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UNIVERSITY CIRCULAR

REPORT OF THE PRESIDENT OF THE UNIVERSITY 1920-1921

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ANNUAL REPORT

OF

THE PRESIDENT OF

THE JOHNS HOPKINS UNIVERSITY

1920-1921

BALTIMORE
THE JOHNS HOPKINS PRESS
1921

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1920-21

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JOHNS HOPKINS

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New Series, 1921, No. 6. NOVEMBER, 1921 Whole Number, 334

ANNUAL REPORT OF THE PRESIDENT

To the Trustees of the Johns Hopkins University:

Gentlemen:

I have the honor to submit to you my annual report as President of the University for the academic year ending September 30, 1921. Attached hereto are the reports of the different departments of the University which contain a statement both of the work done during the year and of some of our most pressing needs.

One cannot read these departmental reports without being impressed with the magnitude of the work which the University is now doing. Primarily, of course, the University is a teaching institution. That it realizes this, its primary purpose, cannot be doubted. But, in addition to the realization of this primary purpose, the University is, through the work of the members of its teaching staff, engaged in investigation and research over an extremely broad field. The account given in Professor Bloomfield's report of the "Studies in Honor of Maurice Bloomfield," published by the Yale University Press and composed for the most part of articles by his former students, shows how wide has been Dr. Bloomfield's

influence, and through him the University's influence, in a field which could not have been cultivated had it not been for the encouragement accorded by this institution to research. The attention given by members of the University's teaching staff is not, however, confined to such subjects as are exemplified by work in Sanskrit and Comparative Philology, but extends through most of the sciences pure and applied, including such subjects as Turbine Engines and Child Nutrition.

Not contented with instruction and research along so many lines, the University is attempting through coöperation with state, city and private agencies to do what with its resources it can to aid in solving some of the problems which present themselves in the community in which it is situated. It is endeavoring to help the teachers of the state and city; so to widen its educational opportunities as to permit those, who in early life have been unable to obtain the education they would have desired, to avail themselves of the facilities it possesses; and to coöperate in the improvement in both state and city of the unsanitary conditions which constitute such a handicap to a well-ordered and successful life.

One cannot read these departmental reports without having a feeling of pride in what the University is doing and attempting to do. That it cannot do more is not due to the lack of desire on the part of its members but solely to the limited income which is a necessary incident of insufficient endowment.

ENROLLMENT

The increase in the enrollment to which I called attention in my last report still continues, though fortunately not at the same rate as heretofore. The report of the Registrar shows that the number of graduate students has slightly increased. It is to be hoped that the unfavorable influences of the great war have spent their force and that we may look forward to an increasing interest in graduate work. The

undergraduate body has also increased slightly. The number of undergraduates this past year was 702, as compared with the 676 of the year before. One of the reasons why this increase was no greater is to be found in the policy carried out by the Dean of the College. As is well known a law of the state passed in 1912 and subsequently reënacted as a part of the educational code of the state requires us as a state-aided institution to accept without further examinations all graduates of approved high schools in the academic course. The graduates of these schools do not in all cases satisfy our requirements for entrance, although they may present the requisite number of units. We accept them as candidates for the degree of Bachelor of Arts, but on the condition that they make up during their course the subjects or parts of subjects in which they are lacking. Apart from such students as are conditioned for these reasons, very few are admitted with conditions. As a result the grade of our students in the undergraduate department is better than it has been, notwithstanding the increase in numbers.

The adoption of this policy has thus served not only to improve the quality of the undergraduate student body but as well to impose a limitation on the number accepted, by reason of the fact that it has served as a method of selecting the better applicants for admission. It is, however, doubtful whether the pursuit of this policy will in the near future have any material effect in preventing an increase in the number of our undergraduates, and for the following reasons: In 1919-20, 151 of 290 entering students came from the Baltimore City College and the Baltimore Polytechnic; in 1920-21, 105 out of 248. In other words, 48% of the entering students in these two years came from these two institutions. During those two years, further, 17 + % of the entering students came from the county high schools of the state. That is, more than 65% of the entering students are now coming from the public schools of the state.

It is not, however, generally known that the school population of these schools is increasing quite rapidly. In six

years the graduates of the county high schools have increased 30%; those of the white male high schools of the city almost 27%. The recent report on State-Aided Colleges in Maryland to the Governor of Maryland made by the General Education Board of New York City calls attention to the fact that the number of students going from Baltimore to college is a very small one when consideration is taken of the size of the city. The number of city high school graduates is, further, small as compared with the number of the graduates of the county High Schools. In 1920, although Baltimore had a population about equal to that of the rest of the state, the number of Baltimore High School graduates was not much more than half the number of county high school graduates. It is to be remembered also that the record of the Maryland County High Schools has not in the past been a brilliant one from the point of view of the number of their graduates.

Now both the state and the city are making preparations to enlarge high school facilities. In the counties a large number of high schools have been established in the last two years. In the city plans are under way through the building of one Senior-Junior and two Junior White High Schools to about double the high school population.

The policy adopted by both the state and the city cannot fail to increase the number of those entering college. For increased enrollment is always followed by an increase in the number of high school graduates and we may normally look forward to about 25% of high school graduates going to college. The only consideration which may militate against the conclusion that the increase in the high school population will be followed by an increase in the number of entering college students is the supposition that the high schools are growing at the expense of the private schools. Our own experience would, however, seem to indicate that such a supposition is not one on which we can place any reliance in reaching a conclusion as to the number of our entering

students in the near future. The number of entering students who came from the private schools of the city were 23 in 1916-17, 18 in 1917-18, 26 in 1919-20, and 26 in 1920-21. (The year 1918-19 is omitted from consideration because in that year the Students' Army Training Corps was in operation.) Finally, from the only other sources of entering students, viz., Other Colleges and High Schools outside of the State, we are receiving more students now than ever. In 1916-17 we received from other colleges 13, in 1920-21, 46, and from High Schools outside of the State in 1916-17, 16, and in 1920-21, 31.

So it would seem that we cannot blink the fact that in all probability we shall in the near future have to look forward to an increasing number of students who will desire to enter the undergraduate departments of the University.

PRESENT CONGESTED CONDITIONS

What now is our situation from the point of view of our ability to take care of a larger number of students than we now have? The reports made by the different departments — to which reference has already been made — indicate, particularly in the case of the scientific departments, that conditions are already greatly congested. The only way in which provision could be made in some of the laboratory departments for taking care of any considerable number of additional students would be the operation of the laboratories both morning and afternoon instead of as at present in the afternoon only. Such a method would also involve the giving of classroom instruction in the afternoon as well as the morning. As the present staff of instructors are generally doing their full stint of work the adoption of such a plan would further involve a large increase in the teaching staff. The increase of expense thereby necessitated could hardly be expected to be provided for out of the increase in the sum received from tuition fees, as it has been our experience that except under very exceptional conditions a student is a financial liability rather than an asset.

NEW CHEMICAL LABORATORY

We must, therefore, in order both to relieve present congested conditions and to take care of a moderate increase in the number of the undergraduate students, erect another building at Homewood. The fact that during the past year the old Chemical Laboratory on Druid Hill Avenue has been sold of course fixes our choice as to the character of the building which will have to be built. The hope has been many times expressed that some generously disposed person or persons who knew of the work which in the past has been done and at the present time is being done by the Department of Chemistry would give us the necessary funds. Up to the present time those hopes have not been realized. Whether they are or are not realized in the future, we must, I am convinced, make up our minds to begin work at once on the construction of a Chemical Laboratory at Homewood in order that it may be ready for occupancy when we are called upon to convey title to the old laboratory.

It is unfortunate that this is the case. For the cost of the new laboratory will, in all probability, be considerably more than the amount which we realize from the sale of the property on Druid Hill avenue. We shall, therefore, be obliged to draw in a considerable sum on our productive endowment, with the result of reducing our income from that endowment at a time when we shall undoubtedly be called upon to increase rather than decrease our expenditure.

THE FUTURE FINANCIAL PROBLEM

I can see no ways by which in the future we can even approximate a balancing of our budget of receipts and expenditures, except by increasing our endowment, or by resolutely adopting the policy of limiting the number of our students. So long as we are a state-aided institution it would appear that we owe a duty to the people of the state which can be satisfied only by giving a preference to the young men

of the state over those coming from other states. Possibly we might consider the advisability of raising the tuition fee for non-residents to a closer approximation than at present to the actual cost of instruction.

SUCCESS IN MILITARY TRAINING

The Johns Hopkins University retains the place it won last year and was again placed in the distinguished class of collegiate institutions giving military training. I may add that the methods originating and developed by our Military Department for the instruction of the Reserve Officers' Training Corps have been widely copied throughout the country. Major Garey, our present Professor of Military Science and Tactics; Lieutenant Colonel Ellis, retired, formerly Professor of Military Science and Tactics here; Captain McMurray, at present Assistant Professor of Military Science and Tactics at this University, in association with two other army officers, have written "The R. O. T. C. Manual," in four volumes, published by The Johns Hopkins Press, which have already been adopted as text books for the R. O. T. C. in a large number of colleges and universities throughout the country.

NEED OF A GYMNASIUM

I can only repeat what I said last year with regard to our need of a gymnasium or cage. This is urgently necessary both from the point of view of physical education needs and from that of our spring athletic sports.

THE DORMITORY

The plans of the proposed Alumni Memorial Dormitory are complete and before this report will have been printed bids for its construction will have been received. It is hoped that we shall be able to begin its erection promptly.

THE MEDICAL SCHOOL

The report of the Dean of the Medical School calls attention to the changing conditions in the field of clinical medicine which are increasing the difficulties incident to medical teaching. A thorough scientific training not merely in the fundamental medical sciences such as anatomy and physiology but as well in the underlying sciences of chemistry and physics is beginning to be recognized as a necessary prerequisite to medical progress. At the present time, however, medical education is in a transition period. The older men with sound clinical judgment, so necessary both for hospital practice and medical teaching, often lack the scientific training which the future will require. On the other hand the younger men who have had the desired scientific training and who undoubtedly will become medical leaders in times to come, have not in most cases as yet developed into pre-eminent clinicians. The co-ordination of sound clinical judgment and scientific training is very rare. Necessary as clinical ability is, unless we are content to remain where we now are we shall be obliged to emphasize more than in the past the scientific training without which hopes for future progress in medicine may hardly be entertained.

During the past year the Medical School has had some experience of the difficulties which this transition period is presenting to American Medical Schools generally. Dr. W. S. Thayer very unselfishly tendered his resignation as Professor of Medicine in order that this professorship might be offered to Dr. W. W. Palmer, who was then Associate Professor of Medicine in this University and who had received an offer from Columbia University of the Professorship of Medicine in that institution. Dr. Palmer had received the scientific training deemed necessary for the coming professor of medicine. Dr. Palmer finally, however, determined to accept the call to Columbia University in large measure because of the inadequate facilities for clinical instruction of as large classes as have been received in our Medical School. Up to the

present we have been unable to find the man for the professorship of medicine who combines the desired qualities. In the meantime we have borrowed for a year from Vanderbilt University Dr. Canby Robinson who will be acting head of our department of medicine for the coming year.

The inadequacy in our facilities for clinical teaching already mentioned, due to the insufficiency in the number of beds in the Hospital available for the Department of Medicine, has also, it will be seen, added to our difficulties. This inadequacy it has been attempted to remedy in two ways. In the first place beginning with the year 1922-3 the incoming class in the Medical School will, for the time being, be reduced from 90 to 75. In the second place a program of Hospital expansion has been determined upon which when realized will not only increase the number of beds in the Hospital but will also provide more ample accommodations for the laboratory departments. When it has been realized we hope to increase the number entering to the old figure.

In addition to providing the necessary funds for carrying out the contemplated program—sufficient funds have already been received to permit a beginning to be made—provision will also have to be made for the permanent endowment of the Phipps Psychiatric Clinic, the support of which is at present assured only up to April 1923, and for a new Medical School and Hospital Library.

It will be seen, therefore, that the problems connected with the Medical School are serious ones. They must be solved if the school is to retain the position which it has so long held in this country.

The existence of these as yet not completely solved problems, has not, however, resulted in any loss in the School's reputation, as shown by the facts that in July 1921 only one of every three applicants for admission to the first-year class and only eight of a large number of applicants for admission to advanced standing could be accepted. The school also discharges as fully as ever its function of training men for

teaching positions and the productivity of the members of the Medical Faculty is still, as it has been so long, a marked characteristic of the school.

The solution of the problems which have been mentioned is, as has been indicated, in large measure dependent on our possession of adequate funds. Medical education is, when account is taken of the necessary hospital and laboratory facilities, probably the most expensive kind of education. But more important than the existence of those facilities is the spirit which, fortunately, animates the staff. The presence of this spirit, more than buildings and endowment, has made the Medical School what it has been and is. Only as we have it are we able to appreciate the changing conditions to which allusion has been made and to find the successful solution of the most important problems which they present.

THE ENGINEERING SCHOOL

This University, in conjunction with six other universities on or near the Atlantic Seaboard, viz., Columbia, Cornell, Harvard, Massachusetts Institute of Technology, Pennsylvania and Yale, entered into an arrangement with the French University administration providing for an exchange of French and American professors in Engineering and applied science. The French representative this year will be Professor J. Cavalier, rector of the University of Toulouse, who will be with us both just before and just after the Christmas holidays.

Attention is called in the report of the Engineering School to the crowded conditions due to the increased enrollment of students to which reference was made in my last report, and to the need of additional support for graduate work and experimental research. The burden of teaching the undergraduates is so great that little if any time will be available for this class of work unless the number in the teaching staff is increased. This problem, like so many other problems in the routine administration of the University, can be solved only

through the increase of our income. A very small such increase would enable us to make much more effective use of our plant than is now possible.

The enrollment of the students in the school which increased so much last year remains at about the figure of last year. In the year 1919-20 it was 314, last year it was 308. In the night course 346 students were in attendance, exclusive of 41 who took the Marine Engineering Courses. These last courses were abandoned after the first courses were completed. The depression in ship-building and shipping was such that no great demand for the courses was felt after the first few weeks of the year.

THE SCHOOL OF HYGIENE AND PUBLIC HEALTH

The routine work in the school was carried on about as usual. In addition thereto a number of new activities are to be noticed. In the first place an intensive course of six weeks designed especially for public health officers was given early in the academic year. It was attended by 29 students, mainly from the Southern States. In the second place plans were formulated for the establishment at Hagerstown of what it is hoped will be a model county health unit and the unit started operations during the summer. The main objects of the experiment are to make a complete epidemiological and sanitary survey of the country and to perfect an organization to deal properly with these conditions. Three agencies are coöperating with the school in carrying on this new activity. They are the Maryland State Board of Health, the International Health Board of the Rockefeller Foundation and the United States Public Health Service. In the third place the school has in coöperation with both public and private agencies in the City of Baltimore made an experiment in the diet of children which has contributed greatly to our knowledge of a proper diet, has made a survey of the health conditions of the children in the public schools of the city and a study of the diphtheria situation in the city from an

epidemiological point of view. Finally, the School has established a scientific journal—The American Journal of Hygiene. The School was able to enter upon this last activity through the employment of part of the income of the De Lamar fund. The income from this fund made possible also the giving of the series of public lectures to which attention is called in the report of the Director of the School.

When one bears in mind the long list of publications which are to the credit of the members of the faculty of the school, one must be convinced of the fact that an active coöperation with governmental and other agencies in the doing of practical health work does not have as one of its effects the elimination of that work of investigation and research which has from the beginning been one of the characteristics of life at this University.

THE SUMMER COURSES

The Summer Courses were conducted as usual from July 5th to August 12th. Co-operation on the part of the University with other agencies continued to be a feature of this work. Particularly to be mentioned among the co-operating agencies are the Board of School Commissioners of the City of Baltimore, the Peabody Institute, and the Baltimore *Sun*. A portion of the income of the De Lamar Fund was used for the provision of instruction in School Hygiene.

The scope of instruction was greatly extended to meet the needs of Baltimore City teachers under the co-operative arrangements made with the School Board. The School Board established at the University a new type of city vocation school of ten grades, providing its teaching staff of a principal and thirteen teachers. One of the reasons for establishing this school was to supply a school for the purpose of demonstrations in teaching and educational investigation.

The widening of the scope of instruction in the summer courses had as one of its results a great increase in the enrollment which reached the number of 949, twenty-five per

cent. of whom were male students. The increase in the enrollment was due for the most part to the increase in the number of city teachers in attendance, although the number of public school teachers from the counties of the State increased about fifty per cent.

The summer courses also attracted 152 graduate students, an increase of seventy-one per cent. over the number present at the courses of the preceding year.

The feature of the session was the demonstration school carried on at Homewood by the Baltimore City School Board. The extent of the service rendered by this new type of school is clearly indicated by the facts that a large number of university students spent a considerable time in observing the teaching in the school, and that the opportunity was offered to pupils in attendance at the school to do work in advance of the grade which they had completed the previous June. Indeed, 168 of the pupils in the school were promoted as the result of their eight weeks' work in the school.

THE COLLEGE COURSES FOR TEACHERS

The report of the Director of the college courses for teachers shows an increased enrollment. During the past year there were at the University in Baltimore and in the University extension centers at Frederick, Elkton and Rockville an attendance of seven hundred and fifty-nine. The enrollment in Baltimore was six hundred and sixty the first half-year and five hundred and ninety-eight the second half-year, being approximately a 20% increase over the preceding year. Of the total in attendance at these courses four hundred and forty-two were school officers and teachers, and one hundred and thirty-six were students registered in other branches of the University. Of those registered at the University in Baltimore two hundred and one had previously been registered in these courses. Eighty-six were candidates for the degree of Bachelor of Science.

THE NIGHT COURSES

The night courses in Business Economics and for Technical Workers, the details of which are given in the reports of the Department of Political Economy and the Engineering School, respectively, were carried on as heretofore. The total registration was 1,152, as compared with 1,042 the previous year.

FINANCIAL STATEMENT

The Financial Report, showing in detail the operations for the fiscal year ending June 30, 1921, and the condition of the University finances on that date, has been published, and copies may be obtained from the Treasurer by those interested. Reference to this report will reveal the following facts:

The operations of the year resulted in an excess * of expenditures over ordinary income in Philosophical and Collegiate Departments		$2,600.69
The excess for the preceding year was.... For Philosophical and Collegiate Departments	$43,373.04	43,373.04
A decrease this year of		$40,772.35
It will be noted that the deficit on the Philosophical and Collegiate account decreased during the year as compared with the year before		40,772.35
Total income from operations for the year was		$1,291,414.48
An increase this year of		122,600.00

This increase came from the following sources:

Increase in income from Endowment Funds	$64,577.80	
Increase in Tuition Fees	31,922.76	
Increase in the use of State Appropriations	8,672.77	
Increase in miscellaneous Receipts	22,577.62	
		$127,750.95

Less:—			
Decrease in Rockefeller Foundation appropriations for School of Hygiene and Public Health	$2,550.26		
Deficit covered by Hopkins Maintenance Fund	2,600.69		
		$5,150.95	
			$122,600.00

Of the total income, the amount received from students was 21 per cent., the income from invested funds 41 per cent., from the State of Maryland 8 per cent., and from other items 30 per cent.

The total operating expenses for the year were.....		$1,367,645.47
A net increase for the year of.....	$140,562.54	
This increase is accounted for as follows:		
Increase in salaries.....	$115,298.25	
In wages, fuel, supplies, etc.	41,261.43	
	$156,559.68	
Less:—		
Decrease in apparatus, books, and plant.....	15,997.14	
	$140,562.54	

The amount paid for salaries during the year constituted 60 per cent. of the total expenses, the amount paid for expenses 37 per cent., and the amount paid for apparatus, equipment, and other items 3 per cent.

The increase in the income of the University shown in the statement above set forth, is largely due to appropriations of the Rockefeller Foundation for the School of Hygiene and Public Health, and to the appropriation of $30,000 so generously made to us by the General Education Board for the increase of salaries, although the income from the general endowment funds also increased by $64,577.80.

Included in the income of the University are also, of course,

* Covered by Hopkins Maintenance Fund for 1920-21 of $2,600.69.

the payments amounting to $2,600.69 on account of the Hopkins Maintenance Fund, which, fortunately, prevented the University from being obliged to face a current deficit. The income from this source ceases with this year.

The result of the increase noted in income is that again we closed the year without a deficit, although we have at the same time enlarged the sphere of our activities. This result is, of course, extremely gratifying. It does not, however, in any way make less necessary the endeavor to secure a larger endowment. We cannot rely in the future on a maintenance fund as in the past four years, nor may we rely longer than for the coming year upon the General Education Board's appropriation.

ASSETS AND LIABILITIES (JUNE 30, 1921)

The University has Assets as follows:		
Stocks, Bonds, Productive Real Estate, etc., belonging to Endowment Funds.		$10,929,196.09
Plant, Equipment, etc.—		
Howard Street Buildings.....	$705,958.23	
Medical School Buildings.....	314,164.68	
Homewood Land and Development..	2,322,571.54	
Equipment, Books, etc.....	749,194.46	
		4,091,888.91
Accounts receivable		189,414.09
Cash on hand.....		49,137.25
Making Total Net Assets (Book Value)..		$15,259,636.34
Corresponding to Liabilities, i. e., Funds and Balances, as follows:		
Permanent Endowments (Trust Funds)		
Funds Consolidated for investment $4,955,446.99		
Funds separately invested 5,376,026.84		
	$10,331,473.83	
Unexpended Income of Special Funds..	8,318.30	
Sundry Open Accounts.....	328,765.76	
		$10,668,557.89
Leaving		$4,591,078.45

Which is represented by—			
Plant, Equipment, etc.		$4,091,888.91	
Unrestricted Bequests		984,017.83	
		$5,075,906.74	
Against which has been charged—			
Deficit in Operations to date	$330,241.57		
Homewood Development in excess of Funds available	154,586.72		
		$484,828.29	
			$4,591,078.45

These liabilities deducted should be offset by cash on hand and good current assets. That such is not the case is due to the fact that the University has had to provide cash to meet the accumulated deficits of $330,241.57 and an amount from General Account for Homewood Development, $154,586.72, a total of $484,828.29—an amount $9,381.34 less than the total at the beginning of the year, which in view of general conditions may be considered satisfactory.

The University has a number of unrestricted funds, amounting in all to $984,017.83, which, together with the proceeds of the remainder of the University property on Howard street as sold, could be applied to liquidate the above liabilities. There are, apart from the liabilities just enumerated, no debts or obligations.

In addition to these present assets, the University is interested in estates in process of settlement and as remainderman in a number of estates which will be available on the termination of life estates. This interest amounts in all to about $2,500,000, most of which has been given for special purposes. The income will enable us to increase our work, but will only in small part be available for general purposes.

GIFTS AND BEQUESTS

For research in Social Hygiene, the United States Government appropriated $5,000.00 from its Interdepartmental Research Fund, this appropriation to be expended for preparation of Educational Material relating to Public Health and Venereal diseases. $5,000.00

For the scientific study and treatment of Patients suffering from Syphilis in the Departments of Neurology and Obstetrics, the U. S. Government appropriated $9,000.00 from its Social Hygiene Fund. 2,250.00

December, 1919—DeLamar Bequest. 777,772.45

Captain Joseph R. DeLamar, of New York, who died in December, 1918, bequeathed to the University for the Medical Department a one-third interest in his residuary estate. This bequest may amount to as much as $4,500,000.00, and it is the purpose of the Trustees to preserve the principal intact as far as possible and to use the income therefrom for the purposes outlined by Captain DeLamar, as follows:

"To provide for the study and teaching of the origin of human disease and the prevention thereof, and for the study and teaching of dietetics and of the effect of different food and diets on the human system and how to conserve health by proper food and diet; and in connection with the foregoing purposes to establish and maintain professorships, instructorships, scholarships and fellowships: to construct, maintain and equip laboratories, clinics, dispensaries and other places for such study and research and to provide for the proper housing of the same: to publish and disseminate the results of such study and research not only in scientific journals and for physicians and scientists, but also,

and this I do especially enjoin on said legatees, by popular publications, public lectures and other appropriate methods to give the people of the United States generally the benefits of increased knowledge concerning the prevention of sickness and disease and also concerning the conservation of health by proper food and diet.

"In aid of the foregoing purposes the said beneficiaries may respectively use any means which from time to time shall to them respectively seem expedient, including research, publication, education, the establishment and maintenance of charitable, educational or benevolent activities, agencies or institutions appropriate thereto and the aid of any other such activities, agencies or institutions already established or which may hereafter be established.

"It is my hope that my said residuary legatees will be able to keep the principal of the bequest to them severally made intact and that they will be able by the proper investment thereof to accomplish the foregoing purposes by the use of the income therefrom, but I do not place any limitations on their right to use the principal of such bequest for the purpose above named should they or any of them desire to use the principal of the same for such purpose or purposes."

The University has thus far received from the executors of Captain DeLamar's estate $2,777,772.45 on account of its residuary bequest.

For the support of the School of Hygiene and Public Health, the Rockefeller Foundation contributed $292,668.96 to meet the expenses and cost of equipment of this School. $292,668.96

General Education Board appropriation for increased salaries. 30,000.00

General Education Board appropriation for the Department of Obstetrics. 20,000.00

An anonymous gift of $5,000.00 was received for the support of the Department of Art as Applied to Medicine.	$5,000.00
The Estate of Kenneth Dows continued the appropriation of $17,500.00 per annum for Tuberculosis Research.	17,500.00
For the support of the Department of Psychiatry, contributions of $5,875.00 were received.	5,875.00
For fellowships in Chemistry, E. I. DuPont de Nemours Co. contributed $1,500.00.	1,500.00
Mr. J. E. Aldred continued his annual gift of $5,000 for the Aldred Lectures and expenses in connection therewith.	5,000.00
Alumni Memorial Dormitory Fund. (Student collections only).	1,000.00
July, 1920—Anonymous, for salaries Mathematical Department.	1,000.00
November, 1920—"Anonymous," for remodeling "Barn."	18.84
January, 1921—John Glenn, for "Homewood Model."	965.44
January, 1921—Ben May, for the establishment of a Fellowship in Clinical Microscopy.	1,200.00
February, 1921—The James Schouler Lectureship and Endowment Fund. Received under the will of the late James Schouler, being the balance of an original gift of $25,000, received March, 1908.	14,000.00
February, 1921—Alumni Memorial Dormitory Fund. A fund raised by the Alumni of this	

University for the erection of a Dormitory at Homewood. $215,000.00.	
March, 1921—Robert Ridgway, for special books, Department of Civil Engineering.	$100.00
April, 1921—National Tuberculosis Association, for research on X-Ray Normals.	500.00
April, 1921—John A. J. Creswell Memorial Fund. A bequest of $20,000.00 left October, 1920, by Mrs. Hannah J. R. Creswell, of Cecil County, Md., as a memorial to her husband, John A. J. Creswell, statesman and lawyer. The income from this fund is to be applied to instruction or research in International Law, in such manner as may from time to time be deemed most advisable by the University authorities.	4,752.00
May, 1921—Miss Lillie Detrick, for *Modern Language Notes.*	100.00
June, 1921—John Glenn, for Models of Dormitory, Homewood.	1,200.00
June, 1921—George Barr Scholl Fund for Medical Research. A bequest received from Rev. George Scholl in memory of his son, Dr. George Barr Scholl, a student of the Medical School. The income to be used for Medical Research and for the purpose of reducing the tuition fees of Dr. Scholl's grandsons so long as they are students in the Medical School.	3,000.00
June, 1921—Bachelor of Science Alumni Endowment Fund.	130.00
Total Gifts and Bequests.	$1,190,532.69

PERSONAL MENTION

Sir Arthur Newsholme, formerly connected with the Local Government Board of England, who came to Baltimore in 1919 and inaugurated with great skill and success the department of Public Health Administration in our School of Hygiene and Public Health, retired from this work at the close of the year, to our great regret, and has returned to England.

Dr. Wade Hampton Frost, of the Federal Public Health Service, has been appointed Head of the Department of Epidemiology and Public Health Administrator, and he will have the co-operation of Dr. Allen W. Freeman, Commissioner of Health of Ohio, as Resident Lecturer. Dr. Frost has been a resident lecturer for two years. Dr. Freeman is a graduate in medicine of this University.

More particular reference to these changes is contained in the appendix to this report, in the statement of the School of Hygiene.

At the beginning of the academic year, on the eighth of September, Dr. Harmon N. Morse, Emeritus Professor of Inorganic and Analytical Chemistry, died suddenly at his summer home on the coast of Maine. Professor Morse was one of the first teachers in the University. In 1876 he was selected as a fellow, but was immediately promoted to a teaching position as Associate in Chemistry. He subsequently held the titles of Associate Professor and Professor of Inorganic and Analytical Chemistry and Director of the Chemical Laboratory, until 1916, when he retired from active duty and was made Emeritus Professor. An appreciation of his work by his colleague, Professor Frazer, appears in the *Alumni Magazine* for March, 1921. A memorial meeting was held on Sunday afternoon, April 24, and this is reported in the *Alumni Magazine* for June 1921.

The following appointments and promotions have been made for 1921-22 *:

* The appointments in the medical faculty are mentioned in the statement of the Dean in the appendix to this report.

In the Philosophical Faculty

Francis D. Murnaghan, Ph. D., from Associate to Associate Professor of Applied Mathematics.

David E. Weglein, Ph. D., from Instructor to Associate in Education.

George Boas, Ph. D., Associate in Philosophy.

Fowler D. Brooks, Ph. D., Associate in Education.

Cyril A. Nelson, Ph. D., Associate in Mathematics.

Ralph C. Williams, Ph. D., Associate in Romance Languages.

Joel H. Swartz, A. B., from Assistant to Instructor in Geology.

J. Graham Edwards, Ph. D., Assistant in Zoology.

Shachne Isaacs, A. M., Instructor in Psychology.

Francis Ludlow, A. B., Instructor in English.

Charles I. Silin, A. B., Assistant in French.

J. Earle Uhler, A. B., Instructor in English.

Thomas C. Whitner, Jr., Ph. D., Instructor in Chemistry.

In the Engineering Faculty

Harry W. Waterfall, S. B., from Associate to Associate Professor of Mechanical Engineering.

J. Truman Thompson, B. S. in Eng., from Instructor to Associate in Civil Engineering.

Guy L. Bryan, B. S. in Eng., Instructor in Civil Engineering.

In the Faculty of Hygiene and Public Health

Wade Hampton Frost, M. D., from Resident Lecturer to Professor of Epidemiology and Head of the Departments of Epidemiology and Public Health Administration.

Allen Weir Freeman, M. D., Resident Lecturer in Public Health Administration.

Percy D. Meader, Ph. D., from Instructor to Associate in Bacteriology.

Sylvia L. Parker, A. B., from Instructor to Associate in Biometry and Vital Statistics.

James A. Doull, M. D., Dr. P. H., Associate in Epidemiology.

Margaret B. MacDonald, Ph. D., Associate in Bio-Chemistry.

Wyatt W. Randall, Ph. D., Associate in Bio-Chemistry.

Richard B. Norment, M. D., Associate in Public Health Administration.

Ida W. Pritchett, A. B., Instructor in Immunology.

Helene Connet Wilson, Ph. D., Instructor in Physiology.

Raymond C. Salter, Sc. D., from Assistant to Instructor in Bacteriology.

Samuel R. Damon, Ph. D., Instructor in Bacteriology.

Abel Wolman, A. B., B. S. in Eng., Assistant in Sanitary Engineering.

J. Ernestine Becker, S. B., Assistant in Bio-Chemistry.

William A. Hoffman, S. B., Assistant in Medical Zoology.

Mary Gover, A. M., Assistant in Biometry and Vital Statistics.

Chong Eang Lim, Dr. P. H., Volunteer Assistant in Immunology.

COMMEMORATION DAY

The forty-fifth anniversary of the opening of the University was observed in the Lyric Theatre on the morning of Tuesday, February 22. The invocation was pronounced by Dr. William Rosenau, Rabbi of Oheb Shalom Synagogue. The principal address was delivered by Dr. Livingston Farrand, Chairman of the Central Committee of the American Red Cross, who gave an account of the conditions in Poland and other European countries and of the work done by the Society. The President of the University described the progress made during the preceding twelve months. His address and that of Dr. Farrand are printed in full in the *Alumni Magazine* for June 1921. Degrees were conferred as follows: Bachelor of Arts, two; Bachelor of Engineering, one; Doctor of Philosophy, six; Doctor of Medicine, six; Doctor of Public Health, two. The President announced that since the last Commencement the following degrees had been conferred: Bachelor of Arts, four; Doctor of Philosophy, one; Bachelor of Science, two. The names of the recipients of degrees are printed in the appendix to this report. The music for this occasion was furnished by the Johns Hopkins Orchestra.

The annual meeting and banquet of the General Alumni Association was held in the evening at the Baltimore Country Club. The class of 1896, which included the Governor of Maryland, Albert C. Ritchie, celebrated the twenty-fifth anniversary of its graduation.

COMMENCEMENT

The exercises of Commencement were held in the Lyric Theatre on the afternoon of Tuesday, June 21. Rev. Dr. Wyatt Brown, rector of St. Michael and All Angels' Church, offered the invocation. In lieu of a formal Commencement oration the President of the University read an address to the candidates for degrees, dwelling especially on the significance of the word "Commencement." A portrait of Professor Herbert S. Jennings was presented to the University by Professor Lovejoy on behalf of colleagues and friends. Degrees were conferred as follows: Bachelor of Arts, seventy-two; Bachelor of Engineering, thirty-seven; Bachelor of Science, twelve; Bachelor of Science in Chemistry, twelve; Bachelor of Science in Hygiene, four; Master of Arts, twenty-one; Master of Electrical Engineering, one; Doctor of Philosophy, twenty-five; Doctor of Medicine, eighty-seven; Doctor of Public Health, twelve; Doctor of Science in Hygiene, one. Certificates in Public Health were granted to six persons. For the names of recipients of degrees see the Appendix. We were again indebted to the Johns Hopkins Orchestra for the musical program.

PUBLIC LECTURES AND ASSEMBLIES

The Percy Turnbull Memorial Lectures on Poetry were given April 11-22 by Charles Mills Gayley, Litt. D., Professor of the English Language and Literature in the University of California. He chose for his general subject "Contemporary English Poetry," which he treated in six lectures, his would-be hearers greatly exceeding the capacity of the Civil Engineering auditorium. This was the twenty-third course in the series of Turnbull Lectures.

The James Schouler Lectures on History and Political Science were delivered by John Holland Rose, Litt. D., Professor of Naval History in the University of Cambridge. The general title of the course, the tenth on this foundation, was

"Sidelights on the World-War," and six lectures were given April 4-14 to large and appreciative audiences.

Two courses (the eleventh and twelfth in the series) were given on the Herter Foundation. In October (26-28) Dr. Jules Bordet, Professor of Bacteriology and allied subjects in the University of Brussels and Director of the Brussels Pasteur Institute, gave three lectures; and in April (12-14) Dr. Frederick G. Hopkins, Professor of Bio-Chemistry and Director of the Bio-Chemical Laboratory in the University of Cambridge, delivered three lectures.

Dr. Frederick J. Bliss, of New Haven, gave six public lectures in November (12-24) on "The Secret Cults of Syria." This course was under the auspices of the American Committee for Lectures on the History of Religions.

The fifth series of J. E. Aldred Lectures on Engineering Practice was given in January, February, and March, and consisted of three lectures by engineers and industrial managers in each of the three branches of engineering taught here, Civil, Electrical, and Mechanical. The lecturers and their topics are named in the statement of the School of Engineering appended to this report.

A series of afternoon lectures, numbering twenty-one, on selected topics in Hygiene and Preventive Medicine, on the De Lamar foundation, was given throughout the year in the hall of the School of Hygiene. The names of the lecturers and their topics will be found in the report of the Assistant Director printed on subsequent pages.

Before the Social Science Club of the University, whose membership is composed of members of the faculty and students, the following lectures were given at an afternoon hour and opened to the public: Professor A. O. Lovejoy, on "Profit-Sharing and Industrial Peace," November 4; Dr. John A. Ryan, on "Roads to Industrial Peace," December 10; Dr. Harry W. Laidler, on "Guild Socialism," January 24; Professor D. A. McCabe, on "The Problem of Industrial Peace," February 25.

The Gilman Memorial Lectures on Geography were inaugurated by a series of weekly lectures on "The Geographic Factors affecting Foreign Trade," by Major Lawrence Martin, of the General Staff Corps, United States Army. These lectures were given Monday evenings through the year and were open to all students, and academic credit was granted in some cases.

Under the auspices of the Archæological Institute of America five public lectures were given in the Civil Engineering hall. The lecturers and their subjects are named in subsequent pages of this report, in the statement of the department of Archæology and Art.

Public meetings and conventions have been held in the University buildings as follows: The thirty-fourth annual convention of the Association of Colleges and Preparatory Schools of the Middle States and Maryland, November 26 and 27, together with meetings of the following affiliated societies—the Classical Association of the Atlantic States, in co-operation with the Baltimore Classical Club, the Associations of Modern Language Teachers, of Mathematical Teachers, and of History Teachers in the Middle States and Maryland, the College Conference on English in the Central Atlantic States, the Association of Financial Officers of Universities and Colleges; the fifty-second annual meeting of the American Philological Association, the twenty-second general meeting of the Archaeological Institute of America, and a meeting of the Maya Society, December 28-30.

Yours respectfully,

FRANK J. GOODNOW,
President.

September 30, 1921.

REPORTS ON THE INSTRUCTION IN THE CHIEF BRANCHES OF STUDY, 1920-21

Prepared by the Principal Instructors in the Several Departments

ARCHAEOLOGY AND ART

The work in Archæology and Art has been carried on by means of the Archæological Seminary, various courses of lectures and practical exercises, demonstrations in the museum of the University, in the Peabody Gallery, in the Walters Art Gallery, and especially by means of conferences with individual students. The members of the Seminary meeting weekly devoted their attention to selected problems and topics in Greek archaeology, especially vases and sculpture. There were eleven advanced students in the seminary, each one of whom presented a long original paper and shorter reports. Seven of these followed archaeology as their principal subject and four as a subordinate subject. Of these one absolved the requirements for the degree of Ph. D., and two the requirements for the degree of Master of Arts, their names and the titles of the disertation and essays being as follows:

Mr. Franklin P. Johnson—Lysippus (Ph. D. dissertation);
Grace H. Beardsley—The Negro Type in Greek and Roman Art;
Elizabeth Persons—Caryatids and the Use of the Human Figure as a Support in Art.

There were 75 other students taking archaeology and art as undergraduates or graduates or special students, or in the College Courses for Teachers.

In addition to his direction of the Seminary, Professor Robinson lectured once a week during the year on Centres of Greek and Roman Life, studying especially the topography and history and the Greek and Roman monuments of Greece and Asia Minor, reading selections also from Pausanias and Strabo. He also lectured once a week on Greek and Roman vases as sources of information on mythology and private life. He also gave a series of weekly practical exercises on Greek inscriptions and discussed inscriptions throwing light on the political and social history of Greece. During the second half year Professor Frank gave a course in Latin palaeography. Professor Robinson also conducted a course on Roman Life as illustrated by Latin literature and the monuments with lectures and reports. He lectured once a week on Roman archaeology and art and once a week on the History of Greek literature with readings of selections. In the courses for teachers he conducted a two-hour course on the History of Art throughout the year. During the first half year he lectured two hours a week on Oriental Art including the art of Asia Minor, India, China, and Japan. He also gave informal instruction to Mr. F. P. Johnson in modern Greek in preparation for his study in Greece. Associate Professor Magoffin was absent on leave as Professor in Charge of the American School of Classical Studies in Rome.

On September 5, Professor Robinson lectured at Gloucester on "Greek Lyric Poetry with readings from Alcaeus and Sappho"; on November 2 at the Arundell Club on "The Greek Drama with readings from Aeschylus"; at the meetings of the American Philological Association and the Archaeological Institute of America which were held at the Johns Hopkins University during the Christmas holidays, he read a paper on "Etruscan Terra-cotta Antefixes"; on January 8 he gave a lecture at the University Museum of the University of Pennsylvania on "The History of War Memorials"; on January 17 he lectured in Richmond on "The Seven Biblical Churches of Asia Minor"; on February 19 he lectured to the Washington Archaeological Society on "Excavations in Western Asia Minor"; on February 23 he gave a talk on "Recent Developments at the Johns Hopkins University," and an address on "Sappho and Her Influence on Later Times" to the Georgia Alumni Association of the Johns Hopkins University at Atlanta, Georgia; on February 24 he lectured on "The Classical Sites of Asia Minor" at Emory University, and talked on "The Museums of the World" to the Atlanta Museum Association; on February 25 he was the guest of honor at the newly formed Southern Classical Association at the University of South Carolina, Columbia, South Carolina, and gave an illustrated lecture on "The Classical Sites of Asia Minor"; on March 24-26 he made the presidential address at the meeting of the College Art Association of America in Washington, and read an illustrated paper on "Etruscan Architecture"; on April 7 he talked to the students of the Western High School on "Roman Private Life as illustrated by the antiquities of the Johns Hopkins University"; on April 11 to the School Arts League on "Art"; on April 22-23 at the annual meeting of the Classical Association of the Atlantic States held in New York City he presided as president and made a a short address; on May 14 he attended the Managing Committee of the American School of Classical Studies at Athens in New York, and presented several reports.

Lectures were given under the auspices of the Archaeological Society by Sir William M. Ramsay on "A Retrospect and Prospect of Exploration in Asia Minor"; by Mrs. Zelia Nuttall, Honorary Professor in the National Museum, Mexico, on "Recent Archaeological Excavations in Mexico"; by Mr. William Bell Dinsmoor, Librarian of Avery Library, Columbia University, on "The Shrine of Apollo at Delphi"; by Professor Michael J. Rostovtzeff, late professor in the University of Petrograd, on "Greek and Oriental Art in Southern Russia 3000 B. C. to 300 A. D."; by Professor Franz Cumont, of Brussels, on "The Journey to the Beyond in Roman Paganism." Students of the Archaeological department attended these lectures as part of their work.

Mr. W. S. Rusk has been appointed Charles A. W. Vogeler Fellow in Archaeology for 1921-22. Mr. Franklin P. Johnson, Charles A. W. Vogeler Fellow in Archaeology for 1920-21, has been appointed Fellow of the American School of Classical Studies in Athens for 1921-22. He is the fifth student of the Johns Hopkins University to hold this fellowship. It is given by competitive examination in modern Greek and several other subjects. The previous winners

from Hopkins have been Dr. J. B. Edwards, now professor of Greek at the University of the South, and Drs. G. W. Elderkin and Allan Johnson, now professors at Princeton, and Miss Adele M. Wildes.

Professor Robinson has been elected President of the Baltimore Archaeological Society; Honorary President of the School Arts League; President of the College Art Association of America; Vice-President of the Archaeological Institute of America; President of the Johns Hopkins Philological Association; a member of the American Oriental Society; a corresponding member of the Numismatic and Antiquarian Society of Philadelphia; and joint editor with Professor Hadzsits of the University of Pennsylvania of a series of fifty or more volumes to deal with all the different fields of classical studies and to be entitled "Our Debt to Greece and Rome."

Needs.—The needs of the Department of Archaeology and Art, which was established only sixteen years ago, and which has received inadequate appropriations, are great. Many of the important archæological publications are lacking in the library and funds are especially needed to purchase photographs, to mount and care for those we have, and to buy some of the more expensive illustrated archæological books, to provide a fine collection of lantern slides, and to purchase antiquities and casts to add to our excellent archæological museum. Funds are also needed to publish a catalogue of the museum and especially of the beautiful collection of coins, which was recently presented by a former trustee, Mr. William H. Buckler. Ultimately a chair of mediæval and modern art should also be established. Money is needed for all these things and there are always many opportunities for archæological research such as the excavation of Sardis, which has already yielded things of the highest artistic and linguistic importance, the inscriptions being published by Mr. Buckler and Professor Robinson. There is also great need of a special museum building and we have material enough to start such a museum if it could be built.

PUBLICATIONS

David M. Robinson.

Review of Pennell's Etchers and Etching. *Art and Archaeology*, x, 1920, p. 157.

Review of Hoppin's Handbook of Red-figured Vases. *Art and Archæology*, x, 1920, p. 157.

Review of Beazley's Attic Red-figured Vases in American Museums. *Art and Archæology*, xi, 1921, pp. 77-8.

Review of Hill's Medals of the Renaissance. *Art and Archæology*, x, 1920, pp. 246-7.

Review of Beazley's The Lewes House Collection of Ancient Gems. *Art and Archæology*, x, 1920, pp. 247-8.

Review of Frank, An Economic History of Rome to the End of the Republic. *Art and Archæology*, xi, 1921, p. 79.

Review of Hambidge's Dynamic Symmetry. *Art and Archæology*, xi, 1921, pp. 123-125.

Review of Havell's The Ideals of Indian Art. *Art and Archæology*, xi, 1921, p. 125.

Review of Ferguson's Outlines of Chinese Art. *Art and Archæology*, xi, 1921, pp. 125 126.

Review of Miss Richter, The Metropolitan Museum. Catalogue of Engraved Gems of the Classical Style. *Art and Archæology*, xi, 1921, p. 173; *The Literary Review*, May 21, 1921, part III, p. 8.

Review of Allen's The Greek Theatre of the Fifth Century before Christ. *Art and Archæology*, xi, 1921, p. 268.

Review of Miss Vaughan's Madness in Greek Thought and Custom. *The Classical Weekly*, xiv, 1921, pp. 150-151.

Review of Marshall's Discovery in Greek Lands. *The Classical Weekly*, xiv, 1921, pp. 166 167; *Art and Archæology*, xi, 1921, p. 267.

Review of Miss McClees' A Study of Women in Attic Inscriptions. *The Classical Weekly*, xiv, 1921, pp. 197 199.

Review of Poulsen's Delphi. *Art and Archæology*, xi, 1921, pp. 45-46.

Review of O'Connor's The Charm of Kashmir. *Art and Archæology*, xi, 1921, pp. 46-47.

A Cylix in the Style of Duris. *American Journal of Archæology*, xxv, 1921, pp. 1-17, pls. I-III.

Etruscan and Later Terra-cotta Antefixes at the Johns Hopkins University. *American Journal of Archæology*, xxv, 1921, p. 79.

Editorial Work as editor in-chief of *The Art Bulletin*, as associate editor for *Art and Archæology*, *The Classical Weekly*, and *The American Journal of Philology*.

DAVID M. ROBINSON,
W. H. Collins Vickers Professor of Archæology and Lecturer on Greek Literature.

CHEMISTRY

The following courses were given during the year 1920-21:

I A. An elementary course of experimental lectures, accompanied by class room conferences and examinations, extending through the year.

II A. A laboratory course, also extending through the year, which was taken simultaneously with course I A and was designed to familiarize beginners with the experimental side of Chemistry and with the general principles of qualitative analysis. The lectures were given by Professor Gilpin, and the laboratory work was carried out under his direction with the assistance of Mr. Sharp and student-assistants.

I B. A course of lectures for students in the engineering department who take only one course in this subject. These students were given lectures in descriptive and applied general chemistry and about thirty lectures in organic chemistry.

II B. The laboratory work of this course was carried on by Dr. Cartledge and student assistants. The lectures of I B were given by Dr. Cartledge.

III. Systematic Inorganic Chemistry, a lecture course extending through the year, taken by undergraduates who had previously completed Courses I and II and by some graduates from other institutions.

IV. A laboratory course, extending through the year, in qualitative and quantitative analysis.

The lectures in this course were given by Dr. Cartledge; the laboratory work in qualitative analysis, for about half the year, was conducted under the direction of Dr. Cartledge and assistants; and quantitative work during the last half of the year by Mr. King.

V. Systematic Organic Chemistry, a course of lectures given by Professor Gilpin, which extended to March 1 and was taken by the more advanced undergraduate students and by less advanced graduate students from other institutions. As this course is required for entrance to medical schools, it is always taken by a number of premedical students from other institutions who are completing the requirements for the Medical School.

After March 1 Dr. Patrick and Mr. Sharp lectured to this class on Physical Chemistry.

VI. The laboratory work of this course consisted of work in quantitative analysis, until January 1, conducted by Mr. King, and organic preparations and a study of organic reactions, for the balance of the year, under Professor Gilpin and assistants.

VII. General Chemistry, a course of lectures through the year. This course is an introduction to theoretical chemistry for students not sufficiently prepared to take Physical Chemistry. This course is given by Professor Frazer.

VIII. Advanced Inorganic Chemistry, a course of lectures by Associate Professor Lovelace, which extended through the year.

IX. Advanced Organic Chemistry, a course of lectures extending through the year, by Professor Reid.

X. A laboratory course extending through the year, in the reactions and preparations of organic compounds, by Professor Reid.

XI. Quantitative Chemistry, a laboratory course extending through the year, by Dr. Thornton.

XII. Physical Chemistry, a course of lectures extending through the year, by Associate Professor Patrick.

XIII. Physical Chemistry Methods, a laboratory course conducted by Associate Professor Patrick.

XIV. Quantitative Chemistry, a course of lectures by Dr. Thornton.

XV. A laboratory course in inorganic and electrochemistry extending through the year, by Associate Professor Lovelace.

XVI. Student Lectures. A course of seventeen lectures on special topics by advanced students.

XVII. Journal Meetings. Reports on current articles in chemistry. Weekly through the year.

In coöperation with the School of Engineering, the degree of Bachelor of Science in Chemistry has been instituted. The course is designed to meet the requirements of those who wish more intensive training in Chemistry. The fourth year is devoted entirely to Chemistry, and the instruction is given by members of the graduate staff.

RESEARCH

During the year a variety of problems has been under investigation by members of the staff and advanced students associated with them.

Professor Frazer had associated with him in research Messrs. R. Gilchrist, W. A. Whitesell, and W. S. English. The problems investigated were:

1. The improvement of osmotic cells for use with electrolytes.
2. The effect of fineness of subdivision in the dissociation pressure of MnO_2 (Mr. English).
3. The atomic weight of Osmium (Mr. Gilchrist).
4. Study of a catalyst for the synthesis of ammonia (Mr. Whitesell).

Professors Frazer and Lovelace had associated with them Messrs. W. H. Bahlke, H. K. Parker, L. C. Beard, and W. R. Norris. The problems investigated were:

1. The lowering of the vapor pressure of water at 20° by dissolved lithium chloride (Mr. Bahlke).
2. The lowering of the vapor pressure of water at 20° by dissolved sucrose (Mr. Parker).
3. The lowering of the vapor pressure of water at 25° by dissolved sucrose (Mr. Beard).
4. The lowering of the vapor pressure of water at 20° by dissolved sodium chloride (Mr. Norris).

Associate Professor Lovelace had associated with him Dr. W. S. Hendrixson. The problem investigated was Electrometic titration as applied to certain reactions used in quantitative analysis.

Professor Reid had associated with him in research Dr. C. H. Milligan, Messrs. A. B. Brown, W. S. Hoffman, W. R. Waldron, T. B. Grave, J. C. Swenarton, R. Rosen, T. M. Berry. The problems investigated were:

1. The ethylation of benzene and napthalene (Dr. Milligan).
2. The catalytic amidation of alcohols (Mr. Brown).
3. Anthraquinone thioethers (Mr. Hoffman).
4. Derivatives of p. nitrothiophenol (Mr. Waldron).
5. Alkyloxy-piperidene compounds (Mr. Grave).
6. Higher alcohols formed by fermentation (Mr. Swenarton).
7. A mustard gas analog (Mr. Rosen).
8. Effect of rate of stirring on reaction velocity (Mr. Berry).

Associate Professor Patrick had associated with him in research Messrs. E. H. Barclay, L. Y. Davidheiser, F. V. Grimm, J. F. King, B. S. Neuhausen, L. H. Opdycke, J. E. Sharp, D. C. Jones, S. Klosky, and I. N. Kugelmass. During a part of the time Dr. D. C. Jones was a National Research Fellow.

The problems investigated were:

1. Impregnated gels of silica (Mr. Barclay and Mr. Klosky).
2. Adsorption of ammonia by silica gel (Mr. Davidheiser).
3. Heat of wetting from the standpoint of surface energy (Mr. Grimm).
4. Influence of capillarity on the adsorption from solution (Mr. Jones).
5. Measurement of dielectric constants (Mr. King).
6. A study of the system water-ammonia (Mr. Neuhausen).
7. A dynamic method for the study of the adsorption of vapors by porous bodies (Mr. Opdycke).
8. A method for the preparation of a large and constant surface of mercury (Mr. Sharp).
9. Ternary critical solution temperature as a criterion for the purity of compounds (Mr. Jones).
10. Rate of solution of colloidal ferric hydroxide (Mr. Kugelmass).

PUBLICATIONS

J. C. W. Frazer, with L. van Doren, P. L. Lotz, and H. K. Parker.

The use of the water interferometer as a pressure gauge.

J. C. W. Frazer, with P. L. Lotz.

The measurement of the osmotic pressure of sucrose solutions at 30° C. and 55.7° C.

J. C. W. Frazer, with C. S. Piggot.

The use of manganese in the catalytic oxidation of ammonia.

J. C. W. Frazer, with T. H. Rogers, C. S. Piggot, W. H. Bahlke, and J. M. Jennings.

The catalytic oxidation of carbon monoxide.

The above researches have been accepted for publication by the *Journal of the American Chemical Society*, and would have appeared during the summer but for delays due to the printers' strike.

B. F. Lovelace and J. C. W. Frazer, with V. B. Sease.

The lowering of the vapor pressure of water at 20° produced by dissolved potassium chloride. *Journal of the American Chemical Society*, 43, 102 (1921).

B. F. Lovelace.

Some present aspects of chemistry in the United States. Address as retiring vice president of the American Association for the Advancement of Science and Chairman of Section C. *Science*, 54, 139 (1921).

E. Emmet Reid, with O. B. Helfrich.

Reactions and derivatives of 2, 2′-dichloroethyl sulphide. *Journal of the American Chemical Society*, **42**, 1208 (1920).

Perchloro-methyl mercaptan. *Journal of the American Chemical Society*, **43**, 629 (1921).

E. Emmet Reid, with Y. Uyeda.

A sulphide acid, or the butyl ether of thioglycolic acid. *Journal of the American Chemical Society*, **42**, 2385 (1920).

E. Emmet Reid, with J. B. Rather.

Identification of acids. VI. Separation of acids by means of their phenacyl esters. *Journal of the American Chemical Society*, **43**, 629 (1921).

E. Emmet Reid, with T. C. Whitner.

A sulphide alcohol, or butyl mercaptoethyl alcohol. *Journal of the American Chemical Society*, **43**, 636 (1921).

Some derivatives of butyl mercaptan and their mercuric iodide compounds. *Journal of the American Chemical Society*, **43**, 638 (1921).

E. Emmet Reid, with R. L. Kramer.

The catalytic preparation of mercaptans. *Journal of the American Chemical Society*, **43**, 880 (1921).

E. Emmet Reid, with J. W. Kimball and R. L. Kramer.

The iodometric estimation of mercaptans. *Journal of the American Chemical Society*, **43**, 1199 (1921).

E. Emmet Reid.

Translation of Sabatier's *La Catalyse en Chimie Organique*. [In Press.]

W. A. Patrick, with F. K. Bell.

Influence of copper on the rate of solution of iron in acids. *Journal of the American Chemical Society*, **43**, March, 1921.

W. A. Patrick, with J. F. King.

The measurement of dielectric constants. *Journal of the American Chemical Society*, **43**, August, 1921.

W. A. Patrick, with B. S. Neuhausen.

Organo gels of silicic acid. *Journal of the American Chemical Society*, **43**, August, 1921.

W. S. Hendrixson.

Determination of iodic acid and silver by electrometric titration. *Journal of the American Chemical Society*, **43**, 858 (1921).

W. S. Hendrixson.

Electrometric determination of bromate, dichromate, nitrite and chloride ions. *Journal of the American Chemical Society*, **43**, 1309 (1921).

STUDENTS

The number of students working in the Chemical Laboratory was 361, of whom 37 were graduate students following Chemistry as their principal subject.

The following received the degree of B. S. in Chemistry:

Biemiller, L. E.	Mullikin, K. R.
Birkmeyer, J. F.	Rosenthal, D. T.
Call, L. W., Jr.	Shaw, E. H.
Chenoweth, G. L.	Strasburger, L. V.
Jones, J. M.	Suwall, F. S. J.
Miller, L. D. B.	Wilhelm, J. R.

One was granted the degree of Master of Arts: G. D. Palmer.

The following were promoted to the degree of Doctor of Philosophy:

Klosky, Simon: Impregnated gels of silicic acid.

Jones, D. C.: Ternary critical solution temperatures as a criterion of chemical purity.

King, J. F.: Dielectric constant: its relation to the structure of liquids.

Neuhausen, B. S.: Study of the system water-ammonia.

Sharp, J. E.: A proposed method for the preparation of a large and constant surface of mercury.

Kugelmass, I. N.: The rate of solution of colloidal ferric hydroxide.

Parker, H. K.: A study of the vapor pressure of aqueous solutions of cane sugar at twenty degrees.

Bahlke, W. H.: A study of the vapor pressure of aqueous solutions of lithium chloride at twenty degrees.

Dr. C. H. Milligan held the Grafflin Scholarship and Dr. W. S. Hendrixson and Dr. F. K. Bell were Grafflin assistants. Mr. W. H. Bahlke and Mr. B. S. Neuhausen held the E. I. du Pont de Nemours Fellowships.

E. EMMET REID,
Secretary, Chemical Staff.

EDUCATION

The Educational Seminary continued to devote its attention to the administrative aspects of the problems of specific professional interest to its members. The problems of the year related themselves more directly to certain phases of instruction. The instruction and investigations were directed by Professor Buchner. Special reports of studies brought to a conclusion were as follows: M. O. Ebaugh, "A study of the county high schools of Maryland with reference to the Ayres' index"; F. M. Froelicher, "An experimental study of the reading choices of ninth grade pupils"; E. P. Hayes, "Chapel exercises in American colleges"; R. E. Hoke, "The improvement of speed and accuracy in typewriting." Miss Ebaugh, Mr. Froelicher, Mr. Hayes, and Mr. Schad (of the preceding year) completed their requirements for the degree of Master of Arts. Mr. Hoke completed his doctoral dissertation. The following studies were begun: R. N. Dempster, "The Co-ordination of preparatory training with college work revealed by students' records"; W. R. Flowers, "Reorganization of the elementary grades on the basis of a better classification of pupils"; J. Grape, "Some aspects of state and high school administration"; F. A. Kuller, "Content and organization of instruction in ancient history"; E. C. Sanford, "The problem of higher education in the United States"; J. K. Smith, "The third group high school and the 1920 Maryland school law"; I. Williams, "The development of vocational education in Indiana."

The investigations in the field of Experimental Education were conducted under Professor Buchner. Reports of the following studies were made: C. E. Adams, "Supervised study in English history, an experiment with pupils of first year classes at the Baltimore Polytechnic Institute"; E. L. Dixon, "Outcome test in plane geometry" (in collaboration with Dr. Shorling); W. R. Flowers, "The application of intelligence tests to the classification of elementary pupils"; G. A. Kramer, "The measurement of spelling in grade three, with the correlation between the Ayres and the Buckingham tests"; F. A. Kuller, "Measurement of ability in ancient history"; B. L. MacCarthy, "Formulation of completion tests in psychology and in education as means of testing the progress of students in these subjects in the first year of normal schools"; J. F. Ruppel, "The amount of retardation, and the spelling and the reading abilities of pupils in Public School No. 42"; J. K. Smith, "Retarded elementary pupils, the Mt. Airy School"; L. L. Thomason, "Experiments in character and conduct education." Additional studies were begun or continued from the preceding year, as follows: C. E. Adams, "Teaching English history"; A. M. Broening, "Teaching appreciation of literature in the fifth grade"; G. D. Broening, "Method of teaching composition to pupils in the fourth grade"; G. Fox, "The problem of the eighth grade in the Maryland county school system"; F. M. Froelicher, "A standard word test in French"; J. Grape, "The cost of pupils' absence in Maryland county schools and the remedy"; S. S. Handy, "High School English"; S. W. Sparks, "First-year Latin vocabulary tests"; I. A. Williams, "Teaching of geometry."

For advanced students Associate Professor Bamberger conducted a course on Modern Educational Theory, and a course on Supervision of Elementary Schools. The application of educational measurements was a special feature of the latter.

One of the two needs of the Department reported last year was met by the appointment to the staff of Dr. Fowler D. Brooks as Associate in Education, whose services are to begin in the coming summer session. Dr. Brooks' assignment to Educational Psychology and its derivatives will enable the University to provide the necessary instruction, training, and investigations in the educational tests, the progress and the mental development of pupils in elementary and secondary schools. The other need of an experimental school located on the campus continues to be more and more pressing, in order to complete the University's scheme for contributions to educational practice.

The "Measuring Scale for Free-hand Drawing, Part I," begun during his residence at the University last year by Dr. Linus W. Kline, now of Skidmore School of Arts, was completed during the year in co-operation with Miss G. L. Carey, of Duluth, Minn., and will be published as one of *The Johns Hopkins University Studies in Education*.

UNDERGRADUATE COURSES

The instruction in this department maintained in the College Courses for Teachers was open to collegiate students. The scope of the instruction, as arranged in accordance with the regulations governing the requirements of certificates issued to secondary teachers fixed in accordance with law by the Maryland State Board of Education, continues to prove satisfactory in enabling students to meet both academic and professional needs in this subject with the sole exception of practice teaching.

Professor Buchner gave instruction in the History of Education and Educational Psychology, each course meeting two hours a week through the year.

Associate Professor Bamberger conducted two courses, Elementary School Organization and Classroom Management, and Elementary Education, each course meeting two hours a week through the year. In response to the needs of a special group of students at the beginning of the session, she also conducted a course on Project Method of Teaching, not announced in the circular, two hours a week through the year.

Dr. Weglein gave instruction in Secondary School Organization and Class Room Management, and the Junior High Shcool, each course meeting two hours a week through the year.

Dr. Jonathan T. Rorer, of Philadelphia, conducted a course on the Teaching of Mathematics in the Junior High School.

Miss Sarah E. Simons, of Washington, D. C., conducted a course on the Teaching of English Composition in the Junior High School.

University Extension Centers were maintained during the year at three places in Maryland. At Frederick, Professor Buchner conducted

a course on Experimental Education. Associate Professor Bamberger conducted at Elkton a course on Elementary School Organization and Classroom Management, and at Rockville a course on Elementary Education.

During the year Professor Buchner was made a member of the Educational Advisory Board of the Beaver Country Day School, Inc., Boston, Mass., newly organizing under the direction of E. R. Smith, appointed a member of Committee D, Relation of Vocational Education to General Education, of the American Association of University Professors. He also continued his services as a member of the Commission on Accrediting Higher Institutions of the Southern Association of Colleges and Secondary Schools and attended its meeting in Chattanooga, and as a member of the National Council of Education of the National Education Association.

Associate Professor Bamberger continued her services as Secretary-Treasurer of the National Society of College Teachers of Education at the Atlantic City meeting and as Vice President of the Educational Society of Baltimore.

In the reorganization of the Baltimore public schools, under the superintendency of Dr. Henry S. West, Dr. David E. Weglein was promoted from the principalship of the Western High School to an assistant superintendency and placed in charge of the secondary schools. Under the arrangement sanctioned by the Board of School Commissioners, Dr. Weglein was enabled to continue giving instruction in the department. He aso served as president of the Educational Society of Baltimore.

PUBLICATIONS

E. F. Buchner.

The Johns Hopkins University Summer Course (1920). *Fifty-Fourth Annual Report of the State Board of Education of Maryland,* 1919. Baltimore, 1920, pp. 40-42.

F. E. Bamberger.

Progressive Education in Public Schools. *Educational Review,* January, 1921, vol. 61, pp. 19 30.

EDWARD F. BUCHNER,
Professor of Education.

ENGLISH

1. Advanced Courses.

The advanced students in English are organized into a Seminary, which is conducted by Professor Bright. Graduate students are admitted to the Seminary as soon as they have satisfied initial requirements for specialization and research. The discipline of the Seminary is designed to impart training in scholarly methods of dealing with literary and linguistic problems. Study and investigation are bestowed on selected periods of literary and linguistic history, on departments of literature extending through successive periods, and on the works of important writers, taken separately or in groups. Usually there is a change of subject each half-year. During the academic year, 1920-1921, the sessions of the Seminary occupied four hours a week.

During the first half year the sessions of the Seminary were devoted to a critical reading of the Minor Poems of Chaucer. Special attention was bestowed on Chaucer's use of 'sources,' and on the aesthetic aspects of his art.

In the second half-year a study was made of the rise and development of the Liturgical Plays. There was also a partial survey of the growth and inter relations of the Cyclic Plays.

Professor S. C. Chew, of Bryn Mawr College, gave a course of ten lectures (Feb. 19 to March 19) on the Tudor Stuart Drama.

Professor Bright met a class twice a week through the year for the critical interpretation of Cynewulf's *Christ*.

In the second half year he lectured on selected topics in the historical grammar of English.

He also gave a course in Anglo-Saxon, extending through the year (two hours a week), that was to serve as an introduction to the science of language and as a basis for the historical study of English.

2. College Courses.

English Composition 1, a course in English Composition and Rhetoric prescribed for first year students, was given three hours weekly throughout the year. Associate Professor French met the whole class twice a week for lectures and assignments; for the criticism of themes and for recitations the class was divided into eight sections, four of which were taught by Dr. Baker, two by Mr. Litz, and two by Mr. Cushing. The plan, used successfully last year, of making the written work of the first three months an exercise in vocational guidance, was continued with satisfactory results. This plan included practical exercises in the use of bibliographies, library catalogs, and works of reference. A mimeographed text, *Usage, Structure, and Style*, specially prepared for this course, was used as a handbook. The work of the course included the reading, month by month, of assignments in prose and verse.

English Composition 2, an elective course in exposition and persuasion, was given by Mr. Cushing, two hours weekly during the first half-year and, for another section, during the second half. The

class met as a whole one hour a week and in two smaller groups weekly for recitation and conference. The *Century Handbook of Writing* was used as a manual of style and Eason and Weseen's *Engish, Science, and Engineering,* as a text.

English Literature 1 was given three hours a week through the year by Associate Professor French and Mr. Weber. The course included two lectures weekly and one hour of recitation and written exercises. For this third hour the class was divided into four sections, of which three were taught by Mr. Weber and one by Dr. French. The class studied the period from the revival of learning to the death of Shakespeare, giving special attention to the poetry of Spenser, as represented by *The Faerie Queene, Book I,* and other poems, and to the Elizabethan drama as represented by *Twelfth-Night* and other Shakespearean comedies.

English Literature 2 was given by Professor Greene, three hours a week, through the year. The course included a study of the English and Scottish popular ballads, of the poems of Burns, Scott, Wordsworth, Coleridge, Byron, Keats, and Shelley, and of the novels of Scott. In connection with the weekly lectures and discussions the members of the class did a large amount of reading, and prepared five papers.

English Literature 3, an elective course in American literature, was given in the late afternoons as English II of the College Courses for Teachers. It was conducted by Associate Professor French.

English Literature 4 was given by Professor Greene, three hours a week, during the first half-year. After a brief introduction to the pronunciation and grammar of Middle English, the class read about ten thousand lines of the poems of Chaucer, chiefly from the *Canterbury Tales,* but including also *The Parlement of Foules,* parts of *The Legend of Good Women,* and several of the minor poems.

English Literature 5 was given by Professor Greene, three hours a week, through the year. The course included (*a*) the reading and discussion of six of the histories and tragedies of Shakspere and of the *Sonnets,* and a careful study of *King Henry the Fifth* and of *Othello;* (*b*) a survey of the origin and development of the English drama from the liturgical plays to its culmination in the tragedies of Shakspere. The class read and discussed representative Miracle Plays, Moralities, and Interludes; Early Comedy and Early Tragedy; representative plays by Lyly, Peele, Greene, Kyd, five plays by Marlowe, and one play by Ben Jonson.

English Literature 7, a new course in Victorian writers, was given by Professor Greene, three hours a week, through the year. This course included a study of the essay, as represented by Carlyle, Macaulay, and Ruskin; of poetry, as represented by Tennyson, Browning, and Mrs. Browning; of the novel, as represented by Dickens and Thackeray. The reading included *Sartor Resartus* and several essays by Carlyle; six essays by Macaulay; chapters in *Modern Painters* and *The Stones of Venice, Unto This Last, Sesame and Lilies,* and *Praeterita;* much of the poetry of Tennyson and Browning; one novel by Dickens and one by Thackeray. The lectures in-

cluded a discussion of the social and political conditions of the time. The members of the class prepared ten papers, which were read and discussed in the class-room.

Public Speaking 1, a course in reading and speaking, was given as an elective, one hour a week through the year, by Mr. Litz. For convenience in instruction the class met in three sections. Knapp and French's *The Speech for Special Occasions* was used as a text-book.

Public Speaking 2, a continuation of English Composition 2, was given two hours weekly, as a half-year elective, by Associate Professor French and Mr. Litz. Six sections were organized, of which two were met by Dr. French and four by Mr. Litz. The text used in English Composition 2 served for this course also.

Contests in Public Speaking and Debating were held during the year as follows:

(1) The Freshman-Sophomore Debate, January 15, on the prohibition of immigration for a period of ten years. Won by the sophomore team.

(2) The contest of the Southern Intercollegiate Oratorical Association, March 11, at the University of North Carolina. Our representative, Mr. Theodore Gould, '21, won the second prize.

(3) The Twenty-Fourth Adams Debate between the junior and senior classes, March 19, on the further restriction of immigration. Won by the junior team.

(4) The Adams Contest in Public Speaking, before the assembly of April 14. Won by Mr. John P. Stump, '23.

(5) The Tocqueville Contest in Oral Discussion, for the Tocqueville medal, April 28. Won by Mr. Albert J. Langeluttig, '22.

(6) The Triangular Intercollegiate Debate, April 30, by teams representing the University of North Carolina, Washington and Lee University, and Johns Hopkins, on the restriction of immigration. The affirmative won in each of the three contests.

3. College Courses for Teachers.

English II, a course in American literature, was given two hours weekly through the year by Associate Professor French. The course consisted of a study of American prose and verse by literary types. Pattee's *Century Readings in American Literature* was used as an anthology.

English I, a course parallel to English Composition 1 in the College of Arts and Sciences, was given two hours weekly by Mr. Litz.

PUBLIC LECTURES

The twenty-third course of The Percy Turnbull Memorial Lectures on Poetry was given (April 11 to April 22) by Dr. Charles Mills Gayley, Professor of the English Language and Literature in the University of California. The course consisted of six lectures on Contemporary English Poetry.

PUBLICATIONS

James W. Bright.

The Individuality of Speech. *The Johns Hopkins Circular*, No. 325, pp. 32-35.

Brief Mention of the following books: Alfred J. Wyatt, An Anglo-Saxon Reader;—Lauchlan Maclean Watt, Douglas's *Æneid;*—Erich Neuner, Ueber ein- und dreihebige Halbverse in der altenglischen alliterierenden Poesie;—M. A. Bayfield, A Study of Shakespeare's Versification;—Eduard Eckhardt, Chaucers Sprache und Verskunst, dargestellt von Bernhard ten Brink;—Frederick M. Padelford, The Poems of Henry Howard, Earl of Surrey;—Arthur G. Kennedy, The Modern English Verb-Adverb Combination;—Albert Keiser, The Influence of Christianity on the Vocabulary of Old English Poetry;—Sir Arthur Quiller Couch, On the Art of Reading. *Modern Language Notes*, XXXV (1920), November—XXXVI (1921), June.

JAMES WILSON BRIGHT,
Caroline Donovan Professor
of English Literature.

GEOLOGY

The Geological Laboratory was open daily throughout the year for both graduate and undergraduate students, with about the usual attendance of graduate students and a marked increase in the number of undergraduate students in the elementary courses.

LECTURES

Undergraduate Courses

(a) Geology I: Physiography, Dynamical and Historical Geology, by Professor Swartz. *Three lectures and one afternoon of practical work each week.*

(b) Geology II: Mineralogy and Elementary Petrography, by Professor Swartz. *Three lectures and two afternoons of practical work each week.*

(c) Geology III: Appied Geology, by Professor Mathews. Not given in 1921.

(d) Geology IV: Historical Geology, by Professor Berry. *Three lectures each week.*

Graduate Courses

(e) Geophysics, by Professor Reid. *Two lectures each week.*

(f) Optical Mineralogy, by Professor Mathews. *Two lectures and two afternoons of laboratory work each week.*

(g) Petrology, by Professor Mathews. *Two lectures each week.*

(h) Paleontology, by Professor Berry. *Two lectures and two afternoons of laboratory work each week.*

(i) Principles of Economic Geology, by Associate Professor Singewald. Three lectures each week, first half-year.

(j) Geological Conferences. Weekly.

FIELD STUDIES

(k) The undergraduate students were given field trips in the vicinity of Baltimore weekly during the fall and early winter months and in the spring two field trips of a week or more in duration were conducted by Dr. Swartz into the folded paleozoic rocks of Western Maryland. Graduate students were taken on a trip into the mining areas of Pennsylvania and New Jersey, including the well-known localities of Cornwall, Pennsylvania and Franklin, New Jersey. The long seasons of practical field work which the graduate students now have each summer make field trips during the academic year less essential than formerly.

The summer work by graduate students is more frequently carried on in conjunction with officials of the U. S. Geological Survey and various State Surveys than with the members of the geological faculty. During the coming season the assignments of students are as follows:

E. M. Spieker, in charge of a large field party for the U. S. Geological Survey in the Book Cliffs region of Utah.

Joel H. Swartz, areal and structural studies of the Chattanooga black shale of Tennessee under the auspices of the Tennessee Geological Survey.

J. K. Roberts, areal and structural studies in the Triassic of Virginia under the auspices of the Virginia Geological Survey.

George M. Hall, studies in the underground water resources of central Montana under the auspices of the U. S. Geological Survey.

J. B. Eby in the coal measures of Wise County, Virginia, under the auspices of the U. S. Geological Survey.

J. D. Sisler, assistant geologist with the Pennsylvania Geological Survey.

L. C. Fenstermacher, areal geological work along the foothills of the Rocky Mountains of Montana under the auspices of the U. S. Geological Survey.

Mark Secrist, investigation of zinc deposits of Tennessee under the auspices of the Tennessee Geological Survey.

J. E. Hoffmeister, Quentin Singewald, Raymond Hazeltine and E. Willard Berry, field assistants on the U. S. Geological Survey in Montana, Colorado, and Utah.

Walter R. Smith, field assistant in Alaska with party of the U. S. Geological Survey.

Winifrid Goldring in the Devonian of New York under the auspices of the Geological Survey of that state.

ACTIVITIES

The work of the Department has been unusually active this year despite the very unsatisfactory conditions of crowding under which it had to be carried on. Much work has been accomplished on the South American collections and although arrangements for publication have not yet been competed, several researches have been completed and are awaiting publication.

The study of the crystalline rocks of the Piedmont region of Maryland and Pennsylvania has continued and is now nearing completion.

Professor Mathews during the last year has continued his work as Chairman of the Division of Geology and Geography of the National Research Council in conjunction with the academic work of the Department and Director of the several State bureaus for which he is responsible. This work has been carried on in addition to his regular duties of instruction. Dr. Mathews has also continued as Chairman of the Advisory Council of the U. S. Board of Surveys and Maps and as a representative of the National Research Council in visiting educational institutions, particularly in the Middle West. He has also served as examiner in geology for the U. S. Civil Service Commission.

Field work with the coöperation of Maryland and Pennsylvania has been continued through the agency of Doctors Jonas and Knopf and a field conference of geologists from the U. S. Geological Survey has confirmed the interpretations of stratigraphy and geological history proposed by these workers for the intricate formations of the Maryland Piedmont.

Professor Reid has continued his studies on seismology and dynamical geology. His work has been on special problems some of which are indicated in his bibliography.

Professor Berry, in addition to his academic duties, devoted a considerable time during the year to the study of materials from South America, both those collected by the Williams Expedition and additional collections submitted by the U. S. National Museum. Monographic studies of paleontologic collections from Texas, Kansas, and western Canada, have been completed and transmitted for publication to the U. S. Geological Survey and the Geological Survey of Canada. A monograph of the Cretaceous Flora of North Carolina was completed and will be published shortly by the Geological Survey of that state. Materials from Panama, Costa Rica, Venezuela, and the Dominican Republic have been studied and described for the U. S. National Museum. Editorial work for the American Journal of Science, and of the section of Paleobotany and Evolutionary History for Botanical Abstracts, has been carried on, and a paper on the present status of our knowledge of the geology of western South America was prepared for the Pan Pacific Congress.

Dr. Swartz has continued his studies on the Carboniferous and has issued in conjunction with his assistants a second report on the Coals of Maryland.

Dr. Singewald was engaged during the year in studies on the ore deposits of Peru and Bolivia. The summer was spent in professional work in Mexico.

During the year there were in the Department twelve graduate students with geology as their principal subject and eighty-nine others taking the subject for a subordinate or as undergraduates.

Mr. E. M. Spieker completed during the year his dissertation on the Molluscan fauna of the Zorrites formation of Peru, and in June received the degree of Doctor of Philosophy.

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Berry, Edward W.

Age of the Andes. *Geol. Soc. Amer. Bull.*, vol. xxxii, pp. 39 40, 1921.

A Potomogeton from the Upper Cretaceous. *Amer. Jour. Sci.*, ser. 5, vol. 1, pp. 421-423, 1921.

Geologic history of the Corocoro copper district, Bolivia. Abst. *Geol. Soc. Amer. Bull.*, vol. xxxii, p. 44, 1921 (with J. T. Singewald, Jr.)

The Teaching of Paleontology, *Geol. Soc. Amer. Bull.*, vol. xxxi, pp. 389-392, 1921.

Paleontology and Pragmatism. *Science*, n. s., vol. lii, p. 529-531, 1921.

The Williams Memorial Expedition. *New York Times*, Book Review and Magazines, Nov. 14, 1921, p. 8, 50.

Ravn's Cretaceous Fauna of West Greenland. *Amer. Jour. Sci.*, vol. i, pp. 93, 94, 1921.

A Palm Nut from the Miocene of the Canal Zone. *U. S. Nat. Mus., Proc.*, vol. lix, pp. 21 22, figs. 1 3, 1921.

Tertiary Fossil Plants from Costa Rica. *U. S. Nat. Mus., Proc.*, vol. lix, pp. 169 185, 1921.

Contributions to the Mesozoic flora of the Atlantic Coastal Plain, XIV. Tennessee. *Torrey Bot. Club. Bull.*, vol. xlviii, pp. 55-72, 1921.

Paleontology, Its Contributions to Knowledge. *Scientia*, April, 1921.

Arber on Devonian floras. *Amer. Jour. Sci.*, vol. i, pp. 514 515, 1921.

Mathews, Edward Bennett.

Geology and geography in the United States, Abst. *Geol. Soc. Amer.*, vol. xxxii, p. 44, 1921.

Report of Division of Geology and Geography. *Fifth Ann. Rept. National Research Council*, pp. 44 46, 1921.

Reid, Harry Fielding.

The problems of seismology. *Nat. Acad. Sci., Proc.*, vol. vi, pp. 555 561, 1920. Reprint and Circular Series of Nat. Research Council, No. 11, p. 92, 1920.

The Kilauea Volcano Observatory. Report to the Secretary of Agriculture by a Committee consisting of Whitman Cross, Chairman, Wm. Bowie, Arthur L. Day, H. E. Gregory, H. Fielding Reid. *Nat. Acad. Sci. Proc.*, vol. vi, pp. 706-716, 1921.

Singewald, Joseph T., Jr.

Across the Peruvian Andes on mule back. *Bull. Pan American Union*, vol. lii, pp. 117 192, 1921.

Among Bolivia's highest tin mines. *Bull. Pan American Union*, vol. lii, pp. 217-235, 1921.

Bolivia. *Eng. and Min. Journ.*, vol. cxi, p. 189, 1921.

Geological history of the Corocoro copper district. Abst. *Geol. Soc. Amer., Bull.*, vol. xxxii, p. 66, 1921.

Ore deposition in the Bolivian tin silver deposits. *Econ. Geology*, vol. xvi, pp. 60 69, 1921.

Peru. *Eng. and Min. Journ.*, vol. cxi, pp. 188-189, 1921.

Age of the Andes. Abstract. *Geol. Soc. Amer., Bull.*, col. xxxii, pp. 39 40, 1921. (With E. W. Berry.)

EDWARD B. MATHEWS,
Chairman, Geological Staff.

GERMANIC PHILOLOGY
GERMAN LANGUAGE AND LITERATURE

Certain changes in the arrangement of the courses and the distribution of the work among the various instructors became necessary owing to the fact that, after having successfully given his efforts for many years to the building up and the direction of the German department, Professor Henry Wood decided to retire. While this is hardly the place to dwell at length on Professor Wood's achievements, it seems appropriate to say at least that his former associates will always remember with pleasure the time of their coöperation with him.

GERMANIC SEMINARY

The work of this Seminary was equally divided between Middle High German (*two hours weekly*) in the first half-year and Old Saxon (*two hours weekly*) in the second half-year. During both terms the work was under the direction of Professor Collitz.

The *Iwein* of Hartman von Aue was selected as the subject for the exercises in Middle High German not only on account of its being one of the best known epic poems or, in fact, the most "classical" of Middle High German court epics, but also because the standard edition of this epic by G. F. Benecke and K. Lachmann (published first in 1827, and in a fourth edition half a century later) affords to this day the best opportunity for the study of problems in Middle High German metre and text criticism.

"Old Saxon" is the name generally used to designate a language occupying (similar to Old Frisian) a position intermediate between Anglo-Saxon and the Teutonic languages of the Continent. While the home and the development of this language remain largely a matter of controversy, there is no doubt as to the value and general importance of the two religious epics, known as the *Heliand* and the *Genesis*, constituting the chief literary sources of this language. The critical reading of selections from these two poems and a dis-

cussion of the various theories concerning "Old Saxon" served as the basis for the seminary work during the second half year.

ADVANCED COURSES

The following courses for graduate students were given by Professor Collitz:

1. General Phonetics, introductory to the study of Modern Languages. *One hour weekly, first half year.* A brief survey was given of the history of phonetics, stress being laid on the different aims that may be pursued and the different methods that have been employed in the study of phonetics. In the systematic part of the course the aim was to emphasize the tasks belonging to the domain of philology or linguistics, as distinguished from the anatomical, physical, and physiological features to which a prominent place is properly accorded in experimental phonetics. Special attention was paid to the attempts at systematising the speech sounds, made by scholars like Hellwag, Brücke, Lepsius, Sievers, Robert Ellis, Melville Bell (father of the inventor of the telephone), V. Passy, Vietor, etc. The views set forth by these and other authorities differ to such an extent, especially with regard to the vowel-sounds, that many phoneticians seem to have abandoned the hope of ever harmonizing the conflicting opinions. Discouraging as this situation may appear, a suggestion could be made (different from the solution proposed by Passy and Vietor) toward combining the two principal systems (i. e., Hellwag's and Bell's) by adopting Hellwag's triangle (or, if we prefer, septangle) for the elementary classification and following (though with certain essential modifications) Bell's "Visible Speech" for the enlargement of the system.—The course was attended by students from various philological departments (English, Romance Languages, Sanskrit, and Germanics).

2. Gothic and the Elements of Comparative Germanic Grammar. *Two hours weekly through the year.* The reasons for combining the study of Gothic with that of Comparative Germanic Grammar have been dwelt upon repeatedly in these Reports (see, e. g., the Annual Report for 1918-19, p. 43).

3. Modern Low German Dialects. *Two hours weekly, first half-year.* This course was offered in continuation of a former course on Low German Authors (cf. the *Annual Report* for 1919-20, *J. H. U. Circular*, nr. 327, p. 48). Klaus Groth, next to Fritz Reuter the best known literary representative of Low German, received the principal share of attention. In order to illustrate an entirely different type of Modern Low German, specimens of the Waldeckian Low German dialect (printed in the Appendix to K. Bauer's *Waldeckisches Wörterbuch*, hrsg. von H. Collitz, Leipzig, 1902) were analyzed.

4. Poems of Walther von der Vogelweide. *Two hours weekly, second half-year.* A course arranged for the benefit of advanced students in Middle High German. The new revision by Carl v. Kraus of Lachmann's well known edition of Walther's poems (seventh ed., Berlin, 1907) was used for the critical reading of selections from both the *Lieder* and the *Sprüche*. A comparison of

Lachmann's text with the reprints by Pfeiffer and Pfaff of the three principal MS. collections of the M. H. G. Minnesingers proved instructive in more than one respect.

COLLEGIATE COURSES

Associate Professor Kurrelmeyer gave the following undergraduate courses:

German 2. Contemporary Literature in rapid reading. *Three hours weekly.* Sudermann, *Frau Sorge; Teja;* C. F. Meyer, *Das Amulet;* Keller, *Frau Regel Amrain; Die drei gerechten Kammacher;* Storm, *Pole Poppenspäler;* Raabe, *Die schwarze Galeere;* Droste-Hülshoff, *Die Judenbuche;* Grillparzer, *Die Ahnfrau;* Hebbel, *Herodes und Mariamne;* Ludwig, *Der Erbförster.*

German 4. Scientific Readings. *Two hours weekly.* Wright, *German Science Reader;* Kip, *A Scientific German Reader.*

Associate Professor Roulston gave the following undergraduate courses:

German 1. Modern Prose Readings and Prose Composition. *Four hours weekly through the year. German Short Stories* ed. Bender; Heyse, *Die Blinden;* Arnold, *Einst im Mai;* Keller, *Die drei gerechten Kammacher;* Meyer, *Gustav Adolfs Page.* Prose Composition based upon Holzwarth, *Gruss aus Deutschland, and Heyse, Die Blinden.*

German 5. Medical German. *Two hours weekly through the year.* Rebmann, *Der menschliche Körper,* and Seiler, *Gesundheitslehre;* Kreibig, *Die Sinne des Menschen.*

Associate Professor Roulston also conducted two courses of *three hours each through the year* in the College Courses for Teachers. One of these was an elementary course in which Vos, *Essentials of German,* was thoroughly studied and Gerstäcker, *Germelshausen,* was read. The other course corresponded to the regular German 1 of the undergraduate department.

OTHER ACTIVITIES

Professor Collitz served as a member of a Committee of Six, appointed by the International Research Council, to consider the desirability of recommending an auxiliary language. He continued his services as a member of the "Joint Committee on Grammatical Nomenclature," appointed by the National Education Association, the Modern Language Association of America, and the American Philological Association, and as a member of the "Filology Committee" of the Simplified Spelling Board. Professor Kurrelmeyer continued to serve as Co editor of *Modern Language Notes,* and also attended to the duties of Secretary of the University Philological Association. Professor Roulston continued to serve as editor of the *Johns Hopkins Alumni Magazine.*

PUBLICATIONS

Hermann Collitz.

The Causes of Phonetic Change. *Johns Hopkins University Circular,* nr. 325, pp. 30-32.

Ags. *rœfnan*. *J. H. U. Circular*, nr. 325, pp. 52-54.

Three Philological Anniversaries. *J. H. U. Circular*, nr. 325, p. 64.

Old Icelandic *raun* and *reyna*. *Scandinavian Studies and Notes*, vol. vi, pp. 58-67.

Saeculum. *Festschrift für Ad. Bezzenberger* (Göttingen, 1921), pp. 8-13.

William Kurrelmeyer.

German Lexicography, Part III. *Mod. Lang. Notes*, xxx, 405.

Review of Lucretia V. T. Simmons, Goethe's Lyric Poems in English Translation prior to 1860. *Mod. Lang. Notes*, xxx, 487.

Etymological Notes. *Journal of Engl. and Germ. Phil.*, xix, 10.

Niflant, Iflant. *Modern Philology*, xviii, 557.

Pisschulle = Pistole. *J. H. U. Circular*, July, 1920.

HERMANN COLLITZ,
Professor of Germanic Philology.

GREEK

SEMINARY

Advanced instruction in Greek was carried on chiefly through the medium of the Greek Seminary, which met three times a week under the direction of Professor Miller. Since the organization of the Seminary in 1876, it has been the custom of the members to concentrate their attention in any one year on some leading author or some leading department of Greek literature. In pursuance of this custom the principal subject of study during the past year has been Greek Comedy. In addition to lectures on the subject by the director, the work of the Seminary included the analysis of a number of the plays of Aristophanes, the interpretation of the Acharnians with especial attention to the dialects of the Archarnian and the Boeotian, a study of the fragments of a number of the Old Attic comic poets, the reading of the new Menandrean corpus, and the interpretation of some of the mimes of Herodas.

OTHER GRADUATE WORK

Besides lecturing to the Seminary and directing its work, Professor Miller gave the following graduate courses:

1. A course of lectures and practical exercises in Greek Rhythmic and Metric, weekly through the year.

2. A course in Greek Composition, weekly through the year.

Mr. George Ragland completed his dissertation on the Genitive in Euripides and met the other requirements for the degree of Doctor of Philosophy, which was conferred on him at the close of the academic year.

UNDERGRADUATE COURSES

Professor Miller conducted a course in Thucydides vii; Aristophanes, *Frogs;* Dêmosthenes, *Olynthiacs;* and Menander, *Epitrepontes* (Greek 4), three hours weekly through the year.

Professor Robinson gave a course in Greek Literature (Greek 4), once weekly through the year.

Dr. L. H. Baker had charge of the following courses:

1. Benner-Smyth, *Beginner's Greek Book;* Xenophon, *Anabasis* i (Greek Elements), three hours weekly through the year.

2. Xenophon, *Memorabilia* (selections); Plato, *Apology* and *Crito;* Herodotus (selections); Homer, *Odyssey*, three books; Prose Composition (Greek 1), four hours weekly, through the year.

Mr. Carol V. B. Wight, Rogers Fellow, conducted a course in Homer and Selections from Greek Prose (Intermediate Greek), three hours weekly through the year.

PUBLICATIONS

Basil L. Gildersleeve.

Brief Mention, *American Journal of Philology*, xli, 401-404.

The Solace of Sonnetry. *Johns Hopkins Alumni Magazine*, ix, 179-185.

C. W. E. Miller.

Report on Rheinisches Museum, lxxii, 3 and 4. *American Journal of Philology*, xli, 288-292.

Notice of the publications of the *Association Guillaume Budé. Ibid.* xlii, 94.

Notice of the Liebaert Collection of Photographs from Latin MSS. *Ibid.* xlii, 189.

Editor of the American Journal of Philology.

C. W. E. MILLER,
Professor of Greek.

HISTORY

The graduate work in American History was conducted by Professor Latané, who gave the following lecture courses:

1. American Constitutional and Political History, 1789-1865. *Two hours weekly, first half-year.*

2. Latin-American History and Diplomacy. *Two hours weekly, second half year.*

With the assistance of Mr. Thach, Professor Latané conducted an undergraduate course in American History and a course in Diplomacy and International Law.

The Seminary in American History was conducted by Professor Latané. The following topics were presented: "The Origin of the Presidency," by C. C. Thach; "The Influence of Thomas Jefferson on the Foreign Relations of the United States," by W. K. Woolery; "The Presidential Election of 1824," by S. R. Gammon; "The Anti Masonic Movement," by S. R. Gammon; "The Life of James H. Hammond of South Carolina," by Elizabeth Merritt; "The Kansas-Nebraska Act," by F. E. Baldwin; "The Attitude of France toward the United States during the Civil War," by W. R. West. A number of book reviews were also given before the Seminary.

The graduate work in European History was conducted by Professor Vincent, the general period of the lecture courses including the sixteenth and seventeenth centuries. The subjects selected for special treatment were (1) the Reformation, preceded by a discussion of the renascence of learning; (2) the Puritan Revolution and the social and constitutional development of Western Europe.

Professor Vincent conducted also the Seminary in European History which met on alternate Fridays through the year. The topics for research were intended to throw light on social and economic conditions in England just previous to the Reformation. To each student an English city was assigned for special study with the requirement that all available material be utilized in the report. The topics were as follows: Coventry, W. K. Woolery; London, Madeleine P. Weeks; Manchester, Frances E. Baldwin; York, C. S. Sydnor; Norwich, Edna M. Biddison; Winchester, W. R. West.

For undergraduates Professor Vincent conducted a course in European History, beginning with Early Middle Ages and following the development of civilization to the present time.

Associate Professor Magoffin was absent during the year, having been granted leave of absence by the Trustees to assume the position of Professor-in-Charge of the School of Classical Studies of the American Academy in Rome for the academic year 1920-1921. In addition to his regular work of directing the faculty and students of the School and giving his courses in Roman History and Latin Epigraphy, he conducted the members of the School on an historical and archaeological excursion through South Italy and Greece, gave a number of lectures in the Roman Forum on its history, and

lectured before the Anglo American and Italian Archaeological Societies. He spent a considerable part of the year in completing a history of the Flavian period, and in collecting materials for a history of Italy from the earliest to the present time.

Professor Magoffin (Major, G. S., Lieut. Col., O. R. C.) was asked by the American Ambassador to take charge of the Flag of the United States during the great ceremonies, Nov. 4, 1920, commemorative of Italian Armistice, or Piave Victory, Day.

During Professor Magoffin's absence his undergraduate course in Greek and Roman History was conducted by Dr. Lawrence H. Baker, that in Roman Life by Professor Robinson, and his graduate courses by Professors Vincent and Frank.

PUBLICATIONS

Professor Latané contributed a series of articles to The World's Work on "The Foundations of American Foreign Policy," (1) "Relations with the British Empire," March, 1921, pp. 505-511; (2) "Relations with Continental Europe," Apr. 1921, pp. 619 624; (3) "Relations with Japan," May, 1921, pp. 36-48.

Dr. Magoffin has published the following:

Review of Hugo Grotius' "De Iure Belli ac Pacis" (Molhuysen). *American Journal of International Law*, vol. xiv (1920), pp. 692 693.

Review of J. P. Trevelyan's "A Short History of the Italian People." *Political Science Quarterly*, vol. xxxvi (March, 1921), pp. 138 139.

Review of Cagnat, R. and Chapot, V., "Manuel d'Archéologie Romaine" (vol. ii). *American Historical Review*, vol. xxvi (1921), pp. 752 754.

Note on J. V. Bates' "Our Allies and Enemies in the Near East." *Political Science Quarterly*, vol. xxxv (1920), p. 329.

Note on E. R. Wagner's "La Revanche de la Kultur." *Political Science Quarterly*, vol. xxxvi (1921), p. 166.

JOHN H. LATANÉ,
Professor of American History.

LATIN

During the past year Professor Frank conducted the Seminary in the literature of the revolution and the early Augustan Period. The reports and investigations of the first semester centered chiefly about Vergil's minor works, and problems connected with the Aeneid. Those of Mr. Carol V. B. Wight and Sister M. Benedicta, embodied in Master's essays, are ready for publication. The second semester was devoted to a critical study of some of Horace's odes, with special emphasis on exegesis, text criticism, and Horace's application of his theories of art. Miss Edith A. Beck completed her dissertation on Marcus Junius Brutus, receiving the degree of Doctor of Philosophy in June.

Dr. Frank also lectured to the graduate students once a week, discussing early Roman Tragedy during the first semester, and giving an outline of Latin Paleography during the second semester.

In the first half-year Professor Mustard lectured twice a week on the Satires and Epistles of Horace. In the second half-year he continued his lectures on Roman Satire, and conducted a short series of exercises in Latin Prose Composition.

Undergraduate courses were given as follows:

Professor Frank:

Latin I: Livy (selections): Horace (selections); Latin Prose Composition. *Four hours weekly through the year.*

Professor Mustard:

Latin II: Horace, Epistles and *Ars Poetica;* Terence, *Adelphoe;* Pliny's Letters. *Three hours weekly through the year.*

Latin IV: Cicero, *De Senectute* and *De Amicitia;* Juvenal. *Three hours weekly through the year.*

Professor Mustard read a paper before the Classical Club of Princeton University, March 4, on Petrarch's "Africa." On June 9 he received the honorary degree of Doctor of Letters from the University of Toronto.

PUBLICATIONS

Tenney Frank.

Epicurean Determinism in the Aeneid. *American Journal of Philology,* xli, pp. 115-126.

Tulliana: Ad Att. xvi, 11; The date of the Vatinian Law; Ad Att. I, 16, 1; Curtius Postumus; Quint. Frat. II, 8, 3; Philodemus, Ad Att. XII, 6, 2. *American Journal of Philology,* xli, pp. 275-282.

Vergil's Theory of his Art. *Classical Philology,* xv, 230-244.

Heliodorus—Apollodorus: Horace, *Serm.* I, 5, 2. *Classical Philology,* xv, 395.

Vergil's Res Romanae. *Classical Quarterly,* xiv, pp. 156-159.

Catullus and Horace on Suffenus and Alfenus. *Classical Quarterly*, xiv, pp. 160-62.

Ticidas the Neoteric Poet. *Classical Review*, xxxiv, pp. 91-3.

Cornificius as Daphnis. *Classical Review*, xxxiv, pp. 49-51.

The Battle of the Trebia. *Journal of Roman Studies*, ix, pp. 202 07.

Various Reviews.

Wilfred P. Mustard.

Review of F. Villeneuve's Essai sur Perse. *American Journal of Philology*, xli, 184-185.

Notice of Helen Price's C. Suetonii Tranquilli De Vita Caesarum Liber VIII. *A. J. P.*, xli, 186-187.

Report of Rivista di Filologia, vol. xlviii. *A. J. P.*, xli, 192-196.

Report of Revue de Philologie, vol. xliii, pts. 1-2. *A. J. P.*, xli, 196-198.

Notices of Haines's Fronto, vol. i, Ker's Martial, vol. i, White's Ausonius, vol. i. *A. J. P.*, xli, 297-298.

Notice of I. M. Linforth's Solon the Athenian. *A. J. P.*, xli, 400.

Notice of Orazio Lirico: Studi di Giorgio Pasquali. *A. J. P.*, xlii, 93.

Notice of Alfred Ernout's Lucrèce De La Nature. *A. J. P.*, xlii, 93-94.

Petrarch's Africa. *A. J. P.*, xlii, 97-120.

Review of E. Nitchie's Vergil and the English Poets. *Journal of English and Germanic Philology*, xix, 298-300.

Review of C. W. Summers, The Silver Age of Latin Literature. *Classical Weekly*, xiv, 151-152.

Pegasus as the Poet's Steed. *Classical Weekly*, xiv, 200.

Notes on Ben Jonson's Catiline. *Modern Language Notes*, xxxvi, 154-157.

TENNEY FRANK,
WILFRED P. MUSTARD,
Professors of Latin.

MATHEMATICS

Professor MORLEY gave the following courses:

1. Higher Geometry. *Three hours weekly, first half-year.*

The course was chiefly concerned with the theory of flow in a plane.

2. Mathematics for Chemists. *Two hours weekly, first half-year.*

This course is designed to give some idea of applied mathematics, of a kind useful to chemists.

3. The Mathematical Seminary. *First half-year.*

Associate Professor Cohen gave a course in the Theory of Functions. *Two hours weekly through the year.*

After a preliminary study of the theories of sequences and series, a study of functions of the complex variable, from both the Weierstrass and Cauchy points of view, was made.

Dr. Murnaghan gave a course in Electricity and Magnetism. *Three hours weekly, through the year.* The application of spherical, cylindrical and ellipsoidal harmonics to the solution of problems in electrostatics was discussed. The method of conjugate functions in connection with problems in electrostatics and magnetism as well as current flow in metallic conductors was dealt with. Finally, Maxwell's equations and their application to the problems of telegraphy, telephony and wireless propagation of signals were taken up.

Dr. Musselman gave a course in the Theory of Probability. *Two hours weekly, one half year.* After a study of the fundamental theorems, applications to the Theory of Statistics and the Theory of Errors were treated in detail.

Visitors to the Mathematical Seminary included Professor A. A. Bennett, who gave two reports; Professor M. R. Cohen, who gave one report; and Mr. Abel Wolman, who also gave one report.

By courtesy of the Board of Trustees Professor Morley was absent in the second half-year. While in Oxford he gave two lectures, one to the Mathematical staff and one to the students.

The Seminary for the second half-year was conducted by Associate Professor Cohen.

The undergraduate courses were conducted by Professor Hulburt, Associate Professor Cohen, Dr. Murnaghan, Dr. Musselman, Mr. C. S. Cragoe, Mr. B. H. Redditt, and Mr. C. D. Gregory.

The American Journal of Mathematics is in its forty third volume.

FRANK MORLEY,
Professor of Mathematics.

ORIENTAL SEMINARY

In the Oriental Seminary, under the direction of Professor Haupt, fourteen courses in the various branches of Oriental research were given during the past year, special attention being paid to the Old Testament and the cuneiform inscriptions bearing on the Scriptures.

Eleven hours weekly throughout the year were devoted to the study of *Hebrew and the Old Testament.* In the *Old Testament Seminary,* two hours weekly through the year, Professor Haupt interpreted the Book of Job. This course was supplemented by conferences on Hebrew grammar and weekly exercises in Hebrew prose composition. Professor Haupt also interpreted, through the year, *Selected Chapters of the Authorized Version,* explaining a number of psalms and prophetical sections as well as some New Testament passages. Dr. Blake gave, through the year, a series of lectures on *Comparative Hebrew Grammar* with special reference to the structure of the verb and the noun, and also met a class, through the year, for the reading and grammatical analysis of the *Book of Ruth.* The instruction in *Elementary Hebrew* was given by Associate Professor Ember, three hours weekly through the year. He also conducted, through the year, *Hebrew Exercises* for advanced students. Dr. Dougherty gave, through the year, a series of lectures on *The Literature of the Old Testament* with special reference to composition, date, and authorship, preceded by a brief introduction on the relations between the Old Testament and cuneiform literature.

A course in *Biblical Aramaic Grammar and Interpretation of the Aramaic Portions of the Book of Ezra* was given, through the year, by Dr. Blake.

Dr. Blake lectured, through the year, on the *History of the Ancient East* (Egypt, Babylonia, Assyria, Persia, Israel, Judah, and the minor nations of Western Asia, preceded by a sketch of the prehistoric period).

Dr. Rosenau gave, through the year, a series of lectures on *Jewish Ceremonial Institutions,* illustrated by the Sonneborn Collection of Jewish ceremonial objects in the Archæological Museum of the University.

A course in *Elementary Arabic* was given by Associate Professor Ember, two hours weekly through the year, comprising a sketch of the grammar followed by the reading of selected stories from the Arabian Nights.

In *Assyriology,* Professor Haupt gave a series of lectures, through the year, on *Comparative Assyrian Grammar,* supplemented by exercises in translating unpointed Hebrew into cuneiform Assyrian and the reading of selected texts including bilingual vocabularies, laws, incantations, proverbs, psalms; during the second half-year the class read the cuneiform account of the Deluge. Dr. Dougherty conducted a course in *Assyrian Historical Inscriptions,* extracts being read from the annals of Shalmaneser III and Assurbanipal, also some cuneiform letters and astronomical reports.

In *Egyptology,* Associate Professor Ember met a class, through the year, in *Hieroglyphic and Hieratic Egyptian,* reading selections from Erman's chrestomathy and the Papyrus D'Orbiney.

The instructors and advanced students met weekly, through the year, to present new discoveries and reports on important articles in the leading Oriental journals. The following original contributions were presented:—Professor Haupt, Sept. 27: Silo = Greek *sīrós, sōrós* = Assyr. *šêlu* = Arab. *šâǧlah.* — Sept. 28: Egypt. *śn,* brother (orig. *kisser;* cf. Cant. 8, 1) and *śn,* kiss; *cf.* Arab. *našiḳah* and *nášaq,* smell.—Oct. 5: Assyr. *šasû,* speak (= *šašâhu*) and Heb. *śîḥ, śûḥ.*—Oct. 12: *Mil'él* orig. *pronounced with a full vowel,* and *milra':* pronounced with *śuâ.* Assyr. *qîštu,* present, and Heb. *qešṯ,* bow (*cf.* Arab. *sahm,* arrow, portion). Assyr. *irtu,* breast (= *uiztu*) and Arab. *muuâzât* and *muuâzanah* = Assyr. *mitxuru,* correspond, be equivalent, orig. *confront.* Heb. *šafál,* low, Šaf'el of of *b'l* (< preposition *bĕ* + noun *'al*). *Uaị ịáreq* (Gen. 14, 14) to be read *uaị-ịôreq* from *uaraq,* to go up, Egypt. *i'q* (cf. Arab. *ráqiia,* to ascend, and Assyr. *mûraqu,* height).—Oct. 19: Assyr. *pâṭu,* edge, border, and Arab. *ṭâfa,* go around, skirt. Assyr. *pâtu* (= *paṷaḥṭu*) *tâmdu,* wind-swept sea. Arab. *ṣabar,* be patient, wait, orig. *be cool,* Šaf'el of *bôr,* pit, well.—Oct. 26: The blindness of Tobit and the demoniacal possession of his daughter-in-law. Arab. *xamr,* wine, and *xamîr,* leaven, from *xamar,* to ferment (Arab. *taxámmara*) = *maxar* < *maxâr,* pit (Egypt. *mḥr,* granary) from *xûr* = *xarar,* to dig (Assyr. *xurru,* hole). Green crops stored in pits ferment; *pitted hay* is *sour hay.*—Nov. 2: Valerian, *calmer of hysteric squirms,* in the dolphin's liver (*delphinic*).—Nov. 9: Heb. *qalás,* mock = Ethiop. *tasâláqa* and Arab. *láqasa.* Assyr. *ellu* and Syr. *ḥĕḥîṯ,* glowing, shining; *ellu* and Arab. *taḥállala,* be radiant; *namru* and Arab. *námir,* limpid. Heb. *ḥêq,* lap, not *bosom* (cf. Luke 16, 22).—Nov. 16: The Dennis collection of Egyptian antiquities. The reputed oldest portrait in the world. Assyr. *gullupu,* carve, mark (not *gullubu*) = Talmud, *galléf.* Greek *glyphein* a Semitic loanword. Assyr. *appûtu,* mark on the forehead (not *abbuttu,* fetter) = Talmud. *appûṯâ,* forehead. *Uaị ịišláḥ uaịqaddĕšém,* he sent word and made them purify themselves (Job 1, 5).—Nov. 23: Interchange of *f* and *š* in Arabic. Assyr. *ina* preserved in the initial *aleph* of Heb. *az, etmôl, emš, akén.*—Nov. 30: *E* in Heb. *mêṯ, kên* (cf. Assyr. *ki-e-nu*) contraction of *aị,* hence *ê.*—Dec. 7: Development of triconsonantal stems from biconsonantal roots in Semitic. *Lĕ-hiṯṯaççéḇ 'al* (Job 2, 1) to line up over against. Ger. *oder* in *ein oder zwanzig Taler,* some twenty dollars, and its abbreviation *er* in *ein Stücker zwanzig Taler* = perhaps, about (*cf.* Goth. *aittau,* or, perhaps, about).—Dec. 14: Armenian and Russian parallels to the story of Tobias and Sara.—Dec. 21: The historical background of Psalm 55. —Jan. 11: Assyr. *marçu,* sick = Arab. *marîḍ;* Assyr. *marçu,* inaccessible = Arab. *ráçama,* enter a narrow mountain-pass. Talmud. *abbâbâ,* at the gate = Assyr. *ina bâbi;* Talmud. *ammái,* wherefore = Assyr. *ammêni.*—Jan. 25: Heb. *môqéš,* throw-stick, and *paḥ,* clap net.—Assyr. *âtu, âti* (in *šu'âtu, ši'âti*) and Ethiop. *ĕtû, ĕtî* (in *uĕ'ĕtû, ịĕ'ĕtî*) = Heb. *ôṯ, eṯ.*—Feb. 8: Assyr. *šû* = Arab. *dû.*—Feb. 15: The ostrich in Job 39, 13-18. Post-Biblical *ôṯô hâ-'iš,* that

man, orig. accusative and older form of *eṯ-hâ-'îš*, the *nota accusativi* being originally used only before suffixes.—March 1: Assyr. *mâr-bânî*, nobleman (son of a father) and *mâr lâ manama*, son of nobody. Talmud. *issûr*, reunion, company, party (ZAT 35, 105) and Arab. *ʒualîmah*, feast, banquet. Assyr. NIM-MEŠ, Deluge 146, *fly brushes*. Heb. *môṯ* in *bĕ môṯô*, when he died, an intransitive infinitive like *bô*.—March 8: Hebrew a dead language after the Exile like classical Latin since Ennius, *c.* 170 B. C.—Heb. *'ez*, goat, from *'azaz*, be strong, smell strong (*n* of Assyr. *enzu* = Arab. *'anz* secondary). Heb. *higgîd* orig. *confront with*. Arab. *šáriba*, drink, and Heb. *śaráf*, burn; *cf.* Heb. *ba'ár*, burn, and Arab. *báġira*, have unquenchable thirst. Heb. *paráś*, spread; Assyr. *rapšu*, wide; Arab. *ráfaḍa* = *ittasa'a*. Heb. *nirdô* (not *nirdî*) Cant. 1, 12 the *membrum virile* of the bridegroom. Heb. *hikkâ lĕ-fî herḥ*, he smote for the mouth of the (devouring) sword.—Heb. *našáq* in *nôšqê qešṯ*, archers, an Assyrian loanword < *nasâqu*, string (bow) = Arab. *násaqa*, string (pearls) = Ethiop. *ʒasáqa*, string bow = Egypt. *ỉsq*, stretch out, lengthen, tarry. Heb. *daráḳ qešṯ*, to step, notch an arrow; *cf.* Eng. *to step a mast*. NIM = *zumbû*, fly brush (not BAN = *qaštu*, bow) in Knudtzon, *Amarna*, p. 210, n. *d*.—May 3: The Sumerian numerative *tam* (TA-A-AN). Sumer. *man kam*, second, lit. *of two;* cf. Syriac *šáttâ da-tĕrên*, second year. Heb. *man*, orig. *part*, portion; then *present*, gift; also *separation*, secretion, excretion. *Man-hû* (Exod. 16, 15) late pun by Aramaic scribe for *mah hû*. Glucose in Herodot. 7, 11. Biblical manna powdered manna-lichen (*Lecanora esculenta*) mixed with tamarisk-manna or alhagi-manna.—May 10: Sumer. *ta* in numerative TA-A-AN orig. *what?* then *something*, amount; *cf.* the Chinese numerative *-ko*. A AN as an abbreviation of TA-A-AN; cf. 4to and 4°. Variants to sixth tablet of Nimrod epic on new duplicate from Asshur.

Associate Professor Ember, Nov. 9: Egypt. *nu.t*, sky = Assyr. *Anatu*, fem. of *Anu*. Berber *th* as suffix of 3 s. m. identical with Egypt. *f*.—Nov. 16: Egypt. *zqr*, hawk = Arab. *saqr*, *çaqr*, hawk; Berber *asker*, claw.—Dec. 7: Egypt. *ǯu*, mountain = Arab. *ʒábal*. Egypt. *h.t* (=**hu.t*) house=Heb. *ḥaṷṷâ*, tent; Arab. *ḥaii*, tent, tribe.—Jan. 4: Egypt. *ḥmt*, crucible; *ḥm*, drill; *ḥm*, majesty < *ḥm*, be hot.—Jan. 18: Egypt. *ḥmu*, artificer, craftsman < *ḥm*, drill; *ḥm*, majesty = Arab. *ḥumâm*, noble lord. Egypt. *ỉ'kb*, mourn = Arab. *káriba*, be distressed, grieve.—Feb. 1: Egypt. *šn'*, granary = Arab. *šáġlah*, stack of grain. Egypt. *ỉbd*, month (orig. *moon*) and Heb. *aḥad*, wander, go astray (*cf.* Heb. *ỉaréḥ* and *ôréḥ*). Egypt. *iu*, island (Heb. *î*) and Arab. *áʒâ*, go to a place of refuge. Assyr. *ubbubu*, cleanse, purify, and Arab. *'ábâ* = *aḍâ'a*, shine, *'abb*, *'ab'*, sunlight; Egypt. *u'b*, wash, purify, priest.—March 8.: Egypt. *mḥ*, flood, inundate, and Heb. *maḥâ*, wipe out, orig. *to flood*. Sumerian roots with phonetic correspondents in Semitic.—May 10: Assyr. *lazîtu* (Cyrus 289) composed of preposition *la* and *zîtu*, countenance, face, like *lapân*, equivalent to *ina pâni*.—May 17: Egypt. *šfd*, book, scroll; Heb. *sefr*, book; Assyr. *šapâru*, be swift. Egypt. *ỉbỉ*, goat, ram = Heb. *ỉôbél*, ram. Egypt. *č'.t* (= **kl.t* =* *ʒkl.t*) vezier < *ʒkl;* cf. Arab. *ʒakîl*, commissioned, empowered. Egypt. *mnč.u* (= **mlk.u*) the god Mont = Heb. *melḳ*, king.—May 24: Egypt. *šf*, ram = Assyr. *šapparu*, wild he-goat; Egypt. *mnph.t*, breast, connected with Arab. *náfaḥa*, *náfaxa*, blow, inflate.

Dr. Rosenau, April 5: The Hebrew liturgical terms *'arbît*, evening service, and *šaḥrit*, morning service, feminine *nisbah* adjectives modifying *'ăḇôdâ* understood.

Dr. Blake, Nov. 2: Philippine ordinal prefix *ika* a causative prefix. Philippine ordinal prefix *ka* < *ika* in those languages where *i* is definite article by haplology from *i-ika*.—Dec. 14: Arab. *ḥaqîr*, lowly; *faqîr*, poor, and *ɣáçala*, *ḥáçala*, arrive, examples of groups whose similarity in consonantism is probably due to congeneric assimilation. —May 17: Moroccan *ḍubb*, wolf, modified from *dubb* through the analogical influence of *ḍ.bâ*, bear (Meakin 137).

Dr. Dougherty, Nov. 16: A new Assyrian word *iqtélis*, he disapproved, connected with Heb. *qâlas*.—Dec. 7: The expression *King of the four quarters* used in the *Shoo king* of the Chinese king Wu-ting, 1324 B. C.—Jan. 18: Assyr. *nalṭar*, inscription, legend = *našṭar*.

The following reports were made:—Professor Haupt, Oct. 19: Nies' *Ur Dynasty Tablets* and Hommel's appendix. *Annual of the American School of Oriental Research in Jerusalem* for 1919.—Nov. 2: *Zeitschrift für die alttestamentliche Wissenschaft*, vol. 38, part 2. Köhler's new translation of Amos. *Mitteilungen der Deutschen Orient-Gesellschaft*, No. 60 with special reference to Jensen's article on the Aramaic inscriptions of Asshur.—Jan. 4: The Meeting of the Society of Biblical Literature in New York, Dec. 27-28.—Jan. 25: *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, Vol. 74, part 4, with special reference to Zimmern's article on *Nazarene*.— March 1: The new Italian journal of Egyptology and Papyrology *Ægyptus, Rivista Italiana di Egittologia e di Papirologia*, Milan. Ungnad's Sumerian legal texts in *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte*, vol. 16; *American Journal of Semitic Languages*, vol. 38, part 2.—March 15: Jastrow's translation of Job.— April 12: *Journal of the Society of Oriental Research*, vol. 5, part 1. —May 3: Hommel's astral arrangement of Phenician alphabet. The April number of the *American Journal of Semitic Languages*.—May 10: The second part of Delitzsch's *Die grosse Täuschung*.—May 17: Enelow's *Jewish View of Jesus*.

Dr. Rosenau, Nov. 2: Jackson and Lake's *Beginnings of Christianity*, containing an article by Montefiore on Judaism in the time of Christ. *Jahrbuch der jüdischen Literatur*, 1920, with special reference to Gunkel's history of the Psalms. Greenstone's *Jewish Religion*, Doctrines, Creed, Customs, and Ceremonies. H. Enelow's *Jewish View of Jesus*. The *Journal of Jewish Lore and Philosophy* —Nov. 9: Montague R. James' *Lost Apocrypha of the Old Testament*. H. Kohn's *Die Religion der Vernunft*.—Nov. 23: Sketch of Marcus Brann, successor of H. Grætz.—Feb. 1: S. M. Dubnow's *History of the Jews in Russia and Poland*, vol. 3. A. Mamorstein's *Doctrine of Merits in Rabbinical Writings*. The *Monatsschrift für die Wissenschaft des Judentums*, vol. 64, parts 4-6 and 7-8. Zollschan's *Jewish Nationalism*, second edition.

Dr. Blake, Nov. 23: Kelly's Notes on Shewa in *Journal of the Society of Oriental Research*, vol. 4, pp. 82-86. Gowner's review of Mercer's Ethiopic Grammar, *ibid.* pp. 93 94.—Jan. 25: *The Biblio-*

graphy of Ferdinand Blumentritt, published by the Philippine Assembly.

Dr. Dougherty, Nov. 2: Enelow's *Jewish View of Jesus.*

On April 19 Professor Margolis, of the Dropsie College, Philadelphia, discussed a new edition of the Septuagint at a joint meeting of the Oriental Seminary and the Classical Department.

The Jewish Chautauqua Society, which convened in Cleveland, Ohio, Dec. 25 31, for the purpose of conducting an institute for teachers of religious schools, was led by Dr. Rosenau.

At the meeting of the University Philological Association the following communications were presented by members of the Oriental Seminary:—Professor Haupt, Oct. 15: Hidalgo and *Filius Hominis;* Dec. 16: Greek *sīrós*, silo, and *sōrós*, stack; Jan. 20: Asmodeus; Feb. 17: The Last Supper; March 17: He who runs may read; April 21: Son of Man = *hic homo* = ego.—Associate Professor Ember, Feb. 18: The Egyptian origin of the word *stibium.*—Mr. Moncure, April 21: Relations between Babylonia and the Far East.

At the annual meeting of the Society of Biblical Literature and Exegesis, held in New York, Dec. 27 28, Professor Haupt read four papers:—(a) Ensilage in the Old Testament; (b) The Fish of Tobias; (c) Abraham's Bosom; (d) Satan in Job.

At the General Meeting of the American Philosophical Society, Philadelphia, April 21 23, Professor Haupt read a paper on Tobit's Blindness and Sara's Hysteria.

At the annual meeting of the American Oriental Society (held at the Johns Hopkins University and Goucher College in Baltimore, March 29-31) the following papers were presented by members of the Oriental Seminary:—Professor Haupt: (a) The Rainbow after the Deluge; (b) The Fall of Samaria; (c) Egyptian Boomerangs; (d) The Names of Mount Hermon.—Associate Professor Ember: (a) The phonetic value of several of the Egyptian alphabetic signs and their correspondence etymologically in the other Semitic languages; (b) The J. T. Dennis Collection of Egyptian Antiquities; (c) Metathesis in Old Egyptian; (d) The etymologies of Heb. *ḥam*, father-in law, and of Egypt. *ḫbd*, month.—Dr. Rosenau: *Har'él* and *Hâ 'ări'él* in Ezek. 43, 15: Comments on two Hebrew liturgical terms in the Mishnah.—Dr. Blake: (a) A new method of syntactical arrangement; (b) The present status of Philippine linguistic studies; (c) Rhyme-formations in Arabic.—Dr. Dougherty: The Goucher College Babylonian Collection.—Mr. Gibble: Mistranslated passages in Job.—Mr. Hamme: The ostrich in Job 39, 13-18.—Mr. Moncure, (a) Chinese and Sumerian; (b) Compensation of geminations by insertion of nasals.—Miss Yeaworth: The preformatives of the Semitic imperfect.

The most pressing needs of the Oriental Seminary are:

(1) The appointment of an Assyriologist to the chair of Oriental History and Archæology;

(2) A less inadequate appropriation for new books in the various

departments of Oriental research, including Assyriology, Egyptology, Biblical Philology, Oriental History and Archæology, Hebrew, Talmud, Rabbinical Literature, Arabic, Persian, Turkish, Jewish, Arabic, Syriac, Ethiopic, Amharic, Phenician, Sabean, Philippine dialects, &c., &c.

PUBLICATIONS

Paul Haupt.

Unpersönliche Konstruktion im Sumerischen. *Zeitschrift für Assyriologie*, vol. xxxiii, pp. 60-62. The manuscript of this and the following five papers was sent to the editor on November 12, 1916).

Assyr. *zamar* und *surriš*, flugs. *Zeitschrift für Assyriologie*, vol. xxxiii, pp. 62-63.

Assyr. *annûrîg*, soeben, und *annîsît*, als eben. *Zeitschrift für Assyriologie*, vol. xxxiii, p. 64.

Assyr. *amîšu*, Sühnmittel. *Zeitschrift für Assyriologie*, vol. xxxiii, pp. 65 66.

Assyr. *marû* and *xamṭu*. *Zeitschrift für Assyriologie*, vol. xxxiii, pp. 66 67.

Assyr. *kamâsu* = hebr. *samâḵ*. *Zeitschrift für Assyriologie*, vol. xxxiii, p. 67.

The Rainbow after the Deluge. *Journal of the American Oriental Society*, vol. xli, p. 181.

The Fall of Samaria. *Journal of the American Oriental Society*, vol. xli, pp. 181 182.

Egyptian Boomerangs. *Journal of the American Oriental Society*, vol. xli, pp. 185-186.

The Names of Mount Hermon. *Journal of the American Oriental Society*, vol. xli, p. 186.

Abraham's Bosom. *American Journal of Philology*, vol. xlii, pp. 162-167.

Heb. *ro'*, evil = Arab. *'urr*. *Journal of Biblical Literature*, vol. xxxix, pp. 152 155.

Heb. *mardût*, chastisement and chastity. *Journal of Biblical Literature*, vol. xxxix, pp. 156-158.

Pelican and Bittern. *Journal of Biblical Literature*, vol. xxxix, pp. 158-161.

Qaš, straw, and *qäšt*, bow. *Journal of Biblical Literature*, vol. xxxix, pp. 161-163.

Assyr. *birku*, knee, and *karâbu*, to bless. *Journal of Biblical Literature*, vol. xxxix, pp. 163-165.

Addenda. *Journal of Biblical Literature*, vol. xxxix, pp. 170 172.

Tobit's Blindness and Sara's Hysteria. *Proceedings of the American Philosophical Society*, vol. lx, pp. 71-95.

Aaron Ember.

The phonetic value of several of the Egyptian alphabetic signs and their correspondents in the other Semitic languages. *Journal of the American Oriental Society*, vol. xli, p. 177.

The J. T. Dennis Collection of Egyptian Antiquities. *Journal of the American Oriental Society*, vol. xli, p. 186.

Metathesis in Old Egyptian. *Journal of the American Oriental Society*, vol. xli, p. 177.

The etymologies of Heb. *ḥam*, father in law, and of Egypt. *ỉbd*, month. *Journal of the American Oriental Society*, vol. xli, p. 186.

(With Dr. Blake): Review of Henry A. Coffey's *Accidence of Hebrew Grammar with Exercises* (St. Louis, 1918). *American Journal of Philology*, vol. xlii, pp. 88 90.

William Rosenau.

Review of *The Jewish Religion* by Julius H. Greenstone. *The Baltimore News*, Nov. 20, 1920.

What Professor Strack has to say on German Jewry's fight against the alleged Jewish peril. *Reform Advocate*, Chicago, Jan. 1, 1921.

Causerie Littéraire. *Jewish Times*, Baltimore, Jan. 7, 1921.

Domestic Atmosphere. *Reform Advocate*, Chicago, March 26, 1921.

Brigadier General Charles H. Lauchheimer. *Publications of the American Jewish Historical Society*, No. 28, 1921.

Frank R. Blake.

Congeneric Assimilation as a Cause of the Development of New Roots in Semitic. *Studies in Honor of Maurice Bloomfield*, New Haven, 1920, pp. 35 48.

(With Professor Ember): Review of Henry A. Coffey's *Accidence of Hebrew Grammar, with Exercises* (St. Louis, 1918). *American Journal of Philology*, vol. xlii, pp. 88 90.

A New Method of Syntactical Arrangement. *Journal of the American Oriental Society*, vol. xli, p. 176.

The Present Status of Philippine Linguistic Studies. *Journal of the American Oriental Society*, vol. xli, p. 176.

Raymond P. Dougherty.

The Goucher College Babylonian Collection. *Journal of the American Oriental Society*, vol. xli, p. 179.

Phares B. Gibble.

Mistranslated Passages in Job. *Journal of the American Oriental Society*, vol. xli, p. 184.

Edward R. Hamme.

The Ostrich in Job 39, 13 18. *Journal of the American Oriental Society*, vol. xli, p. 176.

John Moncure.

Compensation of Gemination by Insertion of Nasals. *Journal of the American Oriental Society*, vol. xli, p. 177.

Eleanor F. F. Yeaworth.

The Preformatives of the Semitic Imperfect. *Journal of the American Oriental Society*, vol. xli, pp. 184-185.

Vol. xxv of the *Assyriologische Bibliothek*, edited by Friedrich

Delitzsch and Paul Haupt, a quarto volume of 232 pages and 64 cuneiform plates, comprising 180 texts including 27 seals, was issued at the beginning of the session. It contains *Ur Dynasty Tablets, chiefly from Tello and Drehem, with translations, lists, and complete indices*, by the President of the American Oriental Society, Dr. James B. Nies, of Brooklyn, N. Y., with an appendix by Professor Fritz Hommel, of Munich.

PAUL HAUPT,
W. W. Spence Professor of the Semitic Languages, and Director of the Oriental Seminary.

PHILOSOPHY

The work of the Philosophical Seminary was devoted during the greater part of the year to an examination of the philosophy of George Santayana. From April 15th to the close of the session some of the chapters in G. P. Adams's "Idealism and the Modern Age" furnished the material for discussion. Other graduate courses were given on the philosophy of Schopenhauer and Nietzsche, and on the problem of the quantitative infinite and the continuum in modern philosophy.

Professor Lovejoy received leave of absence from January 1st to March 31st, and lectured during the winter quarter at the University of Chicago. In his absence Professor Morris R. Cohen, of the College of the City of New York, conducted the Philosophical Seminary and gave a lecture course (primarily for students of philosophy) on the history of the fundamental conceptions of mathematical physics. During the same period Mr. William S. Salter, author of "Nietzsche the Thinker," gave one lecture weekly on Nietzsche's philosophy.

Dr. Slonimsky, who resigned as Associate in Philosophy in February, 1920, was appointed lecturer for 1920 21, and conducted the undergraduate course in the history of philosophy throughout the year. The course in elementary logic was conducted by Mr. A. L. Hammond. An evening course on contemporary philosophy was given by Dr. A. Thalheimer.

A course in ethics was offered, but, in spite of a large number of provisional registrations, could not be given, on account of conflict in the schedule of undergraduate classes.

PUBLICATIONS

Arthur O. Lovejoy.

Pragmatism as Interactionism. *Journal of Philosophy*, vol. 17, pp. 589-596 and 622-632.

Teachers and Trade-Unions. *Educational Review*, vol. 60, September, 1920, pp. 106-119.

Better Organization of Teachers without Unionization. *Educational Review*, vol. 60, November, 1920, pp. 329-335.

Proprietary Professorships and Academic Freedom. *Weekly Review*, Nov. 3, 1920, pp. 417-418.

"Pride" in Eighteenth Century Thought. *Modern Language Notes*, vol. xxvi, 1921, pp. 31-37.

Profit-Sharing and Industrial Peace. *International Journal of Ethics*, vol. 31, April, 1921, pp. 241-263.

Report on Conditions in Washburn College (with Grace S. Van Baur, R. G. Gettell, E. J. Swift and U. G. Weatherly). *Bulletin of the American Association of University Professors*, January-February, 1921, pp. 66-137.

ARTHUR O. LOVEJOY,
Professor of Philosophy.

PHYSICS

The Physical Laboratory has been open daily during the year for the work of advanced and undergraduate students. Regular courses of lectures have been given, and meetings have been held weekly for the reading and discussion of the current journals. The Physical Seminary has met once a week.

The regular courses of instruction were as follows:

By Professor Ames:

1. Physical Seminary. One hour weekly, through the year.
2. General Physics. Theoretical Mechanics. Three hours weekly, through the year.
3. Undergraduate Physics II. Mechanics and Thermodynamics. Three hours weekly, through the year.
4. Journal Meeting. One hour weekly, through the year.

By Professor Wood:

1. Selected Problems in Advanced Physical Optics. Three hours weekly, through the year.

By Professor Bliss:

1. Undergraduate Physics I. Four hours weekly, first half-year.
2. Undergraduate Physics III. Electricity and Magnetism. Three hours weekly, second half year.

By Associate Professor Pfund:

1. X-Rays and Atomic Theories. Two hours weekly, first half-year.
2. Undergraduate Physics I. Four hours weekly, second half-year.

By Dr. E. O. Hulburt:

1. Radio Engineering. Two hours weekly, second half-year.

The work in Undergraduate Physics I, II and III was carried out in part by several assistants: Dr. E. O. Hulburt, Mr. H. T. Wensel,

Mr. W. G. Brombacher, Mr. F. S. Brackett, Mr. F. P. Upton and Mr. M. S. Van Dusen.

The laboratory work for undergraduates has been under the direction of Professor Bliss and Dr. Pfund, with the assistance of Dr. Hulburt and the others named above. The advanced work and the original investigations have been under the direction of Professors Ames, Wood and Pfund and Dr. Hulburt.

In the Physical Seminary the entire year was devoted to a study of Einstein's Principles of Relativity.

There were fourteeen advanced students who followed Physics as their principal subject. Of these five absolved the requirements for the degree of Doctor of Philosophy, their names and the titles of their dissertations being as follows:

Mr. L. B. Tuckerman—"Strength of Columns."

Mr. J. S. van der Lingen—"The Fluorescence of Mercury Vapour."

Mr. Gregory Breit; "The Behaviour of Inductance Coils at Frequencies of Radio-Telegraphy."

Mr. M. S. Van Dusen—"The Thermal-conductivity of Some Heat Insulators."

Mr. R. A. Castleman, Jr.—"Magnetic Rotatory Dispersion in Transparent Liquids."

Professor Wood was engaged during the year upon a series of investigations as to the nature of fluorescence, and upon the character of electrical discharges in tubes of great length containing various gases, such as hydrogen, nitrogen and helium. He was specially interested in the conditions underlying the fluorescent spectrum of mercury vapor. In this connection he improved the phosphoroscope of Becquerel so that he was able ultimately to measure a time interval as short as one four hundred thousandth of a second.

Dr. Pfund in the early part of the year perfected an instrument for measuring the pressure in extremely high vacua, and later continued his studies in the field of colorimetry. This last problem led him to some interesting and novel work in the range ordinarily called ultramicroscopic.

Dr. Hulburt carried on investigations during the year in the study of rotatory polarizations, both magnetic and natural, and also continued his work in the study of the properties of electron tubes in wireless circuits.

The work of the graduate students is illustrated by the dissertations submitted and named above. In addition to these various other problems have been begun.

Professor Ames was elected in April a Trustee of the Bartol Foundation of the Franklin Institute, and has continued to be Chairman of the Executive Committee of the National Advisory Committee for Aeronautics. During the year he has made several addresses before various scientific societies.

In conclusion the final statement of the report of last year may well be repeated. It is impossible to emphasize too strongly the great need of a physical department for its own laboratory building.

At the present time it is housed in the building devoted to Mechanical and Electrical Engineering and is living in very cramped quarters. Conditions are such that the research work of many of the students in Physics must be carried on in other laboratories. Fortunately, owing to the coöperation of the Bureau of Standards in Washington, it is possible for the students of the University to spend their summers and also part of each winter in researches where the facilities of the Bureau are made use of. Were it not for this the work of the department of Physics could not be carried on. A new building is of vital importance.

Since the last report the following papers have been published by members of the staff:

Joseph S. Ames.

Einstein's Theory of Gravitation from the Standpoint of the Teacher of Physics. *School Science and Mathematics*, vol. xx, No 6, 477-481, 1920.

Einstein's Principle of Relativity and its Bearing upon Physics. (Lecture before the Franklin Institute). *Jl. Franklin Institute*, vol. 191, No. 1, 1-23, 1920.

R. W. Wood.

Extension of the Balmer Series, and Spectroscopic Phenomena of very long Vacuum Tubes. *Proc. Roy. Soc. London*, vol. 97, 455-470, 1920.

A. H. Pfund.

The Thickness of Wet Paint Films. *Jl. Franklin Institute*, vol. 191, No. 4, 517-523, 1920.

An Extension of the Range of the McLeod Gauge. *Phys. Rev.*, vol. xv, No. 6, 536-7, 1920.

A New Colorimeter for White Pigments and Some Results obtained by its use. *Proc. Am. Soc. Test. Mats.*, 1920.

E. O. Hulburt and G. Breit.

The Detecting Efficiency of the Electron Tube Amplifier. *Phys. Rev.*, vol. xvi, No. 4, 274 281, 1920.

The Detecting Efficiency of the Single Electron Tube. *Phys. Rev.*, vol. xvi, No. 5, 408 419, 1920.

G. Breit.

The Calculation of Detecting and Amplifying Properties of an Electron Tube from its Static Characteristics. *Phys. Rev.*, vol. xvi, No. 5, 387-407, 1920.

J. S. van der Lingen.

Anisotropic Liquids. *Jl. Franklin Inst.*, vol. 191, No. 5, 651-677, 1921.

F. S. Brackett.

An Examination of the Infra Red Spectrum of the Sun, λ 8900-λ 9900. *Astrophys. Jl.*, vol. liii, 121-132, 1921.

JOSEPH S. AMES,
Director of the Physical Laboratory.

POLITICAL ECONOMY

The instruction in Political Economy was directed by Professor Hollander, who met students daily in seminary organization for formal study and for coöperative research. The courses were designed to afford systematic instruction in general economic principles, intimate acquaintance with special fields of economic activity, and, most important of all, knowledge of and ability to employ sound methods of economic research. Dr. George E. Barnett, Professor of Statistics; Dr. William O. Weyforth, Associate in Political Economy; Miss Theo Jacobs, Associate in Social Economics, and Dr. Broadus Mitchell, Instructor in Political Economy, assisted in the conduct of the work.

ECONOMIC SEMINARY

The students following Political Economy as a principal subject for the degree of Doctor of Philosophy met weekly under the direction of Professors Hollander and Barnett. The work of the year centered in the investigation of representative forms of industrial development in the United States, and in the analysis of significant activities of American labor organizations. The papers and reports presented to the Seminary were as follows: "Economic Issues in the Presidential Campaign," by Professor Hollander; "Land Settlement in California," by Professor Barnett; "A Reprint of the Bullion Report," by Dr. Weyforth; "The Steel Strike of 1919," by Dr. Mitchell; "The Courses in Social Economics," by Miss Jacobs; "The Formation and Functions of Commercial Banking Companies," by Mr. Merrick; "The Situation in the Building Trades in Pittsburgh," by Mr. French; "Government Control of Sugar" and "A Statistical Survey of the Sugar Industry," by Mr. Bernhardt; "The Note-Issue Privileges Under the Federal Reserve Act," by Mr. Evans; "The Development of Building and Loan Associations," by Mr. Mechanic; "The Call Money Rate on the New York Money Market," by Mr. Griffiss; "The Employment of Negroes in the Baltimore Copper Works," by Mr. Wyckoff; "Political Sovereignty in the Light of Economic Progress," by Mr. Bernhardt; "The Brewery Workers' Union," by Mr. Straus; "The Par Collection of Checks Under the Federal Reserve System," by Professor Barnett; "Trade Unions and the Shop Committee," by Mr. French; "Graft in the New York Building Trades Unions," by Miss Morrissy; "The Last Decade in Santo Domingo and Haiti," by Professor Hollander; "Three Books on Industrial Unrest," by Dr. Mitchell; "Economic Influences on Ethics," by Mr. Houston; "Helping Workers to Think," by Dr. Mitchell; "Settlement of Disputes in the Men's Clothing Industry in Chicago," by Father Haas; "The Liquidity of Bank Loans," by Dr. Weyforth; "Coöperative Selling Among Farmers of Southern Maryland," by Mr. Merrick; "A Graphical Representation of the Course of the Call Money Rate," by Mr. Griffiss; "The Juvenile Court in Maryland," by Miss Hopper; "The Care of Mentally Defective Children in Maryland," by Miss Easterwood; "Safeguarding the Health of the Child in Baltimore and Rural Maryland," by Miss Schneidereith; "Wage Policies of the United Mine Workers,"

by Mr. Wyckoff; "Social and Civic Service of Baltimore County Schools," by Miss Muller; "The Shop Committee," by Mr. French; "Child Placing in the State of Maryland," by Miss McDougall.

Appreciable progress has also been made by members of the Seminary in the study of special aspects of the several questions assigned for investigation. During the summer, field work was carried on in various carefully selected localities, and the data thus collected have since been supplemented and corrected by documentary study and personal interview.

Professor Hollander conducted the following courses of lectures:

1. The Development of Economic Opinion. Two hours weekly, through the year. Continuing the analysis of previous years, a critical survey was made of the doctrinal development and present state of fundamental concepts of economic science.

2. Theory and Practice of Taxation. Two hours weekly, through the year. Examination was made of the recent fiscal expedients of the United States.

Professor Barnett lectured one hour weekly, through the year, on the history, structure and activities of American trade unionism.

Professor Barnett, Dr. Weyforth, and Dr. Mitchell conducted the following undergraduate courses:

Political Economy I. Three hours weekly, through the year. In the first half-year the economic development of England and the industrial experience of the United States were studied. In the second half year particular attention was given to the history of distribution and its application to leading economic problems. (Dr. Weyforth and Dr. Mitchell.)

Political Economy II. Three hours weekly, through the year. In the first half year a preliminary study of the value and place of statistics as an instrument of investigation was made; attention was directed to the chief methods used in statistical inquiry. In the second half year the principles of monetary science were taught with reference to practical conditions in modern systems of currency, banking and credit. (Professor Barnett and Dr. Weyforth.)

Political Economy III. Three hours weekly, through the year. In the first half year the theory and practice of labor legislation were studied with attention given to legal, economic and social considerations. The second half-year was devoted to the study of investments, including historical and analytical description of the more important forms of investments and theories of valuation and amortization. (Dr. Mitchell and Professor Barnett.)

Political Economy V. Three hours weekly, through the year. In the first half-year the economic principles of international commerce, the methods of conducting foreign trade, and the theory and practice of foreign exchange were studied. In the second half-year the course dealt with the economic development of the United States and with the way in which the economic motive has influenced our history. (Dr. Weyforth and Dr. Mitchell.)

The University, in coöperation with the Baltimore Alliance of Charitable and Social Agencies, in 1919 and 1920 broadened its

instruction in Social Economics and offered the following courses: Judge Carroll T. Bond, Social Case Work and Law; Dr. Richard A. Bolt, Health and Preventable Disease; Dr. Francis Lee Dunham, Social Medicine; Dr. Ruth Wheeler, Home Economics; Dr. Philip Klein, Community Problems and Organization; Miss Jacobs, Social Case Work; Dr. Joshua Bernhardt, Social Statistics and Immigrant Peoples; Dr. Mitchell, Social Legislation. Miss Jacobs' and Dr. Mitchell's courses ran through the entire year; the other courses for one half year, with the exception of Dr. Wheeler's course, which consisted of sixteen one hour lectures. Twenty one hours a week of field work in approved case-working agencies was required of students taking the full course. Five students completed the two years' course and received the degree of Master of Arts.

COURSES IN BUSINESS ECONOMICS

During the past five years the Johns Hopkins University has offered a series of evening "Courses in Business Economics" under the general direction of the Department of Political Economy. Such instruction is made available at hours and under conditions designed to meet the convenience of those likely to make use thereof. While designed in the main to offer instruction to young men and women actually engaged in, or contemplating entrance into business, industry and commerce, the courses are planned to meet the needs also of those who have a more general interest in the subjects.

The following courses were offered during the year:

Political Economy. Wednesday evenings, 8 to 10. Dr. Mitchell.

Current Economic Problems. Friday evenings, 8 to 10. Professor Hollander.

Elementary Accounting. Thursday evenings, 8 to 10. Dr. Bryan.

Legal Aspects of Business Practice. Tuesday, 5.30 to 7 p. m. Dr. Bryan.

Business English. Thursday evenings, 8 to 10. Mr. Uhler.

Money and Banking. Thursday evenings, 8 to 10. Dr. Weyforth.

Corporation Finance. Tuesday evenings, 8 to 10. Professor Barnett.

Principles of Salesmanship. Wednesday evenings, 8 to 10. Mr. Palmer.

Principles of Advertising. Thursday evenings, 8 to 10. Mr. Gunts.

Foreign Trade. Friday evenings, 8 to 10. Dr. Weyforth.

Industrial Relations. Monday evenings, 8 to 10. Dr. Emmet.

Principles of Suretyship. Wednesday evenings, 8 to 10. Dr. Radcliffe.

Railway Accounting. Monday evenings, 8 to 10. Mr. Deverell.

The total number of attendants on the courses was 765, including two graduate and twenty undergraduate students of the University. The total number of registrations for separate courses was 861, including twenty-six registrations of graduate and undergraduate students.

PUBLICATIONS

Jacob H. Hollander.

Can Federal Taxes be Reduced? *The Magazine of Wall Street*, February, 1921.

George E. Barnett.

Index Numbers of the Total Cost of Living. *Quarterly Journal of Economics*, Feb., 1921, pp. 240-263.

Inflation in the United States. *The Times* (London), July 6, 1920.

Cost of Living. *The Times* (London), July 6, 1920.

A Critique of Cost of Living Studies. *Quar. Pub. Amer. Statis. Assoc.*, Sept., 1921, 6 pp.

William O. Weyforth.

The English Bank Restriction and the Bullion Report. Review. *Quar. Pub. Amer. Statis. Assoc.*, Dec., 1920.

Secrist: Readings and Problems in Statistical Methods. Review. *Quar. Pub. Amer. Statis. Assoc.*, March, 1921.

Broadus Mitchell.

Two Industrial Revolutions. *South Atlantic Quarterly*, Oct., 1921.

Helping Workers to Think. *Educational Review*, May, 1921.

What Can the Workers' Teacher Expect of his Students? *Proceedings First Convention Workers' Education Bureau of America.*

The Inter-Racial Conference of Baltimore. Leaflet published by the conference.

Review of J. Ellis Barker's "Economic Statesmanship." *South Atlantic Quarterly*, Oct., 1920.

Reviews of Baker's "New Industrial Unrest" and Crowther's "Why Men Strike." *South Atlantic Quarterly*, Jan., 1921.

JACOB H. HOLLANDER,
Professor of Political Economy.

POLITICAL SCIENCE

The work in Political Science has been directed by Professor Willoughby and has for its primary purpose the preparation of advanced students for professional and original work in the fields of constitutional law, international law and diplomacy, and political theory. The instruction has also aimed to supply a training for students desiring to enter the higher branches of the public service, as well as to furnish a philosophical equipment to those who expect later to pursue the study and practice of the law.

Seminary. Weekly two hour Seminary meetings were held, devoted to the consideration of doctoral dissertations in course of preparation, and to the discussion of current questions in constitutional and international law, and reviews of books and journals. The Seminary was directed by Professor Willoughby and Mr. W. F. Willoughby.

In order to enable Professor Willoughby to make a trip to New Zealand, Australia, and the South Pacific, leave of absence was granted him beginning with the Easter vacation. During his absence for the remainder of the year, Baron Sergius Korff, formerly of the University of Helsingfors, gave a course of graduate lectures dealing with parliamentary institutions in Europe.

Lecture Courses. The following graduate courses were given:

1. Principles of Political Philosophy. *Two hours weekly, first half-year.* By Professor Willoughby.

2. Legal Aspects of Industrial and Commercial Problems. *Two hours weekly, February 1 to Easter.* By Professor Willoughby.

3. Parliamentarism in Europe. *One hour weekly, Easter to end of the academic year.* By Baron Sergius A. Korff.

4. The Law of Public Administrative Affairs. *Two hours weekly, first half year.* By President Goodnow.

5. The Law of Municipal Government and of Municipal Corporations. *Two hours weekly, second half year.* By President Goodnow.

6. The Organization, Procedure, and Work of Congress. *One hour weekly, through the year.* By Mr. W. F. Willoughby.

Undergraduate Courses

1. The Government and Administration of Modern States. *Two hours weekly, through the year.* By Mr. W. F. Willoughby and Mr. C. C. Thach.

2. American Diplomacy. *Three hours weekly, first half year.* By Dr. Latané.

3. Elements of International Law. *Three hours weekly, second half-year.* By Dr. Latané.

W. W. WILLOUGHBY,
Professor of Political Science.

PSYCHOLOGY

During the year 1920-21 undergraduate courses in introductory general psychology and social psychology were given by Professor Dunlap; in mental measurements by Associate Professor Johnson. Graduate courses were given as follows: Experimental Methods in Psychology, Professor Dunlap; Psychology of Childhood, Associate Professor Johnson; Psychology of Music, Mr. Ortmann. In addition, a seminary was conducted weekly for graduate students, and research directed in the laboratory by Dr. Dunlap and Dr. Johnson. Instruction and research in mental measurements were newly organized this year and represent an important addition to the facilities for training psychologists. The course in the Psychology of Music is also a new departure, and has attracted widespread attention, both because few institutions are prepared to carry on such work, and also because the coöperation of the University and the Peabody makes the opportunities for this work exceptional.

The number of graduate students in psychology has materially increased, thirteen having registered for psychology as principal subject. The undergraduate enrollment has also increased, and in the laboratory courses has been limited by the available space in the laboratory.

Research has proceeded along a number of lines, including investigation of the effect of tobacco smoking, begun last year and financed by the American Committee for the Study of the Tobacco Problem. Plans for extensive work on processes connected with vestibular function have been developed and endorsed by the Division of Anthropology and Psychology of the National Research Council, which proposed to assist in raising the large funds necessary for this work.

Important advances have been made by Dr. Preston H. Edwards, Johnston Scholar in Psychology, toward the perfecting of a practical acoumeter—an instrument very much needed both for research and clinical work on auditory functions. In the course of this work, Dr. Edwards has developed an instrument for the measurement of pitch changes in the human voice and other tone sources. This instrument will shortly be available for research purposes, and will be employed next year in research to be begun here with the collaboration of Professor Miller, of the Greek Department, on the pitch and rhythm of speech.

With the assistance of Mr. M. W. Pullen, of the Electrical Engineering Department, several new forms of apparatus of importance for psychological research have been developed.

Research on the psychology of children, color vision, and mental measurements has also been in progress.

In addition to her University activities, Dr. Johnson has retained the chairmanship of the Research Committee of the Bureau of Educational Experiments (New York), and has directed research for that institution on the effects of nutrition on the mentality of school children.

With the increasing number of graduate students, the present laboratory accommodations have become hamperingly inadequate. Laboratory instruction for undergraduate students is restricted, both as regards numbers admitted and scope of the work, for lack of accommodations. For adequate laboratory instruction, a separate small room is needed for each pair of students in the section, since the work of one pair necessarily interferes with the work of another pair, if in the same room. For ultimate purposes, a group of twelve small rooms, providing for sections of twenty-four students, would be adequate.

PUBLICATIONS

Knight Dunlap.

The Social Need for Scientific Psychology. *Scientific Monthly*, 1920, vol. 11, pp. 502-517.

Light Spot Adaptation. *American Journal of Physiology*, 1921, vol. 55, pp. 201-211.

A Rotator for Vestibular and Organic Stimulation. *Journal of Comparative Psychology*, 1921, vol. 1, pp. 365 7.

Knight Dunlap and Agnes Snyder.

Practice Effects in Intelligence Tests. *Journal of Experimental Psychology*, 1920, vol. 3, pp. 396 403.

English Bagby.

The Psychological Effects of Oxygen Deprivation. *Journal of Comparative Psychology*, vol. 1, 1921, pp. 97-113.

KNIGHT DUNLAP,
Professor of Experimental Psychology.

ROMANCE LANGUAGES

I. ADVANCED COURSES

The Seminary in French Literature met two hours weekly throughout the year. During the first semester, under the direction of Professor Lancaster, the Seminary studied Corneille. Investigations were made in order to determine when and where his plays were first performed, what sources he used, and how he treated them. Some attention was also paid to his use of the *récit*. The results obtained by Mr. Riddle in his study of *Théodore* will be published. During the second semester, under the direction of Professor Chinard, the Seminary studied Chateaubriand. A particular study was made of the sources of *Les Natchez* and *Les Martyrs*, with special reference to Tasso and Milton. An essay by Mr. Olivet on Chateaubriand and Tasso will shortly be published.

The Seminary in the French Language met two hours fortnightly under the direction of Associate Professor Blondheim. The French glosses of Rashi of Troyes (1040 1105), in preparation for a forthcoming edition, continued, as in 1919-20, to be the basis of the work

done. Problems in French word-history were investigated by the members of the Seminary, and studies pursued in the use of the Romance languages among the Jews, which have led to a revision of current views of the origin of the Latin Bible. The results of these investigations are shortly to be published.

Professor Lancaster gave a course on the Nineteenth Century Drama, *weekly*, and a course on the Sixteenth Century, *weekly*. Professor Chinard gave courses on the Realistic Novel, *weekly*, and on Les Parnassiens (*Explication de textes*), *weekly*. Associate Professor Blondheim gave courses in Old French Readings, *weekly*, in old French Grammar, *weekly*, and in Vulgar Latin and Provençal, *weekly*.

Dr. Gruenbaum gave a course in Spanish Historical Grammar, *two hours weekly*, and a course of readings in Old Spanish Literature, *weekly*. Mr. Robles gave a course on Lope de Vega, *weekly*, and a course on *la Novela desde 1850*, *weekly*.

II. Collegiate Courses

French Elements, three sections, *each four hours weekly*, by Mr. Merrill; French 1, four sections, *each four hours weekly*, by Professor Lancaster, Associate Professor Blondheim, Dr. Gruenbaum, and Mr. Riddle; French 2, a survey of French Literature since 1600, *three hours a week*, by Professor Chinard; French 3, a course on French Literature since 1870, *three hours a week*, by Professor Lancaster; French 4, a composition course, *one hour a week*, by Professor Chinard.

Spanish Elements, two sections, *each four hours weekly*, by Mr. Cabello; Spanish 1, two sections, *each four hours weekly*, by Mr. Robles; Spanish 2, Modern Spanish Novel, *three hours weekly*, by Mr. Cabello.

Italian Elements, *four hours weekly;* Italian 1, *three hours weekly*, by Dr. Gruenbaum.

III. College Courses for Teachers

In the division of the College Courses for Teachers instruction in French was given as follows: French Elements, *three hours a week*, Mr. Merrill; French Elements, *two hours a week* (two sections, meeting at the Western High School), Dr. Dulac; French Readings, *two hours a week*, Mr. Merrill; Practical French, *two hours a week*, Dr. Dulac. Especially qualified teachers were admitted to Professor Lancaster's graduate course on the Nineteenth Century Drama and to Professor Chinard's two graduate courses.

IV

The following lectures were given by members of the department:

H. C. Lancaster.

"Stage decoration in France before the acceptance of the Unity of Place," before the Johns Hopkins Philological Association.

"The Demand for Teachers of French and Spanish," at the University of Virginia.

G. Chinard.

"The Future of Franco-American Intellectual Relations."

"L'exotisme sentimental dans la littérature du dix-neuvième siècle," and "Les relations intellectuelles entre la France et les Etats-Unis au dix-neuvième siècle," at Dartmouth College.

"L'exotisme américain dans la littérature française au dix-neuvième siècle," at Brown University.

"Le Voyage de Chateaubriand dans la région de l'Ohio," at Pittsburgh.

"Bernardin de St.-Pierre," in the New York Public Library.

"L'exotisme sentimental dans la littérature française du dix-neuvième siècle," before the Modern Language Association.

"Louis Bertrand," before the Alliance française of Baltimore.

D. S. Blondheim.

"Some Mediæval Echoes of the *Vetus Latina* and their Significance," before the Modern Language Association.

"Latin and its Daughter Languages in the Synagogue and the Church," at Dropsie College.

V. Publications

H. C. Lancaster.

Le Mémoire de Mahelot, Laurent et d'autres décorateurs de l'Hôtel de Bourgogne et de la Comédie-Française au XVIIe siècle (158 pp. and 49 illustrations). Paris, Champion, 1920.

La Calprenède Dramatist. *Modern Philology*, xviii, 121-141 and 345-360.

Corneille's "Illusion Comique," Mahelot's "Mémoire," and Rampalle's "Bélinde." *Studies in Philology*, xviii, 10 14.

Review of Gustave Lanson, "Esquisse d'une histoire de la tragédie française." *Modern Language Notes*, xxxvi, 98-103.

Mairet's "Illustre Corsaire." *Modern Language Notes*, xxxvi, 123.

Review of W. F. Smith "Readings from Rabelais." *Modern Language Notes*, xxxvi, 192.

G. Chinard.

Les Sources d'un poème de Leconte de Lisle. *Modern Language Notes*, xxxvi, 10-14.

L'épopée africaine dans l'œuvre de Louis Bertrand. *La France*, April, 1921.

VI

Miss J. V. N. Smead completed a dissertation for the doctor's degree, entitled "Chauteaubriand et la Bible."

Miss Esther J. Crooks completed an essay for the master's degree, entitled "The Influence of Cervantes on the French Theater of the Seventeenth Century."

Miss Eunice R. Goddard published in *Modern Language Notes*, as the result of an investigation carried on in Professor Chinard's

cours d'explication, an article entitled "Color in Lamartine's 'Jocelyn.'"

VII

The editorial work for *Modern Language Notes* in French was carried on by Professors Lancaster, Chinard, and Blondheim; in Spanish and Italian, by Dr. Gruenbaum. Professor Lancaster is a member of the editorial committee of the *Publications of the Modern Language Association.*

H. CARRINGTON LANCASTER,
Professor of French Literature.

SANSKRIT AND COMPARATIVE PHILOLOGY

During the session of 1920 21 the Seminary, under the guidance of Professor Bloomfield, was engaged with the beginnings of Hindu theosophy in the Veda. After discussing the character of early filosofical thought as an outgrowth of nature worship and liturgic practice, the Rig-Veda was scanned for traces of monotheistic, monistic, and pantheistic thought. Such hymns as deal with the idea of being and non-being (sat and asat); with holy utterance and practice (brahma, vāc, dhī, etc.); with Prajāpati, Bṛhaspati, Puruṣa, and Hiraṇyagarbha (monotheistic-pantheistic conceptions) were analyzed and interpreted so as to show the manner in which they prepared the way for the thought of the Upaniṣads. Especially the great riddle hymn of Dīrghatamas was made the theme of intensive study, at times with rectifications of previous interpretations. The course was, in a measure, preparatory to the study of the Upaniṣads, which will follow in 1921-22.

A second course in advanced Hindu filology was concerned with Prākrit language and literature. One of the chief Prākrit dialects, the Māhārāṣṭrī, is exhibited in the prose tales of the Jainist commentator and teller of stories, Devendra. This language was studied in the light of the numerous dialectic varieties of medieval Hindu speech. The stories were made the basis for comparative studies in the wide field of Hindu narrative in general. Thruout the plan of an Encyclopedia of Hindu fiction was kept in mind; the progress of this work is attested by several papers whose titles are given below.

Parallel with the course in Prākrit, Dr. W. Norman Brown, Johnston Scholar in Sanskrit, gave a course in Pāli, the oldest medieval dialect of India, in which is written the Tripiṭaka, the canon of the Southern Buddhists. A brief study of the grammar was followed by selections from the Jātakas and Suttas.

Dr. Brown also conducted an elementary course in Classical Sanskrit, two hours weekly, during the session, beginning with the elements of Sanskrit grammar, and closing with interpretation of easy texts. This course served also as an introduction into the methods of Comparative Grammar.

Professor Bloomfield gave two courses in Comparative Philology. First, the annual course of lectures on General Comparative Philology. This began with a definition of the theme and its relation to History, followed by a brief sketch of the history of the science. The bulk of the lectures dealt with the linguistic Ethnology of the Indo European peoples, their divisions, special interrelations, and their original home (the so called Aryan question). Then followed sketches of the individual peoples of the family: India, the Vedas, Brahmanism, Upaniṣads, Sanskrit literature, and Buddhism; Persia, the Achemenidan cuneiform inscriptions, the Zoroastrian literature (Avesta) and religion; the minor and problematic Indo-European peoples (including the Hittite question); and, finally, similar sketches of the European peoples of the family and their national religions.

A second course was devoted to the elements of Comparative Grammar of the Indo European languages. The particular subject treated was the history of the consonants, with special reference to Greek, Latin, Teutonic, and Sanskrit. The course was preceded by exercises in the fisiological fonetics of the consonants.

During the year appeared 'Studies in Honor of Maurice Bloomfield,' (New Haven, Yale University Press, 1920). The volume contains, in addition to a bibliografy of Professor Bloomfield's published work, the following articles by former students of his, mostly Doctors of Philosophy in this University:

L. C. Barret, Professor of Latin, Trinity College: Pāippalāda and Rig-Veda.

H. H. Bender, Professor of Indo Germanic Philology, Princeton University: On the Lithuanian Word Stock as Indo-European material.

F. R. Baker, Associate in Oriental Languages, Johns Hopkins University: Congeneric Assimilation as a cause of the development of new roots in Semitic.

G. M. Bolling, Professor of Greek, Ohio State University: The Recension of Cāṇakya used by Galanos.

G. W. Brown, Professor of Old Testament Literature, College of the Bible, Lexington, Ky.: The Sources of Indian Philosophical Ideas.

W. N. Brown, Johnston Scholar in Sanskrit, Johns Hopkins University: Escaping One's Fate: A Hindu Paradox.

E. W. Burlingame, Lecturer in Pāli, Yale University: Buddhist-Zoroastrian Legend of Seven Marvels.

F. Edgerton, Professor of Sanskrit, University of Pennsylvania: The Philosophic Materials of the Atharva-Veda.

E. W. Fay, late Professor of Latin, University of Texas: Irradiation and Blending.

Helen M. Johnson, Fellow by Courtesy, Johns Hopkins University: Rāuhiṇeya's Adventures.

H. W. Magoun, Associate Editor, Bibliotheca Sacra: Agni Ṛtrahan and the Avestan Verethraghua.

Ruth Norton, Fellow in Sanskrit, Johns Hopkins University: The Life-Index: A Hindu Fiction Motif.

S. G. Oliphant, Professor of Greek, Grove City College: The Vedic Press Stones.

R. S. Radford, Professor of Latin, University of Tennessee: Licensed Feet in Latin Verse.

OTHER PUBLICATIONS

M. Bloomfield.

Notes on the Divyāvadāna. *Journal of the American Oriental Society*, vol. xl, pp. 336 352.

On Overhearing as a motif of Hindu Fiction. *American Journal of Philology*, vol. xli, pp. 309 335.

In press: The Language of the Hittites, and, On a possible Pre-Vedic Form in Pāli and Prākrit (both in *Journal of the American Oriental Society*).

W. N. Brown.

Antidotes to Fate. *Asia*, December, 1920.

In press: Vyāghramārī, or the Lady Tiger-Killer. A study of the Hindu Psychic Motif of Bluff in Hindu Fiction. *American Journal of Philology*, for June, 1921.

A comparative Translation of Book Six of Cheikho's Kalīla wa Dimna. *American Journal of Semitic Languages.*

Papers in abstract for the last meeting of the American Oriental Society: Hindu Stories in American Negro Folklore; The wonderful Tar-baby Story.

Miss Ruth Norton has presented a Doctor's Thesis entitled, The Vedic vṛkīs-declension; and Mr. G. Schaenzlin a Master's essay on The Çūnya-Purāna, a Bengāli religious text.

MAURICE BLOOMFIELD,
Professor of Sanskrit and Comparative Philology.

ZOOLOGY, BOTANY, AND PLANT PHYSIOLOGY

1. Zoology

The number of students in Zoology continues large, so that the need of a new biological laboratory remains pressing. Though fortunately, in view of our conditions, the number of graduate students is not so great as last year, we found it necessary to accept, as in some past years, the hospitality of the Botanical Department in placing at our disposal space in the Greenhouse for some of the research work of the graduate students. In the undergraduate courses there were seventy students in the first-year work, forty in the second-year work, and seven in the third; this greatly crowded the available space. Particularly in the work in vertebrate anatomy the poor lighting of the room used led to great difficulties, overcome only by undue exertion on the part of Associate Professor Cowles. It is desirable that the number of students in this (the preparatory medical course) be decreased to the space available.

The large first-year class was for the first time divided into two sections, as made necessary by the arrangements for the laboratory work in chemistry carried on by the same students. This proved an expensive change, and in the opinion of Professor Andrews the work is less efficiently done than on the former plan of a single section. In case of decrease in the number of students it is hoped that there may be a return to the single section plan.

The Zoological Seminary has continued to meet in the Historical Seminary rooms on Thursday evenings, many persons from outside the department attending it. The subject dealt with was the relation of biological science to human affairs. Part of the time was spent in a discussion of the earlier chapters of Popenoe and Johnson's *Applied Eugenics;* then the Seminary resolved itself into a general discussion on the relative part of inheritance and environment in determining human characteristics, in connection with which a considerable number of books and papers were reviewed and discussed. We were fortunate in the participation of a number of the members of the Department of Psychology in these discussions. Special papers were presented by R. P. Cowles, H. T. Folger, S. W. Geiser, H. S. Jennings, S. O. Mast, C. P. Richter, E. C. Sanford, A. M. Schwitalla, and G. L. Taneyhill.

The Biological Journal Club has meet weekly as usual, one meeting a month being held in union with the Journal Club of the Department of Medical Zoology of the School of Hygiene. Besides the usual reports on current literature, the following presented before the Club accounts of their own investigations: W. W. Cort, R. P. Cowles, J. G. Edwards, H. T. Folger, R. W. Hegner, M. J. Hogue, Y. Ibara, H. S. Jennings, R. S. Lynch, S. O. Mast, O. E. Plath, E. A. Andrews, and A. M. Schwitalla.

During the past year the Baltimore Naturalists' Field Club has continued its activities with R. P. Cowles as president and E. W. Berry, Jr., an undergraduate, as secretary. While the graduate students of

the Zoological and Botanical Departments have shown a consistent interest in the Field Club, there are now indications of increasing interest on the part of undergraduate students, who are urged to attend the meetings and excursions. Recently the Club has shown much interest in birds and has been placed in charge of the various activities to protect the wild birds which visit Homewood. The grounds are to be known as the Homewood Bird Sanctuary, and work has been or will be undertaken along the following lines: placing of bird-boxes on trees in favorable localities, numbering and recording of boxes, observing and recording the kinds of birds that nest and the time of nesting in the boxes, cleaning the nests in the fall, recording nests made outside of bird-boxes, recording the time of arrival and departure of migratory birds, recording the time they remain at Homewood throughout the year, and controlling the enemies of birds. In addition to these activities and in accordance with the suggestion of Mr. McAtee of the U. S. Biological Survey, it is proposed to make plantings of vines, shrubs, and trees which will furnish food and protection for birds, to establish feeding boxes and drinking fountains and to feed the birds during the winter-time. The Baltimore Audubon Society has presented the University with a martin house constructed by one of the pupils of the city schools. It is hoped that in time bird fountains may be donated, and it is desirable that there be included in the permanent general landscape plan for Homewood adequate space for a thicket for nesting birds. It is hoped that this work, in which at the present time a few are greatly interested, will attract a larger number of people connected with the University, and that the Homewood Bird Sanctuary will become an institution which will give pleasure to all. The following is a list of the lectures and excursions for 1920 21:

Lectures: Peace River Region of Canadian Rockies, Mr. E. Spiker; Ferns around Baltimore (Illustrated), Professor C. C. Plitt; Illustrated lecture on British Honduras, Father A. M. Schwitalla; Freshwater Clams of the Mississippi River, Mr. J. F. Müller; Nesting Habits of the Red Horse, Mr. H. T. Folger.

Excursions: To Gwynn's Falls with the Maryland Audubon Society; About Homewood to survey bird houses; To Starling Roosts at Mt. Royal Avenue; Christmas Bird Survey of Homewood; To Loch Raven; To U. S. Fish Hatchery at Bryan's Point, Maryland.

The year has been a very active one in investigation and a considerable number of researches have been prepared for publication, or are in process of publication. It so happens however that few have actually appeared between the dates for which our literature list is prepared.

Professor Andrews has continued his investigations of the remarkable infusorian genus Folliculina.

The Biological and Hydrographic Survey of Chesapeake Bay commenced by R. P. Cowles for the U. S. Bureau of Fisheries in January 1920 has been continued and as a result a large series of data on salinity, temperature, current velocity, and current direction have been collected; together with quantitative samples of plankton, qualitative samples of plankton, samples of the mud, sand, etc. of

the bottom, and many specimens of the larger animals and plants. The observations made and samples collected have not been confined merely to the surface nor to the bottom, but have been obtained at definite depths, equal intervals apart, from the surface to the bottom. Probably the most valuable characteristic of the work is the fact that the observations have been made about every sixth week during the year at fixed stations arranged in lines across the Bay, these lines being so placed as to adequately cover the Bay from the region of Baltimore to the Capes.

During the year preliminary work has been undertaken to determine the hydrogen ion concentration of the sea water by colorimetry. This method has now been perfected, and the tests made on the so called 24 hour stations where observations are taken every 1½ hours at definite intervals from the surface to the bottom for a period of 24 hours, have shown some very interesting conditions.

A preliminary report on the results obtained during the past year is in preparation and will be published by the U. S. Bureau of Fisheries. The coming year will be devoted to working over the data and material, with possibly an occasional cruise on the Bay to collect information that may be lacking.

Professor Jennings has had in progress an investigation of certain mathematical relations in inheritance, and certain work on inheritance in Difflugia. Under his immediate direction Dr. Ruth Stocking Lynch carried on work on the effects of conjugation in Paramecium; Inez Coldwell on the Nuclear Phenomena in the Development and Reproduction of Difflugia. Professor A. R. Middleton, of the University of Louisville, continued, in coöperation with Professor Jennings, his researches on the Modification of Hereditary Characters in Lower Organisms.

Professor S. O. Mast continued his researches on reactions to light in insects and lower forms. He organized, with the coöperation of the graduate students, a thorough, detailed investigation of locomotion and behavior in Ameba, particularly of the effects of external conditions upon movement. A considerable number of the graduate students devoted their research time to this work: A. M. Schwitalla studied the Relation between Temperature and the Rate of Locomotion; J. G. Edwards, The Effect of Chemicals on Locomotion; H. T. Folger, Reaction of Ameba to Light; Katharine Evans, Relation between the Concentration of Oxalic Acid and the Rate of Locomotion; L. C. Pusch, Modifiability in the Behavior of Ameba. Some of these researches have already led to results of great interest, and the whole should throw light on one of the fundamental phenomena of biology. In addition to this work, other researches in physiological lines under Professor Mast's direction were carried on as follows: Y. Ibara, (1) Conditions of Encystment in Didinium, (2) Effect of Alcohol on the Growth of Tadpoles; N. J. Howard, The Process of Formation of Food Vacuoles in Paramecium; T. J. White, Relation between Different Types of Food and the Rate of Pulsation in the Contractile Vacuole of Paramecium; C. E. Bills, (1) Effect of Different Alcohols on Paramecium, (2) Nucleic Acid in Lower Organisms; O. E. Plath, Nuclear Changes during Fission

in Dileptus; S. W. Geiser, Spermatogenesis and Sex-Control in Gambusia. Professor W. L. Dolley, of Randolph Macon College, continued, in coöperation with Professor Mast, his researches on the Effects of Light on the Behavior of Insects.

The collection in the Seminary Room of the photographs of the fifty or more that have received the doctorate in Zoology at this University has been during the year, by the care of Professor Andrews, almost completed; it is hoped to obtain shortly the photographs of the few not yet represented.

The requirements for the degree of Doctor of Philosophy were absolved by J. G. Edwards and A. M. Schwitalla; those for the Master's degree by Y. Ibara. Mr. J. G. Edwards was Adam T. Bruce Fellow.

The assistants were: Dr. Ruth Stocking Lynch and S. W. Geiser, assistants in the Graduate Work and Investigation; H. T. Folger, assistant in Vertebrate Zoology; A. D. Shaftesbury, J. B. Moorman, O. E. Plath, and L. M. Bertholf, assistants in General Biology. The work of the Director of the Laboratory has been greatly aided by the very efficient assistance of Dr. Ruth Stocking Lynch, who has devoted her entire time and energy to this work.

LECTURE AND CLASSROOM WORK

The following courses were conducted by the different members of the staff:

Professor Jennings.

Zoological Seminary: The Relation of Biology to Human Affairs. *Thursday evenings through the year.*

Genetics: The Experimental and Statistical Study of the Factors of Evolution. *Three lectures weekly, first half-year.*

Investigations. *Daily through the year.*

Professor Mast.

General Physiology. *Three lectures weekly, second half-year; two laboratory periods weekly through the year.*

Investigations in General Physiology. *Daily through the year.*

Professor Andrews.

Biology 3: Invertebrate Zoology. *Nine hours weekly through the year.*

Professor Andrews and Associate Professor Cowles.

General Biology. *Nine hours weekly, October 1 to March 15.*

Embryology. *Nine hours weekly, March 15 to the end of the year.*

Associate Professor Cowles.

Comparative Anatomy and Embryology of Vertebrates. *Nine hours weekly through the year.*

The courses in Biology in the Summer School were conducted by Professor H. E. Enders (Ph. D. Johns Hopkins), of Purdue University.

PUBLICATIONS IN ZOOLOGY

Andrews. E. A.

Alternate Phases in *Folliculina*. *Biol. Bull.*, July, 1920.

Periodical Cicadas in Baltimore. *The Science Monthly*, April 1921.

Dolley, W. L.

The relative stimulating efficiency of continuous and intermittent light in the tachina fly, *Archytus aterrima*. *Anat. Rec.*, Vol. 20, p. 184.

Mast, S. O.

Reactions to light in the larvae of the Ascidian, *Amaroucium*. *Anat. Rec.*, Vol. 20, pp. 187 188.

Review of "The Nature of Animal Light," by E. Newton Harvey. *Quar. Jour. Univ. of N. Dakota*, Vol. ii, pp. 253 256.

II. Botany

Lectures and laboratory courses were conducted during the year as follows:

Professor Johnson.

Botanical Seminary. The classification, geographical distribution and economic uses of dicotyledonous plants.—Based on Engler and Prantl's Natürliche Pflanzenfamilien, on Britton and Brown's Flora, and on various works in economic botany. *One hour a week from November 1 to the end of the session.*

Reproductive Structures and Processes in Algae, Mosses, Ferns and Seed Plants. Laboratory work, lectures and conferences. *Nine hours per week, February 1 to end of session.* Four field trips on Saturdays.

The Structure and Functions of the Vegetative Organs of Plants. (Undergraduate Biology 3.) Laboratory work, lectures and conferences. *Nine hours per week, October 1 to January 31.* Five field trips on Saturdays.

Assistant Professor J. M. LeCato, of Delaware College, gave, during nine weeks of February, March and April, a course of lectures and laboratory exercises in general bacteriology to a class of 19 graduate and undergraduate students.

JOURNAL CLUB

Botanical instructors and advanced students joined each week with zoologists and plant physiologists for the report and discussion of current literature.

ADVANCED WORK

Professor Johnson spent July 1920 at the Harpswell Laboratory studying the primitive seed plant *Batis maritima*, which had been collected in Jamaica the previous summer. The latter part of the summer was devoted to writing. During the academic year his time, when free from teaching, has been devoted to work on cytological

problems taken up in Jamaica and to the preparation for publication of three briefer papers.

In November, 1920 Professor Johnson represented this University at a meeting of delegates from some twenty universities and museums for the founding of an Institute for Research in Tropical America. He was elected a member of the Committee on Organization. Later he was appointed a member of a committee to secure information regarding existing American institutions interested in tropical research, and was entrusted with getting information of botanical gardens and museums. Considerable time has been devoted to the work of these committees.

Mr. L. J. Pessin, who had served two years as student assistant in botany and was reappointed for 1920 21, resigned in August, 1920, to accept an associate professorship of botany at Mississippi Agricultural College. He continued during the summer, and in Mississippi, the study of air plants, initiated while in Jamaica with the botanical expedition from this University in 1919.

William E. Seifriz (Ph. D. 1920), spent the summer and autumn of 1920 in a study of the periodicity in blooming of the tropical plants of Java and Ceylon, in continuation of the similar studies initiated while with the Hopkins party in Jamaica in 1919. An illustrated summary of these studies was communicated to our Botanical Seminary during the winter.

PUBLICATIONS FROM THE BOTANICAL LABORATORY

D. S. Johnson.

William Harris (a biographical note). *Botanical Gazette*, lxxi, p. 331, 1921.

W. D. Hoyt.

Marine Algae of Beaufort, N. C. and Adjacent Regions. *Bulletin of the Bureau of Fisheries XXXVI*, 1917-18. (Issued December 30, 1920). The work here finally published was initiated and largely done while the author was a student and fellow of this university.

Grace A. Dunn.

A Comparative Study of the two Races of Rhizopus Nigricans. *Physiological Researches*, Vol. 2, 1921.

William E. Seifriz.

Viscosity Values of Protoplasm as determined by the Aid of Microdissection. *Botanical Gazette*, lxx, 1920.

Observations on some Physical Properties of Protoplasm by Aid of Microdissection. *Annals of Botany*, xxxv, 1921.

J. Graham Edwards.

The Flower and Seed of Hedyosmum nutans. *Botanical Gazette*, lxx, 1920.

THE BOTANICAL GARDEN

The planting and labelling of trees and shrubs in and near the Botanical Garden has gone forward steadily. A study has been made

of the possibilities for planting an arboretum on the unoccupied portions of Homewood. Plans are now nearly completed for doing this in such a way as to make the plantings of value both scientifically and also in the landscape setting of the buildings, drives, and walks. Plans are also being developed for a rock garden.

Seeds and plants needed for the Botanical Garden and Laboratories have as in other years been donated by the garden of Mr. Hanbury, of Ventimiglia, Italy, and also by the New York Botanical Garden.

Mr. R. Lee Collins, B. A., 1921, has donated valued services in the preparation of many labels for the Botanical Garden.

Mr. Henry B. Vocke presented the Botanical Garden with thirty living cacti, among them several large specimen plants.

The use of the Botanical Garden and greenhouses by the students of the several biological departments increases steadily from year to year. The number of visitors to the Garden, both members of the University and other residents of Baltimore, grows constantly.

III. Plant Physiology

Academic work

The general course in plant physiology was conducted by Professor Livingston and Doctor Trelease. Three students were enrolled. The other work was all in the form of conferences.

Research and related activities

Professor Livingston gave considerable attention to the duties of Editor-in-chief of *Botanical Abstracts*, an abstract journal reporting all contributions to a knowledge of plants and perhaps the most valuable single means thus far devised for advancing such knowledge. The fact that the editorial plans and policies of the journal have now been fairly well worked out, so that the work can be largely done by assistants, the fact that no funds were clearly in view for hiring the necessary assistants to maintain this work here, and the consideration that other lines of activity seemed to demand more and more of his spare energies, led Professor Livingston to tender his resignation as Editor-in chief at the end of 1920. His duties in this connection came to an end in February, 1921. He also gave some time to the special committee on the Salt Requirements of Agricultural Plants, of the National Research Council, and, for reasons similar to those above mentioned, he resigned from this position early in the year here considered. Dr. A. G. McCall, a Doctor of Philosophy of this University, now of the Maryland Agricultural Experiment Station, was appointed chairman of the committee. Professor Livingston has continued as managing editor of *Physiological Researches*. He has also continued as permanent secretary of the American Association for the Advancement of Science, having an office and clerical assistance in the Smithsonian Institution, Washington.

Dr. Sam F. Trelease, who became instructor in plant physiology at the beginning of the present year, has had charge of the general laboratory and has devoted much attention to the preparation of the author index of Botanical Abstracts. He has also contributed much

toward the calculation and interpretation of several masses of experimental data obtained by members of the laboratory. Dr. Trelease was appointed assistant secretary of the American Association for the Advancement of Science in January, 1921.

Mr. W. F. Gericke, working *in absentia* at the University of California, has practically completed the study of his extensive experimental results on the influence of temperature and the salt composition of the medium on the germination of wheat. It is hoped that his report may soon be presented as a dissertation for the Doctor's degree.

Mr. H. C. Diehl has made a study of certain features of the dynamics of wilting in plants, with special reference to soil-moisture and air moisture conditions. He has also had charge of the apparatus and materials of the laboratory and has completed an itemized inventory of stock, as of January 1, 1921.

Mr. L. M. Hutchins has begun a study of the oxygen supplying power of the soil at various depths and under various conditions, as this oxygen condition may influence plant growth. The dynamics of the oxygen conditions of the soil form a difficult problem, but one that is of fundamental importance to agriculture, forestry, and ecology.

Miss Marguerite Brennan has been in charge of the standardization of atmometers during the year and has assisted Professor Livingston in several lines of research connected with atmometry. In connection with a coöperation between the Laboratory of Plant Physiology and Dr. David I. Macht, of the Pharmacological Laboratory, Miss Brennan has carried out some preliminary studies on the toxic and stimulation effects of a number of plant alkaloids and other organic poisons on the roots of seedlings.

PUBLICATIONS IN PLANT PHYSIOLOGY

B. E. Livingston (Editor).

A plan for coöperative research on the salt requirements of representative agricultural plants. Prepared for a special committee of the Division of Biology and Agriculture of the National Research Council. Baltimore, 1919.

B. E. Livingston and H. S. Fawcett.

A battery of chambers with different automatically maintained temperatures. *Phytopathology* **10**: 336-340. 1920.

B. E. Livingston and Riichiro Koketsu.

The water supplying power of the soil as related to the wilting of plants. *Soil Science* **9**: 469-485. 1920.

B. E. Livingston and Frank Thone.

A simplified non-absorbing mounting for porous porcelain atmometers. *Science* **52**: 85 87. 1920.

B. E. Livingston and W. E. Tottingham.:

A new three-salt nutrient solution for plant cultures. *Amer. Jour. Bot.* **5**: 337-346. 1918.

Grace A. Dunn.

A comparative study of the two races of Rhizopus nigricans. *Physiol. Res.* **2**: 301-339. 1921.

R. B. Espino.

Some aspects of the salt requirements of young rice plants. *Philippine Jour. Science* **16**: 455-525. 1920.

H. S. Fawcett.

The temperature relations of growth in certain parasitic fungi. *Univ. of California Publ. in Agric. Sci.* **4**: 183 232. 1921.

W. F. Gericke.

Influence of temperature on the relations between salt proportions and the early growth of wheat. *Amer. Jour. Bot.* **8**: 59 62. 1921.

F. M. Hildebrandt.

A physiological study of the climatic conditions of Maryland, as measured by plant growth. *Physiol. Res.* **2**: 341-405. 1921.

Koichi Morita and B. E. Livingston.

Some solution cultures of wheat without potassium. *Botanical Magazine, Tokyo* **34**: 71 90. 1920.

H. E. Pulling.

Sunlight and its measurement. *Plant World* **22**: 151 171, 187-209. 1919.

W. E. Tottingham.

A preliminary study of the influence of chlorides on the growth of certain agricultural plants. *Jour. Amer. Soc. Agron.* **11**: 1-32. 1919.

S. F. Trelease.

The relation of salt proportions and concentrations to the growth of young wheat plants in nutrient solutions containing a chloride. *Philippine Jour. Science* **17**: 527-603. 1920.

HERBERT S. JENNINGS,
Director of the Zoological Laboratory.

DUNCAN S. JOHNSON,
Director of the Botanical Laboratory.

BURTON E. LIVINGSTON,
Director of the Laboratory of Plant Physiology.

REPORT OF THE DEAN OF THE COLLEGE FACULTY

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report for the session 1920 1921:

The undergraduate enrolment was the largest in the history of the University, totalling 702 as compared with 676 for the preceding session. Of the total, 393 were in the College of Arts and Sciences, and 309 in the Department of Engineering. The entering class numbered 260, including 38 transfers from other colleges who were given advanced standing, 11 in Engineering and 27 in the College of Arts and Sciences. Most of the latter entered the preliminary medical course. Of the total number of new students, 151 entered the College of Arts and Sciences and 109 the Department of Engineering.

As usual, the great majority of entering students were received on certificate. Of the total number 45 were admitted with conditions and 12 as special students. Of the former 28 were graduates of Maryland high schools (classed as Group 1 in the Annual Report of the State Board of Education), but fell short of our requirements in some particular. Several of the others were graduates of high schools of other States and had 16 or more high school units, but did not fully cover our required units. Only 10 were admitted who fell below 15 units, and in no case did these have more than one subject to make up. It is interesting to note, however, that only 22 of the 45 admitted with conditions are now in attendance. Ten were dropped for three or more failures and others withdrew because they found it difficult to keep up with their classes.

During the session 66 students were dropped for three or more failures, and a number of others withdrew in anticipation of being dropped on account of poor work. The total number of failures was not large, however, and in general the personnel of the student body was better than usual. There were very few cases requiring serious discipline.

At present 473 of the 702 undergraduates are residents of Baltimore and 229 come from the counties of Maryland and other States. The erection of a dormitory will undoubtedly bring an increase in the number of students from points outside of Baltimore. This result is one to be desired, and it is important that a dormitory be erected as soon as possible. With the construction of a chemical laboratory we can probably provide for the increased enrolment for the next four or five years. After that it may be necessary to adopt a definite limit and select the best applicants. This would necessitate some modifications of the existing State law requiring us to admit all graduates of Group 1 high schools.

Under the direction of Major Garey the Reserve Officers Training

Corps has maintained its high standard of efficiency and attracted more students than ever before. The effect of this organization on the general morale of the student body has been marked. The United States army officers stationed here voluntarily assumed charge of the classes in physical training, and, in the absence of a gymnasium, put the members of the freshman and sophomore classes who were not enrolled in the Reserve Officers Training Corps through a valuable course of physical exercise, thus solving a problem that had previously been very difficult to handle. The University is greatly indebted to them for this service.

JOHN H. LATANÉ,
Dean of the College Faculty.

REPORT OF THE DIRECTOR OF THE COLLEGE COURSES FOR TEACHERS

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report on the work of the College Courses for Teachers, conducted in co-operation with Goucher College, during the academic year, October 4, 1920, to May 28, 1921.

This is the twelfth year of these courses, the plans for which are stated in detail in the *University Circular* of July, 1920. Of the courses announced, instruction of collegiate grade was given in the following: Art I, II, IV, V, VI, and VII; Chemistry I, II, and III; Education I, III, V, VII, VIII, IX, X, XI, XII; English I, II, III, IV, and V; French I, II, III, IV, V, VI, VII, VIII, and IX; German I, IIA; History IA and II; Italian; Journalism; Oriental Seminary 1, II, and III; Philosophy I and II; Political Science; Psychology 1 and II; Russian I and II; Spanish I, II, and III. Owing to the small registration, the following courses announced were not given: Art III; Drawing; Education II, IV, and VI; English VI; German IIB; History IB; Latin I and II; Mathematics; Oriental Seminary IV, V, and VI; and Psychology III. Owing to several reasons, change of instructors in two courses was necessary in a few weeks after the opening of the session: French V, Mr. R. M. Merrill *vice* Dr. G. Gruenbaum; and Political Science, Mr. J. Hart *vice* Mr. C. C. Thach. In response to requests at the beginning of the session, a course in elementary Chinese was organized and given throughout the year by Mr. Chao M. Chen. Attention may be called to the continuance of university service in meeting newly appearing special needs of the Baltimore public schools. Two courses in education, the Teaching of English Composition in the Junior High School, by Miss Sarah E. Simons, of Washington, and the Teaching of Mathematics in the Junior High School, by Dr. J. T. Rorer, of Philadelphia, were included in the program for the year in response to the special requests of the Association of Junior High School Teachers of Baltimore. These courses were conducted by thirty one instructors, four of whom were members of the staff at Goucher College, the remainder of the University.

The enrollment in the courses was six hundred and sixty the first half year, and five hundred and ninety eight the second half-year, which, with the sixty seven registered in the courses given at the three University Extension Centers mentioned below, gives a total enrollment of seven hundred and fifty nine. The enrollment of six hundred and ninety two at the University shows an increase of one hundred and twenty, or nearly twenty one per cent. over the preceding year. One hundred and twelve were duplicate registrations from other divisions of the University, as follows: Fifteen graduate, three medical, four hygiene, seventy eight academic, and twelve engineering. The primary registration of the year in the College Courses for Teachers was five hundred and eighty, an increase of one hundred

and seven, or twenty eight per cent., over the preceding year. One hundred and ninety two were men and five hundred were women. Of the five hundred and seventy-two students registered in the courses given at the University last year, two hundred and one continued their registration this year. The increase in this annual carry over of students is most satisfactory, and there is hope that it will continue from year to year. There were thirty-eight graduate students among those primarily registering in these courses. The amount of work accomplished by the students is best indicated by the following figures: One student registered in ten courses, one in eight courses, one in seven courses, eleven in five courses, seventeen in four courses, thirty in three courses, ninety-three in two courses, and five hundred and thirty eight in one course, each. There were eighty-six candidates for the degree of Bachelor of Science in attendance.

The occupational distribution of the persons registered continues to indicate the widening range of service which the University is offering to professional and other definite social interests in our community: School officers and teachers, three hundred and seventy-four, and four hundred and forty one including the Extension Courses; students, one hundred and thirty six; no vocation, seventy-one; vocation not reported, twenty four; merchants, manufacturers, and various other business representatives, thirty four; secretaries, seventeen; lawyers, six; social workers and nurses, six; press representatives, five; physicians and pharmacists, five; clergymen, four; libra rians, four; artists, three; an architect, a chemist, and a naval officer.

The College Courses for Teachers continued during the year the plan of giving courses at University Extension Centers in the State of Maryland, which was begun in 1917 18. Professor Edward F. Buchner conducted a course in Experimental Education, Education XII, at Frederick, with a registration of twenty-two. Associate Professor Florence E. Bamberger conducted a course on Elementary School Organization and Class room Management, Education XI, at Elkton, with a registration of eighteen, and a course in Elementary Education, Education X, at Rockville, with a registration of twenty-seven. This is the third successive year in which courses have been conducted in both Cecil and Frederick Counties, and the first year in Montgomery County. Each of these classes met once a week throughout the year. The fourth year of the work, in courses thus conducted, continues to be satisfactory to the instructors. All the teachers completing their courses, respectively, were enabled to meet some of the certificating requirements of the State Department ot Education under the new school law.

The conference of the officers and instructors in these courses was held on June 3, 1921. The following amounts of credit for the courses were recommended and recorded in accordance with past practice, as follows: Art I, as recommended; Art II, three points (for a grade of nine and one-half or more), two points (for a grade of six or less than nine and one-half); Art IV, three points; Art V, four points (for a grade of nine or more), three points (for a grade of six or less than nine); Art VI, three and one half points (for a

grade of nine or more), two and one-half points (for a grade of six or less than nine); Art VII, three points (for a grade of eight and one-half or more), two and one half points (for a grade of six or less than eight and one half); Chemistry I, six points (for a grade of nine or more), five points (for a grade of six or less than nine); Chemistry II, four points; Chemistry III, as recommended; Chinese, as recommended; Education I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education III, six points (for a grade of eight and one-half or more), four points (for a grade of six or less than eight and one half); Education V, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education VII, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education VIII, six points (for a grade of eight and one-half or more), four points (for a grade of six or less than eight and one half); Education IX, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education X, six points (for a grade of eight and one-half or more), four points (for a grade of six or less than eight and one half); Education XI, six points (for a grade of eight and one-half or more), four points (for a grade of six or less than eight and one half); Education XII, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English III, six points (for a grade of eight and one-half or more), four points (for a grade of six or less than eight and one half); English IV, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English V, six points (for a grade of eight and one half or more), four points (for a grade of six or less than eight and one half); French I, eight points (for a grade of eight and one half or more), six points (for a grade of six or less than eight and one half); French II, eight points (for a grade of eight and one half or more), six points (for a grade of six or less than eight and one half); French III, six points (for a grade of eight and one half or more), four points (for a grade of six or less than eight and one half); French IV, six points (for a grade of eight and one half or more), four points (for a grade of six or less than eight and one-half); French V, six points (for a grade of eight and one half or more), four points (for a grade of six or less than eight and one-half); French VI, four points; French VII, two points; French VIII, two points; French IX, as recommended; German I, six points; German IIA, eight points (for a grade of eight or more), six points (for a grade of six or less than eight); History IA, six points (for a grade of eight or more), four points (for a grade of six or less than eight); History II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Italian, six points; Journalism, four points; Oriental Seminary I, two points; Oriental Seminary II, two points; Oriental Seminary III, two points; Philosophy I, six points (for a grade of eight and one half or more), four points (for a grade of six or less than eight and one half); Philosophy II,

as recommended; Political Science, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Psychology I, six points (for a grade of eight or more), four points (for a grade or six or less than eight); Psychology II, as recommended; Russian I, four points; Russian II, four points; Spanish I, five points (for a grade of nine or more), four points (for a grade of six or less than nine); Spanish II, five points (for a grade of nine or more), four points (for a grade of six or less than nine); Spanish III, five points (for a grade of nine or more), four points (for a grade of six or less than nine).

The degree of Bachelor of Science was conferred by the Trustees of the University, on October 5, 1920, upon Anna C. Albert and Lucille L. Shamberger, of Baltimore; on June 21, 1921, upon Araminta Brinsfield, Bessie B. Bennett, Mary C. Coe, Margaret F. Coe, Margaret M. Corrigan, Elisabeth Gilman, Katharine L. Healy, Mary J. Hille, Grace A. Kramer, Katherine T. Valentine, Marie A. Weidenhammer, and Eleanor F. F. Yeaworth, of Baltimore.

EDWARD F. BUCHNER,
Director.

REPORT OF THE DIRECTOR OF THE SUMMER COURSES

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to present the following report of the eleventh session of the Summer Courses of the University, which was held during the six weeks from July 5th to August 12, 1921.

The coöperation of other agencies with the University in the preparation of the plans for the summer courses continued to be a feature of this session. The Board of School Commissioners of Baltimore constituted the session as a summer school for its teachers in lieu of its own school conducted independently in 1920, and guaranteed a minimum registration at the University. The Board also located a new type of city vacation school of ten grades at Homewood, and provided its teaching staff of a principal and thirteen teachers in order to supply a school for the purpose of demonstrations in teaching and educational investigations. They also granted again the use of necessary rooms and equipment at the Polytechnic Institute for the instruction in manual training and furnished the materials of instruction for the graded demonstration school. Although the students in manual training were almost continuously removed from Homewood, this arrangement for instruction in this subject proved to be the most satisfactory which has yet been devised. The continuation of instruction in training in journalism was made possible through the coöperation of *The Sun*, Baltimore, which detailed a member of its editorial staff to give the instruction, extended the use of its plant as a laboratory, and provided three scholarships to be awarded to students for excellence in this subject. The benefits of the De Lamar Fund for the Extension of Medical Knowledge were extended, through the coöperation of the School of Hygiene and Public Health, by the provision for instruction in School Hygiene and the maintenance of De Lamar scholarships for students in this course. As in former years, the summer session of the Peabody Conservatory of Music continued its coöperation.

The scope of instruction was greatly extended to meet special needs of the Baltimore City teachers under the coöperative arrangements with the Board of School Commissioners, and included an offering of ninety-one courses in the twenty subjects listed below. Among the new features may be mentioned a double course in organic chemistry, an expansion of the work in educational psychology, educational measurement, secondary education, manual training and music, and a renewal of geography, home economics, and physical education.

The persons appointed to give instruction were as follows:

Biology ..... 2 courses

Rheinart P. Cowles, Associate Professor.
Lloyd M. Bertholf, Assistant.

Chemistry ..... 4 courses

J. Elliott Gilpin, Collegiate Professor.
Leslie C. Beard, Jr., Assistant.

Classical Literature ..... 1 course
Lawrence H. Baker, Instructor.

Economics ..... 3 courses
Broadus Mitchell, Instructor.

Education ..... 37 courses
Alice E. Barnard, Instructor in Summer Courses.
Winefred E. Barrett, Teacher in Demonstration School.
Francis M. Berry, Instructor in Summer Courses.
Fowler D. Brooks, Associate.
Corinne Brown, Instructor in Summer Courses.
Edward F. Buchner, Professor.
William Burdick, Instructor in Summer Courses.
Raymond A. Denslow, Instructor in Summer Courses.
Carleton E. Douglass, Instructor in Summer Courses.
Lida B. Earhart, Instructor in Summer Courses.
Katherine C. Erlmeier, Teacher in Demonstration School.
Agnes M. Flinn, Instructor in Summer Courses.
Caroline E. Grote, Teacher in Demonstration School.
Helen K. Grote, Teacher in Demonstration School.
Eleanor C. Heavey, Teacher in Demonstration School.
Margaret L. Hirschman, Teacher in Demonstration School.
Jesse W. Hubbard, Instructor in Summer Courses.
Arthur W. Kallom, Instructor in Summer Courses.
Bessie Klinesmith, Teacher in Demonstration School.
Isabel Lazarus, Teacher in Demonstration School.
Elmer V. McCollum, Professor.
M. Rose Patterson, Principal of Demonstration School.
Edith R. Powell, Teacher in Demonstration School.
Beulah E. Register, Teacher in Demonstration School.
Warren D. Renninger, Instructor in Summer Courses.
Ballard D. Remy, Instructor in Summer Courses.
Jonathan T. Rorer, Instructor in Summer Courses.
Rosalie M. Seymour, Teacher in Demonstration School.
Mabel E. Simpson, Instructor in Summer Courses.
Helen M. Stegman, Teacher in Demonstration School.
Mildred E. Tyson, Teacher in Demonstration School.
Maurice S. H. Unger, Instructor in Summer Courses.
David E. Weglein, Associate.

English Composition ..... 3 courses
Francis E. A. Litz, Instructor.
James E. Routh, Instructor in Summer Courses.

English Literature ..... 3 courses
Francis E. A. Litz, Instructor.
James E. Routh, Instructor in Summer Courses.

French ..... 5 courses
George R. Havens, Instructor in Summer Courses.
Ray M. Merrill, Instructor.

Geography ..... 2 courses
Homer P. Little, Instructor in Summer Courses.

German ..... 3 courses
Robert B. Roulston, Associate Professor.

History ..... 4 courses
Lawrence H. Baker, Instructor.
Beverley W. Bond, Jr., Instructor in Summer Courses.

Home Economics ..... 2 courses
Francis Zuill, Instructor in Summer Courses.

Journalism ..... 2 courses
James E. Routh, Instructor in Summer Courses.
Raymond S. Tompkins, Instructor in Summer Courses.

Manual Training ..... 6 courses
George M. Gaither, Instructor in Summer Courses.
Eugene B. Link, Instructor in Summer Courses.
Charles A. Pettit, Instructor in Summer Courses.

Mathematics ..... 3 courses
Francis D. Murnaghan, Associate Professor.

Music ..... 2 courses
John Denues, Instructor in Summer Courses.

Philosophy ..... 2 courses
Alvin Thalheimer, Instructor in Summer Courses.

Politics ..... 2 courses
Niels H. Debel, Instructor in Summer Courses.

Psychology ..... 3 courses
English Bagby, Instructor in Summer Courses.

Spanish ..... 3 courses
Ray M. Merrill, Instructor.
José Robles y Pazos, Instructor.

Fifteen of the instructors were members of the University. To these were added the following representatives of other institutions and school systems: Dr. English Bagby, of Yale University; Miss Alice E. Barnard, Assistant in Secondary Education, Teachers College, Columbia University; Miss Frances M. Berry, Supervisor of Kindergarten-Primary, Baltimore Public Schools; Associate Professor Beverley W. Bond, Jr., of the University of Cincinnati; Miss Corinne Brown, of the Tower Hill School, Wilmington, Del.; Dr. William Burdick, Director of the Public Athletic League of Baltimore; Assistant Professor Daniel da Cruz, of Miami University (Spanish III, *vice* R. M. Merrill); Professor Niels H. Debel, of Goucher College; Mr. Raymond A. Denslow, of The Scarborough School, Scarborough, N. Y.; Mr. John Denues, Supervisor of Music, Baltimore Public Schools; Assistant Superintendent Carleton E. Douglass, of the Baltimore Public Schools; Professor Lida B. Earhart, of the University of Nebraska; Miss Agnes M. Flinn, of the Public Athletic League of Baltimore; Mr. George M. Gaither, Supervisor of Manual Training, Baltimore Public Schools; Assistant Professor George R. Havens, of Ohio State University; Professor Jesse W. Hubbard, of The State Normal School, Worcester, Mass.; Miss M.

Antoinette Karp, of the Washington Junior High School, Rochester, N. Y. (Education XX and XXX, *vice* Miss Mabel E. Simpson); Mr. Arthur W. Kallom, Assistant Director of the Department of Educational Investigation and Measurement, Boston Public Schools; Mr. Eugene B. Link, of the Polytechnic Institute, Baltimore; Dr. Homer P. Little, Executive Secretary, of the Division of Geology and Geography, National Research Council, Washington, D. C.; Mr. Charles A. Pettit, of the Polytechnic Institute, Baltimore; Dr. Warren D. Renninger, of Central High School, Philadelphia, Pa.; Mr. Ballard D. Remy, of the Forest Park Junior High School, Springfield, Mass.; Dr. Jonathan T. Rorer, of The William Penn High School for Girls, Philadelphia, Pa.; Professor James E. Routh, of Oglethorpe University; Mr. Raymond S. Tompkins, of the Editorial Staff of *The Sun*, Baltimore; Superintendent Maurice S. H. Unger, of Carroll County, Md.; Assistant Superintendent David E. Weglein, of the Baltimore Public Schools; Miss Francis Zuill, Supervisor of Home Economics, Baltimore Public Schools; and the following grade teachers, Baltimore City Schools: Miss Winefred E. Barrett, Miss Katherine C. Erlmeier, Miss Caroline E. Grote, Miss Helen K. Grote, Miss Eleanor C. Heavey, Miss Margaret L. Hirschman, Miss Bessie Klinesmith, Miss Isabel Lazarus, Miss M. Rose Patterson, Miss Edith R. Powell, Miss Beulah E. Register, Miss Rosalie M. Seymour, Miss Helen M. Stegman, and Miss Mildred E. Tyson. Mr. L. M. Riddle gave French IV and V *vice* Mr. R. M. Merrill. In the unavoidable absence of Miss Mabel E. Simpson, Education XXVI was withdrawn.

The enrollment of University students was nine hundred and forty-nine. Of these, two hundred and thirty-seven, or 25 per cent., were men, and seven hundred and twelve, or 75 per cent., were women. The total number of course registrations was two thousand two hundred and forty-eight, the average number of courses taken per student being nearly 2.4. The distribution of these elections was as follows: One course was taken by one hundred and forty students; two courses, by three hundred and twenty-nine; three courses, by four hundred and seventy; and four courses, by ten, each. Seven hundred and eighty-six, or nearly 83 per cent., of the students were administrative and supervisory officers, teachers or prospective teachers in State and county systems, colleges, normal schools, public and private schools. Eighty-five, or over 9 per cent., were students in colleges, normal schools and other institutions. Thirty-two, or over 3 per cent., represented other occupations, and forty-five, or nearly 5 per cent., reported or were engaged in no occupation. One hundred and sixty-five students held academic or professional degrees from seventy institutions. Of the one hundred and seventeen collegiate students registered, ninety-seven were candidates for a baccalaureate degree in this University. The registration showed an increase of five hundred and seven, or nearly 115 per cent., over that of 1920, which is the largest annual gain in any summer session. This was chiefly due to the greatly increased number of Baltimore city teachers in attendance; although the number of public school teachers from Maryland counties increased nearly 50 per cent.

The geographical distribution of students was as follows: Maryland was represented by eight hundred and seventy students, of

whom two hundred and thirty-six, or nearly 25 per cent., were from the counties, and six hundred and thirty-four, or nearly 66 per cent., from Baltimore City; nineteen other States, Africa, China, India, Italy, Mexico, Panama, the Philippines, Porto Rico, and South America, by seventy-nine, or nearly 9 per cent. Two hundred and two students were representatives of the public elementary and secondary school teachers in twenty-two counties of Maryland, one county not being represented.

This is the seventh year in which the program included advanced courses designed to meet the various needs of graduate students. It is especially gratifying to note that the registration of this type of students was one hundred and fifty-two, being an increase of more than seventy one per cent. over that of the preceding session.

An outstanding feature of the session was the new type of Demonstration School operated under plans developed with the active coöperation of the Board of School Commissioners of Baltimore, and conducted as one of the city vacation schools. This school which was located in the two Engineering Buildings, and conducted during eight weeks, replaced the usual summer review school of grades four to eight, inclusive, and differed from its predecessors in two important particulars:

(a) By the addition of a kindergarten and grades one, two, and three, and by a modification of grades seven and eight so as to conform to the new junior high school developments of the City's school system, thus extending the instruction offered to include grade nine B, or the first half-year of regular high school work, the school provided twelve teaching units, the introduction of a kindergarten and the three lower grades and of a junior high school with instruction in English, French, Geography, General Science, History, Latin and Mathematics. The extent of the service rendered by this new type of school is clearly indicated by the report of the Principal that two hundred and ninety-two university students spent over seven thousand hours in observation in the school.

(b) More important than this expansion was the opportunity offered to pupils in attendance at Homewood to do work in advance of the grade which they had completed in the preceding June, and the assurance to pupils in grades four to nine B inclusive, of their promotion, upon satisfactory completion of their work, by half a grade when resuming their regular school work in September following. Accordingly this school admitted children who had made their regular promotions in June. The total enrollment of three hundred and seventy-five included one hundred and eighty-nine boys and one hundred and eighty-six girls. There was an excessive number of applications for admission to the upper elementary grades and to the first two years of the junior high school. Superintendent West and his staff arranged to admit as pupils those who ranked as superior, and thus as the most promising material for this large experiment of accelerating the progress of capable children by means of an eight weeks' summer school. Admissions were based on the results of a series of measurements in mental and school subject tests, and demonstrated to this extent the advantages of organizing instruction upon a basis of the known abilities of pupils.

Teachers attending the University were thus enabled to observe regular teaching and special demonstration lessons by teachers and pupils working under this exceptional motivation. The net roll at the close of the school was two hundred and thirty-seven, one hundred and twenty-one boys and one hundred and sixteen girls. One hundred and twelve were in the junior high school and one hundred and twenty-five in the elementary grades. The marked success of this experiment to accelerate the progress of capable pupils is shown in the recommendation for promotion of ninety one pupils in the junior high school classes and seventy-eight of the eighty three pupils in grades four, five, and six. These recommendations were based on psychological tests, teacher judgments, and pupil marks. By this achievement the Baltimore school system made a distinctive contribution in the field of summer instruction with normal and superior children.

The series of thirty-nine special demonstration lessons and or forty two conferences conducted in connection with the demonstration school, beginning July 6 and closing August 10, included: Miss Barnard, socialized recitation in English; Miss Berry, purposeful activities, and vitalized recitation; Mr. Brooks, group intelligence tests, reading and reasoning, individual intelligence tests, problem-solving and social studies in high schools; Miss Brown, oral composition, reading; Dr. Burdick and Miss Flinn, organized play; Mr. Denslow, general science in the junior high schools; Mr. Denues, school music, school orchestra, introduction of metric dictation; Mr. Douglass, classification and promotion of pupils, socialized recitation in community organization (Roland Park); Dr. Earhart, arithmetic, oral composition, reading; Mr. Gaither, manual training; Mr. Hubbard, geography, oriental exhibit; Mr. Kallom, arithmetic tests, analysis of errors in reading; Miss Karp, supervised study in English and in history, vocational guidance; Dr. McCollum, nutrition; Miss Patterson, school assembly; Mr. Remy, group discussion recitation in Latin, program of studies in the junior high school; Mr. Renninger, supervised study in history, civics in the junior high school; Dr. Rorer, introduction of negative numbers in algebra, the reorganization of the course in algebra in the high school, geometry, teaching the use of the sliding rule; Superintendent Unger, the rural school; Miss Zuill, teaching clothing, teaching food. Mr. Harold S. Custer, of Baltimore, gave an illustrated lecture on July 26 on "The Development of the Adding Machine."

The following table records the courses which were given in the different departments and specifies the credit as graduate or collegiate, with the maximum number of points in the latter, the student enrollment, and the number completing the courses by taking the examinations. The members of the staff of instruction uniformly reported an unusual degree of seriousness and grade of scholarship on the part of the students. The percentage of students completing the work of the courses was 89.1 per cent. The failures on examinations totaled thirty-seven persons in twenty-seven courses, thus distributed among the different subjects: thirteen in Education, five in English Literature, four in Chemistry, four in English Composition, three in German, two in Biology, two in Economics, two in Geography, two in Politics, one in Philosophy, and one in Spanish.

The number of persons enrolled in each subject appears in the Registrar's report (see page 163).

Subject and Courses	Points Credit	Enrollment	Number taking Examinations
Biology			
General Biology	4	34	29
Zoology	4	22	22
Chemistry			
Organic Chemistry	G	22	17
Qualitative Analysis	G	5	5
Quantitative Analysis	G	6	6
Introduction to General Chemistry	4	12	9
Classical Literature			
Outlines of Greek Literature	G	7	6
Economics			
Social Legislation	G	29	23
Economic History of England	3	6	5
Elements of Political Economy	3	10	10
Education			
Educational Administration	G	11	11
Experimental Education: Tests in Secondary School Subjects	G	29	28
Experimental Education: Tests in Elementary School Subjects	G	19	18
Experimental Education: Intelligence of School Children	G	28	26
Educational Psychology: Secondary School Subjects	G	13	12
Educational Psychology: Elementary School Subjects	G	45	44
School Hygiene	G	20	19
Secondary Education	G	42	37
The Teaching of English Composition in Secondary Schools	G	15	12
The Teaching of English Literature in Secondary Schools	G	36	29
The Teaching of Algebra and Geometry in Secondary Schools	G	18	17
The Teaching of History in Secondary Schools	G	16	14
The Teaching of Civics in Secondary Schools	G	13	12
The Teaching of Science in the Senior High School	G	10	8
The Junior High School	G	44	34
Materials and Methods in the Junior High Schools	G	39	36
The Teaching of Mathematics in the Junior High School	G	21	20
The Teaching of General Science in the Junior High School	G	6	5
The Teaching of Geography in the Junior High School	G	20	18
Supervised Study in the Junior High School	G	8	8
Demonstration School: Junior High Grades	1	43	24
Demonstration School: Elementary Grades	1	189	97

Subject and Courses	Points Credit	Enrollment	Number taking Examinations
The Organization and Supervision of City Elementary Schools	3	35	33
School Management and School Law	3	12	12
Types of Teaching and Teaching How To Study	3	66	64
Intermediate Grade Methods	3	37	35
English Literature and Language in the Intermediate Grades	3	51	45
Arithmetic in the Grades	3	10	9
The Teaching of Geography in the Intermediate Grades	3	9	8
The Teaching of History and Civics in the Intermediate Grades	3	26	24
Materials and Methods in Kindergarten Primary Education	3	40	35
Primary Grade Methods	3	73	55
The Teaching of Reading in the Primary Grades	3	66	49
The Teaching of Literature in the Primary Grades	3	6	5
Rural School Problems	2	13	13
Physical Education: Principles and Practice	2	6	6
Physical Education: Games and Athletics	2	14	14
English Composition			
Usage and Structure	3	39	36
Advanced English Composition	3	14	14
Oral English	2	16	14
English Literature			
Types of English Poetry	G	22	21
Shakespeare	3	24	23
American Prose	3	20	16
French			
Rousseau	G	9	9
Practical French	3	19	14
French Phonetics	2	8	8
Intermediate French	3	12	10
Elementary French	2	24	22
Geography			
Physiographic Geography	3	6	6
Industrial and Commercial Geography	3	21	20
German			
Advanced German	G	6	2
Intermediate German	3	13	10
Elementary German	2	14	13
History			
American Colonial History, 1690 1763	G	8	7
England and Greater Britain since 1815	G	26	23
American History since 1789	3	28	23
Roman History	3	11	10
Home Economics			
Materials and Methods in Domestic Science	3	20	19
Materials and Methods in Domestic Art	2	41	40

Subject and Courses	Points Credit	Enrollment	Number taking Examinations
Journalism			
Advanced English Composition	3	8	8
The Principles and Practice of Journalism	3	19	17
Manual Training			
Bench Work in Wood	3	15	15
Mechanical Drawing	2	15	15
Sheet Metal Work	2	10	10
Wood Pattern Making	1	8	8
Electrical Work	2	10	10
Elementary Manual Training	2	16	16
Mathematics			
Elliptic Functions (Introductory)	G	6	6
Advanced Algebra	3	13	11
Analytic Geometry	3	11	9
Music			
Public School Music: Primary Grades	2	67	66
Public School Music: Intermediate and Junior High Grades	2	32	29
Philosophy			
Social Ethics: The Ideal Community	3	23	22
The Relation Between Mind and Body	3	16	16
Politics			
American National Government	G	23	21
American State and Local Government	G	12	11
Psychology			
Modern Tendencies in Psychology	G	19	19
The Personality of the School Child	G	50	50
Introductory Psychology	3	16	15
Spanish			
Spanish Literature	G	6	5
Practical Spanish	2	8	6
Elementary Spanish	2	14	12

The series of Friday evening lectures and entertainments of a more popular character, open to the public, was made especially attractive through the coöperation of the summer session of the Peabody Conservatory of Music. The program was as follows:

July 8—Professor Rheinart P. Cowles, of the University.
"The Chesapeake Bay."

July 15—Mr. Max Landow, Pianist, of the Conservatory.
Recital.

July 22—Mr. G. Herbert Knight, organist, and Mr. Oscar H. Lehmann, tenor, of the Conservatory.
Recital.

July 29—Mr. J. C. Van Hulsteyn, violinist, of the Conservatory, and Miss Vivienne Cordero, violinist.
Recital.

Aug. 5—Professor Elmer V. McCollum, of the University.
"Nutrition as a Basis of Preventive Dentistry."

The social welfare of the members of the faculty and student body received attention. The usual reception to the faculties was omitted owing to the special Fourth of July celebrations arranged in the city the evening of July 5th. The University and Conservatory joined in an opening reception to the faculties and students on Friday, July 8, and a closing reception on Friday evening, August 5. The former was given in the Peabody Art Gallery, and the latter in the Civil Engineering Building, Homewood. Saturday excursions were taken to Annapolis, July 16, to Washington, July 23, and on Saturday, August 6, about the Baltimore harbor.

EDWARD F. BUCHNER,
Director.

REPORT OF THE SCHOOL OF ENGINEERING

TO THE PRESIDENT OF THE UNIVERSITY:

I beg to hand you herewith the Eighth Annual Report of the School of Engineering for the year ending June 30, 1921.

The confusion in the program of undergraduate instruction occasioned by the war has been in great measure cleared, and the normal courses of instruction, in accordance with the regular curriculum, have been for the most part restored. The increase in the enrollment of students noted in the last report has been continued during the past year. Of the total of 309 in attendance at the end of the year, 9 were graduate students, 3 were special students, and 297 were regular undergraduate students.

At the Commencement exercises, June 21, 1921, the degree Master of Electrical Engineering was conferred on one candidate, the degree Bachelor of Engineering on 37 candidates and the degree Bachelor of Science in Chemistry on 12 candidates. The degree of Bachelor of Engineering was also conferred in October, 1920, on one member of the class of 1920.

New appointments of the year to the teaching staff were as follows:

H. W. Waterfall, Associate in Mechanical Engineering.
F. W. Kouwenhoven, Instructor in Mechanical Engineering.
V. L. Doughtie, Instructor in Mechanical Engineering.
T. F. Comber, Instructor in Civil Engineering.

At the end of the year, for work in the succeeding year, the following appointment was made:

H. W. Waterfall, Associate Professor of Mechanical Engineering.

In 1919 the late Dr. R. C. MacLaurin, President of the Massachusetts Institute of Technology, consulted the presidents of six universities on or near the Atlantic seaboard, and of which this University was one, as to whether they deemed it desirable to co operate in a joint exchange with France of professors of engineering and applied science, on a plan definitely outlined. All replies being favorable to the project, a committee was appointed with one member from each of the seven institutions to report on the plan and on methods of carrying it into effect. The Committee met in December, 1919, and ratified the co-operative plan with some few modifications. The first Chairman of the Committee was Prof. A. E. Kennelly, of Harvard, and the Secretary, Dean J. B. Whitehead, of Johns Hopkins. The Chairman and Secretary during the coming year are Director Russell H. Chittenden, of Yale, and Dean John Frazer, of the University of Pennsylvania.

The negotiations between the Committee and the French University Administration have been carried on through the Institute of International Education, of which Dr. Stephen P. Duggan is Director. The French have selected for their first representative Professor J.

Cavalier, rector of the University of Toulouse, and a well-known authority on metallurgical chemistry, to come to America this fall and to divide his time during the ensuing academic year among the seven co-operating institutions, namely—Columbia, Cornell, Harvard, Johns Hopkins, Massachusetts Institute of Technology, Pennsylvania and Yale. Professor Cavalier will make two visits to Baltimore—December 1-15 and January 4-20. A committee has been appointed for arranging the lectures, visits in the neighborhood and other details of these visits.

The American universities have selected as their outgoing representative for the same first year Dr. A. E. Kennelly, Professor of Electrical Engineering at Harvard University.

Other important features of the year's work were the J. E. Aldred Lectures on Engineering Practice and the Night Courses for Technical Workers. These activities are described in further detail later in this report.

We ask particular attention to the crowded conditions in both Engineering Buildings. About one-half of the total available space in each building is assigned to the work in Physics, Geology, Chemistry and Military Science. The recent increase in student enrollment now shows itself in greatly enlarged classes of the junior and senior years. This has resulted in the overcrowding of class rooms and laboratories, and in increasing demands upon the teaching staff. The present attendance marks about the limit that can be accommodated with our present quarters and teaching staff.

Additional support is greatly needed for stimulating the graduate work and experimental research. Those members of the teaching staff who are now giving graduate instruction are carrying this burden in addition to the full program of undergraduate work. Those members of the staff who were engaged in experimental or other forms of engineering investigation are greatly hampered by the routine demands of undergraduate instruction. One additional member of the staff in each of the branches of Enigneering, and a few scholarships open to graduate students would go far to improving conditions in these particulars.

SCHOLARSHIPS

In the award of scholarships provided by the State, the total number of regular awards, under the conditions of the law, was 86. In addition to these, 25 special scholarships were awarded by the Trustees, the greater number of these being to students who had resigned their scholarships to enter military duty during the war and who had returned to the University. The total number of scholarship awards therefore was 111.

HONORS OF STUDENTS

The Board of Engineering Studies recommends each year for honorable mention those students in Engineering who combine, to an exceptional degree, scholastic standing with initiative, resourcefulness, skill and other qualities indicating aptitude for the profession

of Engineering. The names for the year 1920-21 are as follows: In the graduating class—Melvin Edgar Scheidt and Thomas Foy Hubbard in Civil Engineering; Charles Fillmore Chisholm and Edmund Randolph Taylor, Jr., in Electrical Engineering; and Carroll Stansbury and Louis Weil in Mechanical Engineering. In the third year class—Andrew Henry Knecht and William Alexander Randall in Civil Engineering; Warren Viessman and Ernest Hires Salter in Electrical Engineering; and Robert Clementian Muth and Samuel Spintman in Mechanical Engineering.

INSTRUCTION

Following are statements of the activities of the several branches of Engineering during the year:

Civil Engineering

The following undergraduate courses were given during the first and second terms of the year, as indicated:

Engineering Drawing. *Six hours weekly, first half-year.* Mr. Whiteman.

Surveying. *Seven hours weekly, first half-year.* Messrs. Medaugh and Comber.

Theory of Structures. *Seven hours weekly, first half-year.* Associate Professor Dehuff.

Structural Engineering. *Nine hours weekly, through the year.* Messrs. Pagon and Thompson.

Sanitary Engineering. *Nine hours weekly, through the year.* Professor Gregory.

Reinforced Concrete and Foundations. *Six hours weekly, through the year.* Associate Professor Dehuff.

Highway Engineering. *Three hours weekly, first half-year.* Mr. Thompson.

Railroad Engineering. *Two hours weekly, through the year.* Mr. Thompson.

Descriptive Geometry. *Six hours weekly, second half-year.* Mr. Whiteman.

Strength of Materials. *Three hours weekly, second half-year.* Associate Professor Dehuff and Mr. Comber.

Advanced Descriptive Geometry and Stereotomy. *Seven hours weekly, second half-year.* Mr. Comber.

Hydraulics. *Six hours weekly, second half-year.* Professor Gregory and Mr. Medaugh.

Theory of Structures. *Five hours weekly, second half-year.* Associate Professor Dehuff.

Advanced Surveying. *Eight hours weekly, second half-year.* Messrs. Thompson and Medaugh.

Mr. G. L. Bryan, graduate student, continued his experimental investigation of problems in Advanced Structural Design, under the direction of Mr. Pagon.

During the year a number of lectures in the field of Civil Engineering by specially qualified engineers have been given in connection with the various courses of instruction. These lectures, all illustrated and some with moving pictures, were as follows:

Nov. 8, 1920—Chlorination of Water and Sewage.	William J. Orchard, General Sales Manager, Wallace & Tiernan Co., Inc., New York.
Nov. 12, 1920—Construction of Concrete Roads and Streets.	George A. Ricker, District Engr., Portland Cement Association.
Nov. 16, 1920—The Manufacture of Paving Bricks and Their Use in Highway Construction.	William O. Perkins, Ch. Engr., Eastern Paving Brick Manufacturers Association.
Nov. 17, 1920—Highway Construction Machinery.	George A. Sherron, Eastern Manager of the Koehring Machine Co.
Dec. 7, 1920—The Quarrying and Use in Construction of Granite Paving Block.	J. J. Tobin, Field Engr., Granite Paving Block Manufacturers Assn.
Dec. 9, 1920—Manufacture and Use of Wood Paving Blocks.	Lambert T. Ericson, Ch. Engr., Jennison-Wright Co.
Dec. 10, 1920—Recent Developments in Concrete.	Lt.-Col. H. C. Boyden, Portland Cement Association.
Dec. 21, 1920—The Occurrence, History, Manufacture, and Use of Asphalt.	Prevost Hubbard, Cons. Chemist of the Asphalt Association.
Dec. 22, 1920—The Manufacture and Use of Petroleum Derivatives in Highway Engineering.	John S. Crandall, Cons. Engr., General Tarvia Dept., The Barrett Co.

During the year members of the teaching staff have engaged in professional work of importance in several directions.

Professor Gregory has continued to serve as Consulting Engineer to the City of Columbus, Ohio, in connection with the design and construction of extensive enlargements and additions to the existing water supply, purification and pumping works, and has also served as Consulting Expert to the Law Department of the City of Baltimore, Maryland, in connection with the valuation and acquisition by the city of the property of The Baltimore County Water and Electric Company. He is Chairman of the Garbage Disposal Committee and also Chairman of the Publication Committee of the Engineers' Club of Baltimore.

In January he attended the annual meeting of the American Society of Civil Engineers in New York City, and in June he attended the annual convention of the American Water Works Association in Cleveland, Ohio.

On March 29th he addressed the engineering students of Ohio State University of Columbus, Ohio, on "Engineering Ethics and Practice, and Hints to Young Engineers."

Professor Gregory published a paper entitled "New Water Works Improvements in Columbus, Ohio," (Municipal and County Engineer, October, 1920).

During the summer Professor Dehuff was with the Maryland State Roads Commission serving as Assistant Resident Engineer on road and bridge construction, and on June 15th he delivered the address to the graduating class of the Baltimore Polytechnic Institute at the Commencement Exercises in the Lyric Theatre.

Mr. Thompson was employed during the summer on the staff of Charles T. Main, of Boston, who is in charge of the construction of the new works of the American Sugar Refining Company at Locust Point, Maryland, and served in the capacity of Chief Foundation Inspector, largely on pile foundation work. Mr. Thompson has also been serving Mr. Main during the past year as Consulting Engineer on inspection and testing of engineering materials. In January he attended the annual meeting of the American Society of Civil Engineers in New York City.

Mr. Medaugh was employed during the summer in Pittsburgh by the Pittsburgh-Des Moines Steel Company on water tank and tower designing. Two engineering articles were written by Mr. Medaugh, one entitled "Cross Sectioning with Stadia Arc," (Engineering News-Record, December 30, 1920), and the other, "Excluding Air from Pitometer Piping," (Engineering News-Record, April 7, 1921).

Mr. Pagon has continued his private practice in consulting engineering and on June 7th sailed for Europe to study the seaports of northern Europe during the summer. Mr. Pagon is Chairman of the Harbor Committee of the Engineers' Club of Baltimore, and is also Chairman of the Building Code Committee of the Baltimore Section of the American Society of Civil Engineers. On May 10th Mr. Pagon delivered an address on "American Seaports" before the Society of Terminal Engineers in New York City.

During the year important additions have been made to the experimental equipment for the work in Surveying and in Hydraulics. In the laboratory of the latter subject alterations have been made for extending the instruction and for the increasing sizes of the classes.

During the second half of the academic year, a Student Chapter of the American Society of Civil Engineers, known as The Johns Hopkins University Student Chapter of the American Society of Civil Engineers, was formed, membership in the same being open to students in civil engineering in the senior, junior, and sophomore classes. Mr. Eric M. Arndt, Class of 1921, was elected President, and Mr. Melvin E. Scheidt, Class of 1921, Secretary. A number of meetings have been held, and addresses before the Chapter have been delivered as follows:

Apr. 14, 1921—General Engineering Topics and Ideals in Engineering.	Henry G. Perring, Chief Engineer, City of Baltimore.
Apr. 25, 1921—The Topographical Survey of Baltimore City.	Major Joseph Shirley, Ch. Engr., Topographical Survey, Baltimore.
May 23, 1921—Engineering.	Major Ezra B. Whitman, Member, Public Service Commission of Maryland.

INSPECTION TRIPS

As has been the practice in the past, several trips have been made by the senior students in civil engineering, and by the students in sanitary engineering from the School of Hygiene and Public Health, for the purpose of examining and inspecting existing structures in service and works in operation.

The following structures and works were inspected:

Nov. 3, 1920—Baltimore, Md.	Water Filtration Works of the City of Baltimore at Lake Montebello.
Nov. 3, 1920—Washington, D. C.	Testing and Research Laboratories of the U. S. Bureau of Public Roads.
Nov. 3, 1920—Arlington, Va.	Experimental Road Investigations at the Experimental Farm of the U. S. Bureau of Public Roads.
Nov. 8, 1920—Baltimore, Md.	Carnegie Steel Co. and Chesapeake Iron Works.
Nov. 10, 1920—Bridewell, Md.	Water Purification and Sewage Disposal Works at the House of Correction.
Nov. 10, 1920—College Park, Md.	Water Filtration Works at the Maryland State College of Agriculture.
Nov. 10, 1920—Hyattsville, Md.	Water Filtration Works of the Washington Suburban Sanitary District.
Nov. 10, 1920—Washington, D. C.	Water Purification Works and Sewage Screening and Pumping Station of the District of Columbia.
Nov. 29, 1920—Baltimore, Md.	Sewage Disposal Works of the City of Baltimore at Back River.
Dec. 8, 1920—Baltimore, Md.	Reinforced Concrete Construction at the Works of the American Sugar Refinery.
Dec. 8, 1920—Baltimore, Md.	Railroad Yards of the Baltimore and Ohio R. R. Co.
Jan. 12, 1921—Baltimore, Md.	Testing Laboratories of the City of Baltimore.
Mar. 4, 1921—Baltimore, Md.	Typical Reinforced Concrete Buildings in Baltimore.

A further important trip of inspection was taken to New York City and neighborhood. A more detailed statement of this trip will be found under the heading of "The J. E. Aldred Lectures."

Electrical Engineering

The Laboratory of Electrical Engineering was open daily throughout the year and lectures and laboratory work were conducted as follows:

GRADUATE COURSES

Electrical Engineering Seminary. *One hour weekly, through the year.* Professor Whitehead.

Advanced Electrical Measurements. *Two hours weekly, through the year.* Associate Professor Kouwenhoven.

Electric Power Transmission. *Two hours weekly, through the year.* Dr. Lee.

UNDERGRADUATE COURSES

Elements of Electrical Engineering. *Nine hours weekly, through the year.* Professor Whitehead, Mr. Pullen and Mr. Lampe.

Materials of Engineering. *Three hours weekly, first half-year.* Associate Professor Kouwenhoven.

Electrical Measurements. *Three hours weekly, first half-year.* Associate Professor Kouwenhoven.

Design of Continuous Current Machinery. *Two hours weekly, second half-year.* Associate Professor Kouwenhoven.

Alternating Current Theory. *Three hours weekly, first half-year.* Dr. Lee.

Alternating Current Machinery. *Three hours weekly, second half-year.* Dr. Lee.

Electric Railways and Electric Illumination. *Three hours weekly, first half-year.* Mr. Pullen.

Advanced Electricity and Magnetism. *Three hours weekly, first half-year.* Professor Whitehead.

Electric Transmission and Power Plant Machinery. *Three hours weekly, second half-year.* Professor Whitehead.

Radio Transmission. *Three hours weekly, second half-year.* Dr. E. O. Hulburt.

Each of the foregoing courses was accompanied by the regular required amount of laboratory work.

The Seminary met weekly for the review of current journals and the presentation of original papers by members of the faculty and graduate students. Members of the senior undergraduate class took part in this work during the second half-year. The following papers were read in the Seminary:

W. B. Kouwenhoven—"The Primary Dry Cell."
W. B. Kouwenhoven—"Testing of Primary Dry Cells."
J. B. Whitehead —"Recent Work with the Corona Voltmeter."
N. Inouye —"Theory of Corona Formation."
W. B. Kouwenhoven—"Magnetic Analysis."
J. B. Whitehead —"Experiments on Development of Corona Protection for Transmission Lines."

Mr. N. Inouye, graduate student, completed an experimental investigation on the wave form of the current discharge of the high voltage corona. The results of this work were embodied in an essay for the degree of Master of Electrical Engineering, which was conferred upon him at the Commencement exercises June, 1921.

Professor Whitehead has been engaged in an experimental study of the dielectric losses in high voltage insulation.

Professor Whitehead, with the assistance of Mr. Inouye, has continued the experimental study of the protective properties of the high voltage corona on transmission lines. The Westinghouse Electric and Manufacturing Company and the Pennsylvania Water and Power Company are furnishing equipment and co-operating in this investigation.

Professor Whitehead attended the Mid Winter and Summer Conventions of the American Institute of Electrical Engineers.

Professor Kouwenhoven has been engaged in the design and construction of a precision permeameter in preparation for an investigation looking to the possibility of the predetermination of mechanical flaws in steel.

Dr. F. W. Lee published a paper entitled "The Electric Strength of Air Under Continuous Potentials and as Influenced by Temperature" (with J. B. Whitehead), Journal, American Institute of Electrical Engineers, May, 1921.

During the year professional services of various descriptions have been rendered by members of the teaching staff to the following firms:

United Railways and Electric Company.
Black & Decker Manufacturing Company.
Baltimore Tube and Copper Works.
Ellicott Machine Corporation.
Westinghouse Electric and Manufacturing Company.
F. X. Hooper Company.
Franklin Motor Car Company.

The American Institute of Electrical Engineers, Baltimore Section, of which Professor Whitehead is chairman, held a number of its monthly meetings in the Electrical and Mechanical Engineering Building.

A number of trips of inspection to electrical engineering plants and projects were taken by the advanced undergraduate classes, in

charge of members of the faculty. A more detailed statement of these visits will be found under the heading of "The J. E. Aldred Lectures."

Mechanical Engineering

Numerous changes were made in the Mechanical Engineering courses at the beginning of last year. The course in Heat Engines was rearranged so that the first half-year, which is also taken by Civil Engineering students, is now devoted to elementary thermo-dynamics, descriptive and laboratory work, while the second half-year is devoted to advanced engineering thermo-dynamics. In the fourth year a course on Heating, Ventilation and Refrigeration has been introduced. Elective courses in Research Laboratory work and Production Methods have also been offered to seniors.

The following undergraduate courses in Mechanical Engineering were given during the year:

Applied Mechanics. *Four hours weekly, first half year.* Associate Professor Smallwood and Messrs. Doughtie and Kouwenhoven.

Applied Kinematics. *One hour recitation and six hours drafting weekly, second half-year.* Associate Professor Waterfall.

Heat Engines. *Three hours class work and six hours laboratory weekly, throughout the year.* Associate Professor Smallwood and Messrs. Doughtie and Kouwenhoven.

Machine Design. *Three hours class work and six hours drawing weekly, first half-year; two hours class work and three hours drawing, second half-year.* Associate Professor Waterfall.

Dynamics of Machines. *Two hours weekly, first half year.* Associate Professor Waterfall.

Power Plant Calculations. *Three hours weekly, first half-year.* Associate Professor Waterfall.

Materials of Engineering. *Three hours class work and six hours laboratory, first half-year.* Professor Christie and Mr. Kouwenhoven.

Mechanical Laboratory. *Six hours weekly throughout the year.* Professor Christie and Mr. Kouwenhoven.

Heating, Ventilation and Refrigeration. *Three hours weekly, first half year.* Professor Christie.

Seminary and Journal Meeting. *One hour weekly, throughout the year.* Professor Christie.

Steam Turbine Calculations. *Three hours weekly, second half-year.* Professor Christie.

Internal Combustion Engines. *One hour class room and six hours laboratory weekly, second half-year.* Associate Professor Smallwood and Mr. Doughtie.

Industrial Organization and Contracts. *Three hours weekly, second half year.* Professor Christie.

Production Methods. *Three hours weekly, second half year.* Mr. Kouwenhoven.

Advanced Mechanical Laboratory. *Six hours weekly, throughout the year.* Professor Christie.

During the year Professor Christie prepared the new Steam Turbine Section of an edition of Kent's "Mechanical Engineer's Handbook," which is now in press. He also published in "Power" articles on "Radiant Energy in Boiler Practice" and a review on "Steam Turbines."

Professor Christie is Chairman of a Joint Committee preparing a Code of Ethics for all Engineers. This Committee consists of representatives of the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Society of Civil Engineers, the American Institute of Mining Engineers, and the American Society of Heating and Ventilating Engineers..

He is also active in the American Society of Mechanical Engineers, being Vice-Chairman of the Power Section, Secretary of the Steam Engine Committee of Power Test Codes, Member of the Publication Committee, and Secretary of the Baltimore Section.

Professors Christie, Smallwood and Waterfall attended the Annual Meeting of the American Society of Mechanical Engineers in New York in December. Professor Christie also attended the Spring meeting of the Society in Chicago.

A number of investigations of considerable interest have been carried on by students in the mechanical laboratories. Among these are: "A new method of testing non-condensing steam turbines," Weil and Stansbury; "The relation between viscosity and weir coefficient with cold brine," Chandler and Stuart; "The effect of initial pressure on the bomb calorimeter," D. S. Roskes; "Air cooling by sprays," Nicholson and Benson; "The effect of compression and lean mixtures on internal combustion engine efficiency," Tipton and Wessells.

A considerable amount of experimental and research work has been carried on in the mechanical laboratories for commercial firms. Several new pieces of apparatus and machines were added to the equipment during the year, notably a new hydraulic dynamometer, a small refrigerator equipment, and an experimental boiler.

Professor Christie delivered lectures before the Baltimore Section, N. E. L. A., one on Steam Turbines, the other on Modern Boiler Room Practice.

He spent the summer of 1920 with Stone & Webster, Boston, on the design of several large power plants.

Several trips were arranged for the senior students to engineering plants, particularly in connection with the new course on Production Methods.

Professor Smallwood was employed during the summer of 1920 in the Gas Department of the Consolidated Gas Electric Light and Power Company of Baltimore. He was engaged principally in two research investigations of industrial gas apparatus. These investigations were suggested by the American Gas Association and the results of the researches were presented at the Annual Meeting of that association, which Professor Smallwood attended.

During the college year Professor Smallwood gave a course of lectures to the industrial power salesmen of the local electric company. He also published a few short articles and conducted some commercial testing work.

THE J. E. ALDRED LECTURES ON ENGINEERING PRACTICE

In accordance with the plan of the foregoing years, the principal feature of the application of the generous donation of Mr. J. E. Aldred was a series of nine lectures by engineers engaged in the practice of the profession. In accordance with the wish of Mr. Aldred, particular stress was laid, in arranging these lectures, that they should deal with practical phases of engineering problems rather than with underlying theory or new and striking applications. The lectures were intended primarily for undergraduate students, but invitations were extended to a number of engineers not connected with the University and many of them attended. The lectures were as follows:

January 19, 1921—"Electricity Supply Systems in Large Cities." Mr. Philip Torchio, Chief Electrical Engineer, New York Edison Company, New York City.

January 26, 1921—"Railroad Signalling." Mr. Azel Ames, Engineer, Kerite Insulated Wire and Cable Company, New York City.

February 9, 1921—"Radio Telephony; Its Principles and Use." Mr. John V. L. Hogan, Manager, International Radio Telegraph Company, New York City.

February 16, 1921—"Subway Construction in New York City." Mr. Robert Ridgway, Engineer, Subway Construction, New York City.

February 23, 1921—"Municipal River Front Improvements." Mr. George S. Webster, Chief Engineer, Bureau of Surveys, Philadelphia, Pennsylvania.

March 2, 1921—"Recent Advances in Long Distance Telephony." Dr. F. B. Jewett, Chief Engineer, Western Electric Company, New York City.

March 9, 1921—"Present-Day Methods of Gas Making." Colonel Frederick H. Wagner, Bartlett-Hayward Company, Baltimore.

March 16, 1921—"The Methods of Manufacturing a New Line of Product." Mr. Edwin Pugsley, Winchester Repeating Arms Company, New Haven, Conn.

March 23, 1921—"The Use of Automatic and Semi-Automatic Machines." Mr. Ralph E. Flanders, Manager, Jones & Lamson Company, Springfield, Vt.

The lectures were subsequently collected and printed in the order in which they were given, and published by the Johns Hopkins Press as the fifth volume of The J. E. Aldred Lectures on Engineering Practice. Copies have been sent to a large number of university libraries, engineering organizations and engineering periodicals. The published volume has attracted the usual wide interest and a number of requests for copies from individuals have been met.

A portion of the funds made available by Mr. Aldred was used to

enable the advanced students to make visits of inspection to important engineering works and projects. An outline of these visits is given below.

In April and May the senior Electrical and Mechanical students, conducted by Professors Christie and Kouwenhoven, Dr. Lee, and Mr. Kouwenhoven, made inspection trips as follows: to the Westport Station of the Consolidated Gas Electric Light & Power Co., to the Sparrows Point Plant of the Bethlehem Shipbuilding Corp., including the launching of a British tanker, to the Bureau of Standards in Washington, to the Essington Plant of the Westinghouse Electric & Mfg. Co., South Philadelphia, and to the Hydraulic Power Plant of the Pennsylvania Water & Power Co., Holtwood, Pa.

Conducted by Mr. Pagon, the senior students in Civil Engineering went to New York City and inspected the Grand Central Railroad Station, Hellgate Bridge, East River Bridges, the Woolworth Building and Tower, the Crosstown Subways, the Subway Tunnel under the East River, the Arches of the Cathedral of St. John the Divine, the Sewage Screening Station at Dyckman Street, and the Harbor Development of New York, from tug kindly furnished by the New York Department of Docks.

NIGHT COURSES FOR TECHNICAL WORKERS.

The Night Courses for Technical Workers were again conducted under the auspices of the School of Engineering. The following courses were offered during the year:

Mathematics 1 N. Plane Trigonometry and Analytic Geometry. *Tuesday and Friday evenings,* 8 to 10. Professor Hulburt.

Chemistry 1-N. General Inorganic Chemistry. *Lecture on Monday evenings,* 8 to 10 and *laboratory Friday evenings,* 8 to 10. Professor Gilpin and Messrs. Bills and Davidheiser.

Chemistry 2-N. Quantitative and Qualitative Analysis. *Laboratory, Tuesday and Friday evenings,* 8 to 10. Messrs. Sharp and King.

Chemistry 3-N. Organic Chemistry. *Lecture on Thursday evening,* 8 to 10. *Laboratory on Tuesday or Friday evenings,* 8 to 10. Professor Gilpin and Messrs. Sharp and King.

Civil Engineering 1-N. Theory of Structures. *Monday and Thursday evenings,* 8 to 10. Mr. Thompson.

Civil Engineering 3 N. Reinforced Concrete Construction. *Tuesday and Friday evenings,* 8 to 10. Mr. Fahm.

Electrical Engineering 1-N. Direct Current Machinery. *Lectures and laboratory, Monday and Thursday evenings,* 8 to 10. Drs. Lee and Kouwenhoven.

Electrical Engineering 4 N. Elementary Alternating Currents. *Lectures and laboratory, Tuesday and Friday evenings,* 8 to 10. Messrs. Louis and Lampe.

Electrical Engineering 5-N. General Electrical Engineering. *Thursday evenings,* 8 to 10. Professor Whitehead.

Mechanical Engineering 1-N. Machine Design. *Monday and Thursday evenings,* 8 to 10. Professor Waterfall.

Mechanical Engineering 2 N. Heat Engines. *Lectures and laboratory. Tuesday and Friday evenings,* 8 to 10. Professor Smallwood.

Mechanical Engineering 3 N. Heating, Ventilation and Refrigeration. *Monday evenings,* 8 to 10. Professor Christie.

Mechanical Engineering 4 N. Industrial Organization. *Wednesday evening,* 8 to 10. Professor Christie.

Practical Marine Engineering I. *Monday, Wednesday and Friday evenings,* 8 to 10. Messrs. McCleary, Skrivan and Knabe.

Practical Marine Engineering II. *Monday and Thursday evenings,* 8 to 10. Mr. Cook.

Practical Marine Engineering III. *Monday and Thursday evenings,* 8 to 10. Mr. Baier.

Navigation. *Monday and Thursday evenings,* 8 to 10. Mr. Lindau.

The registration in the Night Courses was 346 students in the regular courses and 41 in the Marine Courses. On account of the slump in shipbuilding and in ocean traffic, the Marine Courses were discontinued after the first classes were completed.

JOHN B. WHITEHEAD, *Dean.*

REPORT OF THE DEAN OF THE MEDICAL FACULTY

TO THE PRESIDENT OF THE UNIVERSITY:

During the year October 1, 1920, to September 30, 1921, the school has been conducted as intensively as possible, with a full enrollment of students.

Three of the most important events of the year were the selection of Dr. Eli K. Marshall, as Professor of Physiology, the declination by Dr. Howland of a call to Harvard, and the resignation of Dr. Thayer as Professor of Medicine.

After a careful survey of all possibilities, Dr. Eli K. Marshall was chosen as Professor of Physiology to succeed Dr. William H. Howell, who had become Associate Director of the School of Hygiene, and he assumed duty here on July 1, 1921. Dr. Marshall is one of our graduates, who, after becoming Associate Professor of Pharmacology in this school, went to Washington University, St. Louis, as head of the corresponding department.

Early in the Spring Dr. Howland was offered the pediatric post at the Harvard Medical School, and for a time it was feared that its superior clinical facilities might tempt him to accept. Fortunately for us, he declined the call. Following this decision, the Hospital and University raised the funds necessary to conduct the Harriet Lane Home for Invalid Children at full capacity, and thus our momentary anxiety proved a blessing in disguise in that it resulted in a great increase in the number of children which will be cared for, thereby greatly increasing the usefulness of the Home as a teaching institution, as well as its possibilities for public good.

When Dr. W. W. Palmer was offered the chair of Medicine at Columbia University, Dr. Thayer felt that it was so important for him to be retained here that he unselfishly tendered his resignation as Professor of Medicine, which was accepted, and the post was offered to Dr. Palmer, who, after a long period of hesitation, declined it, and took to New York a number of promising young men who were working with him. As his decision was not made until late in the school year, and as so important a post could not be filled upon short notice, the University was most fortunate in being able to borrow from Vanderbilt University its professor of medicine—Dr. G. Canby Robinson—with the understanding that he would serve as acting Professor of Medicine and be returned to Vanderbilt at the end of the year. Dr. Robinson assumed duty on July 1, 1921, and immediately set about reorganizing the department and promptly put it upon a sound working basis.

This emergency forcibly impressed upon us the difficulty of finding ideal heads for the clinical departments, which is in great part the result of a radical change in our conception as to what should be demanded of them. We are now in a transitional period, in which

the older men with sound clinical judgment usually lack the desired scientific attainments; while the younger men who possess them, and who undoubtedly will become the medical leaders of the future, have not yet developed into pre-eminent clinicians. In all probability this means that the next professor of medicine will be a comparatively young man; who will be selected not so much upon the basis of assured accomplishment as of promise for the future.

The necessity of being able to assure the new professor of medicine that the department will have control of a sufficient number of ward patients to insure ideal instruction for the students brought to a head the problem of increasing the facilities of the Hospital and Medical School. After several meetings of a joint committee consisting of Trustees of the Harriet Lane Home, the Hospital and University, as well as of representatives of the Medical Board of the Hospital and the Advisory Board of the Medical Faculty, a program of expansion was decided upon and a committee appointed to secure funds. The program includes the erection of a new laboratory for physiological chemistry, a modern dispensary building, new medical and surgical clinics, as well as a new power plant and additions to the Nurses Home and other administrative buildings, and calls for an expenditure of $3,800,000 for buildings, as well as $4,200,000 for endowment, and will require eight years for its completion. A considerable part of the money has been secured, and the prospects seem bright for obtaining the balance.

When completed the program will add 300 ward beds to the hospital, and will assure the school of unsurpassed facilities for many years to come. Unfortunately, it failed to take into consideration two urgent needs, namely, provision for a suitable Library building, and funds for the maintenance of the Phipps' Clinic.

At present the Library is in two divisions—one for the fundamental medical sciences, which is supported by the University and housed on the first floor of the New Hunterian Building, and the other for the clinical subjects, which is partly maintained by the Hospital and housed in the Administration building of the Hospital. The latter especially is so over-crowded that books in its possession frequently cannot be located. The situation can be remedied only by consolidating the two collections and by the erection of a commodious building, which will eventually also house the library of the School of Hygiene, and afford facilities for future growth, and especially be so arranged as to foster literary work on the part of the staff and students. While certain funds are already in hand for this purpose, an additional sum of several hundred thousand dollars is necessary for its completion, and its acquisition should be regarded as one of the most pressing needs of the School.

When Mr. Henry Phipps generously erected the Psychiatric Clinic which bears his name, he promised to provide funds for its maintenance for ten years. This period will expire in April, 1923, when it will be necessary to secure from other sources funds for its support. While the maintenance of patients may be regarded as a Hospital matter, the University is responsible for the conduct of teaching and the prosecution of research. It now makes a yearly contribution of

approximately $16,000 for these purposes, which is clearly inadequate, and Dr. Meyer estimates that not less than $50,000 a year is required to conduct a creditable University department. A joint committee, representing the Hospital and University, has been placed in charge of the matter, but it is evident unless considerable sums are promptly raised that a serious crisis in this important department may soon have to be faced.

A committee of the Faculty, consisting of Drs. Howland, Palmer, Smith, Weed and Williams, was appointed to consider the state of the School, and after holding 17 meetings submitted a comprehensive report in June, 1921. In addition to a number of items which have already been mentioned, it pointed out that the clinical facilities of the school are inadequate to care for 90 students in each class, and recommended that the number be decreased to 75 and that more drastic means be adopted to eliminate weak students during the early years of the course. These recommendations were adopted and will go into effect October, 1922.

The Committee also directed attention to the physical needs of the departments of Physiological Chemistry and Pharmacology, which will be taken care of in the program of expansion. It also pointed out the urgent need for expansion in the work in neurology and in syphilis, and steps have already been taken to effect the latter. Likewise, it emphasized the necessity for radical reorganization of several of the specialities, which are now conducted as mere dispensary departments. Adequate physical provision will be made for them in the new buildings planned in the program of expansion, but it is evident that when the latter are completed the University will have to face certain changes in personnel, as well as to provide increased facilities for teaching and research.

Considerable sums were expended during the year for physical improvements in the departments of Anatomy and Physiology. A new cold storage and a modern cremation plant were installed and the entire anatomical building was overhauled, with the result that it is in nearly ideal physical condition. It is, however, already overcrowded and offers no possibility for expansion. The changes in the physiological laboratory were less extensive, and were made primarily to adapt it to Professor Marshall's convenience and needs.

During the year steps were taken to convert the Johns Hopkins Press from an instrumentality of the Philosophical Faculty to one representing all departments of the University. The Medical Faculty welcomed the innovation, and nominated Dr. Winford H. Smith as its representative.

During the year two series of Herter lectures were given—the first in October, 1920, by Professor Jules Bordet, director of the Pasteur Institute of Brussels, Belgium, and the second in April, 1921, by Professor F. Gowland Hopkins, of Cambridge, England. Both series were most interesting and stimulating, and gave renewed evidence of the wisdom and foresight of the late Dr. Christian Herter in so generously providing for their endowment. Several other lectures were delivered by distinguished foreigners—the most important

being by Dr. Carlos Pinheiro Chagas, of the Oswaldo Cruz Institute of Rio de Janeiro.

I regret to report the death of Dr. William D. Booker, Clinical professor emeritus of pediatrics, on March 15, 1921, after a short illness. A suitable minute was passed by the Faculty and sent to his family. Shortly afterwards a picture of Dr. Booker was presented to the School and has been hung in the Dean's office, where it serves to recall his attractive personality to those who were connected with the School in its early days, and to remind them of his important services in fostering the department of pediatrics under discouraging conditions.

The Kenneth Dows Tuberculosis Research Fund expired September 1, 1921, and I am glad to report that his mother, Mrs. Jane S. Dows, and his brother, Mr. David Dows, have generously agreed to continue a yearly appropriation of $17,500 for another period of five years. They stipulated, however, that no part of the fund should be expended for the treatment of patients. This necessitated the assump tion of increased obligations on the part of the Hospital and University, which were gladly undertaken, as by so doing it was possible to increase the facilities afforded Dr. A. K. Krause and his associates, who have so efficiently carried on the work under this foundation.

Under the auspices of the U. S. Interdepartmental Social Hygiene Board, the General Government has made two important donations to the School—one of $9,000 for the extension of work in the subdivision of syphilis, and the other of $7,500 to the department of urology. The latter contribution has in great part been expended in defraying the cost of researches considering new chemical compounds for the destruction of the causative agents of the venereal diseases. By means of chemical union between certain well known disinfectants and dye stuffs, substances have been produced which penetrate the tissues to an unusual degree and thereby make possible the destruction of the causative factors of such diseases at a distance from the surface.

During the year the enrollment of students was as follows:

First year	86
Second year	93
Third year	86
Fourth year	85

This does not include eight physicians taking special courses during the school year, nor thirty physicians who enrolled in the summer courses for practitioners. That the school has not lost in reputation is shown by the fact that in July, 1921, only one out of every three applicants for admission to the first year class could be accepted; while only eight out of a large number of applications for admission to advanced standing were accepted.

Maryland, Virginia and North Carolina scholarships were awarded to the following four students: A. W. Jacobsen, B. W. Leonard, A. J. Schaffer, C. E. McGuigan. The remaining two scholarships

were not awarded, as the standing of those applying for them was not sufficiently high to justify especial consideration.

In this connection, the question arises as to whether it might not be advisable to abolish such scholarships, and to replace them in one, or both, of two ways—first, by awarding them solely as rewards for scholarship without regard to the financial needs of the student, and secondly, by instituting a new type of loan scholarship, in which the amount advanced would be repaid by the student, with or without interest, at the end of a certain number of years following graduation.

During the year the following promotions and new appointments were made, and the following resignations accepted:

I. PROMOTIONS

(a) *Full Time*

Charles D. Snyder, from Associate Professor to Professor of Experimental Physiology.
Edward P. Carter, from Lecturer to Associate Professor of Medicine.
Everett D. Plass, from Associate to Associate Professor of Obstetrics.
Eben C. Hill, from Instructor to Associate in Anatomy.
John W. Harris, from Instructor to Associate in Obstetrics.
James R. Cash, from Instructor to Associate in Pathology.
Arnold R. Rich, from Instructor to Associate in Pathology.
Walter Hughson, from Assistant to Instructor in Anatomy.
Ferdinand C. Lee, from Assistant to Instructor in Anatomy.
Edwin N. Broyles, from Assistant to Instructor in Laryngology.
James R. Dunn, from Assistant to Instructor in Laryngology.
Friedman H. Cathrall, from Assistant to Instructor in Obstetrics.
John L. Ulrich, from Assistant to Instructor in Physiology.
Jay McLean, from Assistant to Instructor in Surgery.
Frederick L. Reichert, from Assistant to Instructor in Surgery.
Horton R. Casparis, from Assistant to Instructor in Pediatrics.
Phyllis Greenacre, from Assistant to Instructor in Psychiatry.

(b) *Part-Time*

Frederick H. Baetjer, from Associate Professor to Professor of Clinical Roentgenology.
Guy L. Hunner, from Lecturer to Associate Professor of Clinical Gynecology.
Walter E. Dandy, from Associate to Associate Professor of Clinical Surgery.
John W. Baylor, from Instructor to Associate in Clinical Laryngology.
Leo J. Goldbach, from Instructor to Associate in Clinical Ophthalmology.
Clyde A. Clapp, from Assistant to Instructor in Clinical Ophthalmology.
Robert Y. Fechtig, from Assistant to Instructor in Clinical Ophthalmology.
Reginald D. West, from Assistant to Instructor in Clinical Ophthalmology.

Robert W. Johnson, Jr., from Assistant to Instructor in Clinical Orthopedic Surgery.
J. Earle Moore, from Assistant to Instructor in Clinical Medicine.

II. NEW APPOINTMENTS

(a) *Full-Time*

Alan M. Chesney, Associate Professor of Medicine.
J. Steph. van der Lingen, Lecturer in Bio-Physics.
Ernst Huber, Associate in Anatomy.
William S. McCann, Associate in Medicine.
Karl Schläpfer, Associate in Surgery.
Leo Brady, Instructor in Gynecology.
Louis H. Braafladt, Instructor in Pathology.
Mary J. Hogue, Instructor in Bacteriology.
William D. Andrus, Instructor in Surgery.
Burr N. Carter, Instructor in Surgery.
William F. Rienhoff, Instructor in Surgery.
C. Sidney Burwell, Instructor in Medicine.
John G. Huck, Instructor in Medicine.
Randolph T. Shields, Assistant in Anatomy.
Henry L. Darner, Assistant in Gynecology.
Harry H. Haggart, Assistant in Laryngology.
Leight M. Higgins, Assistant in Laryngology.
Roger A. Siddall, Assistant in Obstetrics.
Ralph K. Ghormley, Assistant in Orthopedic Surgery.
Richard Dresser, Assistant in Pathology.
Isaac Y. Olch, Assistant in Pathology.
Harry P. Smith, Assistant in Pathology.
John Martinaglia, Assistant in Pathology.
Mary B. Buell, Assistant in Physiological Chemistry.
Frederick K. Bell, Assistant in Pharmacology.
Francis R. Dieuaide, Assistant in Medicine.
Alfred B. Hodges, Assistant in Medicine.
Irmarita Kellers, Assistant in Medicine.
Robert R. Hannon, Assistant in Medicine.
John B. Youmans, Assistant in Medicine.
Ruth Loveland, Assistant in Medicine.
Stanley G. Ross, Assistant in Pediatrics.
Hugh W. Josephs, Assistant in Pediatrics.
Frank H. Boone, Assistant in Pediatrics.
Curt P. Richter, Assistant in Psychiatry.
Benjamin S. Neuhausen, Assistant in Physiology.

(b) *Part-Time*

Henry M. Thomas, Jr., Instructor in Clinical Medicine.
George A. Stewart, Instructor in Clinical Surgery.
Francis L. Badagliacca, Assistant in Clinical Medicine.
Elmer B. Freeman, Assistant in Clinical Medicine.

III. RESIGNATIONS

(a) *Full Time*

William S. Thayer, Professor of Medicine.
Edwards A. Park, Associate Professor of Pediatrics.
Walter W. Palmer, Associate Professor of Medicine.
Alphonse R. Dochez, Associate Professor of Medicine.
Charles C. Macklin, Associate Professor of Anatomy.
Donald R. Hooker, Associate Professor of Physiology.
Chester H. Heuser, Associate in Anatomy.
Roy G. Hoskins, Associate in Physiology.
Verne R. Mason, Associate in Medicine.
Jean Firket, Instructor in Pathology.
Dana W. Atchley, Instructor in Medicine.
Walter P. Bliss, Instructor in Medicine.
George A. Harrop, Instructor in Medicine.
Frank A. Evans, Instructor in Medicine.
Jerome P. Webster, Instructor in Surgery.
Lawrence R. Wharton, Instructor in Gynecology.
Harold L. Higgins, Instructor in Pediatrics.
William M. Happ, Instructor in Pediatrics.
Thomas O. Gamble, Instructor in Obstetrics.
Howard B. Cross, Assistant in Pathology.
Lawrence Getz, Assistant in Pathology.
Edward M. Hanrahan, Assistant in Pathology.
Robert P. Kennedy, Assistant in Pathology.
Tracy J. Putnam, Assistant in Pathology.
Hoyt S. Hopkins, Assistant in Physiology.
William S. Ladd, Assistant in Medicine.
Hugh J. Morgan, Assistant in Medicine.
Robert L. Loeb, Assistant in Medicine.
William S. Tillett, Assistant in Medicine.
Charles Y. Bidgood, Assistant in Surgery.
Allen F. Voshell, Assistant in Orthopedic Surgery.
Moses L. Breitstein, Assistant in Laryngology.
Harold C. Shirley, Assistant in Laryngology.

(b) *Part-Time*

Kenneth D. Blackfan, Lecturer in Clinical Pediatrics.
Grover F. Powers, Associate in Clinical Pediatrics.
Maurice C. Pincoffs, Instructor in Clinical Medicine.
Robert W. B. Mayo, Instructor in Clinical Medicine.
Mildred C. Clough, Instructor in Clinical Medicine.
Daniel D. V. Stuart, Assistant in Clinical Neurology.

J. WHITRIDGE WILLIAMS,
Dean.

REPORT ON THE SCHOOL OF HYGIENE AND PUBLIC HEALTH

To the President of the University:

The number of students enrolled in the School during the past session was 122 as compared with 84 for the previous year. They may be classified as follows:

Fellows by Courtesy	2
Fellows	5
Rockefeller Foundation Scholars	7
Candidates for the Degree of Dr. P. H.	22
Candidates for the Degree of Sc. D. in Hygiene	21
Candidates for the Degree of S. B. in Hygiene	9
Candidates for the Certificate in Public Health	4
Special Students	62
	132
Duplications	10
	122

The regular courses, as announced in the Catalogue, were given in Bacteriology, Immunology, Protozoology, Helminthology, Entomology, Statistics, Epidemiology, Sanitary Engineering, Physiology as applied to Hygiene, Chemistry as applied to Hygiene, Mental Hygiene, Metabolism and Diet, Sanitary Law, Personal Hygiene and Public Health Administration. In addition to these scheduled exercises there was a series of twenty-one De Lamar lectures on selected topics in Hygiene and Preventive Medicine. These lectures were given on Monday afternoons at certain intervals during the year and were attended by the students and staff and by a large number of invited guests. The lecturers and subjects were as follows:

Dr. Victor G. Heiser,
Director for the East of the International Health Board,
"The Halifax Health Program."

Dr. Donald B. Armstrong,
Executive Officer of the Framingham Community Health and Tuberculosis Demonstration,
"The Control and Prevention of Tuberculosis."

Dr. Charles V. Chapin,
Superintendent of Health, Providence, R. I.,
"The Evolution of Preventive Medicine."

Dr. Haven Emerson,
Former Commissioner of Health of New York City,
"How the Diagnosis of a Community's Health Is Made."

DR. CHARLES W. STILES,
United States Public Health Service,
"Some Practical Aspects of the Subject of Soil Pollution."

DR. EDWARD C. SCHNEIDER,
Professor of Biology, Wesleyan University,
"The Influence of High Altitudes on Man."

MR. WILLIAM C. HOAD,
Professor of Sanitary Engineering, University of Michigan,
"Some Relations of Engineering to Public Health."

SIR ARTHUR NEWSHOLME, M. D., K. C. B.,
Resident Lecturer in Public Health Administration,
Late Principal Medical Officer of the Local Government Board of England,
"National Changes in Health and Longevity."

DR. LIVINGSTON FARRAND,
Chairman, Central Committee, The American Red Cross,
"Volunteer and Unofficial Agencies in the Public Health Field."

DR. RICHARD P. STRONG,
Professor of Tropical Medicine, Harvard Medical School,
"The Economic Loss from Disease Due to the War."

SURGEON GENERAL HUGH S. CUMMING,
United States Public Health Service,
"The Activities and Opportunities of the Public Health Service."

DR. DAVID L. EDSALL,
Professor of Clinical Medicine, Harvard Medical School,
"The Relation of Occupation to Health."

MR. SHELBY M. HARRISON,
Director, Department of Surveys and Exhibits, Russell Sage Foundation,
"The Methods and Results of Public Health Surveys."

DR. LAWRASON BROWN,
of Saranac Lake, New York,
"Certain Causative Factors in Pulmonary Tuberculosis."

DR. W. S. RANKIN,
State Health Officer, North Carolina State Board of Health,
"Certain Important Principles of State Health Administration."

DR. HIDEYO NOGUCHI,
Rockefeller Institute for Medical Research,
"A Review of Experimental Studies of Yellow Fever."

DR. WILLIAM H. DAVIS,
Chief Statistician, Vital Statistics, Bureau of the Census,
"Birth Registration in the United States."

DR. C. C. BASS,
Professor of Experimental Medicine, Tulane University,
"Control of Malaria by Curing Those Who Have It."

DR. CARLOS P. CHAGAS,
Director of the Oswaldo Cruz Institute, Rio Janeiro, Brazil,
1. "Some of the Principal Diseases of Brazil and Their Epidemiology."
2. "A Resume of the Etiology and Clinical Aspects of the American Trypanosomiasis."

An intensive course of six weeks designed especially for public health officers was given between November 8th and December 18th, under the general supervision of Sir Arthur Newsholme. Twenty-nine students took this course, representing the health departments of Baltimore, Maryland, Pennsylvania, Virginia, North Carolina, South Carolina, Kentucky, Costa Rico and Porto Rico. The schedule offered was very full, occupying all the morning and afternoon hours, together with frequent conferences in the evening. The following condensed schedule will serve to indicate the character of the course:

LABORATORY DEMONSTRATIONS 9 a. m. to 1 p. m.	EXERCISES	
Bacteriology.	9	Drs. Ford, Robinson, Meader, Lange, Salter.
Medical Zoology.	7	Drs. Hegner, Cort, Taliaferro, Root, Simon.
Vital Statistics.	5	Drs. Pearl, Reed, Miner, Parker.
Physiology (Dust-Illumination-Fatigue).	3	Drs. Spaeth, Clark, Meyer.
Food and Nutrition.	3	Drs. McCollum and Shohl.
Sanitary Engineering.	3	Professor Gregory.
Immunology.	3	Dr. Havens.

AFTERNOON DEMONSTRATIONS 2 to 5 p. m.	EXERCISES	
Epidemiology.	5	Dr. Frost.
City Administration.	1	Dr. Jones.
State Administration.	1	Dr. Fulton.
Municipal Tuberculosis Work.	1	Dr. Jones.
City Methods of Control of Infectious Diseases.	1	Dr. Jones and Dr. Hogan.
Maternity and Pre-Natal Clinic.	1	Dr. Whitridge Williams.
Venereal Diseases.	1	Dr. Rytina.
Child Welfare Work.	1	Dr. Mary Sherwood.
Water Plants.	1	Professor Gregory.
Milk Inspection.	1	Dr. Shohl.

AFTERNOON CONFERENCES
2 to 4 p. m.

Municipal, County and State Public Health Administration. Chairman, Dr. J. S. Fulton.
Hospital Administration ..... Chairman, Dr. Winford Smith.

Control of Tuberculosis.....Chairman, Sir Arthur Newsholme.
Control of Acute Infectious Diseases .....Chairman, Dr. W. H. Frost.
Control of School Medical Inspection .....Chairman, President Goodnow.
Control of Venereal Diseases....Chairman, Dr. W. H. Howell.
Feeble Minded Children.....Chairman, Dr. W. B. Cornell.
Intestinal Diseases .....Chairman, Dr. L. L. Lumsden.
Sanitary Inspection and Housing.Chairman, Prof. J. H. Gregory.
Maternity and Child Welfare Work .....Chairman, Dr. J. H. M. Knox.
Voluntary Public Health Agencies .....Chairman, Dr. Livingston Farrand.
Publicity Work .....Chairman, Dr. C. Hampson Jones.
Preparation of Budgets.....Chairman, Dr. A. J. McLaughlin.

AFTERNOON LECTURES
4 to 5 p. m.

Dr. Welch, Sir Arthur Newsholme, President Goodnow, Dr. Howell, Dr. McCollum and Dr. C. G. Bull.

The general impression was that the course was very successful and it will be offered again during the coming session. The numerous conferences gave opportunities for a free exchange of opinions and experiences with specialists in various fields of work, while in the laboratory exercises the more modern methods of examination and diagnosis were demonstrated. An additional feature that added to the interest of the course was a Conference of Public Health Officers of the Southern States, which met in the lecture room of the School on the invitation of the International Health Board. An interesting program was presented covering the important features of the work of a state health board. The Conference was well attended and we were very glad to have the opportunity of demonstrating the work of the School to this important group of public health workers. In addition to this intensive course a shorter more special course of three weeks was given by the department of Medical Zoology to a group of six students sent to the School for special training by the International Health Board.

The American Journal of Hygiene, issued under the editorship of Dr. Welch, began publication in January of the present year. Three numbers have appeared at the date of this report containing many interesting papers from members of the School and from workers in various parts of the country. This journal is not meant for general articles upon public health since that need is already successfully met by the Journal of the American Public Health Association. It is intended to be a medium for the publication of special investigations in all departments of hygiene and will be distinctly a research journal. It is supported from part of the appropriation of $10,000 made to the School of Hygiene by the Medical School, out of the De Lamar bequest. The second volume of collected papers published by the Staff of the School during the current session will be issued this summer. The volume consists of the reprints of papers pub-

lished by members of the faculty. It is distributed gratuitously to Departments of Health and laboratories and institutions of Hygiene throughout the world. The present volume contains reprints of 55 different contributions. Two hundred and fifty copies will be distributed as indicated above.

At the beginning of the academic year the departments of Medical Zoology and Bacteriology were moved to their new quarters in the building formerly occupied by the Biological Department of the University at the corner of Druid Hill Avenue and Eutaw Street. The building has been put in excellent order and provides very satisfactorily for the present needs of these departments. The department of Biometry and Vital Statistics is housed at 625 St. Paul Street. While the accommodations are adequate for present needs, it has proved to be unfortunate to have this work carried on at such a distance from the rest of the School. After considerable delay, caused by the building situation and other difficulties, the plans for the new building for the School are definitely under way. The building will be located on Wolfe Street adjacent to the Medical School and the Hospital. A consulting board of architects has been appointed consisting of Mr. Coolidge, of the firm of Coolidge & Shattuck, of Boston, and Mr. Fenner, of the firm of McKim, White & Meade, of New York. This Board has selected the firm of Archer & Allen, of this city, as Executive Architects. It is hoped that working plans of the building will be prepared before the end of the summer.

It is very gratifying to report that the plans for the organization of a county health unit, referred to briefly in the last report, have been completed and that the unit will begin its work during the present summer. The unit will consist of a director, Dr. R. B. Norment, Jr., of the United States Public Health Service, a sanitary inspector, a laboratory technician, a clerk, an attendant and three nurses. Its operations will be under the direct control of the State Board of Health. It will be provided with permanent quarters and a laboratory, and with a sufficient number of automobiles to enable the nurses, officers and attending students to make visits to houses in all parts of the county. Four agencies are contributing to the support of the undertaking, namely, the Maryland State Board of Health, the International Health Board of the Rockefeller Foundation, the United States Public Health Service and the School of Hygiene. The County selected for the work will be expected to furnish rooms for offices and the laboratory. The main objects of the experiment are to make a complete epidemiological and sanitary survey of the conditions in a given county and to perfect an organization adequate to deal properly with these conditions. This work will be extremely valuable to the School since it will afford an opportunity for the students and certain members of the staff to become acquainted at first hand with the methods of an effective health service. Much interest has been shown in the plan by the health authorities and leading citizens in several of the counties, and official communications have been received from at least three counties extending an invitation to be selected as the seat of operation of the Unit. After a full consideration of all of the conditions Washington County has been selected. This county has a population of 60,000.

of which about one-half is found in the city of Hagerstown. It will be possible therefore to study both urban and rural conditions. The county is provided with good roads and is convenient of access to both Baltimore and Washington.

Another general activity of the School that is of interest is a combined study of the diphtheria situation in Baltimore from an epidemiological standpoint, undertaken by the departments of Epidemiology and Immunology in connection with the Baltimore City Health Department. In spite of the quite complete knowledge at hand in regard to the diagnosis and treatment of diphtheria, its control in a large community is not satisfactory, and it is hoped that this investigation may add something of value to our knowledge of the origin and mode of spread of epidemics of this dangerous disease.

The Society of Hygiene held regular meetings during the year on the first Wednesday of each month, and in addition several special meetings. The following papers were read before this Society:

"Plague and Its Control"....Dr. George H. Robinson.
"Recent Studies on the Etiology of Rickets"...Dr. E. V. McCollum.
"Medical Zoology in Europe"....Dr. R. W. Hegner.
"Observations on the Diagnosis of Gonococcus Infections"....Dr. P. D. Meader.
"The Danger to the United States of the Introduction of the Human Trematode Diseases"....Dr. W. W. Cort.
"Antipneumococcus Protective Substances in Normal Chicken Serum"....Dr. C. G. Bull
"Pathological Changes in the Bones of Animals Fed on Deficient Diets"....Dr. P. G. Shipley.
"The Real Risk-Rate of Death to Mothers from Causes Connected with Childbirth"....Dr. William T. Howard, Jr.
"A Consideration of Clark and Lubs Theories Concerning Methyl-red Positive and Methyl-red Negative Organisms"....Dr. William W. Ford.
"The Typhoid Carrier"....Dr. Abraham L. Garbat, Lenox Hospital, New York.
"Trachoma as a Public Health Problem"....Dr. John McMullen, U. S. Public Health Service.
"Physiological Effects of Exhaust Gas, and Standards of Ventilation for the Proposed Vehicular Tunnels Under the Hudson River"....Dr. Yandell Henderson, Yale University, School of Medicine.
"The Chemistry of Tryparsamide"....Dr. Walter A. Jacobs, Rockefeller Institute for Medical Research.
"Tryparsamide Therapy of African Sleeping Sickness in the Belgian Congo"....Dr. Louise Pearce, Rockefeller Institute for Medical Research.
"The Etiology and Pathology of Typhus Fever"....Dr. S. B. Wolbach, Harvard Medical School.

At the close of the session Sir Arthur Newsholme, Resident Lecturer in charge of the department of Public Health Administration, severed his connection with the School to return to England. His services during the two years that he has been a member of the faculty have been invaluable. No member of the staff has been more zealous and devoted in his work, and his extensive experience in public health matters was especially valuable in the formative period of the School's development.

Experience with the work of this department during the past two years has shown that it is desirable to unite it with the department of Epidemiology under a single administrative head. This arrangement has been followed in the appointments made for the coming academic year. Dr. W. H. Frost, of the United States Public Health Service, who has been Resident Lecturer in Epidemiology for two years, has been made Professor of Epidemiology and Head of the Departments of Epidemiology and Public Health Administration, and the School has been most fortunate in securing the services of Dr. Allen W. Freeman, Commissioner of Health of Ohio, as Resident Lecturer in Public Health Administration. Dr. Freeman is a graduate in Science of Richmond College and a graduate in Medicine of the Johns Hopkins University. He has had a long and distinguished career in public health in this country.

Other matters of general interest that may be mentioned are as follows:

Dr. Hegner, who represented the School at an International Congress of Public Health held in Brussels, May 20th to 24th, 1920, made a tour of the laboratories of Medical Zoology in England, Belgium, France, Switzerland and Italy, and presented a report of his observations which was subsequently published in *Science*, vol. 52, p. 591. As one result of this trip, Dr. Hegner brought back an extensive collection of insects from the Imperial Bureau of Entomology of Great Britain, together with a large number of macroscopic preparations and slides.

A gift of 30,000 specimens of Fasciolopsis buskii was made to the department of Medical Zoology by Dr. C. H. Barlow of Shaohsing, China, and smaller gifts of a similar character have been received from field workers connected with the International Health Board and the United States Public Health Service. Dr. Barlow has been doing work in the department of Medical Zoology during the year upon the Fasciolopsis buskii and, in consequence of results obtained from this work, he has been granted a special appropriation through the School of Hygiene and Public Health by the Rockefeller Foundation for an investigation of the widespread disease caused by this fluke in China.

Dr. Cort, Associate Professor of Helminthology, Dr. Ackert, Fellow by Courtesy, and Mr. Augustine, Assistant in Helminthology, were granted leave of absence from May 22nd to proceed to Trinidad to undertake a special study of the biology of the hookworm larva in the soil under a grant furnished by the International Health Board.

Dr. Taliaferro, Associate in Protozoology, was granted leave of absence from May 1st to carry on some special work upon trypanosomes at the Rockefeller Institute, New York.

Dr. Hegner, Associate Professor of Protozoology, and Dr. Root, Associate in Medical Entomology, will spend the summer in Porto Rico in a special study of the malarial mosquito and other forms of insects of medical interest.

In the department of Biometry and Vital Statistics, Dr. A. J. Lotka, who was a guest of the department for a part of the year, gave a series of four lectures, April 11th to 15th, on "The Dynamics of Evolution and the Foundations of Physical Biology," which were attended by advanced students and instructors from several departments of the University.

During the year additional funds have been granted to the department of Biometry and Vital Statistics by the Russell Sage Foundation and the Commonwealth Fund for the completion of an extensive investigation of the genetic factors in the etiology of tuberculosis.

This department has been fortunate also in establishing co operative relations with the Johns Hopkins Hospital, the United States Public Health Service and the Division of Vital Statistics of the New York Department of Health. These connections promise to be very helpful to the department both directly in supplying material of an important character and indirectly in widening the influence of its work.

In the department of Bio Chemistry, Professor McCollum in addition to his laboratory investigations, has been carrying out some interesting studies upon under nourished children. This work has been done in part at a negro orphans' home and in part in the public schools. In the former case it was found that the inmates of the home were receiving a diet derived practically entirely from cereals, tubers and fleshy roots, a diet which can not provide all of the essentials of nutrition. The children were divided into two groups of 42 each. One group was continued on the institutional diet, the other was placed upon a modified diet in which a part of the energy value was furnished from milk made from a milk powder. This experiment was continued for 15 months with results which were most striking in demonstrating the greater value of the modified diet in bringing the children to their normal weights and nutritive condition. The funds for this work were contributed by a donor who desires to remain unnamed. The data obtained are now about complete and will be prepared for publication during the summer.

The object of the second study are described by Professor McCollum, as follows:

"In the Summer of 1918 a number of agencies in Baltimore contributed money to the extent of six thousand dollars for the purpose of defraying the cost of a survey of the health conditions among children in the public schools of the city. It was at the request of the donors and their advisors that Professor McCollum undertook to direct this survey. The City of Baltimore contributed five thousand dollars to supplement this fund. The survey was conducted in cooperation with the United States Public Health Service, Dr. Taliaferro Clark being in direct charge of the medical examination of the

children. About six thousand children were weighed and measured and fifteen hundred were given medical examinations.

The results showed that between twenty and thirty per cent. of the children in the six schools studied were ten per cent. or more under the normal weight for their ages. These conditions are comparable with those found in New York City and other cities in the Eastern United States.

The study was completed about February 1, 1919, and during the remainder of the year all children who were 10 per cent. or more under normal weight in four schools were organized into classes of 12 to 15 each, and were given regular instruction in hygiene, the selection of food, and the principles of right living. We reached in an intensive way about 550 children. These were all weighed and measured at suitable intervals as an index to their well being. A special study was made of each child and its home conditions, and every effort was made to co operate with the parents in improving its habits and conditions of living. During the academic year 1920 21 the funds available for this work which were privately contributed were continued, and the City of Baltimore again appropriated $5,000 to further the work. The work is being continued along the lines indicated above."

The following publications have been made by members of the staff and their students during the present academic year.

1. The relations of medical zoology to public health problems. By R. W. Hegner. *Journal of the American Medical Association*, vol. 75, p. 1607.
2. Surveys of the intestinal protozoa of man, in health and disease. By R. W. Hegner and G. C. Payne. *Scientific Monthly*, 1921, p. 47.
3. Measurements of trypanosoma diemyctyli from different hosts and their relation to specific identification, heredity and environment. By R. W. Hegner. *Journal of Parasitology*, vol. 7, p. 105.
4. Medical zoology in Europe. By R. W. Hegner. *Science*, vol. 57, p. 591.
5. Diagnosis of protozoa and worms parasitic in man. By R. W. Hegner and W. W. Cort. Baltimore, 1921.
6. An analysis of the relations between growth and nuclear division in a parasitic infusorian, Opalina sp. By R. W. Hegner and Hsiang Fong Wu. In press. *The American Naturalist.*
7. Cytameba bacterifera. By R. W. Hegner. In press. *Journal of Parasitology.*
8. A new cystophorous cercaria from California. By W. W. Cort and Elinor B. Nichols. *Journal of Parasitology*, vol. 7, p. 8.
9. The development of the Japanese blood fluke Schistosoma Japonicum Katsurada, in its final host. By W. W. Cort. *American Journal of Hygiene*, vol. 1, p. 1.
10. Prenatal infestation with parasitic worms. By W. W. Cort. *Journal of the American Medical Association*, vol. 76, p. 170.

11. Sex in the trematode-family Schistosomidae. By W. W. Cort. *Science*, March, 1921.
12. Life-cycle in the rat and variations in size throughout a pure line infection of trypanosoma lewisi. By W. H. Taliaferro. In press. *Proceeding of the National Academy of Sciences.*
13. Experiments on the carriage of intestinal protozoa of man by flies. By F. M. Root. *American Journal of Hygiene*, vol. 1, p. 131.
14. Studies on the life history of Vahlkampfia patuxent n. sp. parasitic in the oyster, with experiments regarding its pathogenicity. By Mary J. Hogue. In press. *American Journal of Hygiene.*
15. A comparison of an amoeba. Vahlkampfia patuxent, with tissue culture cells. By Mary J. Hogue. In press. *Journal of Experimental Zoology.*
16. Chilomastix mesnili and a method for its culture. By W. C. Boeck. *Journal of Experimental Medicine*, vol. 33, p. 147.
17. Thermal death-point of the human intestinal protozoan cysts. By W. C. Boeck. In press. *American Journal of Hygiene.*
18. Observations on abnormal courses of infection of Paragonimus Ringeri. By Sadamu Yokagawa and Susumu Suyemori. *Journal of Parasitology*, vol. 6, p. 183.
19. A new nematode from the rat. By Sadamu Yokagawa. *Journal of Parasitology*, vol. 7, p. 29.
20. On the migratory course of Trichosomoides Crassicauda (Bellingham) in the body of the final host. By Sadamu Yokagawa. *Journal of Parasitology*, vol. 7, p. 80.
21. An experimental study of the intracranial parasitism of the human lung-fluke, Paragonimus Westermanii. By Sadamu Yokagawa and Susumu Suyemori. *American Journal of Hygiene*, vol. 1, p. 63.
22. The development of Heligmosomum Muris Yokagawa, a nematode from the intestine of the wild rat. By Sadamu Yokagawa. In press. *Journal of Morphology.*
23. Giardia (Lamblia) Intestinalis, a common protozoan parasite of children. By Kenneth F. Maxey. *The Johns Hopkins Hospital Bulletin*, May, 1921.
24. The precipitin reaction in the diagnosis of gonococcus infections. By G. H. Robinson and P. D. Meader. *Journal of Urology*, vol. 4, p. 551.
25. Biological and physical properties of the hemotoxin of streptococci. By P. D. Meader and G. H. Robinson. *Journal of Experimental Medicine*, vol. 32, p. 639.
26. A comparative study of hemolytic streptococci from milk and from human lesions. By Raymond C. Salter. *American Journal of Hygiene*, vol. 1, p. 154.
27. The use of tissue in broth in the production of diphtheria toxin. By G. H. Robinson and P. D. Meader. *Journal of Infectious Diseases*, vol. 27, p. 106.

28. Non-bacterial population of sewage trickling filters. By C. R. Cox. In press. *Engineering News-Record*, 1921, vol. 87, No. 18.
29. The mathematics of biometry. By Lowell J. Reed. *American Mathematical Monthly*, vol. 27, p. 409.
30. On the numerical expression of the degree of inbreeding in a pedigree. By Tage Ellinger. *American Naturalist*, vol. 54, p. 540.
31. On the rate of growth of the population of the United States since 1790 and its mathematical representation. By Raymond Pearl and Lowell J. Reed. *Proceedings of the National Academy of Sciences*, vol. 6, p. 275.
32. A contribution of genetics to the practical breeding of dairy cattle. By Raymond Pearl. *Proceedings of the National Academy of Sciences*, vol. 6, p. 225.
33. The effect of the war on the chief factors of population change. By Raymond Pearl. *Science*, vol. 51, p. 553.
34. Some landmarks in the history of vital statistics. By Raymond Pearl. *Quarterly Publications of the American Statistical Association*, June, 1920.
35. The natural history of typhoid fever in Baltimore, 1851-1919. By William Travis Howard, Jr. *The Johns Hopkins Hospital Bulletin*, vol. 31, p. 276.
36. On a single numerical index of the age distribution of a population. By Raymond Pearl. *Proceedings of the National Academy of Sciences*, vol. 6, p. 427.
37. Fitting straight lines. By Lowell J. Reed. In press. *Metron.*
38. Variation in the rate of infant mortality in the United States birth registration area. By Raymond Pearl. *Transactions Eleventh Annual Meeting American Child Hygiene Association*, October, 1920.
39. A biological classification of the causes of death. By Raymond Pearl. In press. *Metron.*
40. The relative influence of the constitutional factor in the etiology of tuberculosis. By Raymond Pearl. *American Review of Tuberculosis*, vol. 4, p. 688.
41. Influenza Studies. II. Further data on the correlation of Explosiveness of outbreak of the 1918 epidemic. III. On the correlation of destructiveness of the 1918 epidemic. IV. On the correlation between explosiveness and total destructiveness of the epidemic mortality. By Raymond Pearl. *Public Health Reports*, vol. 36, p. 273.
42. Studies on the physiology of reproduction in the domestic fowl. XVIII. Further observations on the anatomical basis of fecundity. By Raymond Pearl and William F. Schoppe. In press. *Journal Experimental Zoology.*
43. Studies on the reproduction of the domestic fowl. XIX. On the influences of free choice of food materials on winter egg production and body weight. By Raymond Pearl and E. T. Fairchild. *American Journal of Hygiene*, May, 1921.

44. The real risk rate of deaths to mothers from causes connected with child-birth. By William Travis Howard, Jr. *American Journal of Hygiene,* vol. 1, p. 197.
45. A further note on war and population. By Raymond Pearl. *Science N. S.,* vol. 53, p. 120.
46. The biology of death: I—The problem. By Raymond Pearl. *Scientific Monthly,* 1921, p. 193.
47. The biology of death: II—Conditions of cellular immortality. By Raymond Pearl. *Scientific Monthly,* 1921, p. 321.
49. The biology of death: III—The chances of death. By Raymond Pearl. *Scientific Monthly,* 1921, p. 443.
49. The reactivation of the natural hemolytic antibody in chicken serum. By R. R. Hyde. In press. *The American Journal of Hygiene.*
50. A study of the natural and acquired anti-sheep hemolysins of the rabbit as regards thermolability. By R. R. Hyde. In press. *The American Journal of Hygiene.*
51. An eyeless mutant in Drosophila Hydei (Sturtevant) that functions through the environment. By R. R. Hyde. In press. *Proceedings of the Indiana Academy of Sciences.*
52. Segregation and recombination of the genes for tinged, blood. buff and coral in Drosophila Melanogaster. By R. R. Hyde. In press. *Proceedings of the Indiana Academy of Sciences.*
53. Behavior of the gene for the mutant curved of Drosophila Melanogaster in crosses involving genes in the same and other chromosomes. By R. R. Hyde. In press. *Genetics.*
54. The relation of certain carrier conditions to the virulence of hemolytic streptococci. By L. C. Havens. *American Journal of Hygiene,* vol. 1, p. 192.
55. Toxic substances obtained by growing hemolytic streptococci in a special medium. By L. C. Havens. In press. *The American Journal of Hygiene.*
56. Examples of selective adsorption by bacillus pyocyaneus. By W. C. Moore. *Thirty seventh Meeting of the American Electro-Chemical Society,* April 8th, 1920.
57. Observations on the zinc electrode. By W. C. Moore. *Journal of the American Chemical Society,* vol. 43, p. 81.
58. Antipneumococcus protective substances in normal chicken serum. By C. G. Bull and Clara M. McKee. In press. *The American Journal of Hygiene.*
59. A study of the factors which interfere with the use of yeast as a test organism for the antineuritic substance. By Geraldo de Paula Souza and E. V. McCollum. *Journal of Biological Chemistry,* vol. 44, p. 113.
60. The "Bios" of Wildiers and the cultivation of yeast. By Margaret B. MacDonald and E. V. McCollum. *Journal of Bilogical Chemistry,* vol. 46, p. 525.
61. The antiscorbutic content of certain body tissues of the rat. By

Helen T. Parsons. *Journal of Biological Chemistry*, vol. 44, p. 587.

62. The antiscorbutic requirement of the prairie dog. By E. V. McCollum and Helen T. Parsons. *Journal of Biological Chemistry*, vol. 44, p. 603.
63. The cultivation of yeast in solutions of purified nutrients. By Margaret B. MacDonald and E. V. McCollum. *Journal of Biological Chemistry*, vol. 45, p. 307.
64. Studies on experimental rickets. I. The production of rachitis and similar diseases in the rat by deficient diets. By E. V. McCollum, Nina Simmonds, P. G. Shipley and E. A. Park. *Journal of Biological Chemistry*, vol. 45, p. 333.
65. Studies on experimental rickets II. The effect of cod liver oil administered to rats with experimental rickets. By P. G. Shipley. E. A. Park, Nina Simmonds and E. V. McCollum. *Journal of Biological Chemistry*, vol. 45, p. 343.
66. Studies on experimental rickets III. A pathological condition bearing fundamental resemblances to rickets of the human being resulting from diets low in phosphorous and fat-soluble A; the phosphate iron in its prevention. By P. G. Shipley, E. A. Park, Nina Simmonds and E. V. McCollum. *Bulletin of the Johns Hopkins Hospital, May*, 1921.
67. Food at the front lines. By C. C. Mason and A. T. Shohl. *Military Surgeon*, April, 1921.
68. Public health and insurance: American Addresses. By Sir Arthur Newsholme. *The Johns Hopkins Press*, Baltimore.
69. Article on epidemiology. By W. H. Frost. *Nelson Loose-Leaf Medicine*, 1920.
70. New water works improvements in Columbus, Ohio. By J. H. Gregory. *Municipal and County Engineer*, October, 1920.
71. The action of light on the leucocyte count. By Janet H. Clark. *American Journal of Hygiene*, vol. 1, p. 39.
72. Scientific research and public health. By W. H. Howell. *Transactions of the Royal Canadian Institute*, Toronto, vol. 13, no. 2.
73. Samuel James Meltzer. An appreciation. By W. H. Howell. *Science*, vol. 53, February 4th, 1921.
74. The nature of secondary valence I. The concept of secondary valence. Preliminary communication. By Homer W. Smith. *Journal of Physical Chemistry*, vol. 25, p. 160.
75. The nature of secondary valence II. Partition coefficients. By Homer W. Smith. *Journal of Physical Chemistry*, vol. 25, p. 204.
76. An answer to the Gilbreth indictment of stop-watch time study. By Reynold A. Spaeth. In press. *Taylor Society Bulletin.*
77. The correlation between motor control and rifle shooting. By R. A. Spaeth and G. C. Dunham. In press. *The American Journal of Physiology.*
78. A method for determining the finer dust particles in air. By A. L. Meyer. *The Journal of Industrial Hygiene*, vol. 3, p. 51.

Degrees were conferred during the year as follows:

On Commemoration Day: Doctor of Public Health, two.

On Commencement Day: Doctor of Public Health, twelve; Doctor of Science in Hygiene, one; Bachelor of Science in Hygiene, four; Certificates in Public Health, six. The names of the recipients are printed at the end of the President's report.

W. H. HOWELL,
Assistant Director.

REPORT ON THE GYMNASIUM

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report as Director of the Gymnasium for the year 1920-21.

The activities that come under our direction are those which, in other institutions, make up the department of physical education. We are concerned only with the first- and second-year students of whom physical training is required as a condition of graduation. This year we have had 207 sophomores and 186 freshmen, making a total of 393. Of these 223 were enrolled in physical training, and 122 were excused either on account of advanced standing, as in the case of second-year Baltimore Polytechnic students, or were excused by the Dean because of outside work. Of this group there were 74 who asked to be excused on account of engaging in extra work at the time when physical training classes were held. We feel that we have been obliged to excuse a great many students who should not have been excused, and we suggest that no student be admitted to the University unless his full time can be given to the requirements of the institution.

There were 386 initial medical and physical examinations, and each student had a re-examination when he entered actively upon the work of any particular athletic sport. In the examinations all entering students and members of the R. O. T. C. are included. Out of this number there were found to be 18 physically defective, who were excused or debarred from taking physical training. Of these 10 had heart defects, 3 hernias, 2 partial paralysis, and 3 other physical defects. On the whole the physical condition of the men compared favorably with former years, though, when we compare our figures with those of other first class institutions, we find that the average condition of our students is below normal, owing, I believe, to the utter lack of physical training in their secondary school work. It is unfortunate that we do not have required physical training of the third- and fourth year men, so that we could gather statistics to show what improvement proper physical training would accomplish. Our work, conducted under adverse circumstances, actually shows an improvement of twenty-five per cent. in those students who took the work.

The work has been conducted in the open in the physical training class by Major E. B. Garey and his assistants, and we are most grateful to him and them for their untiring efforts in our behalf. No better class work could be had than under Major Garey's instructions.

We allow a student of whom physical training is required to substitute an equivalent amount of work and time, such as he would get in the ordinary athletic activities, and thus the large class was divided so that we were able to assign students to the various teams and to keep an accurate record of their attendance and work,

and therefore give them credit on account of physical training. There were eighty that availed themselves of this privilege. The athletics pertaining to this work are managed through the Homewood Company and Varsity Club, with supervision of the personnel residing in this Department. There were, during the year, 331 undergraduate students engaged in athletics comprising the official teams, namely: football 45, basketball 69, baseball 32, lacrosse 62, track 62, tennis 11, swimming 10. There were scheduled during the whole season nine football games, two being played away; eight basketball games, four being played away; eight swimming events, five away; eight track events, four away; five baseball games, one away; five freshmen baseball games, two away; ten lacrosse games, three away; seven tennis matches, four away. The report of the Homewood Company, which manages and finances the sports and intercollegiate athletics, will be published at the end of its fiscal year.

Through the kindness of Dr. T. B. Futcher, of the Department of Medicine of the Johns Hopkins Dispensary, we have been able to arrange for a medical survey of those students whom we find defective and who are willing to go through a further examination to determine what is best for them, or of individuals as to whom a difference of opinion might exist, or when a border line case may be found. Six of our students took advantage of this privilege. We are grateful to Dr. Futcher for so willingly co operating in this phase of our work.

It has been customary to give the lecture course in Hygiene on those days when the Physical Training class could not be held out of doors on account of inclement weather. This year the course was conducted during the months of January, February, and March, while the physical training was discontinued. This was due, of course, to the fact that we have no indoor space for conducting any part of our work, and we call attention to the urgent need of a gymnasium, or armory, or other covered space such as a cage. We now require physical training of the first- and second-year men only, and we would strongly recommend that, as soon as facilities can be provided, physical training be required of all undergraduate students.

RONALD T. ABERCROMBIE,
Director of the Gymnasium.

REPORT ON MILITARY SCIENCE AND TACTICS

TO THE PRESIDENT OF THE UNIVERSITY:

In July, 1920, I relieved Colonel O. O. Ellis, Infantry, U. S. A., who resigned from the army. The policy that has governed my work throughout the year has been the continuation of the work and plans that he so ably inaugurated. A large measure of whatever success this department has had throughout the year must be attributed to the preparatory work formulated by the two previous commandants, Major Guild and Colonel Ellis.

The War Department, appreciating the constructive work done by my predecessors, has been most liberal in supplying my department with personnel and equipment. Last summer Captain T. L. McMurray was detailed here as an assistant. In the fall Captain A. W. Williams was detailed as second assistant, and this spring Major B. A. Dixon, ret., was detailed as another assistant. In addition to this, I have four non-commissioned officers as assistants.

Beginning with the scholastic year a notable change was inaugurated. Previously punishment tours and demerits were given to students for infractions of discipline. I found upon investigation that this system was unsatisfactory and I eliminated it. How long it will be possible to proceed along the present lines remains to be seen. At the present time it is a sufficient stimulus to be on the Distinguished List. The overwhelming majority of students undergoing military training are actuated by lofty motives, and in a competitive spirit they are desirous of standing No. 1 on the Distinguished List. Those students who do not take kindly to the intensive course of training given are eliminated.

Another step has been taken this year which I believe will prove to be beneficial to all concerned. As the Professor of Military Science and Tactics is stationed here but temporarily, and, in the second place, as he has an allegiance not only to the University but to the Government as well, I have recently proposed to the Board of Collegiate Studies that a Military Committee be formed by members of the faculty that would serve as a connecting link between the Military Department and the University. From the University's point of view it seemed desirable to have some one to whom the Professor of Military Science and Tactics might go in order that there might be a continuing policy in his department, and at the same time have a definite organization whose business it would be to be familiar in detail with the variety and quality of instruction and with the organization, discipline, personnel, etc., in the Military Department. It requires a considerable period of time for the Professor of Military Science and Tactics to become properly acquainted with the policies and traditions of the University. To have some one to whom he can go for detailed counsel and advice is most helpful. The Board of Collegiate Studies has accordingly appointed a Military Committee, and I feel that it will have a most healthful influence at this University.

I find that the War Department has taken a great interest in this matter, and I believe that in the course of time such a committee will be found in most of the educational institutions in the country where military instruction is given. I am giving below the functions of the Military Committee:

First: To serve the interests of National Defense.

Second: To serve as a connecting link between the Professor of Military Science and Tactics and the University authorities.

Third: To meet upon proper request to consider any matters pertinent to the Military Department. The Professor of Military Science and Tactics will, from time to time, bring such matters before the Military Committee as may be desirable for its consideration.

Fourth: To give to the Professor of Military Science and Tactics the benefit of its counsel in making the Military Department fit into the general policy of the University, and to assist him in increasing the efficiency of his department.

Fifth: To constitute a University check upon the organization of the Military Department, upon its administrative and disciplinary measures, and upon the variety of the instruction that it gives to the student members of the R. O. T. C.

Sixth: In general to serve as a faculty check upon officers, noncommissioned officers, and all other matters connected with the Military Department.

Seventh: In case the committee finds that serious conditions exist in the Military Department which should be corrected, it will, in case it cannot correct these conditions, bring them to the attention of the President and Board of Collegiate Studies for action.

Eighth: The Professor of Military Science and Tactics will attend the meetings of the Military Committee upon the request of that committee.

Ninth: The individual members of the Military Committee shall serve during the pleasure of the President of the University.

Tenth: It is understood that the President of the University will have final executive decision in all matters pertaining to the Military Department.

Eleventh: These lines of policy for the Military Committee have been brought to the attention of the President and the Board of Collegiate Studies of the University and meet with their approval.

This unit was started with 210 men at the beginning of the scholastic year and 170 men have completed the course. It has a larger percentage of men in the advanced course than any other institution in the country. Seventy-five students are attending the camp at Plattsburg this summer. This is a larger percentage than any other institution in the country is sending. These are objects greatly desired by the War Department.

A Medical Unit has been established at the Medical School, with Major Howard H. Baily in charge.

The Board of Trustees has approved my request to establish an Engineer Unit for the benefit of students in the Engineering School. This question is now up with the War Department.

Last summer the War Department prepared a Program of Training for institutions taking military training throughout the United States. The department this year has sent study sheets to the institutions throughout the country and has prepared a set of text-books, one for each of the four classes, embodying the system of training at this institution. These text-books are being adopted by the large majority of the institutions throughout the country having infantry training.

For next year arrangements have been made to stop practical work at 5.35 p. m. It is too hard for students to have to work until 6 p. m.

The need for a combined gymnasium and armory is perhaps more apparent to me than to most others. The physical standards of the undergraduates are far from being what they should be. This condition cannot be changed until a suitable gymnasium with ample facilities and instructors are provided. Pending the time when that will be brought about, I would like to see some form of healthy physical exercise or athletics required of every undergraduate in the University.

Official notice has just been received that we have been put on the Distinguished List for the year 1920-21. I wish to take this opportunity to thank the President of the University, Deans Latané and Whitehead, and the other members of the faculty for the unfailing courtesies and assistance given to me throughout the year. I cannot give too high praise to the majority of the students who have been in the Military Department. This class of students has performed work throughout the year, which in many respects I regard as being notable. For the loyalty and efficiency shown by the members of my staff I am most grateful.

E. B. Garey,
Major, Infantry.

REPORT OF THE LIBRARIAN

To the President of the University:

Herewith is submitted my thirteenth annual report on the Library, covering the year ended June 30, 1921.

The year has been marked by three events of importance: (1) The removal of the Maryland Diocesan Library to Homewood from its old quarters on Madison Avenue; (2) extensive foreign acquisitions by both purchase and exchange; (3) an investigation of the price system maintained by international importing publishers.

The Maryland Diocesan Library is the property of the Diocese of Maryland of the Protestant Episcopal Church. It consists of between thirty-two and thirty-three thousand volumes. It was founded in 1879 by the bequest of Bishop William R. Whittingham's library of between seventeen and eighteen thousand volumes. Two years later the library of eight or nine thousand volumes belonging to Reverend Edwin A. Dalrymple, an Episcopal clergyman and former Provost of the University of Maryland, was left it by will. The remainder of the collection, known as the Lending Library, has been amassed by purchase and gift. The collection's chief strength lies, of course, in church history and theology, but it has important sections in philosophy, classical texts, mediæval humanists, and so forth. It boasts, also, the possession of no less than thirty-two incunabula which, with some two hundred and fifty other volumes of especial value, have been placed in the vaults of Peabody Institute for safe keeping.

The library is destined for ultimate establishment in the cathedral being built by the diocese. As this is a large project, destined to cover at least a generation of construction, the section in which the library is to stand is not thought likely to be completed for at least five years. Meanwhile the University was glad to accord quarters for it in the second tier of the north stack, which it fills, following the sale of the church's property on Madison Avenue. In Gilman Hall it retains its complete independence, and is in charge of the librarian, Frank M. Gibson, Ph. D., whose office is in the reading room on the ground floor. Mutual exchange of facilities has been duly arranged between the two libraries, for the benefit of the Episcopal clergymen and the University staff and students.

In my last report some account was given of the scheme of discrimination against foreign buyers established by the Börsenverein der deutschen Buchhändler under the auspices of the German government. On May 1, however, the system of basing their foreign charges on fluctuations of exchange was definitely abandoned. Instead of dividing the world up, virtually, into as many classes as there are countries, the new program established two groups. The first, enjoying the more favorable financial position, includes Belgium, China, Denmark, Egypt, England, France, Holland, Japan, Mexico, Norway, Sweden, Switzerland, and the United States. The nether group consists of Argentina, Brazil, Chile, Greece, Italy, Portugal,

and Spain. The former countries are now charged double the domestic price, the latter 60% more than in Germany. The Teuerungszuschlag, once 20%, later 10%, is cancelled. Now, as heretofore, antiquarian items are to be exempt. So, too, periodicals. That is to say, journals and books out of print can be charged at whatever rate the publisher or bookseller chooses. In the case of the former, he chooses, in nearly all cases, to follow the Börsenverein rate. Antiquarian items are, however, a law to themselves. The situation is left in a somewhat chaotic state because of two opposing exceptions: (1) Publishers may charge more than 100% if they like; (2) they may employ the domestic price if an item costs in Germany more than M. 300. As seen below we took advantage of this situation to lay in a stock of many sets of periodicals.

The Bureau of International Exchanges of the Smithsonian Institution succeeded, in the course of the year, in re-establishing its service by an arrangement with the Amerika-Institut. Consequently, we began before the year was over to receive shipments of wartime cumulations from the Central Empires, with large consignments to follow in the course of the summer. We, in turn, have dispatched our accumulation for the same period.

In the spring the Librarian, as Chairman of the Committee on Book Buying of the American Library Association, following his studies and published counsel on the German situation, made an investigation of the prices charged by the American establishments of international importing book publishers. It was found that while many establishments were charging English books from their New York stock at about twenty-five cents to the shilling, which, after payment of duty and with grant of library's discount, is equitable, certain other well-known houses, widely patronized by the libraries of educational institutions and by their faculties, were charging such books of theirs at anywhere from thirty-three to fifty-five cents per shilling, at a time when the shilling was under twenty cents. The publication of these facts led to some ameliorative proposals by the publishers concerned but these affect libraries alone. Members of the Faculty, therefore, will do well to approach their foreign purchases with caution. Either the Manager of the Johns Hopkins Press or the Librarian of the University will be glad to give specific counsel.

In the bibliography at the conclusion of this report is given the list of the Librarian's studies on the above heading as published from time to time in the Library Journal and elsewhere in the name of the American Library Association; also, the title of the forthcoming doctoral dissertation by the Assistant Librarian, Mr. J. Mattern.

The Library could not get through the year without a little fire. On January 3, 1921, one occurred in the bindery of Mr. Joseph Ruzicka where we had several hundred volumes. Only a single book was destroyed, though 198 required rebinding. The damage was fully covered by insurance.

ACCESSION STATISTICS

Irrespective of binding, we received, of books and pamphlets, by purchase, 7445 volumes in 7394; by gift, 3268 volumes in 3245; by exchange, 7487 volumes in 7489; by U. S. Government deposit, 217 volumes; Maryland Geological Survey deposit, 82 volumes; J. H. U. dissertations in manuscript, 30; two copies each of 25 J. H. U. printed dissertations; 26 other publications of ours; Total, 18753 pieces. In addition we received 271 maps (195 by purchase, 3 by gift, and 73 by exchange), 25 charts and 2 manuscripts.

Of these receipts 8712 were bound. The net accessions being 8585, the total number of bound volumes in the library on June 30, 1921, was 234,857.

PURCHASES

The most noteworthy acquisitions of the year were made for the various libraries of the Medical School, that of the School of Hygiene, in Physics, and in Classical Archaeology. These consisted mainly of sets of foreign periodicals, sometimes duplicating files already here, secured upon especially favorable terms because of the depreciation of European exchange.

For the central collection of the Medical School, the following may be listed:

Archiv f. d. geschichte der medizin, 1-10.
Archiv f. mikroskopische anatomie, 1-28.
Centralblatt f. stoffwechsel- u. verdauungskrankheiten, 1-6.
Deutsche zeitschrift f. chirurgie, 1-80.
Excerpta medica, 1-27.
Frankfurter zeitschrift f. pathologie, 1-21.
Journal de la physiologie, 1-5.
Klassiker der medizin, 1-25.
Kongress f. innere medizin. Verhandlungen, 1-31.
Mitteilungen z. geschichte d. medizin u. naturwissenschaft, 1-18.
Naturforschende gesellschaft zu Leipzig. Sitzungsberichte, 1-40.
Revue médicale de la Suisse romande, 1-34, pt. 6.
Sammlung klinische vorträge, 37 volumes.
Untersuchungen z. naturlehre d. menschen u. d. tiere, 1-17, pt. 4.

For its branches, the following:

In Medicine:

Berliner med. gesellschaft. Verhandlungen, 1-44.
Kongress f. innere medizin. Verhandlungen, 1-31.
Verein f. innere medizin zu Berlin. Verhandlungen, 1-33.

In Obstetrics:

Archiv f. frauenheilkunde, 1-6.
Archives de tocologie et de gynécologie, 1-23.
Nouvelles archives d'obstétrique et de gynécologie, 1-10 (except 4).
Obstetrical journal of Great Britain, 1-8.

In Pathology:

Archiv f. schiffs- u. tropenhygiene, 1-23, and Beihefte 10 volumes.
Beiträge z. path. anatomie u. allg. pathologie, 50 66.
Ergebnisse d. physiologie, 1-17.
Frankfurter zeitschrift f. pathologie, 1-21.
Institut de pathologie et de bactériologie de Bucarest. Annales, 1-6.
Lepra, 1-14.
Nothnagel's Spezielle pathologie u. therapie. 24 volumes and 9 suppl.
Zeitschrift f. immunitätsforschung. Orig. 1-28, Ref. 1-10, pt. 3.

In this Department, also, another set was added to the Livingood memorial, viz.:

Archives de médecine expérimentale et d'anatomie pathologique, 1-24.

In Pediatrics:

Gesellschaft f. kinderheilkunde. Verhandlungen, 1-25.

In Surgery:

Annalen des Charité-krankenhauses . . . zu Berlin, 1-15.
Freie vereinigung d. chirurgen Berlins. Verhandlungen, 1-25.
Journal d. chirurgie u. augenheilkunde, 1-39.

For the School of Hygiene, these may be recorded:

Archiv f. soziale gesetzgebung, 5 38.
Beiträge z. klinik d. tuberkulose, 1-48.
Germany. K. Gesundheitsamt. Arbeiten, 35-51.
Institute of actuaries. Journal, 1-52.
Ireland, Register-General. Annual report, 1-56 (except 18 and 19.)
Strahlentherapie, 1-10.
Vierteljahrsschrift f. gerichtliche medizin, N. F. 38–III. F. 36.
Zeitschrift f. diätetische u. physikal. therapie, 1 22.
Zentralblatt f. gewerbehygiene, 1-6.

Among various purchases in Classical Archaeology, three deserve special mention, as greatly strengthening that department's fundamental resources in plates. These are

Denkmäler griech. u. röm. sculptur, 137 lief. (685 plates).
Griechische u. röm. porträts, 101 lief. (1010 plates).
Wiener vorgeblätter f. arch. übungen. 12 series.

The following scattered titles are also worth recording:

Plautus Codex Heidelbergensis 1613 Palatinus (one of the Sijhthoff phototypic reproductions of classical manuscripts); Ruskin's Works, ed. by Cooke and Wedderburn, 39 volumes; Deventer, J. v., Atlas des villes de la Belgique au XVIe siècle, *and* Nederlandsche steden in de 16e eeuw—together a facsimile reproduction, now being published, of 152 leaves of the plans executed for Philip II, King of Spain, in the 16th century; Zeitschrift f. komprimierte u. flüssige gase, 1-14; and the three Dutch philological journals: Archief voor Nederl. taalkunde, 1847-56, 5 v.; Taalkundig magazijn, 1835-48, 4 v.; Noord en Zuid, 1877-1906, 29 v.

Finally, we purchased the library of Professor Charles R. Mann, formerly of the University of Chicago, now Chairman of the Advisory Board of the General Staff of the War Department. This collection was gathered through a long period of foreign travel and correspondence as the basis for a history of physics. It consists of 485 volumes, of which 371 are bound, together with 23 numbers of periodicals.

GIFTS

Among the 8392 volumes reported as given the past two years, the following may be singled out for special mention:

Ames, J. S. 104 volumes and 22 maps, including The Times History of the War, 22 volumes; and 28 volumes on aeronautics.

Armstrong, E. C. 96 numbers of Les Annales.

Bernhardt, Joshua. 21 volumes and 65 numbers dealing largely with food control, together with 92 folders, containing the official

bulletins etc. of the Statistical division information service of the U. S. Food administration.

Boyce, W. G. Moody's Analyses of investments, 1916-17. 4 volumes.

British Academy. The Schweich lectures, 1913-16, 1918; *its* Records of the social and economic history of England and Wales, vols. 1, 2, 4 and 5.

Buchner, E. F. Twenty volumes in education.

Century Club. Twenty eight numbers of the Journal of biological chemistry.

Crosby, W. W. 1086 volumes, mostly in engineering, including 287 volumes of periodicals.

Ember, A. Twenty one volumes, including sixteen of The American Jewish year books.

Frank, T. *His* Economic history of Rome to the end of the Republic; nine volumes of classical texts.

Goodnow, F. J. 283 miscellaneous volumes.

Gregory, J. H. 575 volumes and pamphlets, mainly on sanitation.

Guaranty Trust Company of New York. 57 volumes and pamphlets dealing with business conditions.

Hollander, J. H. 142 volumes and pamphlets, mostly on economic subjects.

Holt & Company, H. 81 of their publications.

Jennings, H. S. 11 volumes, nine being publications of the Instituto Oswaldo Cruz.

MacCallum, W. G. 7 volumes in pathology.

Macmillan Co., The. 26 of their publications.

Maltbie, W. H. U. S. Food administration. Rulings, books I VII; *do.* License regulations.

Newsholme, Sir Arthur. 50 Reports of the Local government board of Great Britain.

Remsen, I. 111 miscellaneous volumes.

Rockefeller, John D. *His* Altoviti Aphrodite. 1920.

Rockefeller Foundation. 22 of its publications.

Russell Sage Foundation. 47 of its publications including 33 numbers of its Library Bulletin.

Scotland. General Register House. Annual report. 59 volumes.

Welch, W. H. 123 volumes, mostly in the medical sciences.

White, Richard J. Indenture signed by Samuel Hopkins, father of Johns Hopkins, on November 16, 1807; Map of Maryland, Nov. 1, 1819. 18 miscellaneous volumes.

Zion Church of the City of Baltimore. The Weimar edition of Martin Luther's Werke (58 volumes to date) "in commemoration of April 17th, 1521."

CATALOGING

The staff was in health this year, losing but 190 hours as against the equivalent of six months of one person's time the preceding year. The result was a forward leap in output. 8668 titles, representing

16,231 volumes (and maps), as against 7880 titles for 13,927 volumes of the previous year, were handled by the Department. Nevertheless, once more the composite pamphlet volumes—150 of them—had to be sent to the shelves without analysis. In this respect we are now nearly a year of one person's time in arrears. With the amount of exchange material quadrupling in two years, this situation becomes chronic. Unless a new experiment in the mechanical reproduction of cards, contemplated for the incoming session, brings phenomenal relief, we can meet the difficulty only by adding another cataloger.

The following table shows the record in detail:

Cards:		
Main entries (titles)	8,668	
Duplicate main entries	8,124	
Added entries	15,372	
Duplicate added entries	8,424	
Shelf list cards	4,578	
Source cards	1,506	
Cross references	596	
		47,268
Volumes (including 36 maps)		16,231

Cf. 41812 cards and 13927 volumes last year.

Of the *titles* handled, cards were received from the Library of Congress for 49.7%, and 2.3% from the Wistar Institute, while for the remaining 48% we ourselves prepared copy.

Of the 47268 *cards* employed, 54.1% were printed by the Library of Congress, and 2.5% by the Wistar Institute, while 26.4% were printed on our multigraph, and the remaining 16.7% were typewritten.

In the Reading Room catalog, which aims to be complete for the entire University, 26070 cards were added by the custodians. The total now is 521,528 cards.

In the Library of Congress depository catalog 31194 cards, representing new entries, were filed. This took 328 hours.

CLASSIFICATION

As forecast in my last report, Mr. Mattern, the Assistant Librarian, classified Italian literature early in the year, thus completing the Romance group. To this was added the Skandinavian languages and literatures, the last of the Teutonic group. Finally, a start was made in Classics. Here generalia, journals, monographic series, philology and literary criticism, followed by the Greek language, were handled. In this group we are left, then, with Greek and Latin literature, Latin language, and classical archaeology. Elsewhere there remain Religion, Church history, Law, the Oriental languages and literatures.

Mr. Shules, the Chief Cataloger, supplemented this work in arrears with 224 titles and 36 revisions. In the current accessions, he accepted the Library of Congress classification assigned on its cards for 999 titles, while he handled 2206 titles independently—a total of 3465 titles. (Cf. 2390 for 1918 19, and 2415 for 1919 20.)

It will be recalled that the L. C. schedules are not all published

yet or even available in manuscript. We are keeping abreast of these schedules as they appear even in typewritten form. As this work nears completion, Mr. Shules' task changes more and more from cataloging to classifying and assignment of subject headings, for when Mr. Mattern has completed a subject, the future additions become the routine task of the Chief Cataloger. In the end, his whole time and more will be thus required. That we get off so cheaply is due to our adoption of the L. C. system, since its numbers are carried on its cards, which we buy as the most economic method of cataloging. Of that decision made in 1910 we have had no substantial reason for repentance, though there are in it, as in any general system, distinct elements of embarrassment.

BINDING

Mr. A. C. Munzner reports having prepared 6464 volumes for local binding. This breaks all previous records, 5113 of the preceding year (cf. 3491 of 1918-19) being the high-water mark before. This increase was mostly due to the decision to have books from Germany come unbound as far as possible, till we could be assured of genuine materials and sound workmanship.

Of these 6464 volumes, 554 were rebindings. The cost of the whole was $6852, or $1.06 per volume. (Cf. 82 cents, 93 cents, 97 cents, $1.01, and $1.05, of the preceding five years.) Speaking comparatively, we must admit this to be remarkably economical. (See my Report of 1919-20).

In addition to the above, 507 pamphlets were put into Gaylord binders, at about 8 cents apiece.

During the year we had dummies made for the engineering periodicals, so as hereafter to avoid sending patterns to the binder. The system will be extended steadily to other groups.

INTER-LIBRARY LOANS

In the operation of the inter-library loan system, we borrowed 229 volumes from the following institutions: American Museum of Natural History (1), Bryn Mawr (1), Columbia (7), Cornell (1), Dropsie College (1), Harvard (5), Minnesota U. (1), Pan American Union (1), Pennsylvania U. (2), Princeton (2), St. Mary's Seminary (18), U. S. Bureau of Education (1), U. S. Dept. of Agriculture (5), U. S. Geological Survey (5), U. S. Library of Congress (63), U. S. Surgeon General's Office (113), Yale (2).

We lent 173 volumes to the following institutions: American Museum of Natural History (1), Amherst (2), California U. (1), Camp Meade (10), Chicago U. (3), Cincinnati P. L. (1), Concordia College (Morehead, Minn.) (1), Delaware College (2), E. I. du Pont de Nemours & Company (3), Grove City College (7), Hamilton College (1), Harvard (2), Illinois U. (3), Indiana U. (2), Juniata College (3), Louisiana State Museum (1), Marlboro High School (2), National Industrial Conference Board (10), Newark Supt. of Public Schools (1), Ohio State U. (6), Penn. College (9), Penn U. (1), Princeton (3), Randolph-Macon College (17), Randolph-Macon Woman's College (12), Rock Hill High School (2), St. John's College (1), Sweet Briar College (2), Tennessee U. (1), Texas U. (4),

Tome School (2), U. S. Bureau of Standards (2), U. S. Bureau of Public Health Service (1), U. S. Dept. of Agriculture (5), U. S. Naval Academy (3), U. S. War Department. Ballistic Section (6), Virginia U. (11), Washington and Lee U. (1), Washington County (Md.) P. L. (9), Washington U. (1), Wells College (1), Wesleyan U. (Conn.) (3), West Va. U. (3), William and Mary (5), Williams College (2), Wooster College (4).

PUBLICATIONS

Johannes Mattern.

. . . The employment of the plebiscite in the determination of sovereignty. J. H. U. Press. 1920. (J. H. U. Studies in historical and political science. Series 38, no. 3.)

M. Llewellyn Raney.

German discrimination abates. Library Journal. Jan. 1, 1921.

A tale of two cities. Library Journal. Jan. 15, 1921.

Going down. Library Journal. February 1, 1921.

The Smithsonian acts. Library Journal. February 15, 1921.

100% Profit plus. Library Journal. March 15, 1921.

Reparations and the libraries. Library Journal. May 1, 1921.

Act IV. Library Journal. June 1, 1921.

A. L. A. Committee on Book Buying. Annual Report for 1920-1921.

Respectfully submitted,

M. L. RANEY,
Librarian.

June 30, 1921.

REPORT ON THE JOHNS HOPKINS PRESS

(ABSTRACT)

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith the report of the Johns Hopkins Press for the past year:

American Journal of Insanity. At a meeting of the American Medico Psychological Association held in May, it was decided to change the title of that Association to the American Psychiatric Association, and also the title of its Journal from the American Journal of Insanity to the American Journal of Psychiatry. This is effective with the July number. It was also decided to abandon the publication of the Transactions, and to send the Journal instead to members of the Association.

Of the American Journal of Insanity, which is edited by Drs. E. N. Brush, of Baltimore; J. Montgomery Mosher, of Albany, N. Y.; Charles Macfie Campbell, of Boston, Mass.; Charles K. Clarke, of Toronto, Ontario, and Albert M. Barrett, of Ann Arbor, Michigan, volume lxxvii (four numbers) was issued. It contained 620 pages.

American Journal of Mathematics, edited by Professor Frank Morley, A. Cohen, assistant editor, and with the co operation of Charlotte A. Scott, A. B. Coble and other mathematicians. Numbers 3 and 4 (154 pages octavo) completing volume xlii (290 pages) and two numbers of volume xliii (142 pages octavo) have appeared.

American Journal of Philology, edited by Professor C. W. E. Miller, with the co operation of Maurice Bloomfield, Hermann Collitz, Tenney Frank, W. P. Mustard, and D. M. Robinson. Numbers two, three and four (316 pages) completing volume xli (416 pages octavo) and one number (96 pages) of volume xlii have appeared.

Hesperia: Schriften zur germanischen Philologie, edited by Professors Collitz and Wood. No part was published during the year. *Schriften zur englischen Philologie,* edited by Professor Bright. Ergänzungsreihe, 7 Heft, entitled "The Stonyhurst Pageants" by Professor Carleton Brown of the University of Minnesota, appeared in September.

Johns Hopkins Hospital Publications:

Of the *Bulletin* six numbers (250 pages) completing volume xxxi (468 pages quarto) and six numbers (212 pages) of volume xxxii were issued.

Of the *Reports* the following were issued during the year: a special volume on "Investigation of the Central Nervous System," by R. H. Clarke and E. E. Henderson (180 pages and numerous illustrations, quarto); parts 1 to 3 of volume xx (324 pages and numerous illustrations, quarto); also two parts of volume xxi (156 pages with numerous illustrations, quarto).

The Johns Hopkins University Circular. Three numbers, 1040

pages, completing volume xxxix (1674 pages, 8vo.) and two numbers (102 pages) of volume xl have been issued. These have included College Courses for Teachers 1920 21, Proceedings of the University Philological Association, 1919 20, Catalogue and Announcement for 1920 21 of the Medical Department, Report of the President of the University, 1919 20, University Register, 1920 21, Summer Courses 1921, Catalogue and Announcement for 1921 22 of the School of Hygiene and Public Health.

The Johns Hopkins University Studies in Historical and Political Science. The Studies are issued under the direction of the department of history, political economy and political science. Two numbers (384 pages), completing series xxxviii (512 pages octavo) and one number (106 pages) of series xxxix have been published. These have included "The Amalgamated Association of Iron, Steel and Tin Workers," by Jesse S. Robinson; "The Employment of the Plebiscite in the Determination of Sovereignty," by Johannes Mattern; and "The Capitalization of Goodwill," by Kemper Simpson.

The Johns Hopkins University Studies in Education, edited by Professors Edward F. Buchner and C. Macfie Campbell. Number three entitled "Studies in Experimental Education" by Professor Bird T. Baldwin and others was published during the year. It contains twelve papers, with numerous illustrations and tables, aggregating 84 pages, 8vo.

Modern Language Notes. This Journal is edited by James W. Bright (editor-in chief), Gustav Gruenbaum, William Kurrelmeyer, and H. Carrington Lancaster. Two numbers (146 pages plus ix pages of bibliography), completing vol. xxxv (530 pages plus xlviii pages of bibliography, octavo), and six numbers (384 pages plus xxiv pages of bibliography) of volume xxxvi have been published.

Terrestrial Magnetism and Atmospheric Electricity, edited by Dr. Bauer. Numbers 3 and 4 (114 pages) completing volume xxv (194 pages 8vo) appeared during the year.

The J. E. Aldred Lectures on Engineering Practice, 1919-20 was published in July 1920 and includes three lectures each on Civil, Electrical and Mechanical Engineering. It contains 226 pages 8vo, and numerous illustrations. The lectures for 1920 21 are now in press, and will soon appear.

Papers and Addresses by William Henry Welch. On the eighth of April, 1920, Dr. Welch attained his seventieth birthday. To many of his friends it seemed that such an occasion ought not to pass without some manifestation of affection and admiration on the part of the medical profession of America to one who has long stood as its leader, and that a worthy expression would be the preservation in suitable form of the chief contributions from his pen. They therefore decided to publish his writings and addresses in three volumes under the following subjects: Vol. I: Pathology, Preventive Medicine, 712 pages: Vol. II: Bacteriology, 661 pages; Vol. III: Medical Education, History, Miscellaneous, Bibliography, Index, 640 pages. These appeared in April.

A Committee to regulate the affairs of the Press was recently

appointed and consists of the President, Professor W. W. Willoughby, Professor J. H. Gregory, Dr. W. H. Smith, Professor Raymond Pearl, Dr. M. L. Raney and Mr. C. W. Dittus.

DISSERTATIONS PUBLISHED DURING THE YEAR

Following is a list of dissertations for the degree of Doctor of Philosophy, published during the year:

Bagby, English: The Psychological Effects of Oxygen Deprivation.

Bell, Frederick Keller: The Influence of Copper on the Rate of Solution of Iron in Acids.

Bernhardt, Joshua: Government Control of Sugar in the United States during the War of 1917-18 and The Transition to Competitive Conditions.

Connet, Helene: The Effect of Adrenalin on Venous Blood Pressure.

Doetsch, Ernest P.: On the Rearrangement of the Tautomeric Salts of 1,4,-Diphenyl-5-Thionurazole and 1,4,-Diphenyl-5-Thiolurazole.

Dryden, Hugh L.: Air Forces on Circular Cylinders, Axes Normal to the Wind, with Special Reference to Dynamical Similarity.

Espino, Rafael B.: Some Aspects of the Salt Requirements of Young Rice Plants.

Hastings, Walter Scott: The Drama of Honoré de Balzac.

Helfrich, Oregon B.: Reactions and Derivatives of Dichloro-Ethyl Sulfide.

Hildebrandt, F. Merrill: A Physiological Study of the Climatic Conditions of Maryland as Measured by Plant Growth.

Judefind, William Lee: The Identification of Acids. Para Halogen Phenacyl Esters.

Laing, Gordon J.: The Genitive of Value in Latin and Other Constructions with Verbs of Rating.

McGavack, Jr., John: The Adsorption of Sulfur Dioxide by the Gel of Silicic Acid.

Mattern, Johannes: The Employment of the Plebiscite in the Determination of Sovereignty. (Degree not as yet conferred.)

Miller, George Edgar: Anthraquinone: 1, 8 Aliphatic Thio-Ether-Sulphonic Acids and Di-Thio-Ethers.

Robinson, Jesse S.: The Amalgamated Association of Iron, Steel and Tin Workers.

Rogers, Thomas Hunton: A Study of the Vapor Pressure Lowering of Aqueous Solutions of Mannite at 20° C.

Seifriz, William: Viscosity Values of Protoplasm as Determined by the Aid of Microdissection.

Simpson, Kemper: The Capitalization of Goodwill.

Taliaferro, W. H.: Reactions to Light in Planaria Maculata with Special Reference to the Function and Structure of the Eyes.

Thalheimer, Alvin: The Meaning of the Terms 'Existence' and 'Reality.'

Towles, Oliver: Prepositional Phrases of Asseveration and Abjuration in Old and Middle French.

Wear, Luther Ewing: On Self-Dual Plane Curves of the Fourth Order.

Whitner, Jr., Thos. C.: A Study of the Reactions of Normal Butyl Mercaptan and Some of its Derivatives.

Williams, Ralph Coplestone: The Theory of the Heroic Epic in Italian Criticism of the Sixteenth Century.

C. W. DITTUS,
Manager, The Johns Hopkins Press.

REPORT OF THE REGISTRAR

To the President of the University:

I have the honor to submit the following statistics of the enrollment during the year 1920 21:

Academic Staff

The academic staff included 346 teachers. Of these 56 were engaged primarily in graduate instruction in the faculty of philosophy, 41 primarily in collegiate work, 17 chiefly in the engineering department, 196 in the department of medicine, 36 in the school of hygiene. In addition there were 24 lecturers, resiednt and non resident; and 55 persons, not members of the regular teaching body, gave instruction in the college courses for teachers, the summer courses, the courses in business and in social economics, the night courses for technical workers, and the courses in marine engineering and navigation.

Students

The enrollment of students in the regular courses included 1388, of whom 801 were residents of Maryland (608 of Baltimore), 529 came from 44 other states and territories of the Union, and 58 from 16 foreign countries. Of these students 638 pursued graduate courses—228 in the graduate school (including 64 women), 359 (women 59) in the department of medicine, 45 (women 10) in hygiene and public health, and 6 in engineering. The undergraduates included 384 candidates for the degree of bachelor of arts, 300 for the degrees of bachelor of engineering and bachelor of science in chemistry, and 12 special students. In the school of hygiene there were 8 candidates (5 women) for the degree of bachelor of science in hygiene and 47 non graduate special students (5 women). In the college courses for teachers there were enrolled 729 persons (women 540); in the summer courses of 1920 there were 442 (289 women); in the courses in business economics 765 (women 161); in the night technical courses 346 (women 6); in marine engineering and navigation 41; in the courses in social economics 14 graduate and 41 special students (all women). The total enrollment of women (excluding duplicate registrations), was approximately 1100, nearly 33 per cent. of the student body.

Summary of Enrollment, 1920-21

Faculty

President and Professors,	66
Clinical Professors,	8
Associate Professors,	47
Assistant Professors,	2
Associates,	66
Instructors and Assistants,	157
	346
Lecturers for the year,	24
Additional Instructors in College Courses for Teachers, Courses in Business and in Social Economics, Night Courses for Technical Workers, and in Marine Engineering, and Summer Courses,	55

Students

I.	GRADUATE SCHOOL OF ARTS AND SCIENCES:		
	1. Fellows by Courtesy,	8	
	2. Fellows:		
	Bruce Fellow,	1	
	Rogers Fellows,	2	
	Du Pont Fellows,	2	
	Vogeler Fellow,	1	
	Peabody Scholar,	1	
	3. Other Students following Graduate Courses:		
	Full-Time Students,	147	
	Part Time Students,	66	
			228
II.	DEPARTMENT OF MEDICINE:		
	1. Candidates for the Degree of Doctor of Medicine,		359
	2. Attendants on Special Courses, Summer of 1920,		20
III.	SCHOOL OF HYGIENE AND PUBLIC HEALTH:		
	1. Candidates for Higher Degrees,	41	
	2. Candidates for Bachelor's Degree,	8	
	3. Candidates for Public Health Certificate,	4	
	4. Special Students,	47	
			100
IV.	COLLEGE OF ARTS AND SCIENCES:		
	1. Candidates for the Degree of Bachelor of Arts,	384	
	2. Special Students,	9	
			393
V.	DEPARTMENT OF ENGINEERING:		
	1. Candidates for Higher Degrees and Special Graduate Students,	6	
	2. Candidates for the Bachelor's Degree in Engineering or in Chemistry:		
	a. College Graduates,	3	
	b. Undergraduates,	297	
	3. Special Undergraduate Students,	3	
			309
VI.	COLLEGE COURSES FOR TEACHERS:		
	1. Candidates for the Degree of Bachelor of Science,	81	
	2. Special Students,	648	
			729
VII.	SOCIAL ECONOMICS:		
	1. Graduate Students,	14	
	2. Special Students,	41	
			55
VIII.	EVENING COURSES:		
	1. Business Economics,	765	
	2. Technical Subjects,	346	
	3. Marine Engineering and Navigation,	41	
			1152
	Total receiving instruction, 1920 21,		3345
	Attendants on Summer Courses, 1920,		442
			3787
	Counted more than once,		301
	Net total,		3486

ENROLLMENT BY YEARS

	Total *	Graduates	Undergraduates	
			Candidates for Degrees	Special
1876-77	89	54	12	23
1877-78	104	58	24	22
1878-79	123	63	25	35
1879-80	159	79	32	48
1880-81	176	102	37	37
1881-82	175	99	45	31
1882-83	204	125	49	30
1883-84	249	159	53	37
1884-85	290	174	69	47
1885-86	314	184	96	34
1886-87	378	228	108	42
1887-88	420	231 (Phil., 220; Med., 11)	127	62
1888-89	394	216 (Phil., 202; Med., 14)	129	49
1889-90	404	229 (Phil., 209; Med., 20)	130	45
1890 91	468	276 (Phil., 233; Med., 43)	141	51
1891-92	547	337 (Phil., 298; Med., 39)	140	70
1892-93	551	347 (Phil., 297; Med., 50)	133	71
1893-94	522	344 (Phil., 261; Med., 83)	123	55
1894-95	589	412 (Phil., 284; Med., 128)	126	51
1895-96	596	406 (Phil., 253; Med., 153)	149	41
1896 97	520	344 (Phil., 210; Med., 134)	144	32
1897-98	641	456 (Phil., 215; Med., 241)	152	33
1898 99	649	462 (Phil., 210; Med., 252)	163	24
1899 1900	645	469 (Phil., 185; Med., 284)	159	17
1900 01	651	473 (Phil., 168; Med., 305)	158	20
1901-02	694	530 (Phil., 172; Med., 358)	158	6
1902-03	695	532 (Phil., 187; Med., 345)	147	16
1903 04	715	556 (Phil., 202; Med., 354)	141	18
1904 05	746	563 (Phil., 195; Med., 368)	160	23
1905 06	720	530 (Phil., 162; Med., 368)	163	27
1906 07	671	504 (Phil., 158; Med., 346)	146	21
1907-08	683	518 (Phil., 171; Med., 347)	142	23
1908 09	731	562 (Phil., 187; Med., 375)	138	31
1909-10	821	595 (Phil., 188; Med., 407)	143	14
1910-11	916	625 (Phil., 210; Med., 415)	180	10
1911-12	1206	623 (Phil., 217; Med., 406)	170	9
1912-13	1090	600 (Phil., 215; Md.,)	192 (A. B., 165; S.B.(E), 27)	8

* Including those enumerated in table of College Courses for Teachers, etc., and excluding duplicates.

	Total*	Graduates		Undergraduates			
				Candidates for Degrees		Special	
1913-14	1325	607	Phil., 213 Med., 378 Eng., 16	249	A. B., 170 S.B.(E), 79	14	
1914-15	1413	637	Phil., 235 Med., 383 Eng., 19	273	A. B., 169 S.B.(E), 104	16	
1915-16	1668	625	Phil., 226 Med., 380 Eng., 19	303	A. B., 175 S.B.(E), 128	21	
1916-17	2667	637	Phil., 249 Med., 371 Eng., 17	384	A. B., 219 S.B.(E), 165	13	
1917-18	2232	552	Phil., 157 Med., 390 Eng., 5	343	A. B.. 210 S.B.(E.),133	13	
1918-19	1986	540	Phil., 135 Med., 382 Hyge., 18 Eng., 5	614	A. B., 350 B. Eng., 264	4	
1919-20	3137	685	Phil., 221 Med., 390 Hyge., 70 Eng., 4	662	A. B., 350 B. Eng. & B.S.in Ch., 303 B.S.in Hyg. 9	33	
1920-21	3486	652	Phil., 242 Med., 359 Hyge., 45 Eng., 6	692	A. B., 384 B. Eng. & B.S. in Ch., 300 B.S. in Hyg. 8	100	A. & Sc. 9 Eng. 3 Hyge. 47 Soc. Econ. 41

The enrollment in the College Courses for Teachers and the other courses established from time to time since 1909 is given below. The figures for the Summer Courses are in each case for the Summer of the year first named.

	College Courses for Teachers	Summer Courses	Courses in Business Economics	Night Technical Courses and Marine Eng.	Courses in Social Economics
1909-10	69				
1910-11	101				
1911-12	118	335			
1912-13	119	201			
1913-14	167	347 Coll., 277 Med., 70			
1914-15	189	356 Coll., 287 Med., 69			
1915-16	343	487 Grad., 65 Coll., 363 Med., 59			
1916-17	435	654 Grad., 110 Coll., 485 Med., 59	499	208	
1917-18	350	570 Grad., 102 Coll., 416 Med., 52	351	207	
1918-19	347	326 Grad., 75 Coll., 251	228	157	
1919-20	633	422 Grad., 89 Coll., 333	704	338	30
1920-21	729	462 Grad., 97 Coll., 345 Med., 20	765	387	55

* Including those enumerated in table of College Courses for Teachers, etc., and excluding duplicates.

The enrollment in the medical department has been as follows:

	Candidates for M.D.	*Drs. of Med.*	*Total.*		*Candidates for M.D.*	*Drs. of Med.*	*Total.*
1893 94	18	65	83	1907-08	277	70	347
1894-95	51	77	128	1908-09	297	78	375
1895-96	84	69	153	1909-10	334	73	407
1896-97	123	11	134	1910-11	351	65	416
1897-98	167	74	241	1911-12	355	51	406
1898 99	197	55	252	1912-13	351	34	385
1899 1900	211	73	284	1913-14	360	18	378
1900-01	209	96	305	1914-15	361	22	383
1901-02	229	129	358	1915-16	353	27	380
1902 03	256	89	345	1916-17	358	13	371
1903-04	276	78	354	1917-18	373	17	390
1904 05	291	77	368	1918-19	373	9	382
1905 06	293	75	368	1919-20	390	0	390
1906 07	263	83	346	1920-21	359	0	359

In the school of hygiene and public health the registration has been:

	Graduate.	*Special.*	*Total.*		*Grad.*	*Under Grad.*	*Special.*	*Total.*
1918 19	18	4	22	1919 20	70	9	10	89
				1920-21	45	8	47	100

Geographical Distribution

Of students in the regular courses:

	From Maryland.	*From and Other States Countries.*			*From Maryland.*	*From and Other States Countries.*	
1876-77	59		30	1898 99	277		372
1877-78	71		33	1899-1900	262		383
1878 79	76		47	1900 01	270		381
1879 80	97		62	1901-02	273		421
1880 81	95		81	1902 03	283		412
1881-82	97		78	1903-04	294		421
1882-83	106		98	1904 05	312		434
1883 84	123		126	1905 06	304		416
1884-85	130		160	1906 07	257		414
1885-86	130		184	1907-08	267		416
1886-87	162		216	1908 09	311		420
1887 88	199		221	1909 10	286		466
1888 89	183		211	1910 11	337		478
1889-90	215		189	1911-12	337		465
1890-91	235		233	1912 13	358		442
1891-92	273		274	1913-14	436		420
1892-93	266		285	1914 15	487		439
1893 94	260		262	1915 16	491		458
1894 95	260		329	1916 17	578		455
1895-96	272		324	1917 18	464		441
1896-97	254		266	1918 19	695		459
1897-98	279		362	1919 20	808		569
				1920 21	801		587

Enrollment by Subjects

In the regular graduate and undergraduate courses during five years:

	1916–17	1917–18	1918–19	1919–20	1920–21
Mathematics	240	207	197	386	322
Physics and Astronomy	185	156	96	136	167
Chemistry	156	148	180	362	340
Geology and Mineralogy	53	58	52	115	111
Zoology, Botany, Plant Physiology	89	61	68	158	137
Greek	38	36	17	40	21
Latin	55	69	27	26	27
Classical Archæology and Art	25	20	8	34	38
Sanskrit and Comparative Philology	22	29	6	21	21
Semitic Languages	34	57	31	33	37
English	299	293	253	421	331
German	117	105	64	74	40
French, Italian and Spanish	207	197	233	313	266
History	105	72	105	154	105
Political Economy	138	113	159	272	293
Political Science	36	30	10	77	80
Psychology	41	...	47	65	145
Philosophy	130	83	60	126	93
Education	22	20	18	32	21
Engineering (Civil, Elec. and Mech.)	112	94	46	75	269

In the College Courses for Teachers:

	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21
Mathematics	9	15	6	..	6	..	..	6	..	..	..	1
Chemistry	..	10	..	..	6	..	20	10	19	14	22	17
Biology	1	4	..	..	..	..	..	1	..	4	..	1
Latin	3	..	6	4	6	..	..	..	..	7	13	..
Hebrew, etc	..	..	..	1	..	..	..	..	..	..	..	2
English Comp.	29	28	36	26	27	27	49	44	38	19	53	34
English Lit.	16	8	22	32	49	46	50	70	68	23	44	119
German	4	6	9	23	25	5	22	39	27	12	15	41
French	2	5	12	17	35	33	33	43	53	68	111	97
History	7	15	12	4	8	9	10	12	38	62	83	46
Education	..	14	21	21	21	43	73	121	93	89	173	274
Psychology	..	..	..	7	9	11	34	46	..	1	84	47
Political Econ.	..	..	..	..	..	16	34	42	13	..	..	..
Hygiene	..	..	..	..	..	7	7	20	..	..	..	..
Italian	..	..	..	..	..	..	11	11	..	..	..	12
Spanish	..	..	..	..	..	..	6	18	29	36	46	41
Life Insurance	..	..	..	..	..	..	42	..	..	..	..	..
Biblical Archæol.	..	..	..	..	..	..	..	3	2	..	..	..
Hist. Anc. East	..	..	.	..	..	..	..	7	5		6	9
History of Art and Archæol.	..	..	..	..	..	..	..	35	25	44	78	43
Hist. of Israel	..	..	..	..	..	..	..	2	..	..	..	..
Old Test. Lit.	..	..	..	..	..	..	..	3	4	..	2	5
Philosophy	..	..	..	..	..	..	..	2	26	35	24	47
Physics	..	..	..	..	..	..	..	1	..	..	..	1
Political Science	..	..	..	..	..	..	..	..	12	..	20	17
Drawing	..	..	..	..	..	..	..	..	1	..	..	..
Russian	..	..	..	..	..	..	..	..	..	8	11	23
Old Test (A. V.)	..	..	.	..	..	..	..	..	..	..	2	3
Journalism	..	..	..	..	..	..	..	..	..	..	..	46
Greek	..	..	..	..	..	..	..	..	..	..	..	2

In the Summer Courses:

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
Mathematics	23	8	9	16	19	12	11	10	13	..	27
Physics	14	11	7	13	27	20	8	..	..	14	..
Chemistry	25	29	41	28	39	40	27	27	35	38	42
Biology	59	9	19	18	15	16	30	15	34	24	36
Latin	22	9	12	9	6	7	14	6	6	..	..
English Comp.	121	65	51	68	72	93	40	26	27	49	68
English Lit.	48	39	37	49	35	53	32	34	33	50	65
German	33	24	20	20	46	41	24	6	11	15	30
French	26	26	15	27	29	27	42	56	67	51	66
Spanish	..	..	..	7	9	20	19	13	31	18	27
History	56	31	50	43	44	71	40	57	36	63	65
Education	172	95	148	135	245	387	313	156	206	229	639
Domestic Sci. and Art (Home Economics)	24	15	27	22	31	17	14	5	..	..	52
Manual Training	24	4	19	12	24	31	24	17	16	26	44
Politics	..	..	..	14	16	9	7	7	14	16	29
Playground, etc.	..	..	..	..	16	14	..	10	..	..	..
Psychology	..	..	..	..	15	57	50	8	27	42	79
Geography	..	..	..	..	..	28	11	..	..	..	30
Economics	..	..	..	..	..	11	23	17	53	39	45
Penmanship	..	..	..	..	..	84	33	..	..	..	..
Fine Arts	..	..	..	..	..	..	34	30	40	..	..
Philosophy	..	..	..	..	..	..	16	20	43	24	30
Semitic Lang.	..	..	..	..	..	..	17	4	..	..	..
Vocational Educ.	..	..	..	..	..	..	..	5	..	..	..
Red Cross Home Nursing	..	..	..	..	..	..	..	..	24	..	..
Class. Lit. and Hist.	..	..	..	..	..	..	..	..	..	11	7
Journalism	..	..	..	..	..	..	..	..	..	48	20
Public School Music	..	..	..	..	..	..	..	..	..	..	90

Degrees Conferred

During the academic year degrees were granted to 308 candidates, —Bachelor of Arts, 78; Bachelor of Engineering, 38; Bachelor of Science, 14; Bachelor of Science in Chemistry, 12; Bachelor of Science in Hygiene, 4; Master of Arts, 21; Master of Electrical Engineering 1 (the first time); Doctor of Philosophy, 32; Doctor of Medicine, 92; Doctor of Public Health, 14; Doctor of Science in Hygiene, 1. Certificates in Public Health were awarded to 6 persons (including 1 woman).

Beginning in 1878 degrees have been granted to 1557 candidates for the degree of Bachelor of Arts; 162 for the bachelor's degree in Engineering; 20 for Bachelor of Science in Chemistry; 5 (2 women) for Bachelor of Science in Hygiene; 45 (women 31) for Bachelor of Science; 140 (women 49) for Master of Arts; 1157 (women 42) for Doctor of Philosophy; 1682 (women 166) for Doctor of Medicine; 17 for Doctor of Public Health; 2 for Doctor of Science in Hygiene; 1 for Master of Electrical Engineering. The total of individuals receiving degrees is 4358 (including 283 women). Certificates of proficiency in applied electricity were awarded to 91 persons from 1889 to 1899. Certificates in public health have been awarded to 11 persons, beginning in 1920.

Summary of Degrees Conferred

	A. B.	*Ph. D.*	*M. D.*		*A. B.*	*Ph. D.*	*M. D.*
1877-78	..	4	..	1893-94	41	34	..
1878-79	3	6	..	1894-95	37	47	..
1879-80	16	5	..	1895-96	37	36	..
1880-81	12	9	..	1896-97	36	42	15
1881-82	15	9	..	1897-98	49	36	22
1882-83	10	6	..	1898-99	38	42	33
1883-84	23	15	..	1899-1900	46	35	43
1884-85	9	13	..	1900-01	43	30	53
1885-86	31	17	..	1901-02	47	17	57
1886-87	24	20	..	1902-03	46	27	49
1887-88	34	27	..	1903-04	37	31	45
1888-89	36	20	..	1904-05	33	35	54
1889-90	37	33	..	1905-06	48	32	85
1890-91	51	28	..	1906-07	47	35	76
1891-92	41	37	..	1907-08	47	28	63
1892-93	40	28	..				

	A. B.	*Ph. D.*	*M. D.*	*A. M.*	*B. Eng.*	*B. S.*	*D. P. H.*	*D. S. Hyg.*	*B. S. Hyg.*	*B. S. Chem.*	*M. E.E.*
1908-09	37	27	53	4	..	..	..	..	..	..	..
1909-10	14	25	69	3	..	..	..	..	..	..	..
1910-11	31	28	85	11	..	..	..	..	..	..	..
1911-12	37	32	85	5	..	..	..	..	..	..	..
1912-13	36	32	76	11	..	..	..	..	..	..	..
1913-14	52	30	91	13	..	..	..	..	..	..	..
1914-15	35	31	89	12	3	..	..	..	..	..	..
1915-16	27	37	82	13	12	3	..	..	..	..	..
1916-17	44	44	92	13	37	3	..	..	..	..	..
1917-18	47	12	87	13	26	8	..	..	..	..	..
1918-19	39	12	93	9	18	4	..	..	..	..	..
1919-20	66	31	93	12	28	13	2	1	1	8	..
1920-21	78	32	92	21	38	14	14	1	4	12	1
	1557	1157	1682	140	162	45	17	2	5	20	1

Thomas R. Ball,
Registrar.

REPORT ON THE BUREAU OF APPOINTMENTS

To the President of the University:

I respectfully submit the following report of the activities of the Bureau of Appointments for the year ending June 30, 1921:

Applications to the Bureau for teachers in schools and colleges have increased in number and variety; and the supply continues to be inadequate. Inquiries for teachers of English, of Romance languages, and of mathematics, biology, and chemistry have been most numerous. The demand for the part-time services of students has fallen off.

The plan of combining vocational counsel for freshmen with the work of the first three months of English Composition was continued successfully.

I append tables showing the number and the nature of applications to the Bureau and the results so far as they have been ascertained. A table showing the proposed vocations of freshmen is included.

APPLICATIONS IN GENERAL

Employes	*Applications*	*Recommendations*	*Appointments Reported*
Teachers	254	85	12
Tutors	32	29	21
Camp councilors	3	8	
Sailors	4	1	
Library attendants	8	9	5
Secretaries or Clerks	9	6	3
Canvassers	10	11	9
Salesmen	6	4	
Business agents	23	10	4
Readers	1	1	1
Companions	1	2	1
Domestic employes	2	2	2
Research assistants	3	5	
Applications for a number of persons: Clerks in U. S. Post Office			25
	356	163	83

APPLICATIONS FOR TEACHERS

Subjects	*No. Required*
Agriculture	1
Astronomy	1
Athletics and Physical Training	8
Biology	17
Botany	2
Business Administration	3
Chemistry	22
Commerce and Marketing	2
Economics	13
Education	2
Elementary subjects	5
Engineering	4
English	47
Geology	1

German	2
Greek	5
History	16
Industrial Arts	3
Journalism	1
Latin	13
Manual Training	1
Mathematics	22
Mechanical Drawing	1
Modern Languages	5
Physical Geography	1
Physics	19
Political Science	4
Public Speaking	1
Romance Languages	45
Science	4
Sociology	1
Spanish	1
Zoology	1
	274

REGISTRATION

Total previous registration		270
New registration:		
For Part-time Employment	101	
For Full-time Employment	46	
Graduate Students	12	
Graduates and former students	22	
Unclassified	12	
	147	

OFFICE STATISTICS

Letters	200
Circulars	180
Telephone calls	200

PROPOSED FUTURE VOCATIONS OF FRESHMEN, 1920-21

Medicine (Surgery 9)		53
Chemistry		22
Business		23
Engineering:		
Electrical	21	
Mechanical	15	
Civil	12	48
Law		9
Teaching		7
Theology		6
Transportation		3
Journalism		2
Pharmacy		1
Dentistry		1
Hygiene		1
Forestry		1
Geology		1
		178

JOHN C. FRENCH,
Director.

REPORT ON THE YOUNG MEN'S CHRISTIAN ASSOCIATION

To the President of the University:

I respectfully submit the following report of the activities of the Young Men's Christian Association for the year ending July 1, 1921:

New Students. New students were met by friendly upperclassmen on their arrival at the University, introduced to professors and students, and presented with a copy of the Johns Hopkins Handbook, a brief picture of college life in general. The out-of town men were secured reasonable rooming and boarding facilities; in this work the Association was able to secure homes for over 300 men and women of the student body and the faculty. On the first Friday evening of the academic year all new men were officially welcomed to the University at a reception at which upperclassmen and faculty members were also guests.

Church Relations. A religious census of the whole undergraduate body was taken, after which the effort was made to introduce the out-of town men especially to young folks in nearby churches and to relate them to the church of their own preference in the early days of their college career.

Bible and Mission Study. The Bible classes for the Junior and Senior classes were led by Mr. John R. Cary, of the George R. Morris Apartment Corporation, on "Religion and Business"; Mr. W. H. Morriss, General Secretary of the Central Y. M. C. A., led the Sophomores on the general theme "What the Bible has for Me"; while Dr. W. H. Morgan, Pastor of First M. E. Church, led the Freshman class on "The Heart of the Heart of Things."

The mission study classes were on China and Japan. We were very fortunate in being able to secure natives from these lands to conduct the classes, which were eagerly received. Mr. Y. T. Li conducted the class on China; Mr. Y. Ibara, the Japan group.

The total attendance for these short courses in Bible and mission study was about 500.

New Activities. During the year, the following valuable activities were undertaken by the University Christian Association:

A Preachers' Club was organized for the purpose of mutual aid in common problems and for the fellowship possible only in such a group. The membership for the year was 21.

A Speakers' Bureau, aiming to render service to nearby churches and young peoples' societies, sent out speakers to a total audience of over 10,000. Returned missionaries and others actively interested in Christian work eagerly gave their time to the Bureau.

A Book Exchange was established for the purpose of aiding students to buy and sell books at a reduced rate. An added feature was the attempt to collect from students at the completion of their course any books that they might not wish to save, as a loan to

students upon whom the financial burden of the college course was resting heavily.

The Cosmopolitan Club was organized by the Association early in the year for the grouping together of all foreign students of the University into an active organization. The Club has been very successful this year, with a membership of 60.

The Lost and Found Bureau was established as the official bureau of the University, under the direction of the Association. More than 800 articles have been returned to the owners.

Although the University conducts an official Employment Bureau, many opportunities for assistance and many calls for appointments have come to the Association, with the result that in this unofficial bureau numerous students by this financial assistance were able to continue in the University.

Social Service and Naturalization. More than 1500 Italians, Poles, and Bohemians of the city were in classes taught by twenty Hopkins men. The classes were in English, civics, and the preparation for citizenship papers. Five hundred men have received their naturalization papers as the result of these classes.

Deputation or Gospel Team. The team composed of six undergraduates spoke before church and young people's groups in nearby parishes to a total of 2000 persons, bringing a very practical Christian message from college men.

The Personal Touch. The most important work of the Association is the introducing of Christian life and thinking to college men. We have in the past year been able, through some twenty men who are active, vital Christians, to enter into the lives of probably a hundred or more students who, in their new life of college temptations, were faltering from their former religious background, or who for the first time have been able to see the strength and power of a vital religion. This is the primary work of the Association; it must always stand as the great objective of the University Christian Association.

E. PEARCE HAYES,
General Secretary.

DEGREES CONFERRED, 1920-21

Doctor of Philosophy

William Herbert Bahlke, of Maryland, S.B. Richmond College 1916. Chemistry, Physical Chemistry, and Physics
A Study of the Vapor Pressure of Aqueous Solutions of Lithium Chloride at 20° C

Mingchien Joshua Bau, of China, A.B. Yale College 1918, A.M. Columbia University 1919, B.D. Yale Divinity School 1920. Political Science, Political Economy, and History
The Foreign Relations of China

Edith Adelaide Beck, of Pennsylvania, A.B. Goucher College 1904, A.M. Columbia University 1917. Latin, Classical Archaeology, and Greek
The Life of Marcus Junius Brutus

Kathryn Laura Behrens, of Maryland, A.B. Goucher College 1917, A.M. Johns Hopkins University 1919. History, Political Science, and Political Economy.
Paper Money in Maryland, 1727-1789

Gregory Breit, of Maryland, A.B. Johns Hopkins University 1918 and A.M. 1920. Physics, Mathematics, and Applied Mathematics
The Behavior of Inductance Coils at Frequencies of Radio Telegraphy

Joshua Bernhardt, of New York, A.B. University of Rochester 1916. Political Economy, Political Science, and Hebrew
Government Control of Sugar During the War and the Transition to Competitive Conditions

Robert Allen Castleman, Jr., of Virginia, A.B. George Washington University 1915, A.M. Johns Hopkins University 1917. Physics, Applied Mathematics, and Electrical Engineering
Magnetic Rotatory Dispersion in Transparent Liquids

Howard Benjamin Cross, of Maryland, A.B. University of Oklahoma 1915. Bacteriology, Zoology, and Pathology
An Experimental Study of Phagocytosis in Relation to Terminal Infections

JOHN GRAHAM EDWARDS, of Virginia, A.B. and A.M. University of Virginia 1915. Zoology, Botany, and Physical Chemistry

The Effect of Chemicals on Locomotion in Amoeba

SAMUEL RHEA GAMMON, JR., of Virginia, A.B. Washington and Lee University 1911. History, Political Science, and Political Economy

The Presidential Campaign of 1832

ISAAC NEWTON KUGELMASS, of Alabama, B.S. College of the City of New York 1916, A.M. Columbia University 1917. Chemistry, Physical Chemistry, and Mathematics

The Rate of Solution of Colloidal Ferric Hydroxide

FRANKLIN PLOTINOS JOHNSON, of Missouri, A.B. University of Missouri 1914. Classical Archaeology, Greek, and Egyptology

Lysippus

DAVID CHARLES JONES, of England, B.Sc. University College of North Wales 1906. Chemistry, Physical Chemistry, and Physics

Ternary Critical Solution Temperatures as Criteria of Liquid Purity

JOHN FITCH KING, of Ohio, A.B. Oberlin College 1917. Chemistry, Physical Chemistry, and Sanitary Engineering

A Study of the Structure of Liquid Mixtures from the Standpoint of Dielectric Constant Refractive Index Density

SIMON KLOSKY, of Maryland, A.B. Mt. St. Mary's College 1914. Chemistry, Physical Chemistry, and Physics

A Study of Silica and Impregnated Silica Gels

WILLIAM LLOYD LINTON, of West Virginia, B.S. West Virginia University 1915. Chemistry, Physical Chemistry, and Physics

Compressibility of Liquids and Mixed Organic Liquids

FRANCIS ALOYSIUS LITZ, of Maryland, A.B. St. Mary's University 1912. English, Latin, and Philosophy

A Critical Study of the Life and Works of John Banister Tabb, with a Collection of Unpublished Poems

ELIZABETH MERRITT, of Maryland, A.B. Goucher College 1911, A.M. Smith College 1914. History, Political Science, and Political Economy

James Henry Hammond, 1807-1864

BENJAMIN SIMON NEUHAUSEN, of Maryland, A.B. Johns Hopkins University 1918. Chemistry, Physical Chemistry, and Bacteriology

A Study of the System Ammonia-Water as a Basis for a Theory of the Solution of Gases in Liquids

RUTH NORTON, of Ohio, A.B. Lake Erie College 1914, A.M. University of Wisconsin 1915. Sanskrit, Germanic Philology, and French

The Vedic Declension of the Type *vṛkīs*

HUGH KLEMME PARKER, of Iowa, A.B. Upper Iowa University 1916. Chemistry, Physical Chemistry, and Mathematics

A Study of the Vapor Pressure of Aqueous Solutions of Cane Sugar at 20°

FLORENCE POWDERMAKER, of Baltimore, S.B. Pennsylvania State College 1915. Physiological Chemistry, Physiology, and Histology

Studies on Prematurely Senile Rats

GEORGE RAGLAND, of Kentucky, A.B. Richmond College 1896. Greek, Latin, and Sanskrit

The Genitive Case in Euripides

CURT PAUL RICHTER, of Colorado, B.S. Harvard University 1917. Psychology, Psychiatry, and Neurology

The Behaviour of the Rat

ALPHONSE M. SCHWITALLA, of Missouri, A.B. St. Louis University 1906. Zoology, Plant Physiology, and Chemistry

The Influence of Temperature on the Rate of Locomotion in Amoeba

JAMES EDWIN SHARP, of Arkansas, B.S. University of Arkansas 1917. Chemistry, Physical Chemistry, and Mineralogy

A Proposed Method for Obtaining a Constant Measurable Surface of Mercury for Measuring Absolute Adsorption

JANE VAN NESS SMEAD, of Pennsylvania, A.B. University of Paris 1910, A.M. Johns Hopkins University 1918. French, Spanish, and Italian

Chauteaubriand et la Bible: Contribution à l'étude des Martyrs

EDMUND MAUTE SPIEKER, of Maryland, A.B. Johns Hopkins University 1916. Geology, Paleontology, and Chemistry

The Molluscan Fauna of the Zorritos Formation of Northern Peru

FLORA DOBLER SUTTON, of Maryland, A.B. Goucher College 1912. Mathematics, Education, and Statistics

On Certain Chains of Theorems in Reflexive Geometry

LOUIS BRYANT TUCKERMAN, of the District of Columbia, A.B. Western Reserve University 1901. Physics, Applied Mathematics, and Pure Mathematics

On the Theory of Columns of Ductile Materials

MILTON SHELDON VAN DUSEN, of New Jersey, B.S. Syracuse University 1913. Physics, Applied Mathematics, and Geological Physics

The Thermal Conductivity of Some Heat Insulators

JAN STEPHANUS VAN DER LINGEN, of South Africa, A.B. Victoria College, University of Stellenbosch, 1911. Physics, Geological Physics, and Applied Mathematics

The Fluorescence of Mercury Vapour

(32)

MASTER OF ARTS

GRACE HADLEY BEARDSLEY, of New Jersey, A.B. Vassar College 1917. Classical Archaeology

The Negro Type in Greek and Roman Art

SISTER M. BENEDICTA CARNEY, of Maryland, A.B. Mt. St. Agnes College 1916. Latin

Metrical Studies based upon the Aetna

ESTHER JOSEPHINE CROOKS, of West Virginia, Ph.B. Denison University 1909. Spanish

The Influence of Cervantes upon the French Theater of the Seventeenth Century

HELEN CULLUM EASTERWOOD, of Pennsylvania, A.B. Allegheny College 1918. Political Economy

The Care of Mentally Defective Children in the State of Maryland

MARY OLIVE EBAUGH, of Maryland, A.B. Goucher College 1907. Education

An Index Number for the Public High Schools in the Counties of Maryland, 1917-18, 1918-19, 1919-20.

FRANCIS MITCHELL FROELICHER, of Maryland, A.B. Haverford College 1913. Education

Effects of English Instruction upon the Reading Taste of Pupils

SISTER M. CATHERINE GURRY, of Maryland, A.B. Mt. St. Agnes College 1916. English

A Study of the Christ of Cynewulf, as Showing the Influence of the Liturgy of the Church upon Anglo-Saxon Poetry

EDWARD PEARCE HAYES, of Maryland, A.B. Johns Hopkins University 1916. Education

The College Chapel Exercise

KATHARINE BAIRD HOPPER, of Maryland, A.B. Goucher College 1919. Political Economy

The Juvenile Court in Maryland

YASHUSHI IBARA, of Japan, A.B. Randolph-Macon College 1917. Zoology

Effect of Temperature and Food on Encystment in *Didinium Nasutum*

HELEN DENTON MCDOUGALL, of New Jersey, A.B. Wells College 1919. Political Economy

Factors in Placing Children Temporarily and Permanently

MORRIS A. MECHANIC, of Maryland, A.B. Johns Hopkins University 1918. Political Economy

The Development of Building and Loan Associations

ELIZABETH ELMER MULLER, of Maryland, A.B. Goucher College 1919. Political Economy

Social and Civic Service of the Baltimore County Schools

GEORGE DAVID PALMER, JR., of Arkansas, B.S. Clemson College 1919. Chemistry

The Limitations of the Mass Action Law, as Applied to Aqueous Solutions of Non-volatile Substances

ELIZABETH PERSONS, of Maryland, A.B. Wells College 1916. Classical Archaeology

Caryatids and the Use of the Human Figure as a Support in Art

HARRY SCHAD, of Maryland, B.S. Johns Hopkins University 1917. Education

The Legal Aspects of Education as Reflected in Recent State Laws

GOTTLIEB SCHAENZLIN, of Ohio, A.B. Baldwin-Wallace College 1905. Sanskrit

The *Çūnya-Purāṇa*

HELENE MATHILDA SCHNEIDEREITH, of Maryland, A.B. Goucher College 1918. Political Economy

Safe-Guarding the Health of the Child in Baltimore and Rural Maryland

GEORGE WILLIAM SMALL, of Maryland, A.B. University of Tennessee 1916. English, French, and German

The Syntax of Comparison, with a Special Study of the Romance Development

CAROL VAN BUREN WIGHT, of Massachusetts, A.B. Johns Hopkins University 1919. Latin

The Political Life of Caius Asinius Pollio

CARL GEORGE WOLF, of Maryland, A.B. Capital University 1907. Psychology

A Study of Symbolism with Special Reference to the Cross, Swastika, and Triangle

(21)

MASTER OF ELECTRICAL ENGINEERING

NOBORU INOUYE, Imperial University of Kyoto 1918 (Kogakushi). Electrical Engineering

I. Outline of the Theory of Corona Formation. II. Wave Form and Amplification of the Corona Voltmeter Discharge

DOCTOR OF MEDICINE

HARRY DAVIS ABELL, of Kentucky, S.B. University of Kentucky 1917

ERRETT CYRIL ALBRITTON, of Kentucky, A.B. University of Missouri 1916

FRED HAROLD ALLEN, of California, A.B. University of California 1913

CLYDE I. ALLEN, of Illinois, A.B. Illinois Wesleyan University 1917

EDWIN COWLES ANDRUS, of Ohio, A.B. Oberlin College 1916

WILLIAM DEWITT ANDRUS, of Ohio, A.B. Oberlin College 1916

ELIZABETH ARTHURS, of Maryland, A.B. Vassar College 1916

CECIL H. BAGLEY, of Maryland, A.B. Johns Hopkins University 1917

ALBERT ADGATE BAILEY, of Virginia, A.B. Randolph-Macon College 1915

IMOGEN BALDWIN, of Ohio, A.B. Mt. Holyoke College 1916

CLAUDE SCHAEFFER BECK, of Pennsylvania, A.B. Franklin and Marshall College 1916

WALTER ANDREW BELL, of New York, A.B. Williams College 1917

RALPH DAVID BERGEN, of Ohio, A.B. Catholic University of America 1917

EDITH BOYD, of Colorado, A.B. Colorado College 1917

DORSEY BRANNAN, of West Virginia, S.B. West Virginia University 1916

HELEN BRUCKMAN, of California, S.B. University of California 1912

MODESTINO CRISCITIELLO, JR., of New Jersey, A.B. Princeton University 1917

SEVERN TEACKLE WALLIS CULL, of Maryland, A.B. Princeton University 1914

PERCY BERNARD DAVIDSON, of Massachusetts, A.B. Harvard University 1916

KENNETH MOSIER DAY, of Pennsylvania, A.B. Princeton University 1917

KATHARINE DODD, of Masachusetts, A.B. Bryn Mawr College 1914

MARION DREXEL DOUGLASS, JR., of Ohio, A.B. Kenyon College 1917

RICHARD DRESSER, of Rhode Island, Ph.B. Brown University 1916

ERNEST EDLAVITCH, of Maryland, A.B. Johns Hopkins University 1917

ELISABETH EMERSON, of Rhode Island, A.B. Bryn Mawr College 1917

WARFIELD MONROE FIROR, of Maryland, A.B. Johns Hopkins University 1917

CLYDE MARVIN FITCH, of Ohio, S.B. Ohio Wesleyan University 1917

ROBERT EDWARD FREEMAN, of Washington, S.B. University of Washington 1917

CLARENCE FRY, of Ohio, A.B. Ohio Wesleyan University 1917

GEORGE HENRY GARDNER, of Missouri, A.B. Wittenberg College 1917

THOMAS BOLLING GAY, JR., of Georgia, A.B. University of Georgia 1917

MOSES GELLMAN, of Virginia, S.B. Richmond College 1917

GOMER FLOW GOFF, of Texas, A.B. University of Texas 1917

CARL HARTLEY GREENE, of Missouri, A.B. University of Missouri 1914, Ph.D. Yale University 1917

HARRY HUMPHREY HAGGART, of North Dakota, A.B. Fargo College 1914

HAROLD VERNON HARPER, of Pennsylvania, S.B. Allegheny College 1916

JULIAN DERYL HART, of Georgia, A.B. Emory University 1916

ARTHUR JOSEPH HEARN, of New York, Ph.B. Yale University 1916

JOSIAH B. HIBBITTS, JR., of Tennessee, A.B. William Jewell College 1916

CHARLES HANCHETT HITCHCOCK, of New York, S.B. Amherst College 1917

PHILIP BIRD HOPKINS, of Maryland, A.B. Randolph-Macon College 1913

IRA LUTHER HOUGHTON, of Maryland, A.B. Johns Hopkins University 1917

DAVID TAYLOR HYATT, of Arkansas, A.B. Washington and Lee University 1916

MORRILL LEONARD ILSLEY, of Maine, A.B. Colby College 1917

EDITH BANFIELD JACKSON, of Colorado, A.B. Vassar College 1916

ARTHUR L. JACOBSON, of North Dakota, A.B. University of North Dakota 1917

IRMARITA KELLERS, of New Jersey, A.B. Vassar College 1916

JAROLD ELIJAH KEMP, of Maryland, A.B. Western Maryland College 1917

RALPH EMERSON KENDALL, of Ohio, S.B. Mount Union College 1917

EDWARD ANDREW KITLOWSKI, of Pennsylvania, S.B. Bucknell University 1917

LAWRENCE SCHLESINGER KUBIE, of New York, A.B. Harvard University 1916

RICHARD SHERMAN LYMAN, of Connecticut, A.B. Yale University 1913

CRUTCHER MCCLURE, of Tennessee, S.B. Vanderbilt University 1916

PAUL BEATTY MACCREADY, of New Jersey, S.B. Princeton University 1916

JOHN ARCHIBALD MCKAY, of North Carolina, A.B. University of North Carolina 1911

IRVINE MCQUARRIE, of California, A.B. University of Utah 1915

CLEON CARL MASON, of California, Ph.B. Grinnell College 1909

JAMES PATRICK MOLLOY, JR., of Illinois, A.B. St. Ignatius College (Chicago) 1916

LESLIE EDWIN MYATT, of Tennessee, S.B. and Phar.D. Vanderbilt University 1917

LILLIAN LYDIA NYE, of Minnesota, A.B. University of Minnesota 1909

ISAAC Y. OLCH, of Rhode Island, Ph.B. Brown University 1917

CAYETANO PANETTIERE, of Peru, S.B. Washington College 1915

ROBERT WESLEY PARR, of Ohio, A.B. Marietta College 1916

JAMES CRAIG POTTER, of New York, A.B. Yale University 1919

PHILIP BARBOUR PRICE, of China, A.B. Davidson College 1917

MARIAN CABOT PUTNAM, JR., of Massachusetts, A.B. Radcliffe College 1917

EVELYN B. REICHENBACH, of New York, S.B. University of Rochester 1917

WILLIAM HARRY RESNIK, of Connecticut, Ph.B. Yale University 1916

KEITH CHILTON RICE, of Tennessee, A.B. Washington and Lee University 1917

ARCHIBALD LOCKHART RIDDICK, of North Carolina, S.B. Guilford College 1916

ALICE ELIZABETH ROCKWELL, of Connecticut, A.B. Goucher College 1917

WILLIAM HELLMAN ROSENAU, of Maryland, A.B. Johns Hopkins University 1917

DAVID HARRY RUBEN, of Pennsylvania, S.B. Washington and Jefferson College 1917

WILLIAM PAUL SADLER, JR., of Arkansas, A.B. University of Arkansas 1916

WINFIELD WENTWORTH SCOTT, of New York, S.B. University of Rochester 1915

GORDON STIFLER SEAGRAVE, of Ohio, A.B. Denison University 1917

EUGENE CLAY SHAW, of Alabama, A.B. Howard College 1915

CHARLES PHILLIPS MAHOOD SHEFFEY, of Virginia, A.B. Randolph-Macon College 1914

KENNETH EDWIN SMILEY, of California, S.B. Occidental College 1917

DAN MAX STIEFEL, of Texas, A.B. University of Texas 1917

ARTHUR ADLER SONDHEIMER, of Pennsylvania, A.B. Franklin and Marshall College 1917

PAUL WINDOM SUTTON, of Maryland, A.B. Johns Hopkins University 1917

HARRY MORGAN TIEBOUT, of New York, S.B. Wesleyan (Conn.) University 1917

CHARLOTTE C. VAN WINKLE, of New Jersey, A.B. Smith College 1914

HELEN VINCENT, of Florida, A.B. Mount Holyoke College 1915

SILAS WILLARD WALLACE, of Tennessee, S.B. Earlham College 1917

MARY DUNNE WALSH, of Virginia, A.B. Trinity College, Catholic University 1916

GRANT E. WARD, of Ohio, A.B. Baldwin-Wallace College 1917

ROXIE ADELINE WEBER, of Texas, A.B. University of Texas 1916

ALEXANDER ASHLEY WEECH, of Maryland, A.B. Johns Hopkins University 1917

CASPAR LIGON WOODBRIDGE, of China, A.B. Princeton University 1916

MAX MASER ZINNINGER, of Ohio, A.B. Harvard University 1917

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DOCTOR OF PUBLIC HEALTH

REGINALD MYERS ATWATER, of Colorado, A.B. Colorado College 1914, M.D. Harvard University 1918

Epidemiological Studies on Diphtheria in Baltimore, 1920-21

GARLAND HOWARD BAILEY, of West Virginia, S.B. West Virginia University 1915, M.D. Johns Hopkins University 1920

The Etiology and Prevention of Pellagra

ORVILLE GRAHAM BROWN, of the District of Columbia, M.D. Columbia University 1900, Lieut. Col. Medical Corps, U. S.A.
A Department of Epidemiology for Army Divisions

JAMES ANGUS DOULL, of Nova Scotia, A.B. Dalhousie University 1911 and M.D.C.M. 1914, Diploma P.H. University of Cambridge 1919
Public Health in Nova Scotia

GEORGE CLARK DUNHAM, of Oregon, M.D. University of Oregon 1914, Major Medical Corps U.S.A.
The Control of Typhoid Fever in the Larger Cities of the United States

VALCOULON LEMOYNE ELLICOTT, of Maryland, S.B. Massachusetts Institute of Technology 1916, M.D. Johns Hopkins University 1920
The Biology of Diphtheria

CHONG EANG LIM, of China, M.B. and S.B. Hong Kong University 1916, Diploma Tropical Medicine Liverpool School of Tropical Medicine January 1921
The Practical Aspects of the Preparation of Vaccine Virus

KENNETH FULLER MAXCY, of Maryland, A.B. George Washington University 1911, M.D. Johns Hopkins University 1915
A Study on the Control of Typhoid Fever in Rural Areas

RALPH WELTY NAUSS, of Ohio, S.B. Ohio State University 1901, M.D. Northwestern University 1905, D.P.H. University of Pennsylvania 1916
Hookworm in California Gold Mines

FRANK OLDT, of Ohio, A.B. Otterbein College 1901, M.D. Ohio Medical University 1905
Summer Resorts as Related to Typhoid

REGINO PADUA Y GAERLAN, of the Philippine Islands, M.D. University of the Philippines 1915 and D.T.M. 1918
The Factors concerned in the Etiology of Rickets

JOHN JOSEPH SZYMANSKI, of New Jersey, A.B. St. John's College (Brooklyn) 1910, M.D. Johns Hopkins University 1914
The Treatment of Helminths

EUGENE RUDOLPH WHITMORE, of the District of Columbia, S.B. University of Wisconsin 1896, M.D. University of Illinois 1899, Lieut.-Col. U.S.A. Retired
Malaria

GEORGE HUNTINGTON WILLIAMS, of Maryland, A.B. Harvard University 1915, M.D. Johns Hopkins University 1919

Medical Work in the City Public Schools

(14)

DOCTOR OF SCIENCE IN HYGIENE

HOMER WILLIAM SMITH, of Colorado, A.B. University of Denver, 1917.

The Nature of Secondary Valence.

CERTIFICATES IN PUBLIC HEALTH

RUFINO ABRIOL, of the Philippine Islands, M.D. University of Illinois 1913, Dr.T.M. University of the Philippines 1916

JOHN BLACK GRANT, of New York, A.B. Acadia College 1912, M.D. University of Michigan 1917

CHARLES NELSON LEACH, of New York, A.B. Leland Stanford Jr. University 1909 and M.D. 1913

GLADYS NEWMAN, of New York, A.B. Oberlin College 1917

FRANK GORDON PEDLEY, of Canada, A.B. McGill University 1913 and M.D.C.M. 1916

RICARDO RIVAS VIDES, of San Salvador, S.B. El Salvador Institute 1906, M.D. El Salvador University 1916

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