also the tongue, which was roughened at the apex, and unusually wide and thick.

A general foreshortening and lateral compression of the bones of the face have taken place, resulting, among other things, in limiting the gape, contracting the palate, and crowding the exterior nares to a position nearer the orbit, and on a line with the superior portion of the pupil. The symmetry of the head is unaltered; and there is no evidence that this condition was due to a wound inflicted by a fish-hook, or otherwise.

Some measurements of the head, taken in straight lines, are as follows: —

	mm.
Depth of head (through centre of pupil and angle of mouth)	51
Angle of mouth to symphysis of inferior maxillary,	27
" " superior "	23
Pupil " inferior "	35
" " superior "	25
Width of mouth	24
Distance between orbits	23
Nares from orbit	2
Width of tongue at base	16
Root of tongue to symphysis of inferior maxillary	16

The accompanying figure is intended to represent in profile the head of this specimen, half life-size, drawn with the mouth open to show better the points in question. A careful dissection would probably show some anatomical facts of interest.

F. H. HERRICK.

The magnetic declination in 1728.

In an official publication lately issued by the U. S. geological survey (Bulletin No. 13, Washington, 1885), we notice an error, which, if not corrected, would do injustice to the memory of the surveyors of 1728, by throwing doubt upon their work on the coast where the state boundary between Virginia and North Carolina intersects it near the head of Currituck Sound, and which reflects injuriously on a chart published by the U. S. coast and geodetic survey.

It is asserted (p. 95) that there is a discrepancy of 6° in the variation of the compass as given by the boundary commissioners, and as inferred from a magnetic chart of the Coast and geodetic survey. We quote from the bulletin: "It is stated in Byrd's journal, that the variation of the compass was ascertained to be a little less than 3° W. [The magnetic chart of the U. S. coast-survey would make it 3° E.]" We take exception to this last statement. The magnetic chart referred to is published in the Coast and geodetic survey report for 1882, illustrating Appendix No. 13, on the distribution of the magnetic declination in the United States at the epoch 1885, Jan. 1. It gives the declination for the present year 3° 36′ W., and is supported by an observation at the north end of Knott Island in latitude 36° 33.9′, long. 75° 55.3′, which gave in April, 1873, 2° 54.8′ W., and, when reduced to 1885, 3° 38′ W. For the effect of the secular change between 1728 and 1885 we make use of the Baltimore series of observations, Coast and geodetic survey report for 1882, Appendix No. 12, p. 273, and find the declination in 1728 nearly 0.45° smaller or less west than at present: hence it was then nearly 3° W., as closely as can now be computed, and not 3° E. as stated in the bulletin. It is true, that, about 1800, the declination was slightly *east;* and it was probably overlooked that the needle *reversed* its motion about that time.

An interesting account of the labors of the surveyors, the hardships they had to endure, and of the anxiety felt for the safety of the party while traversing the Dismal Swamp, is contained in the Westover manuscript by William Byrd [now accessible in print: two copies exist in the Congressional library]. He states that the commissioners of the dividing line found on March 6, 1728, the variation somewhat less than 3° W.; and had any serious error been committed by the surveyors, they could not have helped discovering it.

In connection with the above, the bulletin also states: "But it appears from the operations of the U. S. coast-survey at both ends of the line, that the point of beginning on Currituck Inlet, instead of being, as so constantly assumed, in latitude 36° 30′, or, as determined by the surveyors of 1728, in 36° 31′, is in 36° 33′ 15″." On this point it may be remarked that the line laid down on Coast chart No. 137A, edition of 1885, in latitude 36° 33′ nearly, rests, not on direct evidence, since no ancient boundary mark was ever discovered, but simply on tradition, and was so laid down on the best information that could be had. The Coast and geodetic survey was never officially called upon either to recover or to rectify this ancient boundary line. It may also be stated that the old Currituck Inlet closed long ago. C. A. S.

Washington, D.C., Sept. 4.

The Kongo free state.

The account of the Kongo free state in a recent number of *Science* suggested an idea which is, perhaps, not undeserving of some attention. The two principal difficulties in the way of Mr. Stanley's enterprise, seem to be the climate, which is deadly to white men, and the absence of a civilized population with which to trade. Now, it might be found that both these difficulties would be overcome by colonizing the country with American negroes. They have become re-acclimated on the coast of Liberia, where the climate is fatal to white men; and it is not unfair to assume that the difficulty of acclimatization would be much less in the high regions of the Kongo country. They will bring with them some of the wants of civilized life, thus furnishing a basis for trade. They would, perhaps, furnish the best class of workmen for the projected railway, and form a happy medium of communication between the whites and the natives. A PATRIOT.

Washington, Sept. 1.

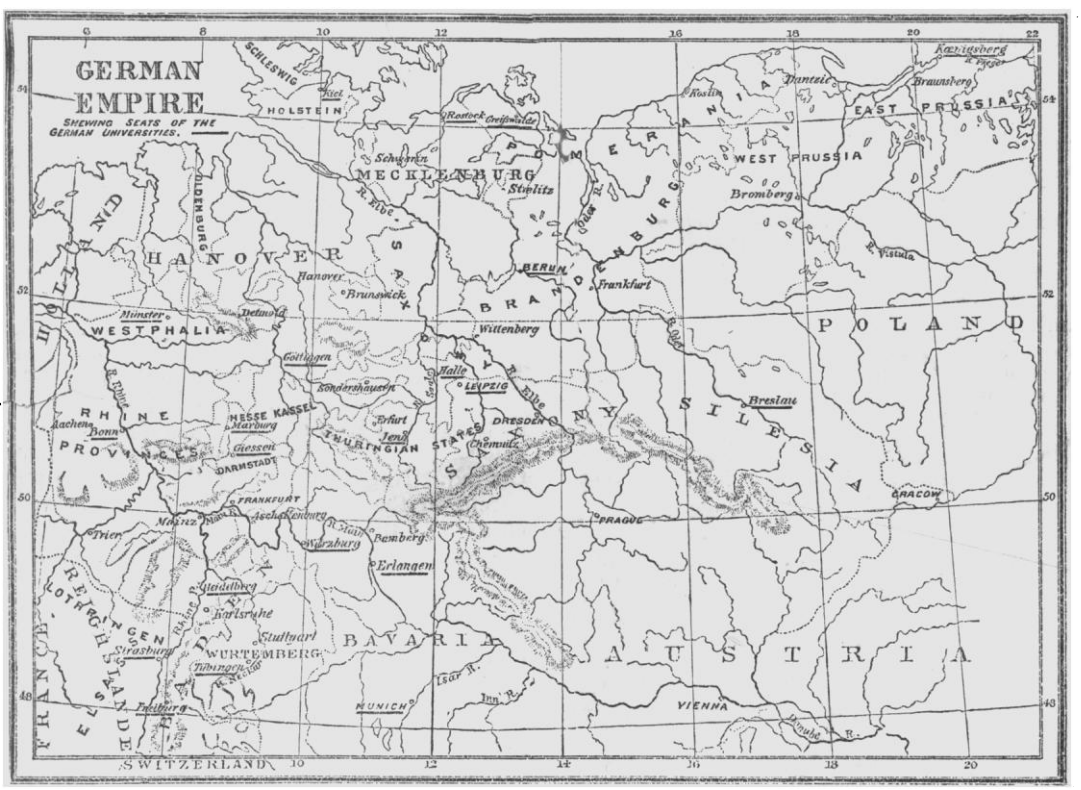
GERMAN UNIVERSITIES FROM A NEW POINT OF VIEW.

So much has been written about the German universities, — so many histories of separate foundations, so many discussions of academic methods, so many descriptions of student-life, and the like, — that it would seem hardly possible to bring their merits and their limitations before the public in any fresh aspect. Yet a recent writer has done exactly this. He has studied the subject from the point of view of a political economist, or more exactly of a philosophical statistician. That is to say, by a very careful and orderly comparison of the recorded facts of different decades and of different parts of the country, he has thrown such light on the results of an academic system as he might have thrown upon a system

of finance or taxation. He is not one of those students who think that all social movements can be expressed in terms of arithmetic. He is as well aware as any one, that intellectual forces are too recondite to be measured by any calculus; but he knows the value of numbers as well as their inadequacy, and he has used them accordingly in the study of universities with a master's skill.

We refer to the recent work of Dr. J. Conrad of Halle, translated by John Hutchiso of Glasgow, and introduced to English readers by Professor Bryce of Oxford. The translator rightly says of the original, that it is characterized by "that thoroughness for which German research is proverbial," thus reminding us of a remark of Matthew Arnold's, that, as a general rule, "hardly any one amongst us, who knows French and German well, would use an English book of reference when he could get a French or German one." We do not believe that it would be possible to produce in any land but Germany an educational memoir so trustworthy in its facts and in its inferences, so complete in its many-sidedness, and so helpful to those who wish to know the significance and the tendencies of advanced education in the nineteenth century, as that of the great economist of Halle.

Although it is not probable that the United States will ever have a system of universities exactly like that which Germany has established, the German experience will always be of the highest value to Americans. Our historical roots are in England; and our highest educational foundations are likely, hereafter as heretofore, to be developed according to non-Germanic methods. Nevertheless it would be deplorable if the leaders of progress in this land were indifferent to the wonderful influence which has been exerted upon modern society by the systems of research, of publication, and of instruction, brought by the Germans to such a high state of development. Foundations, the earliest of which came into being five hundred years ago, have shown new vigor within the last half-century, and were never so well worth study as now.



MAP SHOWING THE DISTRIBUTION OF GERMAN UNIVERSITIES.

In every important institution of learning in this country, there are scholars who have felt the beneficent effects of German method in their own intellectual culture, who have been inspired by German enthusiasm and devotion, who have profited by German erudition and research, and who are endeavoring to hold up to Americans the example of German scholarship. To all these persons we particularly recommend the study of Dr. Conrad's volume. It will not show what wonderful contributions have been made to knowledge during the past fifty years, nor the effect of university education upon the political and religious condition of the country It will introduce the reader neither to great books nor to great men. But it will reveal the results of academic administration in bringing together large bodies of teachers and students. and of holding them by positive restrictions and requirements to prolonged and systematic study.

We hear a great deal of the freedom of academic life in Germany, *Lehr-freiheit and Lern-freiheit*, and especially from those who would carry the elective principle through all our institutions of learning; but, in the German-university system, laws and regulations, traditional, political, and institutional, are to be met with at every turn. To begin with, the establishment of a university does not depend upon the bounty of a millionnaire, nor upon the religious zeal of some ecclesiastical body. Universities are not established to bring fame to private individuals, to give value to corner-lots, or to make a local school for boys or girls appear to better advantage because it bears an aristocratic name. In this country, the name university is not protected by law or by tradition; and authority to confer the rights and dignities of academic degrees can be secured in most states more easily than a charter for a horse-railroad or a bank. But in Germany, since the first foundation at Prague in 1348, only forty-two universities have been established; and of these, sixteen, for various reasons, have been given up, or combined with other institutions. Only three new foundations have been laid in this century, — at Berlin, Bonn, and Munich; and of these, the two last were based on earlier undertakings. The new university at Strassburg is, in fact, the revival of an old name. There are to-day, in so much of Germany as constitutes the German empire, but twenty-one universities, — ten in Prussia, six in South Germany, four in the minor confederated states, and one in the Reichslande; but what a score they are![1]

[1] The map which we have reproduced from this volume shows their geographical position.

The restrictions placed upon the establishment of universities are equalled by those which control their interior organization, their distribution into faculties, their responsibility to the government, their employment of funds, their modes of instruction. So also even the boasted freedom of students is a freedom based upon law which would seem tyrannical to the American public. The university portals are not open to every one. those who would enter them, if belonging to the country, must bring the final certificate of the gymnasium; and that cannot usually be acquired without eight or nine years of rigid discipline in a school where the studies are obligatory, and where every hour of every week has its appropriate pre-appointed task. Great opposition has been made to the admission of students from the real-schools to the universities, especially in Prussia; and the controversy, in respect to the essentials of a liberal education, is still in progress, with a tendency, so far as we are able to judge, toward the re-affirmation of the principles of gymnasium instruction, and the belief that this is the only fit introduction to university privileges.

From these general remarks, we proceed to gather from the copious stores before us some statements in detail which may interest those who have not access to the pages of Dr. Conrad. Noteworthy fluctuation has been apparent in the attendance at German universities. At the end of the *twenties* (1821–31), the number of students was extraordinarily large; at the beginning of the *thirties*, there was a great and sudden decrease; in the *seventies*, a powerful increase; and the causes of this ebb and flow are an interesting field for trained conjecture. The drift of students toward Berlin, Leipsic, and Munich is remarkable, these three universities having forty-two per cent during the last *semester* which was under review. There has been an increase in the number of foreigners in attendance, but the importance of this element has relatively decreased during the last twenty years. In 1880 there were a hundred and seventy-three students enrolled from the United States, — mostly devoted to the philosophical faculty. The 'migrations' of German students are a very interesting subject of investigation. Just now north Germans go to the south, much more than south Germans go to the north. "It is the fine scenery, the mild climate, the geniality of south Germany," which prove attractive. "The desire to study at a large university, and the preference for cheap liv-

ing," give Leipsic its advantages. An attempt is made to discover the social position of the fathers of students, but without much result, except in respect to Halle, the author's own sphere. His conclusion is, that it is "the custom for people who have had a university education" to give their sons like advantages; and, when an unusual increase in attendance is apparent, it is due to a recruiting from the families of subordinate officials, elementary teachers, etc.: though it is also obvious that people in the higher walks of business send more students to the universities now than formerly.

We pass by what is said in respect to the other faculties, in order to give such space as we can command to the philosophical faculty, the importance of which has increased actually and relatively. The time is almost within the memory of our older contemporaries when every student belonged to one of the three faculties of law, medicine, or theology; and if he also followed lectures in the philosophical department, it was as supplementary or preliminary to his professional course. All this is now very different, in consequence of the enormous importance which science has gained in the whole development of our culture. In forty years the number of students of science has increased tenfold: the students of philosophy and history have not yet been tripled, but even they have increased faster than the students of medicine. This faculty also shows the largest increase in the number of teachers, so that at present more than half the entire teaching-body at all the universities belong to the philosophical group. The new foundations are especially for comparative philology, modern languages, archeology, Egyptology, geography, agriculture, etc. The professorships of history have been increased with reference to better instruction in modern history. 'Exercising-classes,' seminaries, private training-schools, are coming more and more into vogue, as complementary to the ordinary lectures. "We admit to the teaching-office only men of proved ability and capacity to promote learning. This is the sole test." Some would even think that "too little weight is attached to power of communicating, and that too exclusive regard is had to literary activity."

Those who would see with what painstaking accuracy the statistics which underlie these statements have been brought together, must go to the volume itself. We have only endeavored to arrest attention to the many suggestive lessons with which the work abounds.

THE CHANGE IN THE GREAT NEBULA *IN ANDROMEDA.*

THE remarkable change in the great Andromeda nebula, discovered by Dr. Hartwig, the news of which has just been received by cable, is an event of capital importance to astronomy. It will be a disappointment if it should fail to afford substantial aid in directing conjecture, and narrowing the field of hypothesis, as to the construction of the sidereal universe; a problem in regard to which our present knowledge is so defective, that the imagination has hitherto wandered, guideless, in a vague region of speculation.

The sudden appearance of a star of about the eighth magnitude, in the middle of this well-known object, is a phenomenon which, although extraordinary, is not unique in astronomical history. An exact counterpart seems to be furnished by the star, which, in May, 1859, suddenly shone out in the nebula or cluster 80 Messier. The analogy is so striking, that it is worth while to recount the various features presented.

The object 80 Messier, or 4,173 of Sir J. Herschel's general catalogue, was described by its discoverer in 1763 as a '*nebuleuse sans étoiles.*' Sir W. Herschel characterized it, however, as the richest and most condensed cluster in the heavens. Other observers, including Sir J. Herschel, Argelander, d'Arrest, and Pogson, have always described it as cometary or nebulous. In ordinary telescopes, and with moderate powers, it is certainly irresolvable. I am very familiar with its aspect in the six and one-fourth inch Clacey refractor in the west dome of the Harvard observatory, having had occasion to examine it, and the surrounding region, a great many times in observing the variable stars R, S, and T Scorpii. I have always seen it as a beautiful, bright, circular, nebulous mass, running up towards the centre into a strong condensation of light.

It was nearly in the middle of this nebula, that Auwers, at Königsberg, found, on May 21, 1859, a bright star, which, on many previous occasions, the last only three days previous, had certainly not been visible. He estimated it as 7th magnitude, and Luther as 6.5. On May 25 it had become sensibly fainter. It was independently discovered by Pogson, in England, on May 28, when, on looking for the neighboring known variable stars, he was startled to find in the nebula itself a star of the 7.6 magnitude. He is certain that on May 9, his last previous examination of the