for the insurance against fire. But assumes no responsibility either for damage or for loss of articles.

IV. Those who desire to exhibit under closed cases must do so at their own expense.

V. The charge of transport (to Nürnberg) and, if desired, the insurance of transport is at the expense of the exhibitor. In what refers to the return transport, by the courtesy of the directors of the Bavarian and the other main lines of German railways free transport is guaranteed for all unsold objects of the exhibition. All expense of home-transport beyond this border is at the expense of the exhibitor.

VI. An explanatory detailed catalogue of the mathematical exhibition is to be issued.

The first part will consist of essays, having reference to problems, results, and methods of geometrical representation.

The second part of an enumeration of all articles exhibited in connection with detailed theoretical descriptions. Here, if desired, the prices may be added. This part of the catalogue will be fully illustrated to give a vivid impression of the exhibited articles. We respectfully request all institutes, publishers, &c., to forward woodcuts, *clichés*, &c., which may be inserted in the text.

An appendix to the catalogue will be published, including all advertisements which may hereafter serve as a directory for all those interested.¹

VII. As far as possible all technical explanations of the articles will be undertaken by the committee.

VIII. The committee will attend to all sales and buyings (which are in view by various mathematical institutes of our Hochschulen) and give all desired information.

During the exhibition the sold articles must not be removed from the exhibition rooms, except with special permission of the committee.

IX. The intention to participate in the exhibition may be given by the use of the "Exhibition Announcement" until July 1. Address: Herrn Prof. Dr. Walther Dyck, München, Hildegardstrasse 1½.

At the same time all papers and scientific notices for the catalogue respecting woodcuts and *clichés* for illustration must be sent to the same address.²

The editors reserve the right of all abbreviation and change in the notes of Part 2 of the catalogue that the uniformity may require.

X. All articles proposed for exhibition must be forwarded from September 1 to 7, under the address: Mathematische Ausstellung in Nürnberg (Bayern), zu Händen der Herren Danler und Co.

The return of all articles will be effected within two weeks after the close of the exhibition under the conditions fixed above (No. V.)

XI. For nearer information in respect to the intentions and the extent of the exhibition we annex a preliminary classification of the articles.

1. Geometry. Theory of Functions.

Models employed in elementary teaching of geometry (solid geometry, trigonometry, descriptive geometry).

Polyhedra. Division of surfaces and spaces in polygons respecting polyhedra.

Plane curves.

Curves in space. Developable surfaces.

Surfaces of the second order.

Higher algebraic surfaces.

Transcendental surfaces.

Models illustrating geometry of complexes.

" " curvature of surfaces.

" " theory of functions.

" " analysis situs.

2. Arithmetic, Algebra, Integral Calculus.

Calculating machines. Slide rules.

Instruments for solving equations and for construction of functional relations.

¹ The fees for insertion in the appendix are 30 Reichsmark for the whole page (great 8°), 18 R.-M. for ½ page, 10 R.-M. for ¼ page, 5 R.-M. for ⅛ page.

² All advertisements for the Appendix and payments for same must not be deferred later than August 1, to the same address, Prof. Dyck.

Curvometers, planimeters, integrating machines, instruments for solving differential equations.

3. Mechanics. Mathematical Physics.

Models employed in elementary teaching.

Kinematics. Machines for description and transformation of curves and surfaces. Pantographs, perspectographs.

Apparatus for demonstration of mechanical principles.

Equilibrium and motion of a point.

Poinsot motion of a rigid body; precession, nutation; dynamical tops, gyroscopes.

Models and articles showing the effect of stress flexion and torsion of solids.

Elastic properties of solids (especially of crystals).

Hydrodynamics.

Geometrical representations and mechanical apparatus illustrating physical phenomena (for ex. vibrations, wave-motion, propagation of sound and light. Thermodynamic and electro-dynamic phenomena).

XII. It is understood that the exhibitors declare their willingness to submit to the present rules and further dispositions ordered by the committee for the interest of the exhibition.

For all further information please address the undersigned delegate of the committee.

Prof. Dr. WALTHER DYCK,
München, Hildegardstrasse 1½.

For the purpose of collecting and forwarding objects of interest, a Committee has been formed consisting of Lord Kelvin (Chairman), Lord Rayleigh, Profs. Sylvester, O. J. Lodge, G. F. Fitzgerald, W. G. Adams, Sir R. Ball, A. A. Common. Secretaries: A. G. Greenhill, O. Henrici.

The Secretaries will forward prospectuses and forms of application to intending exhibitors, and will take charge of objects at the Central Institution, Exhibition Road, South Kensington, S.W., and forward the objects at the proper time to Nürnberg, unless forwarded direct by the exhibitors.

THE KEKULÉ FESTIVAL AT BONN.

ON June 1 a remarkable demonstration took place at the University of Bonn. The occasion was the twenty-fifth anniversary of the call of August Kekulé to the Professorship of Chemistry at that University. The details, which we have taken chiefly from the *Kölnische Zeitung*, will be of interest to the student of chemistry, and probably of value to the future historian of the science.

The ceremony began in the morning with an enthusiastic ovation on the part of the students. The chemical theatre was decorated with plants; on the blackboard figured the benzene hexagon, made up with garlands of flowers, in the midst of which appeared the letters A. K. as a monogram of roses. At the usual lecture hour Prof. Kekulé entered, and was greeted with great enthusiasm. One of the chemical students, Alfred Helle, delivered a graceful address, in which he congratulated his fellows on being privileged to sit at the feet of the greatest of living chemists, ending by calling for three cheers for the Professor, in which the audience heartily joined.

Prof. Kekulé then addressed the students, detailing with characteristic humour some passages in his life. He was, he said, a pupil at the Darmstadt Gymnasium, where he chiefly devoted himself to mathematics. He was destined by his father for the profession of architect, and some houses still existed in Darmstadt, the plans of which he had drawn when a youth at the Gymnasium. At Giessen, where he went to study architecture, he attended Liebig's lectures, whereby he was enticed to chemistry. But his relations would not at first hear of his changing his profession, and he was given half a year's grace to think over it. He spent this time at the Polytechnicum at Darm-

stadt; from which circumstance arose the myth, affirmed by Kolbe, that he was a "Realschüler," and not, as was really the case, a "Gymnasiast." His first teacher in chemistry at Darmstadt was Moldenhauer, the inventor of lucifer matches. His leisure time was spent in modelling in plaster and at the lathe. He was then permitted to return to Giessen. "I attended," he said, "the lectures, first of Will and then of Liebig. Liebig was at work on a new edition of his 'Letters on Chemistry,' for which many experiments had to be carried on. I had to make estimations of ash of albumen, to investigate gluten in plants, &c. The names of the young chemists who helped Liebig were mentioned in the book, among them mine. The proposal was then made to me, just at the time when Liebig intended to make me his assistant, that I should go for a year abroad, either to Berlin, which at that time was to Giessen a foreign land, or to Paris. 'Go,' said Liebig, 'to Paris: there your views will be widened; you will learn a new language; you will get acquainted with the life of a great city; but you will not learn chemistry there.' In that, however, Liebig was wrong. I attended lectures by Fremy, Wurtz, Pouillet, Regnault; by Marchandis on physiology, and by Payen on technology. One day, as I was sauntering along the streets, my eyes encountered a large poster with the words 'Leçons de philosophie chimique, par Charles Gerhardt, ex-Professeur de Montpellier.' Gerhardt had resigned his Professorship at Montpellier, and was teaching philosophy and chemistry as *privatdozent* in Paris. That attracted me, and I entered my name on the list. Some days later I received a card from Gerhardt; he had seen my name in Liebig's 'Letters on Chemistry.' On my calling upon him he received me with great kindness, and made me the offer, which I could not accept, that I should become his assistant. My visit took place at noon, and I did not leave his house till midnight, after a long talk on chemistry. These discussions continued between us at least twice a week, for over a year. Then I received an offer of the post of assistant to Von Plantu, at the Castle of Reichenau, near Chur, which I accepted, contrary to Liebig's wish, who recommended me as assistant to Fehling at Stuttgart. So I went to Switzerland, where I had leisure to digest what I had learnt in Paris during my intercourse with Gerhardt. Then I received an invitation from Stenhouse, in London, to become his assistant, an invitation I was loth to accept, since I regarded him, if I may be allowed the expression, as a 'Schmierchemiker.' By chance, however, Bunsen came to Chur on a visit to his brother-in-law, at whose house I first met him. I consulted Bunsen as to Stenhouse's offer, and he advised me by all means to accept it. I should learn a new language, but I should not learn chemistry. So I came to London, where as Stenhouse's assistant I did not profit much. By means of a friend, however, I became acquainted with Williamson. The latter had just published his ether theory, and was at work on the polybasic acids (in particular on the action of PCl_5 on H_2SO_4). Chemistry was at one of its turning-points. The theory of polybasic radicals was being evolved: with Williamson was also associated Odling. Williamson insisted on plain simple formulæ without commas, without the buckles of Kolbe, or the brackets of Gerhardt. It was a capital school to encourage independent thought. The wish was expressed that I should stay in England and become technologist, but I was too much attached to home. I wished to teach in a German University. But where? In order to get acquainted with the circumstances at the several Universities, I became a travelling student. In this capacity I came, among other Universities, to Bonn. Here there was no chemist of eminence, and hence there were no prospects. Nowhere did there seem so much promise and so great a future as at Heidelberg. I could ask no help of Bunsen. 'I can do nothing for you,' he said, 'at least not openly. I will not stand in your way,

but more I cannot promise.' I fitted up a small private laboratory in the principal street in Heidelberg at the house of a corn merchant, Gross by name—a single room with an adjoining kitchen. I took a few pupils, among whom was Baeyer. In our little kitchen I finished my work on fulminate of silver, while Baeyer carried out his researches, which subsequently became famous, on cacodyl. That the walls were coated thick with arsenious acid, and that silver fulminate is explosive, we took no thought about. After two years and a half I received a call to Ghent as ordinary professor. There I stayed nine years, and had to lecture in French. With me to Ghent came Baeyer. Through the kindness of the then Prime Minister of Belgium, Rogier, I obtained the means to establish a small laboratory. I had there with me a number chiefly of more advanced students, among whom I may name Baeyer, Hübner, Ladenburg, Wichelhaus, Linne-mann, Radziewski, and Meyer. There was not so much a systematic course of instruction as a free and pleasant academic intercourse. After nine years' work, I received the call to Bonn." With some account of his work in Bonn, and with a reference to the great attention he had always received from his pupils, Prof. Kekulé concluded his address. The enthusiasm it occasioned, says the *Kölnische Zeitung*, baffled description.

The Professor then received the congratulations of his personal staff, as well as those of the University officials, among whom were the Rector Prof. Strasburger, the Curator Dr. Gandtner, and the Dean of the Philosophical Faculty Prof. Schlüter. In the evening the Bonn students honoured him with a torchlight procession, it being the third time the Professor had received this, the most conspicuous honour which is bestowed by German students. The first occasion was in 1875, when he declined the Professorship at Munich. The second was in 1878, when he was Rector of the University, held to commemorate the restoration of unity among the students after a long period of disunion. Among the torch-bearers on that occasion was the present Emperor of Germany.

In addressing the students, Prof. Kekulé reminded them of the previous occasions on which they had honoured him in like manner, and impressed on them the necessity of guarding and fostering the unity they had attained. Thus ended an impressive and memorable incident in the history of chemical science.

J. E. MARSH.

THE TRUE BASIS OF ANTHROPOLOGY.¹

THE Nestor of American philologists, and at the same time the indefatigable Ulysses of comparative philology in that country, Mr. Horatio Hale, has just published in the Transactions of the Royal Society of Canada, an important essay on "Language as a Test of Mental Capacity," being an attempt to demonstrate the true basis of anthropology. His first important contribution to the science of language dates back as far as 1838-42, when he acted as ethnographer to the United States Exploring Expedition, and published the results of his observations in a valuable and now very scarce volume, "Ethnography and Philology." He has since left the United States and settled in Canada. All his contributions to American ethnology and philology have been distinguished by their originality, accuracy, and trustworthiness. Every one of them marks a substantial addition to our knowledge, and, in spite of the hackneyed disapproval with which reviewers receive reprints of essays published in periodicals, it is much to be regretted that his essays have never been published in a collected form.

¹"Language as a Test of Mental Capacity." By Horatio Hale. From the Transactions of the Royal Society of Canada, 1891.