stalks bearing them, while others were pollinated with pollen from other hybrid seedlings of the same parentage. The hybrids of the second generation, where the seed was inbred with pollen from the same stalk, showed great loss of vigor, being small in stature and almost totally sterile; while those produced from seed which was inbred with pollen from a different seedling were much more vigorous and productive, seeming to have lost but little by this process of inbreeding.

Judging from these observations, it would seem that in fixing corn hybrids in practical plant-breeding it will be found desirable to cross different hybrid seedlings of the same parentage, which are found by careful observation to present the same characters, rather than inbreed a hybrid with its own pollen, as is somewhat generally directed by plant-breeders. It is of the utmost importance in plant-breeding that the best methods of fixing hybrids of various kinds of plants be determined, and further observations on this point with other plants are greatly needed.

W. F. GANONG,
Secretary.

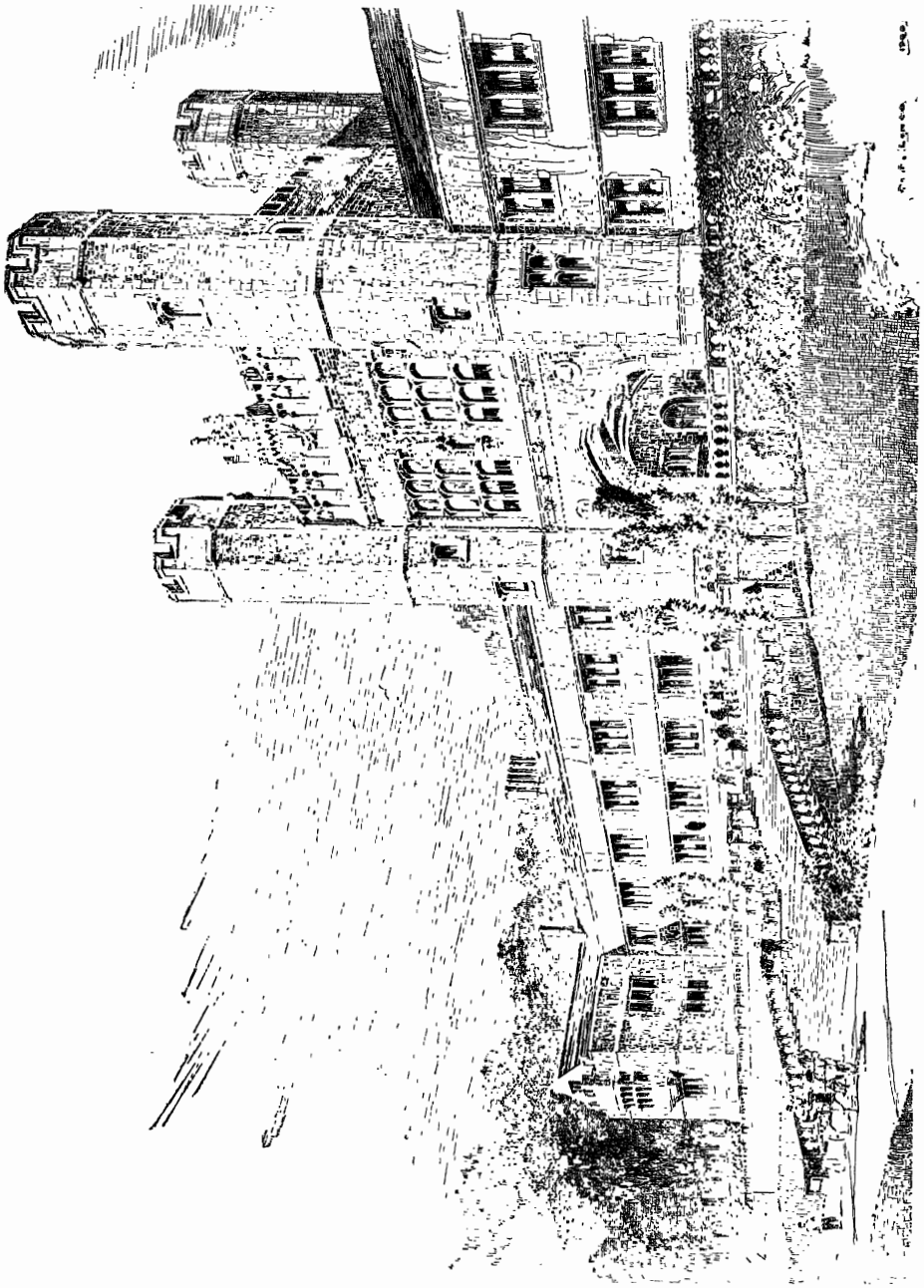
WASHINGTON UNIVERSITY.

THE new grounds of Washington University are situated at the western boundary of the city just west of Forest Park. The distance from the Mississippi River is about six miles and from the business center of the city about five miles. The most direct approach from the city is along Lindell Avenue. The site covers 153 acres and cost $350,000. The eastern boundary of the ground is Skinker Road, from which the land rises rapidly westward for about 1,000 feet. About 1,200 feet from Skinker Road is placed the main building of the institution, to be called University Hall and to be devoted to the offices of administration and to those subjects which do not require a laboratory or a drawing room. This building forms the eastern side of the first quadrangle; the other buildings on this quadrangle are Busch Hall, to be devoted to chemistry, Cupples Hall No. 1, to be devoted to Civil Engineering and Architecture, and the Library which separates the first quadrangle from the second.

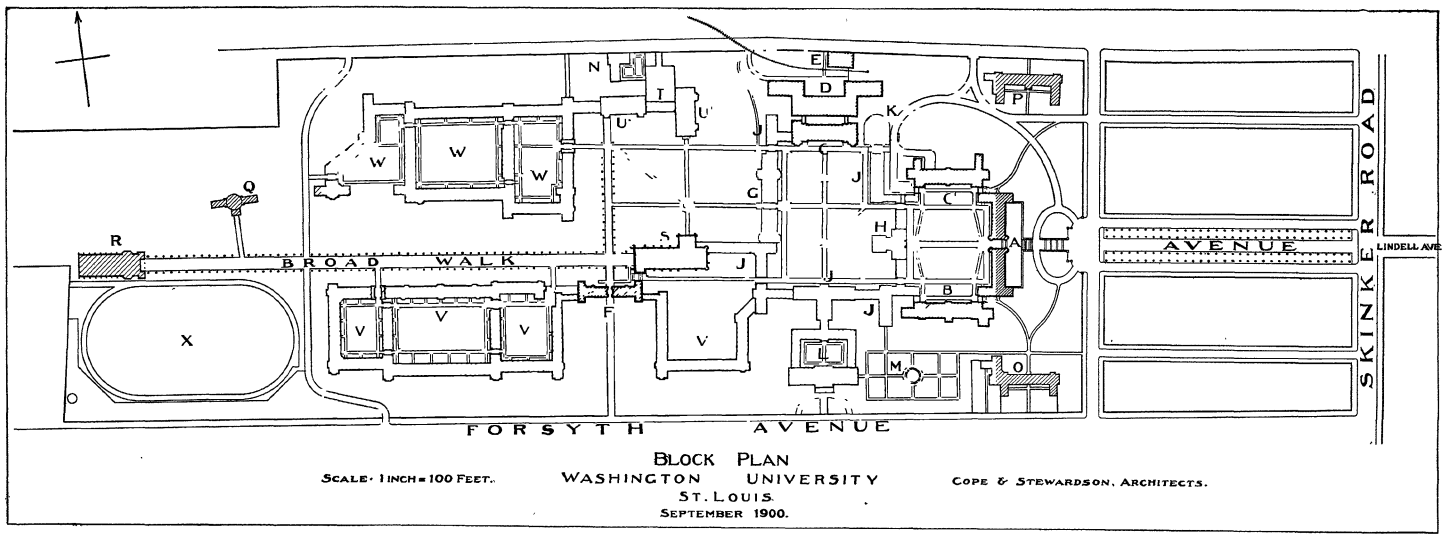
On the second quadrangle are also to be Cupples Hall No. 2, which is to be devoted to electrical and mechanical engineering, a building for physics, and sites for other buildings not yet planned. The first and second quadrangles are to be devoted exclusively to buildings for instruction. The other quadrangles are to be devoted to dormitory buildings. Those to the north of the Broad Walk are intended to be occupied by women students and those to the south of the Broad Walk by men students. The Broad Walk, something over a third of a mile long, leads to the gymnasium, near which is the athletic field, which will be excavated in the top of the hill in the form of an amphitheater. The architects, Messrs. Cope & Stewardson, of Philadelphia, have so arranged the quadrangles as to occupy the highest land of a long hill whose general direction is east and west.

Seven of the buildings shown on the general plan are to be constructed at once, and five of them are already under construction. The St. Louis, Kansas City and Colorado Railroad, running along the north line of the property at the bottom of the hill, makes it easy to bring in the supplies for the University. The power house, located beside the railroad track, will provide heat, light and power for all the buildings. The buildings generally will be two stories high on the quadrangles and three stories high on the opposite sides. The buildings to be erected immediately will cost about $700,000, and about $100,000 will be expended in the grading and planting of the grounds.

The style of architecture is what is called



University Hall, Washington University



BLOCK PLAN

SCALE: 1 INCH = 100 FEET. WASHINGTON UNIVERSITY ST. LOUIS. SEPTEMBER 1900. COPE & STEWARDSON, ARCHITECTS.

INDEX.

A—University Hall — Administration.
B—Busch Hall—Laboratory of Chemistry.
C[1]—Cupples Hall, No. 1—Civil Engineering and Architecture.
C[2]—Cupples Hall No. 2—Mechanical and Electrical Engineering.
D—Laboratories of Mechanical and Electrical Engineering.
E—Power House.
F—Liggett Hall—Men's Dormitory.

Now being erected.

G—Laboratory of Physics.
H—Library.
J —Position of Future Extension of Scientific Schools.
K—Auditorium.
L —Museum.
M— Botanic Garden.
N —Gardener's House.
O —Instructors' Houses—Men.
P —Instructors' Houses—Women.

Q —Observatory.
R —Gymnasium.
S —Chapel.
T —Kitchen Service.
U[1] —Commons Hall—Men.
U[2] —Commons Hall—Women.
V —Dormitories for Men.
W —Dormitories for Women.
X —Athletic Field—Running Track, 3 laps to the mile.

Tudor Gothic which appears so prominently in the buildings of the Universities of Oxford and Cambridge. The amount of cut stone in the buildings will be large; the material used for this purpose comes from the Bedford quarries of Indiana. The field of the walls is to be of rubble masonry of red Missouri granite. It is expected that the five buildings now under way will be completed in about one year.

Besides these gifts, the University has recently received gifts for its endowment fund of three and a half million dollars, part available at once and part available after a few years.

W. S. CHAPLIN,
Chancellor.

THE BUSCH CHEMICAL LABORATORY.

THE new chemical laboratory of Washington University, the plans of which appear in this number of SCIENCE, is the generous gift of Mr. Adolphus Busch of St. Louis, who has given the University $100,000, for its construction and equipment. The building is situated on the south side of the university quadrangle, and as the ground slopes away on this side, the new laboratory is two stories high on the north front and three stories on the south. Directly opposite on the quadrangle is the Cupples Hall No. 1 devoted to Civil Engineering and Architecture, while adjoining it on the east is the large and beautiful University Hall. The windows of the Busch laboratory command a beautiful view of the campus to the north and west, while to the south and east they overlook the wooded hills of Forets Park. The laboratory stands to-day as an enduring monument to the liberality of Mr. Busch.

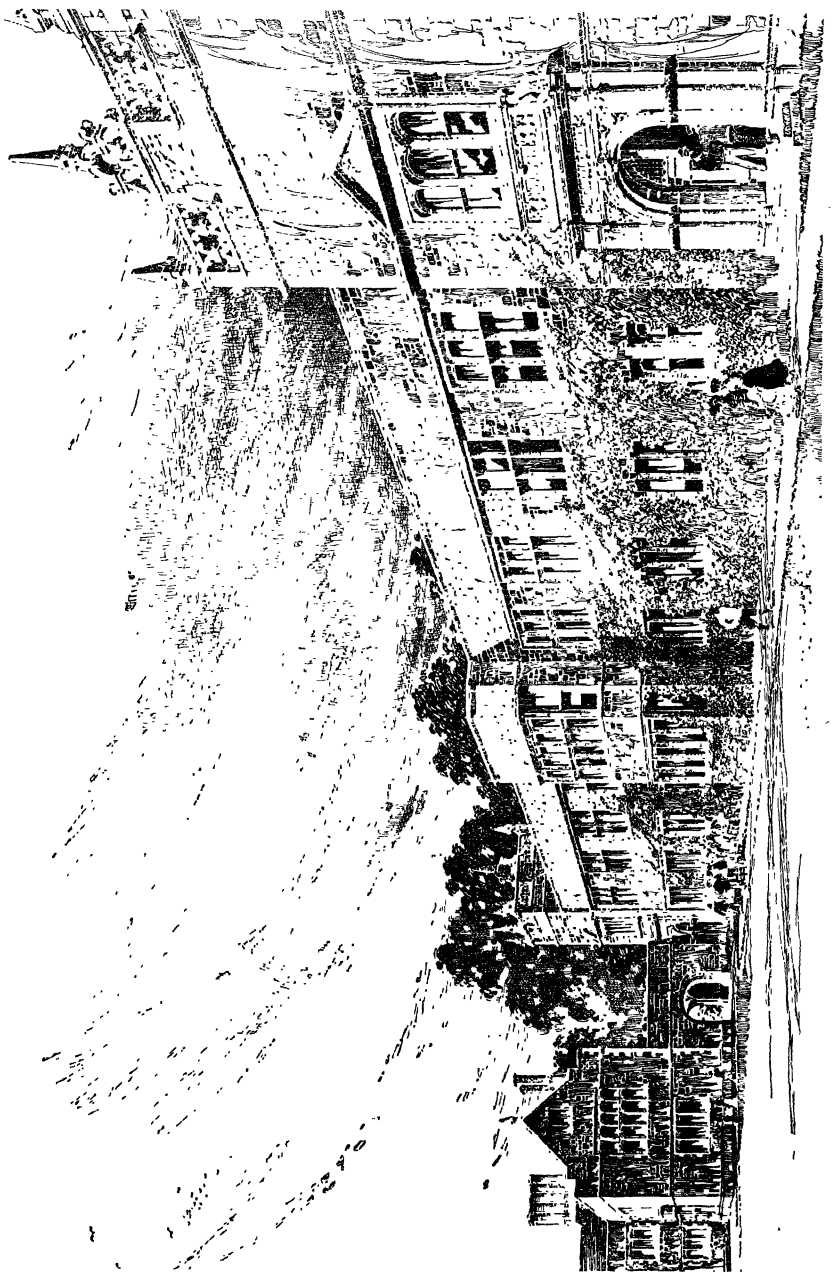
The architects of the building are Messrs. Cope and Stewardson of Philadelphia and St. Louis, who a few years ago designed the John Harrison Laboratory of Chemistry of the University of Pennsylvania. In planning this laboratory they have retained all of the desirable features of the Pennsylvania laboratory, they have avoided everything that experience has shown to be undesirable and have in a number of ways improved upon their earlier work.

The building is of Tudor Gothic design, the walls are of Missouri granite, the ornamental cut stone work of the windows and doors is of Bedford limestone. It is of fire-proof construction throughout. From the illustrations it will be seen that the building is long and narrow. The length is 291 feet and the width 60 feet. This plan was adopted in order that all the rooms may be well lighted, and since the main length of the building extends from east to west, a long north front with ample window space is secured for the main working laboratories.

Entering at the east front door, one finds immediately on the left the large lecture theater, a room 46 feet by 30 feet 10 inches. The rows of seats rise one above another, and there are places for 186 students. The front of the lecture room is half a flight lower than the rear. Immediately in the rear of the lecture theater and communicating with it is the preparation room. Here the lecture experiments are prepared and the apparatus and chemicals used in the lectures are stored.

Passing westward in the main corridor on the first floor, one finds on the right a large laboratory devoted to general chemistry. This room is 130 feet 6 inches by 18 feet. Here are working tables for the accommodation of 125 students. The new feature in this laboratory is that each working table is placed with one end against a window. On each side of the table are drawers and cupboards for four students. Each table, having a window at the end, is well lighted, and no student works further than twelve feet from a win-

dow. On the wall opposite the windows there is a continuous line of hoods extending from one end of the room to the other.



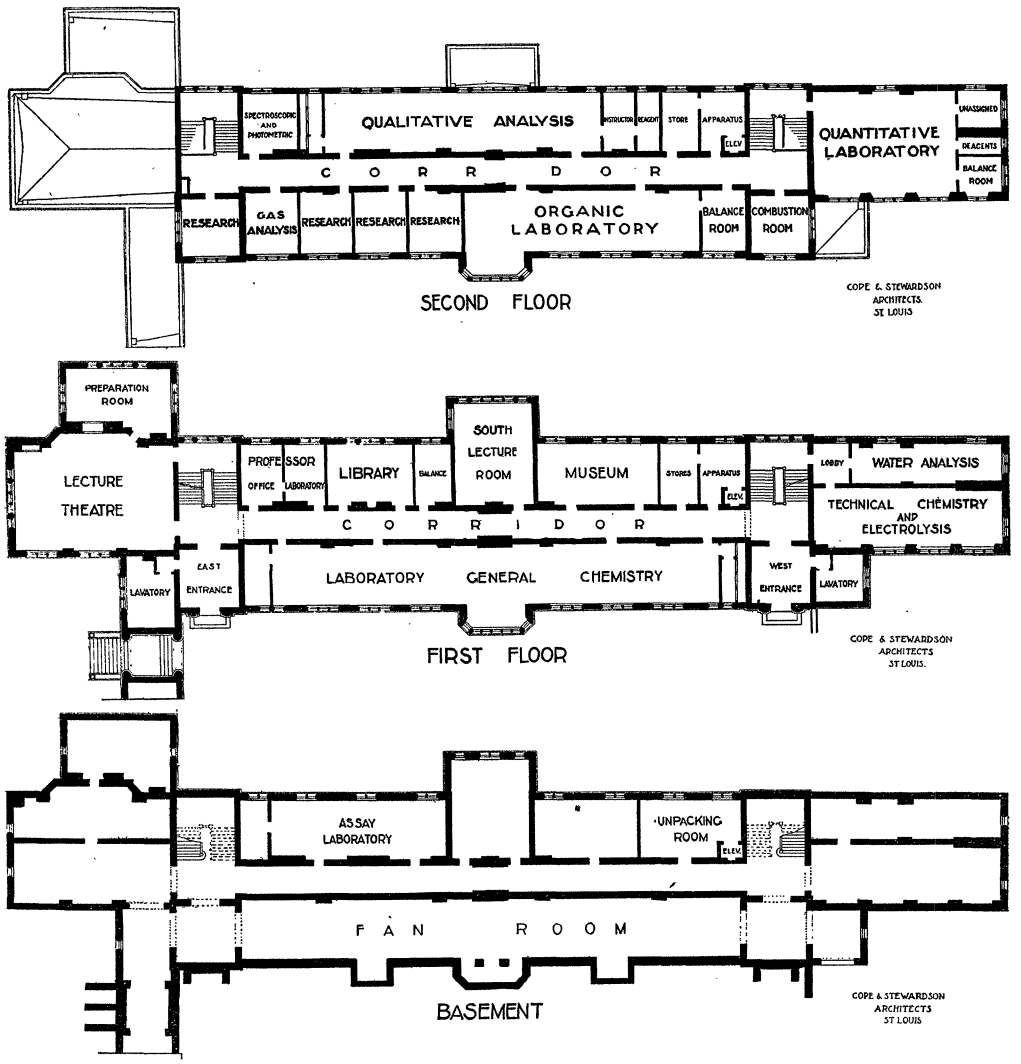
The Busch Chemical Laboratory.

At each end of this large laboratory there is a small room, one of these is used as a hydrogen sulphide room, the other as a storeroom for keeping the stock bottles of reagents.

On the south side of the corridor are the professor's office and private laboratory,

the library and balance room, a lecture room, 23 feet by 32 feet, seating 60 students, a museum and storerooms for apparatus and chemicals. At the west end of the building and half a flight lower there are rooms for special kinds of chemical work, such as water analyses, electrolytic work and technical chemical operations.

Ascending the western stairway one-half flight, one reaches a large room, 41 feet 9 inches by 32 feet, lighted with large windows on the north and south sides. This is the laboratory for quantitative analysis, and communicating with it at the western end are smaller rooms for balances, reagents and a private laboratory for the instructor. On the main second floor there are two laboratories, one of these, with working tables for sixty students, is devoted to qualitative analysis, the other, with places for thirty students, is arranged for work in organic chemistry. As



Ground Plan of Busch Chemical Laboratory.

in the large laboratory on the first floor, the tables have their ends against the windows and the hoods extend along the interior walls. On this floor there are also four smaller rooms for research work, a room for photometric and spectroscopic work, a balance room, a room for organic combustions and store rooms for apparatus and chemicals. These last are immediately over the store rooms on the first floor, and communicate with them and with the unpacking room in the basement by means of an elevator.

In the basement, besides the unpacking room, there are two large well lighted rooms fitted up with furnaces for work in assaying. There is also a room for the apparatus used in preparing distilled water.

In the rooms on the north side of the basement are located the ventilating fans. These are driven by electric motors. In the system of heating and ventilating adopted cold air from the outside is drawn in by the fans and is forced over steam radiators and into the rooms. The warm air enters the rooms near the ceiling and the outlet flues have their openings near the floor. A separate system of fans, also driven by electricity, is placed immediately under the roof. These are connected with the hoods and with the hydrogen sulphide room, and they have been so arranged that they can be made to draw air from all the hoods or they can be made to draw simultaneously from the hoods of any one laboratory.

Edward H. Keiser.
Department of Chemistry.

SCIENTIFIC BOOKS.

Ueber die Natur der Centrosomen. By Theodor Boveri. Zellenstudien, Heft 4. Fischer, Jena. 1901. Pp. 220, 8 plates, 3 text-figures.

Probably the most remarkable series of cytological papers yet published by a single author are the 'Cell-Studies' of Theodor Boveri, which have placed before students of cellular biology not only a wealth of original discoveries, but also a model of critical analysis and lucid exposition that has hardly been surpassed. They form to-day a fine example of the value of intensive work in this field, for although they have extended over a period of nearly fifteen years they have been mainly devoted to the examination of but two objects, namely, the eggs of *Ascaris* and of the sea urchin; yet few works have accomplished more for the advancement of the general subject.

The first three parts, which appeared successively in 1887, 1888 and 1890, were inspired by the epoch-making res arches of Van Beneden on the eggs of *Ascaris*, and the first two were entirely devoted to the same object. The first cleared away the confusion of the earlier work regarding the formation of the polar bodies and laid the basis for most of the subsequent work on the reduction of the chromosomes, a subject which was thrown into especial prominence through the theoretical essays of Weismann. The second was a masterly study of the phenomena of fertilization and cleavage, with a full development of the hypotheses of the individuality of the chromosomes and of fibrillar contractility in mitosis, which exerted a far-reaching influence on all subsequent work in this field. The third placed upon a broad comparative basis the epoch-making discoveries of himself and Van Beneden on the equivalence of the paternal and maternal chromosomes in fertilization ('Van Beneden's Law'). The fourth, which appears eleven years after the third, deals with the nature and function of the centrosome, which has become one of the most difficult and perplexing problems of cytology. Students of cellular biology have eagerly awaited a critical discussion by Boveri of the later and in many respects conflicting aspects of this subject, in which he was one of the ablest pioneers. The present work contains a detailed study of the centrosomes in the segmenting eggs of *Echinus* and *Ascaris*, a valuable critique of technical methods, and a critical examination of the literature, with chapters on the structure and division of the centrosome in general, its relation to cell-division, its origin and physiological activity, and related questions.