

of glutelin insoluble in neutral solvents. With the exception of the nearly related wheat and rye, the proteins soluble in alcohol from each of the cereals are distinct substances. Although no certain difference has yet been detected between the gliadin of wheat and of rye, their glutelins are not alike.

The leguminous seeds are similar in the general character of their proteins, but marked differences exist between the proteins of the various groups. Thus *Lupinus*, *Vicia* and *Phaseolus* present marked differences in their proteins, whereas the proteins of the species of each genus are very much alike. The proteins of *Lupinus luteus* and of *Lupinus angustifolia* differ slightly but in their physical properties are clearly distinguished from any of the other seed proteins. Although similar proteins are obtained from the horse bean, lentil, pea and vetch, these are distinctly different from the proteins obtained from other leguminous seeds. These seeds are not alike, however, in the proportion of their several proteins. The chief protein of *Phaseolus vulgaris* appears to be identical with that of *Phaseolus radiatus*, but the small amount of other protein was found to be different in properties and composition in each of these seeds.

The cow pea (*Vigna*) and soy bean (*Glycine*) contain distinctly different proteins which, however, are similar to but different from those of *Vicia*. The globulins of the seeds of *Corylus* and *Juglans* are much alike, but not identical, while those from *Juglans regia*, *nigra* and *cinerea*, so far as they have been compared, show no differences. The proteins of other seeds show marked differences, but the botanical relations of these seeds are not such as to permit of further discussion of this subject.

Although the data for generalizations are as yet few, those that are available

plainly indicate a close connection between the chemical constitution of the seed proteins and the biological relations of the plants producing them.

That similar differences exist between homologous proteins of different species of animals is becoming evident from the facts which are gradually accumulating, and these strongly suggest a chemical basis for the multitude of diverse forms of animal and vegetable life.

THOMAS B. OSBORNE

CONNECTICUT AGRICULTURAL
EXPERIMENT STATION

THE FINANCIAL STATUS OF THE UNIVERSITY PROFESSOR IN GERMANY¹

ORGANIZATION OF GERMAN UNIVERSITIES

ALL the German universities are government institutions. Like the primary schools and the *gymnasias*, the university is part of the educational system of that German state in which it is located. The professors are officials of the sovereign, and the major part of the university revenues are derived from the state treasury. The government of the university is, in the last resort, in the hands of the sovereign's Minister of Education, who in the constitutional monarchies is responsible to the Chambers, and in Mecklenburg-Schwerin, to the Grand Duke.

The university is thus under the control of the state Parliament and, according to the laws enacted by it, under the immediate supervision of the Minister of Education. The university budget must be passed each year by the Chambers; the creation of a new chair can only be by parliamentary approval. The appointment of professors rests with the sovereign or his minister, and the scheme of instruction together with

¹ Extracted and abridged from Bulletin number two of the Carnegie Foundation for the Advancement of Teaching. See also the issue of SCIENCE for July 24.

the entire educational policy of the university is a matter of state control. As will be seen hereafter, however, this is compatible with a very large measure of professorial freedom and self-government.

As the Minister of Education has charge of the entire school system of the state and is generally also minister of ecclesiastical affairs and several other important branches of government supervision, it is impossible for him to give any minute personal attention to the details of university management. When the annual university budget is before Parliament, or Parliament is discussing any bill affecting the university, he is, of course, in his place as the spokesman of the government, and when university matters must be laid before the sovereign, it is he who is granted an audience by the King or reigning Grand Duke. But while any changes in university policy must be considered by the minister and he is responsible for them, the actual management of university interests generally rests with the permanent officials of the bureau of the ministry which is directly charged with university affairs. The director of that bureau is, therefore, often a person of great influence, Director Althoff, of the Prussian Ministry, having had a power in molding the Prussian universities and, through their example, the universities of the other German states, which is likely to become historic.

At each university the ministry is represented by a commissioner who has charge of the economic side of the academic administration, and acts as the general advisory agent of the government, conducting the correspondence of the university with the ministry. At the Prussian universities, and at the University of Jena and the University of Strassburg this official is called the curator. At the University of Leipzig he is styled the government plenipoten-

tiary; at the University of Tübingen the chancellor, and at the University of Rostock the vice-chancellor, the title of chancellor at Rostock being borne by the reigning Grand Duke. The Ministry of Instruction of Prussia itself attends to the curatorial business at the University of Berlin, assisted by the rector and the university judge.

The curator is a trained jurist or administrative official who has charge of the erection of buildings, the management of the special scholarship funds, and of all those administrative functions, apart from the direct supervision of the instruction, which in the United States are vested in the university president under the general direction of the board of trustees. The tenure of office of the curator is a fairly permanent one.

The titular executive head of a German university is the rector, elected by the full professors (at the University of Göttingen and at the Bavarian universities by the associate professors also) from among their own number for one year, with the approval of the reigning sovereign. The rector represents the university on occasions of ceremony, presides over the senate, is in control of the university officials, of matriculation, and of all meetings and societies of students, and in general transacts the current business of the institution. The rector is never reelected, the office being held in rotation by the full professors. At the universities of Erlangen, Freiberg, Göttingen, Heidelberg and Jena the above duties are performed by a Prorector, and at Giessen and Leipzig by the *Rector Magnificus*, these seven universities having as their titular executive a *Rector Magnificentissimus*, who is at Erlangen the King of Bavaria, at Leipzig the King of Saxony, at Freiburg and Heidelberg the Grand Duke of Baden, at Giessen the Grand Duke

of Hesse, at Jena the Grand Duke of Saxe-Weimar and at Göttingen a prince of the royal house of Prussia.

The distinguishing characteristic of the German university is the power of the full professor (*ordentlicher Professor*). In American universities the professor is simply the highest in rank of an ascending series of teachers. Like the instructors and assistants, he is appointed by a board from which all teaching officials are excluded and he holds his office during the pleasure of that board. Unless he occupies an endowed chair, his salary is generally the result of a bargain with the university president. The professor, indeed, sits as of right in the faculty, which determines the number of courses in the curriculum and regulates the activities of the student body, but seldom is an American faculty asked to propose candidates for vacant professorships.

In Germany the professors are practically the university. The professor, to borrow Anglo-Saxon legal terminology, holds his office as a freehold. Buildings are for the professors to lecture in and subordinate teachers are for the relief of the professors from the less important parts of instruction. The professor decides for himself how he will best serve the students; the body of professors settles such general university matters as in their nature can not be left to individual control. Each university is subject, as are all other institutions in the land, to the control of the sovereign advised by the representatives of his people. But no intermediate non-academic board is interposed between the ultimate authority of the crown and the plenary academic authority of the professors, and the rector, elected by the professors and serving a limited term, has powers analogous to those of the presiding officer of a legislative body; while the powers of an

American college president resemble those of the president of a railroad. It must, however, be kept in mind in making any such comparison that the business life of a German university is conducted by the government, through the Minister of Education. The problem of ways and means does not confront the rector and the professors. It is the ever-present demand for money which has gone far to transform the American university organization into a business corporation, as differentiated from a teaching body.

A German university ordinarily consists of the four faculties of philosophy, theology, law and medicine. At the universities of Bonn, Breslau, Strassburg and Tübingen there are both a Roman Catholic theological faculty and a Protestant theological faculty.² The universities of Heidelberg and Strassburg have a separate faculty of mathematical and natural science and the University of Tübingen, besides this faculty, has also a faculty of political economy. The University of Munich likewise has a faculty of political economy and its faculty of philosophy is in two separate divisions—classical-historical and mathematical-scientific.³ The University of Münster is the one German university having but three faculties, lacking that of medicine.

Each of these faculties is composed of the full professors holding chairs therein. The faculty confers the degrees to which its courses lead, gives (except in Bavaria) to promising young scholars the privilege of acting as *Privat-Dozenten* in the university, proposes candidates for vacant professorships, and in general takes such ac-

² In the universities of Freiburg, Munich, Münster and Würzburg the theological faculties are Roman Catholic; elsewhere they are Protestant.

³ In the universities of Freiburg, Münster, Strassburg and Würzburg political economy is studied under the faculty of law.

tion on matters pertaining to instruction within the faculty as it is inappropriate to leave to the individual professor. The faculty is presided over by the dean, elected each year. The election of the dean must usually be confirmed by the Minister of Instruction. The teaching staff consists of full professors (*ordentliche Professoren*), associate professors (*ausserordentliche Professoren*), lecturers below professorial rank (*Privat-Dozenten*), with numerous laboratory assistants and helpers (*Diener*).

At the universities of Erlangen, Jena, Marburg and Tübingen the entire number of full professors, in all the faculties, make up the senate of the university. This is the general legislative body of the institution. In the other universities the senate is composed of the rector and his immediate predecessor, the university judge, the deans of the several faculties and a certain number of professors elected each year by the entire professorial body. The universities of Freiburg, Giessen and Heidelberg, in addition to this smaller representative senate, have also a senate consisting of all the professors, which deals with general disciplinary and administrative matters not referred to the higher body. The universities of Greifswald, Halle, Kiel, Königsberg and Rostock call this full gathering of the professors the Consistory, or the General or Academic Council.

When a vacancy occurs in a professorial chair, the general usage is for the faculty to submit candidates to the reigning sovereign, who either approves one of those proposed or by the exercise of his prerogative appoints a scholar of his own selection. The exact details of these nominations and the frequency with which they are disregarded by the sovereigns differ in the several states. In Prussia, although the faculty concerned has the right to submit three

names to the King, the King often makes an independent choice. In Bavaria the faculty sends three names to the senate of the university, and in Württemberg four names, the nominees being arranged in order of preference. The university senate considers the nominations and, having altered them if it sees fit, forwards the list through the minister to the King. It is seldom that either the King of Bavaria or the King of Württemberg does not make the appointment from one of these nominees. In Baden the senate of the university can append a report to the three names, arranged in order of preference, which have been nominated by the appropriate faculty, but can not change the nominations. The grand-ducal Minister of Instruction then makes the selection himself without referring the matter to the Grand Duke, and it is very unusual for another than one of the faculty nominees to be chosen.

When a new chair is created at a university, the final decision whether it is to be a full professorship or an associate one rests with the legislature of the state (or in Mecklenburg-Schwerin with the Grand Duke) at the time of considering the annual budget. Of course, the proposals of the ministry generally receive the assent of the Chambers. A regular professorship is maintained indefinitely, but occasionally personal professorships are created which expire when the occupant of the chair ceases to exercise the functions of a professor. In Prussia, when a chair is to be filled for the first time, the crown does not ask the faculty in which it is to exist for nominations.

The procedure in the selection of associate professors is generally the same as that which prevails in respect to full professors, except that the Minister of Instruction himself acts upon the nominations of

the faculty. The honor of an appointment, coming technically from the reigning sovereign, is usually reserved for the full professor.

The professor, when appointed, is required to announce one public or free lecture course of one hour each week. He must also announce one private or fee lecture course, which may be from two to six hours weekly. These are the only obligations resting upon him. Other fee lecture courses he can announce at will. The professor has entire freedom in arranging his courses and choosing his own lecture subjects. He naturally confines himself to subjects germane to the chair which he occupies and to whose study he has devoted his life, but there is usually nothing in the university regulations which would prevent him from lecturing on any subject he might desire.

The preliminary step necessary to render a scholar eligible for a professorship is for him to secure from a faculty "habilitation," or admission to the privileges of a privat-docent (*venia legendi*). The privat-docent is not an officer of the government, as are the professors, nor does he receive any salary from the university. His "habilitation" means that he is permitted to give lectures in the university to such students as are willing to pay fees therefor, and that the universities will give to students taking such courses the same credit as if the courses were those of a professor.

In Prussia the "habilitation" of the privat-docent rests entirely with the faculty, the ministry of instruction simply signifying through the curator that the royal government has no objection to the candidate. The privat-docent is not required to lecture unless he sees fit, but his name will be dropped from the announcement of lectures if for two successive semesters he fails to give courses. In Bavaria,

the King, through the ministry of instruction, grants to a privat-docent the *venia legendi* and he may be removed at will by the royal command. He must conduct each year one course. In Saxony, Württemberg and Mecklenburg-Schwerin the consent of the ministry is necessary for an "habilitation"; in Hesse the rector of the university grants the privilege with the consent of the university senate; and at the University of Jena it is necessary, before a docentship is conferred, to obtain the consent of the Grand Duke of Saxe-Weimar and the reigning Dukes of Saxe-Meiningen, Saxe-Altenburg and Saxe-Coburg-Gotha. In the Roman Catholic theological faculties an "habilitation" must receive the sanction of the bishop of the diocese.

The requirements for an "habilitation" have been constantly rising in recent years, and the average age at which a scholar acquires this privilege is well above thirty. Although instances of large fees by privat-docents have existed, the largest practical possibility is from four to five hundred dollars a year. The average income is certainly not much above two hundred dollars. Students have a strong tendency to pay their fees for the lectures of the better known professors, and the situation to-day of the privat-docent who does not possess a private income or is without the backing of wealthy relatives remains the same as when Herr Teufelsdröckh climbed his many flights of stairs at the University of Weissnichtwo. Nor is there any sure hope of a professorship to solace their years of financial barrenness. A chair in the faculty may never come at all; even if it is attained, the period of waiting is beyond calculation. Probably the situation is more difficult than it was when Kant remained a privat-docent at the University of Jena until he was forty-six.

When a man, however, has been commissioned a full professor or an associate professor in a German university, he has attained a financial status which, although it varies widely, is certain to be well within the margin of comfortable living. His income is a total usually composed of (1) a salary attached to his professorship, (2) a personal supplement, (3) a residence or a residence indemnity, (4) all or part of the fees paid by students for his courses and (5) a part of the more general fees paid by students to the university (faculty fees, examination fees, diploma fees, etc.). The receipts from fees are a very important proportion of the total income of the professor, often far exceeding all the other sources of income combined.

The Carnegie Foundation for the Advancement of Teaching has secured from the governments of the Kings of Prussia, of Saxony and of Württemberg, from the government of the Grand Duke of Baden and from the university authorities, a statement of the individual incomes in 1906, from each of the above-mentioned five sources, of the full professors and the salaried associate professors (*etatsmässig ausserordentliche Professoren*) in thirteen universities. These thirteen universities are the ten Prussian universities of Berlin, Bonn, Breslau, Göttingen, Greifswald, Halle, Kiel, Königsberg, Marburg and Münster, the University of Leipzig (Kingdom of Saxony), the University of Tübingen (Kingdom of Württemberg) and the University of Freiburg (Grand Duchy of Baden).

It is only upon such statements of individual incomes that any final account of the financial status of a professor can rest, and the Carnegie Foundation takes this opportunity to express its thanks for the courteous and efficient cooperation of the governments of the German sovereigns and

of the German universities which has enabled the foundation to secure these detailed individual incomes. It is to be regretted that they can not be published, but it was not thought wise to present the facts concerning individuals even though no names should be stated. Only averages will be given.

To the statement of income directly resulting from the teaching is added in each case on our lists a statement of income from other governmental employments. This secondary income varies in its nature from what is really a civil-list pension from the sovereign to the professor to a distinct outside salary for outside work, such as the professor might earn by private tutoring or the practise of a profession. These additions to income will not be considered in any of the text or tables that follow unless a special statement to that effect is made.

GOVERNMENT SALARY SCHEDULES IN THE UNIVERSITIES OF THE DIFFERENT GERMAN STATES

Below will be found the salary schedules for full professors which have been adopted by the different German governments. These salaries are simply the guarantees which the government gives to the professor, and constitute only a small proportion of the total professorial income. Following the account of these government appropriations to the professorial chairs will be a table giving the total academic income of the full professor in German universities, and some discussion thereon. It is with these later figures that the salary of the American professor must be compared.

Kingdom of Prussia.—In 1897 the royal government presented to the professors in all the Prussian universities a contract and invited their signatures. According to this contract the professor was to give up to the kingdom one half of

all the fees in excess of 3,000 Marks (\$713), except at the University of Berlin, where the surrender was one half of the fees above 4,500 Marks (\$1,069). This calculation of 3,000 and 4,500 Marks was not to include the commission of the "Quaestus" for collecting the fees. The professor was to receive these sums of 3,000 and 4,500 Marks net. Professors appointed in 1897 and afterwards were required to sign this contract. In exchange the royal government promised to arrange the salary schedule so that there should be an increase in the professor's salary proportional to his length of service, and guaranteed a minimum income of fees of 800 Marks (\$190) from lecture fees, examination fees, and promotion fees, to all of the full professors and the associate professors alike. Many professors whose fees were greatly in excess of 3,000 Marks, or 4,500 Marks at the University of Berlin, declined to accept the government's invitation. According to Professor Biermer, only 361 out of the 738 *etatsmässig* professors in the Prussian universities agreed at once to the proposal. For the others there was thus no regular increase of salary as their period of service lengthened. But many of the professors who at first refused have since given their adhesion to these regulations, and as all of the appointees since 1897 are under its provisions, the plan may now be considered as the normal arrangement in the Prussian universities.

Under the salary schedule thus in force since 1897, the theory is that a full professor begins his service with an annual government salary of \$950; at the University of Berlin \$1,040. Thereafter there is an increase of \$95 every four years until in twenty years a maximum of \$1,425 is reached; at the University of Berlin a maximum of \$1,711 in twenty-four years. At the discretion of the royal Ministry of

Public Instruction the maximum may be raised in special instances to \$1,853—at the University of Berlin to \$2,233. With the approval of the King the respective maxima may go even higher, and at the University of Berlin it is now \$3,563.

Associate professors in the Prussian universities begin usually at an annual salary of \$475—at the University of Berlin \$570. Their salaries are advanced in the same manner by \$95 every four years until the maximum of \$950 is reached in twenty years—at the University of Berlin \$1,140 in twenty-five years. An associate professor, like the full professor, may likewise receive a special guarantee of fees, or a special salary supplement.

In Prussia each full and salaried associate professor receives an additional sum of money each year as a "residence indemnity," granted quite generally to all the higher civil servants of the King, because of the greater cost of living in the cities. The Universities of Berlin and of Breslau (which has recently been raised to the same class as Berlin) fix this residence indemnity at \$214 annually. At the Universities of Bonn, Halle, Königsberg and Kiel, it is \$157, and at the Universities of Göttingen, Greifswald and Marburg, it is \$128.

Kingdom of Bavaria.—About fifteen years ago the Bavarian government adopted a new salary scale for the university professors, whereby their incomes are considerably augmented. A full professor now commences with a government salary of \$1,083 (4,560 M.). At the end of each of three periods of five years \$85 (360 M.) are added to the salary, and thereafter the increment is \$42 (180 M.) at the end of each period of five years. An associate professor usually commences with a government salary of \$756 (3,180 M.), receiving the same increases

as the full professor. The salary scale is as follows:

	Full Professor	Associate Professor
To commence	\$1,083 (4,560 M.)	\$756 (3,180 M.)
After 5 years	1,168 (4,920 M.)	841 (3,540 M.)
After 10 years	1,255 (5,280 M.)	926 (3,900 M.)
After 15 years	1,340 (5,640 M.)	1,013 (4,260 M.)
After 20 years	1,383 (5,820 M.)	1,055 (4,440 M.)
After 25 years	1,426 (6,000 M.)	1,098 (4,620 M.)
After 30 years	1,470 (6,180 M.)	1,140 (4,800 M.)
After 35 years	1,512 (6,360 M.)	1,183 (4,980 M.)
After 40 years	1,555 (6,540 M.)	1,227 (5,160 M.)
After 45 years	1,598 (6,720 M.)	1,264 (5,340 M.)
After 50 years	1,640 (6,900 M.)	1,312 (5,520 M.)

In addition to the above there is also the residence indemnity—called in Bavaria “salary supplement” of \$127 (540 M.) for full professors and \$99 (420 M.) for associate professors. Besides this, there is a further residence indemnity—called “local supplement” in Bavaria—which was added a few years ago because of the increased cost of living. This amounts to \$64 (270 M.) at the Universities of Munich and of Würzburg—in cities of the “first class”—and to \$54 (225 M.) at the University of Erlangen—in a city of the “second class.” In case the fees of a professor amount to more than \$286 (1,200 M.) in one year his residence indemnities for that year are cancelled. If the fees do not amount to \$286, so much of the residence indemnities is paid to the professor as is necessary to bring the total up to \$286.

Grand Duchy of Hesse.—A full professor at the University of Giessen begins his service with an annual government salary of \$1,069. This is increased every four years by \$95 until in twenty years the maximum of \$1,544 is attained.

The associate professor is appointed at an annual salary of \$595 (2,500 M.) and after each period of four years’ service \$71 (300 M.) is added annually. The maximum is \$950 a year. Very recently the grand-ducal government has author-

ized a residence indemnity. This is calculated on the basis of eight per centum of the maximum salary, and is therefore \$123 (520 M.) a year for the full professor and \$75 (320 M.) for the associate professor. There is in addition a special fund, amounting at present to \$2,350 a year, at the disposal of the Grand Duke’s Minister of the Interior for the purpose of adding supplements to individual salaries.

Grand Duchy of Saxe-Weimar.—Until 1902 government salaries at the University of Jena were very meager, the professors being released from all payments of taxes, however, whether grand-ducal or communal. In 1902 there was a salary reform, a schedule being introduced on the Prussian model, optional as regarded the holders of professorial chairs at that time. About one fourth of the professors adhered to the old arrangement. Those who accepted the change and all professors appointed since are liable like other subjects to taxes, all of the grand-ducal taxes so collected and one third of the communal taxes going, however, into the treasury of the university. In return for this the full professor begins his service at an annual government salary of \$950, which is raised every four years, until in twenty years he receives \$1,425. The associate professor receives a similar increase in the same periods, his annual salary beginning at \$475 and reaching in twenty years \$950. A part of this increase in the university salary schedules was made possible by the income of the Karl Zeiss Foundation, which is now annually \$7,130. The grand-ducal government of Saxe-Weimar, the ducal governments of Saxe-Meiningen and Saxe-Altenburg, and the Gotha duchy of the reigning Duke of Saxe-Coburg-Gotha also contributed a similar amount. These four governments jointly have royal rights over the university.

Grand Duchy of Mecklenburg-Schwerin.

—The full professors at the University of Rostock begin with a government salary of \$998 (4,200 M.) and receive a \$95 increase at the end of the second and fourth years of service. Thereafter there is an increase of \$95 every four years until at the end of twenty years of service the maximum of \$1,568 is reached.

The associate professor at the University of Rostock commences with a salary of \$570. After three years there is an increase of \$71, and thereafter the like increase at the end of each four years. The maximum government salary of \$856 is attained at the end of fifteen years' service.

At present, the average government salary for full professors at the University of Rostock is \$1,321. By faculties, the averages are as follows: theology, \$1,473; law, \$1,654; medicine, \$1,179; philosophy, \$1,249. The averages in theology and law are much above the similar figures for Prussia. The associate professors in the theological and in the law faculty (there is but one each), and the honorary professor of the medical faculty, receive government salaries of \$641. The average for associate professors in the philosophical faculty is \$615.

Kingdom of Württemberg.—At the University of Tübingen the full professor usually commences at \$950 government salary annually, and is advanced at the end of every three years \$119. Four such three-year promotions are allowed. Salary supplements are granted by the royal Minister of Public Education and sometimes these supplements equal two thirds of the regular government salary. A newly appointed professor may begin his service with one of these large supplements.

The associate professors are appointed at \$570 a year, and every three years receive an increase in salary of \$71. There may be five of these advances. There are now but two associate professors at the

University of Tübingen receiving personal salary supplements from the royal government, promotion to the rank of full professors being the usual reward for distinguished service.

The University of Leipzig (Kingdom of Saxony) has no government salary schedule, the salary being arranged in each case between the professor and the royal Minister of Education. The grand-ducal Minister of Instruction makes a similar arrangement with the professors in the Baden Universities of Freiburg and Heidelberg, and at the University of Strassburg each professor's government salary is likewise the result of negotiation with the Minister of Instruction of the Reichsland.

INCOMES OF PROFESSORS

Table XI. gives the facts concerning the total professorial incomes of the full professors in the German universities. The incomes range from \$1,000 a year to over \$10,000, with three professors receiving incomes above that figure. Up to \$10,000 the incomes have been segregated, as a convenient division, into two-hundred-dollar groups.

This table shows that a fourth of the incomes are below \$2,100, while, on the other hand, a fourth are over \$3,200, a trifle short of a half being over \$2,500. The most frequent income is one between \$1,600 and \$2,000. The average is \$2,800, but this does not represent the typical income, because, like most averages in financial statistics, it is a result of the compounding of many moderate deviations downward with fewer, but larger, deviations upward.

One of the most significant facts disclosed by this table is the wide variability of the professorial income. On account of the salary schedules announced by their respective governments for all except four

of the German universities, these universities give at a superficial glance an aspect of uniformity and rigidity. The truth is far otherwise. There is a much greater variation in income to suit individual merit than is the case with comparable institutions in the United States. It will be seen from Table XI. that in Germany the best paid full professor receives ten times as much as the least paid professor and that the highest income from professorial teaching is more than four times the median income. This is not the case in America.

This adjustment of the financial returns of German professors according to the capability of each individual is due primarily to variations of income within the same institution. Of course, as in the United States, there is a considerable variation among the institutions themselves. Owing to the different fiscal policies of the different governments and the different provisions made by the same government for universities in more important locations, and also on account of the difference in fees due to the size of the student body, there will be found German universities in which the average income of the full professor is from twice to three times the average income in some other university. The wide range of the academic income of professors in the same institution is hardly known in America. In any large German faculty some full professor will generally be found who receives for teaching an income from two to five times as large as some of his colleagues. These larger incomes are due to special allowances from the government, to extra university perquisites, and to fees from the large body of students attracted by a superior reputation. Both the German and the American universities pay for merit. This is understood when a man in either country is made a full professor. The distinction

TABLE XI
*Incomes received for Teaching by Full Professors
in German Universities*

Amount of Annual Income	Total Number of Professors re- ceiving said Income	Percentage of Pro- fessors receiving said Income
\$1,000-1,199	5	.7
1,200-1,399	17	2.5
1,400-1,599	38	5.6
1,600-1,799	64	9.4
1,800-1,999	71	10.4
2,000-2,199	82	12.1
2,200-2,399	51	7.5
2,400-2,599	52	7.6
2,600-2,799	54	7.9
2,800-2,999	53	7.8
3,000-3,199	24	3.5
3,200-3,399	21	3.1
3,400-3,599	17	2.5
3,600-3,799	16	2.4
3,800-3,999	16	2.4
4,000-4,199	11	1.6
4,200-4,399	9	1.3
4,400-4,599	13	1.9
4,600-4,799	9	1.3
4,800-4,999	6	.9
5,000-5,199	5	.5
5,200-5,399	7	1.0
5,400-5,599	2	.3
5,600-5,799	1	.1
5,800-5,999	3	.4
6,000-6,199	6	.9
6,200-6,399	3	.4
6,400-6,599	3	.4
6,600-6,799
6,800-6,999	2	.3
7,000-7,199	2	.3
7,200-7,399	2	.3
7,400-7,599	1	.1
7,600-7,799	2	.3
7,800-7,999	1	.1
8,000-8,199	1	.1
8,200-8,399	2	.3
8,400-8,599
8,600-8,799
8,800-8,999	1	.1
9,000-9,199
9,200-9,399	2	.3
9,400-9,599	1	.1
9,600-9,799	1	.1
9,800-9,999 ⁴	1	.1

⁴Three professors received incomes of over \$10,000.

between the two countries is that the German universities pay an unusual amount for unusual merit. In America, on the contrary, the unusual man fares no better than his colleagues of mediocre ability.

Table XII. gives the facts of Table XI., distributing the income among the four faculties of each university.⁵ It is evident at a glance that professors of law receive most, and professors of theology least.⁶ Professors of medicine occupy the second place.

The associate (*ausserordentliche*) professors in German universities are of two kinds, the *etatsmässig ausserordentliche* professors and the *nicht-etatsmässig ausserordentliche* professors. The former is the class meant when associate professors are spoken of without any qualifying expression. The latter class is about one fourth of the entire number, varying in different universities from ten to eighty per cent. They enjoy the title of associate professor, but the title is not accompanied by an appointment from the government, nor do these associate professors draw the government salary appropriate to their rank. They are either teachers who have practically the financial status of privat-docents but have been given the higher title on account of merit or long service, or they are men who for various reasons are exempt from the responsibilities and the rewards which normally attach to the professorial office. The following statements will deal solely with the *etatsmässig* associate professors.

In the thirteen universities which have

⁵ Faculties of natural science are counted as faculties of philosophy in this table and throughout this bulletin.

⁶ It must be remembered that at eight German universities there are Roman Catholic faculties of theology, which consist largely, if not exclusively, of celibate ecclesiastics.

been carefully studied, the number of these professors is about three sevenths of the number of the full professors. Four tenths of the associate professors are in receipt of professorial incomes of from \$1,000 to \$1,400; one fourth of them receive less than \$900; half of them receive over \$1,200; and one fourth receive more than \$1,700. The incomes below \$600 and those above \$2,400 number about the same. The typical income is one from \$1,000 to \$1,200. Ninety-six per cent. of the incomes lie between \$900 and \$2,400, and eighty-seven per cent. between \$600 and \$2,000, and although this indicates a very large variability of income, it is not as great a variability as was found in the case of full professors. The average income of an associate professor is a trifle over \$1,300.

The professorial incomes which have been given must, of course, be interpreted in terms of the cost of living. To compare this cost of living with the similar cost for an American university professor is difficult. The Carnegie Foundation has endeavored to obtain the cost of provisions, servant-wages, and house rent in the German university cities, in order to be able to institute a comparison with a similar investigation conducted in America. The cost of foodstuffs in Germany, especially since the new Imperial Tariff Act, is higher than in the United States; the wages of servants, on the other hand, are very much lower. House rent is lower than in America, although not nearly as much lower as servant hire. For the latter item there is, as in the United States, a great difference between different localities. Marburg and Berlin can no more be considered together in respect to the necessary scale of professorial expenditure than can Charlottesville and New York. Furthermore, in Germany no more than in America is it possible to estimate what a professor and a

professor's family need to spend. Individuals and families vary in their necessities and standards of living as much in university circles as in other circumstances of life. Probably, however, it will be a fair approximation to the facts if we estimate the cost of living in the localities of the United States in which universities most comparable to those of Germany are situated, taking all of these variables into account, as one and a half times greater than in Germany.

Compared with other classes in the community, the German university professor is still better off than his American colleague. He ranks financially with very important legal and administrative officers; and no principal of a normal school or head of a city system of schools approaches in income from educational work the income received by a considerable percentage of university professors. The German governments pay teachers in the elementary schools well, and the teachers in the secondary schools especially well, but the full professor in a university receives over four times as much as the former and over twice as much as the latter class. The financial status of the university professor in Germany is thus seen to be at the top in the educational world and on a level with all except the nobility and the more successful of business men. It is unnecessary to revert to the dissimilar position of the university professor in America. And human nature being what it is, the higher relative prosperity of the German professor probably seems as important to him as his higher absolute prosperity.

THE OKLAHOMA GEOLOGICAL SURVEY

THE Oklahoma Geological Survey was established by the act of the first legislature of the state of Oklahoma. The sum of \$15,000 was appropriated. The law provides that until suitable laboratories, libraries and test-

ing apparatus are provided by the state the survey shall be located at the state university.

The commission, consisting of the governor, the superintendent of public instruction and the president of the state university, met for organization, July 25, 1908. A director was appointed and instructed to begin at once the preparation of reports on building stone, road material and oil and gas.

A number of parties were at once organized and active field work pursued for six weeks. L. L. Hutchison, assistant director of the survey, had charge of a party in the oil fields in the vicinity of Tulsa and Muskogee. Members of this party were: W. J. Cross, B. C. Belt, A. C. Reeds and T. R. Corr. Dr. D. W. Ohern had charge of a party in the northern part of the state engaged in studying building stone, oil and gas and Portland cement rock. H. A. Everest, E. Z. Carpenter and H. G. Powell were in this party. Pierce Larkin made a reconnaissance of the Cretaceous deposit along Red River from Ardmore east to the Arkansas line. Dr. J. W. Beede, of Indiana University, studied the Pennsylvania-Permian contact in the northern part of the state. Chester A. Reeds and Key Wolf studied the economic products of the Arbuckle mountains. Gaylord Nelson collected data on the lead, zinc and tripoli deposits in the northeastern part of the state. G. W. Kneisly visited the granite quarries in the Wichita and Arbuckle mountains. Frank A. Herald and Chester C. Clark made a reconnaissance of the gypsum region in western Oklahoma looking for deposits of gypsite.

A geologic map of Oklahoma is being prepared, and it is the intention to publish preliminary reports on the oil and gas regions, the available road material, and the building stone of the state and a report on the economic resources of the Arbuckle mountains.

CHAS. N. GOULD

THE INTERNATIONAL CONGRESS ON TUBERCULOSIS

THE program of the congress in session this week in the new National Museum, Washington, is as follows: