

I may add that one obtains quite similar phenomena with ordinary light and two ordinary (200 lines per millimetre) gratings, when the incident beam forms similar angles of incidence with the plane of the gratings.

M. DE BROGLIE.

Increase of Definition in a Moving Telescope.

I HAVE received several suggestions, for which I wish to express here my indebtedness, as to the probable explanation of the increase of definition in a moving telescope, referred to in my letter in NATURE of March 27. They are chiefly based on the principle of "contrast" as described by Mr. G. W. Butler in NATURE of April 10, but Mr. W. H. Robinson, of Oxford, attributes the increase of definition to "averted vision," by which a faint source of light is better seen if the eye be directed a little on one side of it. This, at first, seemed to me the correct explanation, the more satisfactory that it involves but a well-known physiological property of the eye. By moving the telescope the object is continually eluding the eye, and visibility by continuous unconscious "averted vision" would be the result. I, however, satisfied myself that there must be some other cause, as a *deliberate* use of "averted vision" failed entirely to show me the time-ball when I tried it after receiving Mr. Robinson's letter, while I noticed that, as soon as the sweeping motion had begun, it was plainly visible by *direct vision*, my eye following it all the time. Mr. Butler's suggestion seems therefore more plausible, although less definite.

M. E. J. GHEURY.

Woolwich Polytechnic, April 15.

THE NINTH INTERNATIONAL CONGRESS OF ZOOLOGY AT MONACO.

THE ninth International Congress of Zoology terminated its session under the presidency of his Serene Highness the Prince of Monaco at Monaco on Saturday, March 29. Altogether, the meeting was an unqualified success, not only on account of its numbers, which, as already stated, were greater than on any previous occasion, but also for the general interest of the contributions, which, although no single one can be selected as absolutely outstanding, were all of very high quality, and demonstrated the result of much serious and useful work by zoologists during the past three years. The beauties of the Côte d'Azur doubtlessly attracted many from northern lands, and although the weather was not all that could be expected for the Riviera at this season, yet the rather copious rainfall settled and washed away the dust and refreshed the herbage, which was the more brilliant during the intermittent periods of bright sunshine. The chief attraction, however, was the noble Oceanographical Museum, which crowns the cliffs of the rock upon which the town of Monaco with its palace is situated, and the fact that the congress was to hold its chief meetings within its precincts, with its founder as their president.

The opening reception in the museum, the holding of many of the meetings of the congress within its walls or only across the other side of the road at the Lyceum, and the fact that members were entitled to visit all its galleries and its

aquarium at any time during the whole congress enabled everybody to become thoroughly acquainted with the museum and its interesting collections. Since its opening in 1910 there have been great developments and additions, thanks to the indefatigable energy of Dr. Jules Richard, its able director, and his assistants. A very full account of the museum was given soon after its opening in the columns of NATURE by Mr. J. Y. Buchanan; it is not, therefore, necessary to repeat what he has said, but since that time there have been many developments, and among others the opening up of a large new gallery in the western wing of the building. Zoologists were especially delighted, not only in seeing the excellent cetacean collection—whales mostly captured by the Prince himself—but also the really marvellous collection of well-mounted deep-sea fishes, which were familiar to many as figures, but the original specimens of which they now saw for the first time, and the same may be said of the invertebrates. A particularly useful and instructive arrangement is that side by side of each specimen is placed, where possible, the original painting of the animal taken from the fresh specimen, or the reproduction of such a coloured drawing as presented in the unique plates appearing in the Prince's publications. This is specially valuable, since it is impossible to preserve the original colours of animals in alcohol and because a better idea of the form of the fresh animal is given.

Besides the Prince's collections were also shown the first fruits of exchange with outside collections, and notable among these was a case containing many of the deep-sea and shallow animals taken by the *Scotia*. There is also a well-mounted case of penguins taken by the French Antarctic Expedition, as well as seals, birds, and eggs taken by the *Scotia* in the antarctic regions.

The collection of instruments and various forms of fishing appliances, nets, trawls, dredges, traps, hooks, &c., used not only for scientific but also for economic fishing, was also a source of attraction, and not least of all the aquarium with its wonderful living forms of Mediterranean fishes and invertebrates, each more wonderful than its neighbour, and which only those who had previously visited such stations as Villefranche and Naples had seen before, but were more than ready to see again.

Some days before the opening of the congress many zoologists made their appearance, and on Monday, March 24, practically the complete roll of 723 members, including more than eighty British representatives, was signed, and members had received their insignia, cards, and papers. On Tuesday afternoon there was a meeting of the permanent committee for the election of vice-presidents of the congress and presidents of the sections, Lord Walsingham being chosen first vice-president. At 6 p.m. the congress was formally opened by the Prince, who, dressed in the official uniform of the Institut de France, delivered his inaugural address. The president

was supported by the delegates of twenty-four Governments, the only Government not being officially represented being the British Government; very appropriately, however, the Prince recognised Lord Walsingham, one of the trustees of the British Museum, as the official representative of Britain.

In an eloquent address the Prince suggested that by their meeting at Monaco, zoologists marked the importance of the study of marine animals, that they conceived that marine zoology possessed the principal elements necessary to elucidate the history of life and the origin and evolution of its different forms. They had considered this temple of oceanography worthy of an assembly which dealt with these subjects. These congresses, he said, should be encouraged because they brought about a *rapprochement* of men of all shades of opinion from countries representing occupations of intelligence. They measured the force of production of different human communities, and gave young people an opportunity of associating rapidly with the general progress of ideas. The study of zoology was of the greatest significance, because it dwelt upon the history of life, effacing illusions of ignorance. Above all, the study of marine zoology was precious in relation to the investigations of the origin of life. He believed that the ocean was the origin of life, and that there was ancestral colonisation from the waters to the land. The Prince emphasised that, in the study of oceanography, it was important to investigate the regions that lay above the surface of oceans; hence his investigations of the higher atmosphere. Finally, he asked the congressionists before leaving the old rock of Monaco, still scarred by old buildings which marked the law of force, to consider well the edifice constructed to arbitrate in favour of science. Below was the savage instinct which was now surmounted by progress, time giving dominion to creative force over the vain rivalries of man. He emphasised how these developments had taken place in a country long protected by peace.

The Prince was followed by Dr. Perrier, director of the Natural History Museum of Paris, the eminent president of the permanent commission of the congress. Dr. Perrier dwelt on the importance of oceanographical research to zoology, paid well-merited eulogy to the Prince for his great and lifelong services to oceanography and zoology, and also to the epoch-making work of Guyon, Jeffreys, Wyville Thomson, and William Carpenter. In the evening there was a reception given by the president in the museum, which gave the first opportunity of congressionists meeting each other and discussing various matters of common interest—a feature, indeed, which is perhaps, after all, the great result of all such meetings, for one hears of some fellow man of science and one knows something of his work, reading much perhaps that he has published and probably having also corresponded with him, but now for the first time one meets him face to

face, discusses knotty points to the immense advantage of each, often clearing away misunderstandings and sealing a bond of friendship. This was especially the case at Monaco regarding the long discussion on nomenclature.

More than 150 papers were given by different authors, and most of these were given in abstract, in many cases being illustrated by lantern or kinematograph. Time, however, curtailed many authors, and compelled others to have their contributions held as read. British zoologists were on this account deprived of hearing Prof. Ewart give an account of the new zoological gardens to be opened in July in Edinburgh by the Zoological Society of Scotland, which promises to be one of the finest, if not the finest, zoological garden in Europe.

Among British contributions was one by Prof. Elliot Smith, of Manchester, who gave an account of the homologies of the cerebral cortex in vertebrates. Prof. J. Arthur Thomson, of Aberdeen, gave an important communication on Alcyonarians recently collected by H.S.H. Prince Albert I. of Monaco, illustrating his remarks by a series of finely executed paintings which are to form the plates of his monograph. Mr. G. P. Mudge, of the London Hospital Medical College, gave an interesting communication on some problems of hybridisation, whilst Dr. Scharff, of Dublin, gave a paper on zoogeography, giving an account of his most recent researches in a subject to which he has devoted so much attention with such excellent results. Prof. Hull, late director of the Geological Survey of Ireland, discussed recent discoveries in the physical features of the North Atlantic Ocean, as confirming the view of the distribution of European animals by land connection in Tertiary times.

Dr. W. S. Bruce, of Edinburgh, summarised the zoological results of the *Scotia*. He pointed out that the leading feature of the *Scotia's* work was her investigations in great depths in high southern latitudes by means of trawl and vertical plankton net. The percentage of new species taken in great depths down to 2645 fathoms was very high. Out of about a thousand *Scotia* species described more than 25 per cent. were new to science. The zoological researches of the Scottish naturalists disproved bipolarity, those species which had a bipolar distribution having also universal distribution. They tended also to show that antarctic fauna was not circumpolar, at least to the extent that arctic fauna was, but that it was subdivided into regions, which appeared to be associated with the south polar "deeps" separated by those "rises" which probably indicate former connections of Antarctica with the more northern continental land masses.

The Indian Museum, Calcutta, accounted for a goodly number of interesting communications. Dr. Nelson Annandale gave an important paper on the African element in the fresh-water fauna of India. He showed there was a strong affinity,

extending even to species in some cases, between fresh-water sponges, Hydrozoa (Limnocoidea), and Polyzoa of India and of tropical Africa. In some instances this affinity extended to South America. The same phenomenon existed in other groups, and indicated former land connection. So far as the invertebrates were concerned, there was little evidence of any African element in the aquatic fauna of the Jordan valley, although many African fishes are found in that district. The difference between the African element in the fresh-water fauna of India and that in the fresh-water fauna of Palestine is probably due to the fact that the geographical connection was broken at a comparatively early date in the case of India, and that the climate and the composition of the water of the Jordan at present differ greatly from those both of India and Africa. Captain R. B. Seymour Sewell, I.M.S., surgeon-naturalist to the Indian Marine Survey, gave a communication on the post-larval development of the Copepoda. The collections on which these observations were based were from three estuarine regions on the coast of Burma and Bengal. In their post-larval development the Copepoda follow Brooks's law, and under suitable conditions apparently may be dimorphic in both sexes, thus resembling Amphipoda and Ostracoda.

Prof. Roule, of Paris, described a new species of abyssal fish, to which very great interest is attached, because it was captured by the Prince of Monaco in the great depth of 6035 metres, a depth in which no fish had previously been caught. Prof. V. Dahlgren, of Princeton, gave an account of his recent researches in a remarkable polarity in the motor nerve cells of the electrical apparatus of *Tetronarce occidentalis*. Prof. Th. Mortensen, of Copenhagen, described a new genus and species of a sessile Ctenophore, upon which Prof. Ziegler, of Stuttgart, made some important comments. Miss Foot and Miss Strobell, of New York, showed the results of crossing three Hemiptera species with reference to the inheritance of an exclusively male character. Prof. J. Petersen, of Copenhagen, gave a paper entitled "Determination of the Quantities of Animal Life in the Sea: its Communities and their Geographical Value." Prof. C. Wardell Stiles, of Washington, gave an account of the distribution of *Nector americanus* in the United States, its medical and economic importance, and the campaign for its eradication. This formed one of a series of important papers on applied zoology.

Dr. Jacques Liouville, of Paris, emphasised the importance of constructing a faunistic chart of the antarctic regions, especially in relation to the continental shelf. His suggestion was specially supported by Prof. J. Arthur Thomson, who thought Dr. Liouville should be thanked for taking the initiative in this matter. Mr. Heron-Allen and Dr. Bruce also supported the suggestion. Dr. Liouville suggested taking up the French section, and Dr. Bruce agreed to take the Scottish section, suggesting that others should similarly be asked to join, and further that the

president of the congress should be asked for his patronage, and also be requested to allow the publication of the chart to appear in his publications. This was afterwards further approved of in the general section.

M. Henri Bourée gave two kinematograph and colour photograph lantern demonstrations, illustrating the work of the Prince and his staff on board the *Princesse Alice*. The series of pictures is excellent in every respect, the colour pictures of animals being exquisite, and the kinematograph pictures showing sounding, trawling, fishing, and whaling operations being most instructive.

The subject of zoological nomenclature played a large part in the proceedings. It had been feared that there might be a battle royal between the advocates and opponents of the law of priority, carried out to the bitter end, but happily preliminary discussions of a more or less informal kind led to the adoption of a *via media*. A resolution was adopted which empowered the nomenclature commission to suspend the rules in cases where it would cause great confusion to carry them out. This power is, however, safeguarded by such stringent conditions that there is no fear of its being used except in very urgent cases. Prof. Brauer opened the discussion on nomenclature, presenting the well-known views of the German Zoological Society, and was followed by the Hon. Walter Rothschild and Dr. Hartert, of Tring, M. Oberthur, of Rennes, Prof. E. Ziegler, of Stuttgart, Prof. S. W. Williston, of Chicago, Prof. Fauvel, of Angers, Prof. Th. Mortensen, of Copenhagen, Lord Walsingham, of the British Museum, Dr. Hoyle, of Cardiff, Dr. J. A. Allen, of New York, and Dr. Ch. Wardell Stiles, of Washington, the secretary of the permanent committee.

In proposing a resolution "That an international commission on entomological nomenclature be appointed, whose powers and authority shall be equal to those of the existing commission on zoological nomenclature, and who shall report their decisions and recommendations annually to the Zoological Congress," Lord Walsingham emphasised that the principal object of zoological nomenclature was to give to all zoologists the means of acquiring and imparting information about the subjects of their studies. The aim should be to establish an accepted system ensuring simplicity and finality in nomenclature. This had to be attained on the basis of the law of priority. He supported Dr. Ernst Hartert against certain proposals put forward by the German Zoological Society which, if adopted, would be fatal to any attempt to obtain uniformity or finality in nomenclature. The first principles of the law of priority must be adhered to. Let revision be gradual, and proceed on well-considered lines, subject to the final authority of the International Zoological Congress, acting on the recommendations of its two equal commissions—that of general zoology and that of entomology.

The Hon. Walter Rothschild emphasised the point that any society or individual proposing such an important change as that proposed by the German Zoological Society ought, if they wanted serious consideration at all, to put their meaning in absolutely clear and unequivocal language. He stated that the time quoted, "twelve" years, as being sufficient to judge of the need of the "law of priority" was absurd, as it would take at least two generations for the law in question to settle nomenclature in general, and at least one generation before we could judge of its effects. Mr. Rothschild also stated that a progressive list of exceptions to that law, namely, one to be augmented from congress to congress, would lead to utter chaos. He was opposed to any exceptions whatever, but would be willing to see, in cases where confusion was likely to arise, that names for a long time employed for one genus or species, and which under the rules must be transferred to another, should be dropped altogether, and that names differing only in one letter from any already in use should be treated as inadmissible. He was also in favour of using larval names, and those founded on a single phase only, being used in that sense only, and not under the law of priority used for the adult in another phase.

Finally, it was resolved—that plenary power is herewith conferred upon the international commission in zoological nomenclature acting for this congress to suspend the *règles* as applied to any given case, where in its judgment the strict application of the *règles* will clearly result in greater confusion than uniformity, *provided*, however, that not less than one year's notice shall be given in any two or more of the following publications, namely, *Bulletin de la Société Zoologique de France*, *Monitor Zoologica*, *NATURE*, *Science* (N.Y.), and *Zoologischer Anzeiger*; that a question of the possible suspension of the *règle* as applied to such cases is under consideration, thereby making it possible for zoologists, particularly specialists in the group in question, to present arguments for and against the suspension under consideration; and *provided* also that the veto of the commission is unanimously in favour of suspension if not less than two-thirds be present. The commission is hereby instructed to report the facts to the next succeeding international congress.—It was also resolved "That the congress fully approves of the plan that has been inaugurated by the commission of conferring with special committees from the special groups involved in any given case, and that it authorises and instructs the commission to continue and extend their policy." Altogether, the conclusions arrived at appear thoroughly satisfactory, especially as the plenary power of the commission is very adequately safeguarded.

The invitation of the Government of Hungary to hold the congress of 1916 in Budapest was accepted, and Prof. Hovarth, of Budapest, was elected president.

THE INTERNATIONAL CONGRESS OF HISTORICAL STUDIES.

THE members of the International Congress of Historical Studies have been holding their meetings in London, under the presidency of Mr. James Bryce, who was, however, unfortunately absent throughout the proceedings. Five years ago, the congress held very successful meetings in Berlin, and ten years ago it assembled under favourable auspices in Rome. If the London meeting has attracted less notice in the country of its assembling than the two preceding ones, it has none the less produced some excellent papers, and it must be accounted a real loss to the general public that the very faulty organisation of the congress, combined with our insular aloofness and the ignorance of modern languages which is an accepted item of English education, has prevented the meetings from receiving their due share of attention.

The congress has covered so large a field of historical studies that any general survey of its deliberations would be impossible in this place. It has discussed the philosophy of history and the history of historical studies, while other sections have met daily to exchange views on Egyptian, classical, Byzantine, and Oriental history, as well as on matters pertaining to military, naval and colonial, religious and ecclesiastical, legal and economic, mathematical and scientific, studies.

The President of the Board of Education (Mr. J. Pease) directed attention to the frequent connection that has existed in England between history and politics, citing the names of Clarendon, Gibbon, and Macaulay; and, at the present time, of Bryce and Trevelyan. The advantages of such a connection may perhaps be questioned. From it has resulted the habit of treating history as a branch of politics rather than of considering politics as a department of history. The current text-book treatment of the English civil war and the American revolution—to give but two instances—has probably suffered much in its accuracy from the fact that the principal English historians have been primarily Whig politicians. To the popular conception of the politician as the sufficient and efficient historian, we may perhaps attribute the neglect by successive Governments of the marvellous series of records—the admiration and envy of other European nations, and the best material for history—which belong to this nation. No one knows better than Prof. C. H. Firth, who dealt with the subject of English records, how badly kept, how inaccessible, how uncalendared, are a great proportion of our English public documents.

It was entirely characteristic of the English politician-historian that, at the Oxford dinner, Lord Morley of Blackburn should warn his hearers against laying too much stress on research in diplomatic archives and parish registers, and should remind his audience that, fortunately or unfortunately, sentiment and prejudice have had far more to do with the making of history than reason and precedent.