wisconsin, on the third Thursday of August, 1893, unless the date shall be changed by the council.

Cordial invitations from the city government of San Francisco, the California Academy of Science, the University of California, and the new and munificently-endowed Leland Stanford, Jun., University, indicate that a meeting at San Francisco will be arranged for 1895.

### THE INTERNATIONAL CONGRESS OF ORIENTALISTS.

THE meetings of the International Congress of Orientalists are being held this week in London, and the proceedings, which are of great interest, have been attracting a good deal of popular attention. The Congress is being attended not only by a large number of British scholars, but by many representatives of other countries, among whom are the following:—Austria-Hungary: Prof. G. Bühler, the Rev. Joseph Dahlmann, Dr. I. Goldziher, Dr. J. Karabacek, Prof. L. Reinisch; Belgium: Dr. Abbeles; Egypt: Dr. Vollers; France: Prof. J. Darmesteter; Germany: Prof. K. Abel, Prof. R. E. Brünnow, Prof. Geiger, Prof. Hommel, Prof. Hübschmann, Dr. G. Huth, Prof. Kautsch, Prof. Kielhorn, Prof. Leumann; Holland: Prof. J. P. N. Land; Italy: Prof. Ascoli, Dr. Carlo Formichi, Count Angelo de Gubernatis, Dr. Pavolini; Sweden and Norway: Dr. Karl Piehl; United States of America: Prof. Charles Lanman, Mr. W. H. Ward.

At the opening meeting on Monday, Prof. Max Müller delivered his presidential address. After some preliminary observations, in the course of which he expressed the obligations of the Congress to the Duke of York for having consented to act as honorary president, Prof. Müller spoke of the splendid service which has been rendered by Oriental scholarship in proving that in prehistoric times language formed a bond of union between the ancestors of many of the Eastern and Western nations, and that in historic times also, language, which seemed to separate the great nations of antiquity, never separated the most important among them so completely as to make all intellectual commerce and exchange between them impossible. These two discoveries seemed to him to form the highest glory of Oriental scholarship

during the present century. It was often supposed that students of Oriental languages and of the science of language dealt with words only. Even now, when scholars spoke of languages and families of languages, they often forgot that languages meant speakers of languages, and that families of speech presupposed real families, or classes, or powerful confederacies which have struggled for their existence and held their ground against all enemies. "Languages," said Prof. Müller, "as we read in the book of Daniel, are the same as nations that dwell on all the earth. If therefore Greeks and Romans, Celts, Germans, Slavs, Persians, and Indians, speaking different languages, and each forming a separate nationality, constitute, as long as we know them, a real historical fact, there is another fact equally real and historical, though we may refer it to a prehistoric period, namely, that there was a time when the ancestors of all these nations and languages formed one compact body, speaking one and the same language, a language so real, so truly historical, that without it there would never have been a real Greek, a real Latin language, never a Greek Republic, never a Roman Empire; there would have been no Sanskrit, no Vedas, no Avesta, no Plato, no Greek New Testament. We know with the same certainty that other nations and languages also, which in historical times stand before us so isolated as Phœnician, Hebrew, Babylonian, and Arabic, presuppose a prehistoric, that is, an antecedent powerful Semitic confederacy, held together by the bonds of a common language, possibly by the same laws and by a belief in the same gods. Unless the ancestors of these nations and languages had once lived and worked together, there would have been no common arsenal from which the leading nations of Semitic history could have taken their armour and their swords, the armour and swords which they wielded in their intellectual struggles, and many of which we are still wielding ourselves in our wars of liberation from error, and our conquests of truth."

With regard to the question as to the exact part of the world where these consolidations took place, no definite or positive statement could be made. Nothing, however, had shaken his belief—he did not call it more—that the oldest home of the Aryas was in the East. All theories in favour of other localities, of which so much had been said lately, whether in favour of Scandinavia, Russia, or Germany, rested on evidence far more precarious than that which was collected by the founders of comparative philology. There was also a difference of opinion as to the original home of the Semites, but all Semitic scholars agreed that it was "somewhere in Asia." With regard to time the difficulties were still greater; but Prof. Müller expressed the opinion that if we must follow the example of geology and fix chronological limits for the growth of the Proto-Aryan language, previous to the consolidation of the six national languages, 10,000 B.C. would by no means be too distant as the probable limit of what he would call our historical knowledge of the existence of Aryan speakers somewhere in Asia. There must also have been a long period previous to the formation of the great Semitic languages, because thus only can the fact be accounted for that on many points so modern a language as Arabic is more primitive than Hebrew, while in other grammatical formations Hebrew is more primitive than Arabic. Whether it was possible that these two linguistic consolidations, the Aryan and Semitic, came originally from a common source was a question which scholars did not like to ask, because they knew it did not admit of a scholarlike answer. Another question also which carried us back still further into unknown antiquity, whether it was possible to account for the origin of languages or rather of human speech in general, was one which scholars eschewed, because it was one to be handled by philosophers rather than by students of language. The deeper we delved the farther the solution of this problem seemed to recede from our grasp; and we might here too learn the old lesson that our mind was not made to grasp beginnings. And yet, though accepting this limitation of their labours as the common fate of all human knowledge, Oriental scholars had not altogether laboured in vain. No history of the world could in future be written without its introductory chapter on the great consolidations of the ancient Aryan and Semitic speakers. It might be said that this great discovery of a whole act in the drama of the world, the very existence of which was unknown to our forefathers, was due to the study of the Science of Language rather than to Oriental scholarship. But where would the Science of Language have been without the students of Sanskrit and Zend, of Hebrew and Arabic? "At a