MUNSEY'S MAGAZINE.

VOL. XXV. AUGUST, 1901. No. 5.

A GREAT NEW NATION.

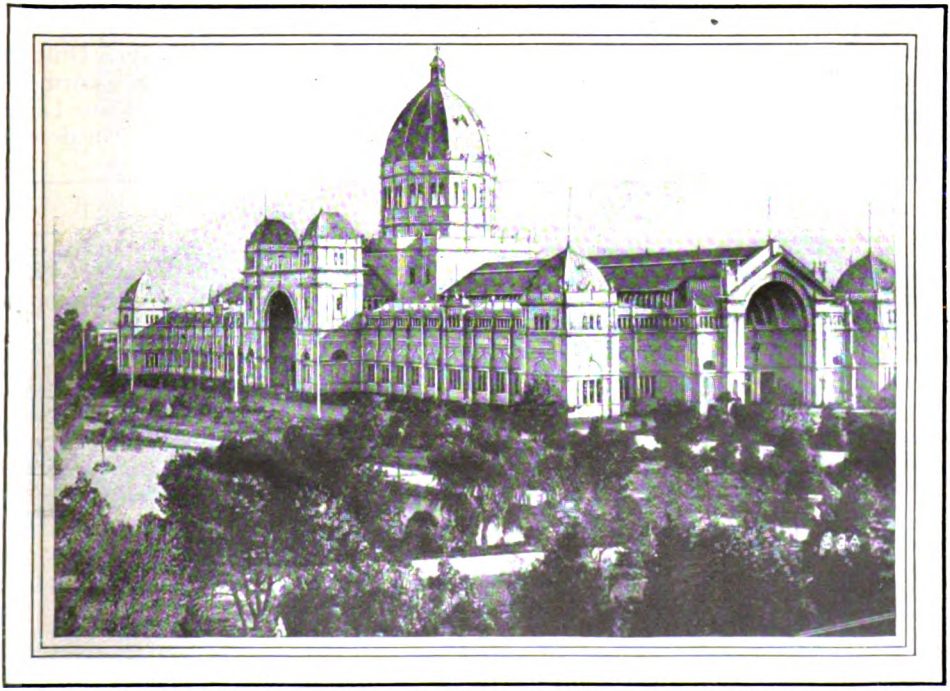
BY WALTER JEFFERY,

EDITOR OF "THE TOWN AND COUNTRY JOURNAL," SYDNEY, NEW SOUTH WALES.

THE COMMONWEALTH OF AUSTRALIA, WHICH CELEBRATED ITS BIRTH-DAY AS A UNITED NATION ON THE FIRST DAY OF THE TWENTIETH CENTURY—THE NEW CONFEDERATION'S BRIEF PAST, ITS PROSPEROUS PRESENT, AND ITS GREAT FUTURE.

THE last year of the nineteenth century will probably be remembered in subsequent history for two epoch making events—the union of South Africa under the British flag and the birth of the Australian Commonwealth. Of the two, the latter is assuredly the more important; for the future of Australia looms larger and brighter than that of even the most habitable part of the Dark Continent.

It may seem a little premature to speak of the new confederation as a great nation, while its population is less than



THE EXHIBITION BUILDING AT MELBOURNE, IN WHICH THE FIRST PARLIAMENT OF THE AUSTRALIAN COMMONWEALTH MET IN MAY LAST.

The Expansion of Our Great Universities.

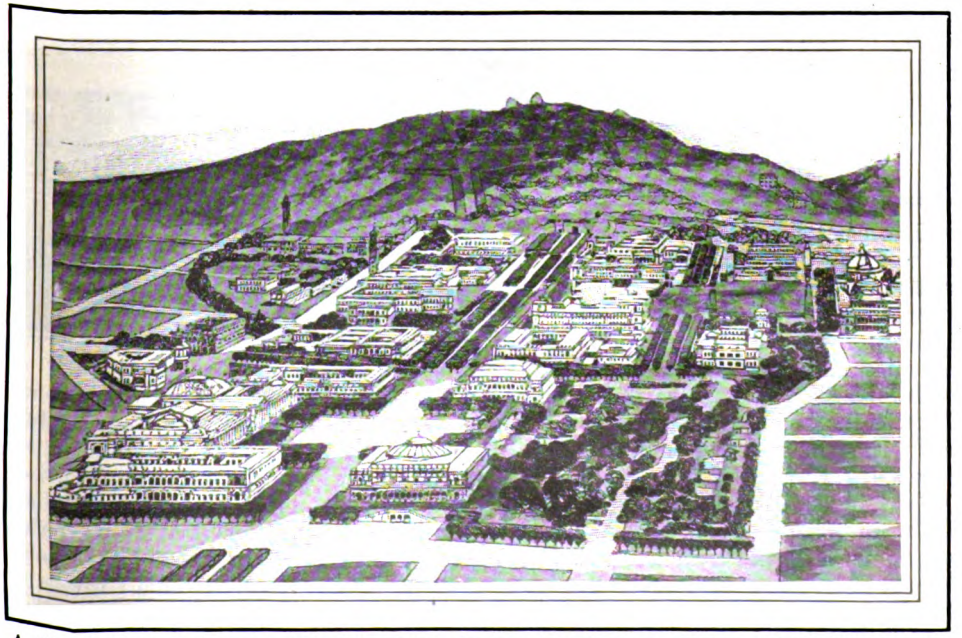
BY ETHELBERT D. WARFIELD, LL.D.,
PRESIDENT OF LAFAYETTE COLLEGE.

THE ORIGINAL PURPOSES OF HIGHER EDUCATION IN AMERICA, THE LINES ON WHICH OUR SYSTEM HAS GROWN, AND ITS MARVELOUS EXTENSION IN RECENT YEARS—A SPLENDID DEVELOPMENT THAT IS NOT WITHOUT ITS PROBLEMS AND ITS WEAKNESSES.

NO phase of social progress is more characteristic of the development of the United States in the nineteenth century than the growth of our universities. Indeed, the whole field of education has been so fertile in ideas and undertakings that European critics, and especially English critics, have declared that America is "education mad." The fact is that the growth of democracy demanded a leveling principle, and the growth of wealth made this a leveling up and not a leveling down, as it rendered it possible for the poor boy to work his way to an education, and the educated man to become a leader in political and —which is true of America almost alone —in social life.

One of the most marked features of our educational growth has been its spontaneousness. It has sprung from the people, from local needs and, even more, from local aspirations. On this account it has lacked unity and system; but it has gained something far better than either unity or system—vitality. It has been a part of the social life of the people, and the divergence in the social life of Massachusetts and of Georgia, of Pennsylvania and of California, has been no less than the difference in the school and college growth of those States.

As the educational institutions were the outgrowth of local needs, they were nearly always adapted to the field in



A GENERAL VIEW OF THE BUILDING PLAN ADOPTED BY THE UNIVERSITY OF CALIFORNIA, AT BERKELEY, CALIFORNIA—THE PLAN WAS DESIGNED BY E. BÉNARD, OF PARIS, AND WON THE PRIZE OFFERED FOR COMPETITION TO THE ARCHITECTS OF THE WORLD.

which they sprang up; as they were not less the progeny of local aspirations, they were often vastly ambitious in plan and name. Fortunately those ambitions were allowed to slumber in the charter

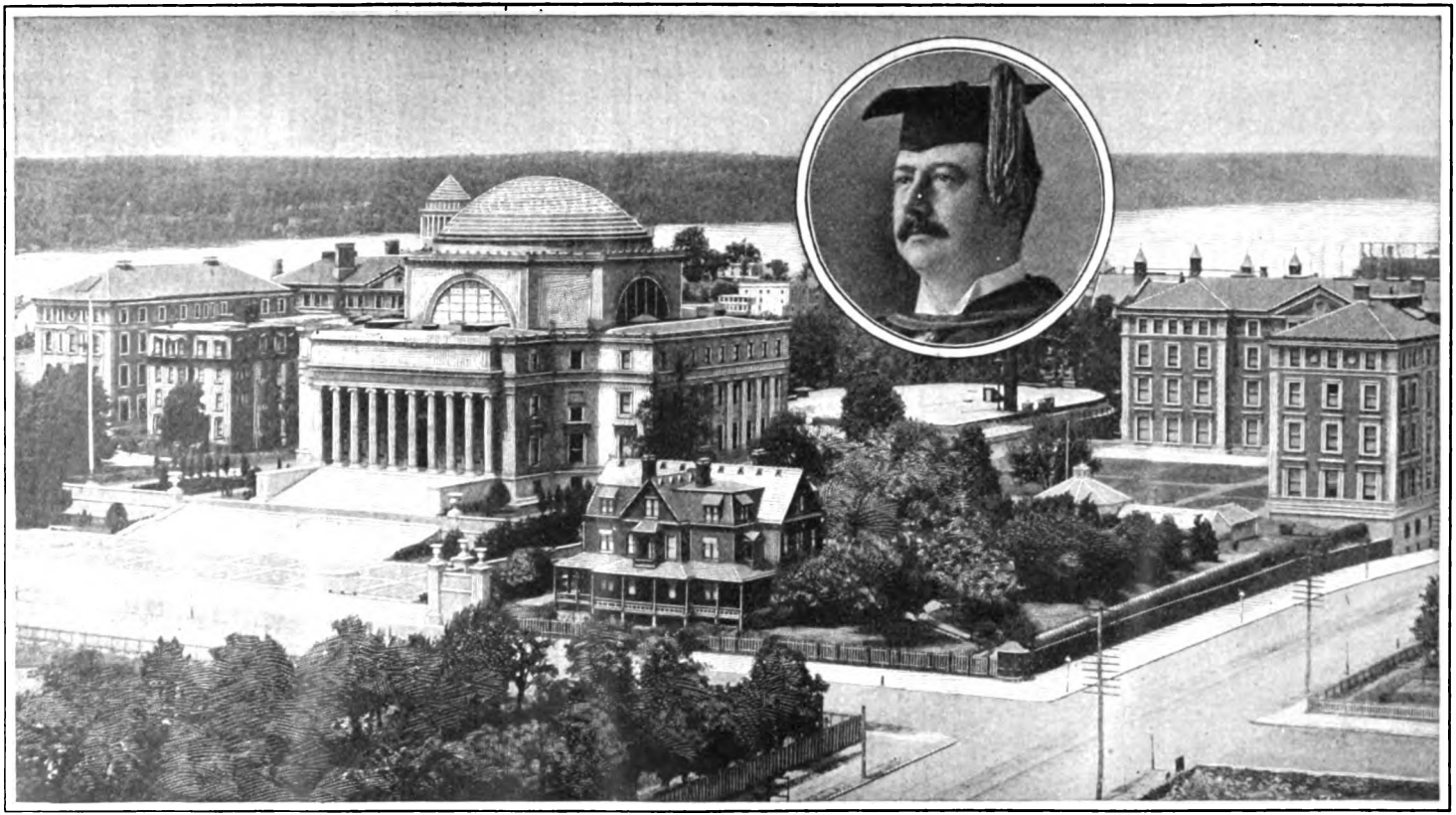
CORNELL UNIVERSITY, ITHACA, NEW YORK—THE UPPER ENGRAVING SHOWS BARNES HALL, THE CHRISTIAN ASSOCIATION BUILDING; IN THE CENTER IS THE ARMORY, AND BELOW A GENERAL VIEW OF THE UNIVERSITY AND CAYUGA LAKE. THE PORTRAIT IS THAT OF THE PRESIDENT, JACOB GOULD SCHURMAN.

till the time was ripe for their prophecy to be fulfilled in fact.

THE FIRST AMERICAN UNIVERSITIES.

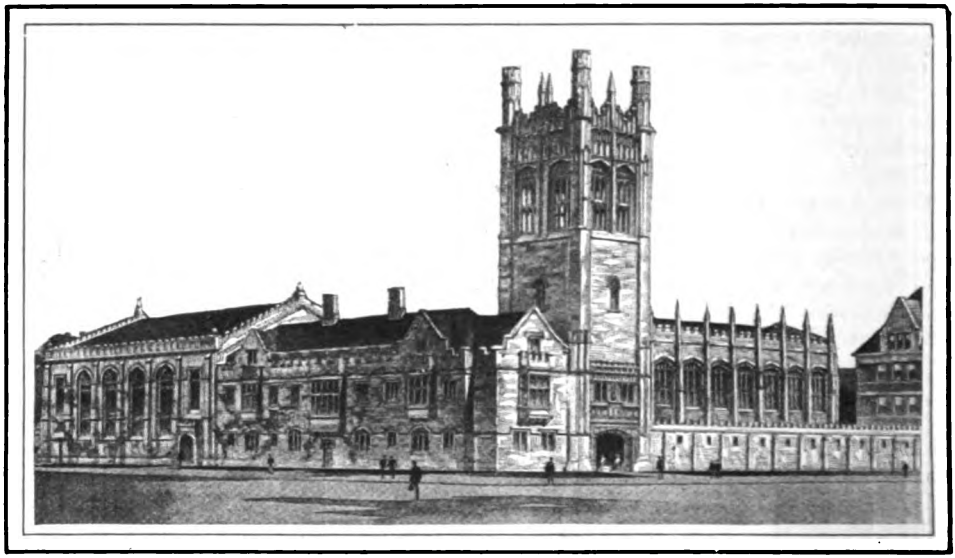
The early colonists were jealous of their position as educated men, and determined that their children should not decline in knowledge and intelligence. Yet few of the colonies made permanent foundation of schools upon such a liberal basis as insured a proportionate growth with the colony. The notable exceptions are Harvard, founded in 1636; Yale, in 1701, and William and Mary, in 1693. Among the colonial institutions still in existence, nearly all have had a more or less broken continuity. They are Bowdoin (Maine), Brown University (Rhode Island), Kings, now Columbia (New York), Dartmouth (New Hampshire), Princeton and Rutgers (New Jersey), the University of Pennsylvania, and Washington, now Washington and Lee (Virginia). Of these, Harvard and Yale, of the earlier group, have grown with each generation and are typical American universities, and the same is true of Columbia, Princeton, and the University of Pennsylvania in the second group.

Immediately after the Revolution there was a movement for the founding of academies and colleges, a movement which spread rapidly into the new West. There, in Kentucky, Tennessee, and Ohio, it gave birth to academies which somewhat prematurely set up the curriculum of colleges, and in the largeness of expectation which has ever characterized the West—whether trans-Appalachian, trans-Mississippi, or transcontinental, first flung out the banner of the "university." Thus Transylvania University burst its chrysalis on January 1, 1799, while Harvard and Yale, long after they had become universities in fact, clung to the time honored name of college.



A GENERAL VIEW OF THE NEW BUILDINGS OF COLUMBIA UNIVERSITY, WITH THE LIBRARY IN THE CENTER—THE PORTRAIT IS THAT OF THE PRESIDENT, SETH LOW.

From a copyrighted photograph by Sidman, New York—The portrait of President Low from a photograph by Rockwood, New York.



PART OF THE NEW BUILDINGS OF THE UNIVERSITY OF CHICAGO—ON THE LEFT IS MANDEL HALL; IN THE CENTER, A STUDENTS' CLUBHOUSE; TO THE RIGHT, BEYOND THE TOWER, THE COMMONS, OR DINING HALL.

The early type was based upon the colleges of the English universities, especially Cambridge, in which the American clergy had largely had their academic training. The instruction was relatively upon a low standard, and tended to gravitate rather to the type of the so called English colleges, or public schools, of Eton and Winchester. The chief subjects of instruction long remained elementary mathematics, Latin, and Greek. The impulse in the founding of the earlier schools having been given very largely by the clergy, there was always some instruction in mental and moral philosophy, and generally in history, which was really treated more as applied philosophy than as pure history. The practical demands of the pulpit and the controversial atmosphere of the times put a high value on what now appear to have been very dry and formal courses in rhetoric and logic. The sciences were in their infancy, but the claims of chemistry, physics, and astronomy were not wholly neglected. Indeed, the fact that they early found a place in the American curriculum shows the relative liberality of our colleges as compared with most European schools of the same grade and purpose.

It was unfortunate for the American people that, while they were struggling with high ambitions and keen practical vision for some basis for their educational system, they had so little to aid them in the mother country. The English universities had fallen into a sleepy old age in the eighteenth century, from which they have even yet but half aroused themselves. Jefferson saw this, and invoked the French influence in his foundation of the University of Virginia, in 1825, setting an example which affected many Southern institutions.

About 1840 England turned to Germany for more vital methods; the leaders of thought in New England took the same course at a somewhat earlier time. Gradually German influence brought about radical changes. The new suggestions fell upon a rich field. The time was fully come for American educational growth. Many ideas of native origin were stirring, such as those associated with the personality and work of Horace Mann, which embraced the thorough organization of the public schools, a normal school system, and the coördination of the education of women with that of men.

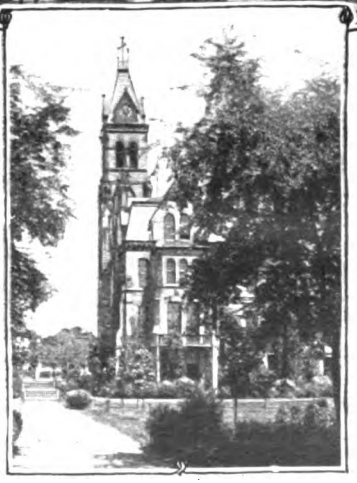
THREE GREAT FACTORS IN OUR UNIVERSITY DEVELOPMENT.

Two or three definite ideas became clearly marked in American education

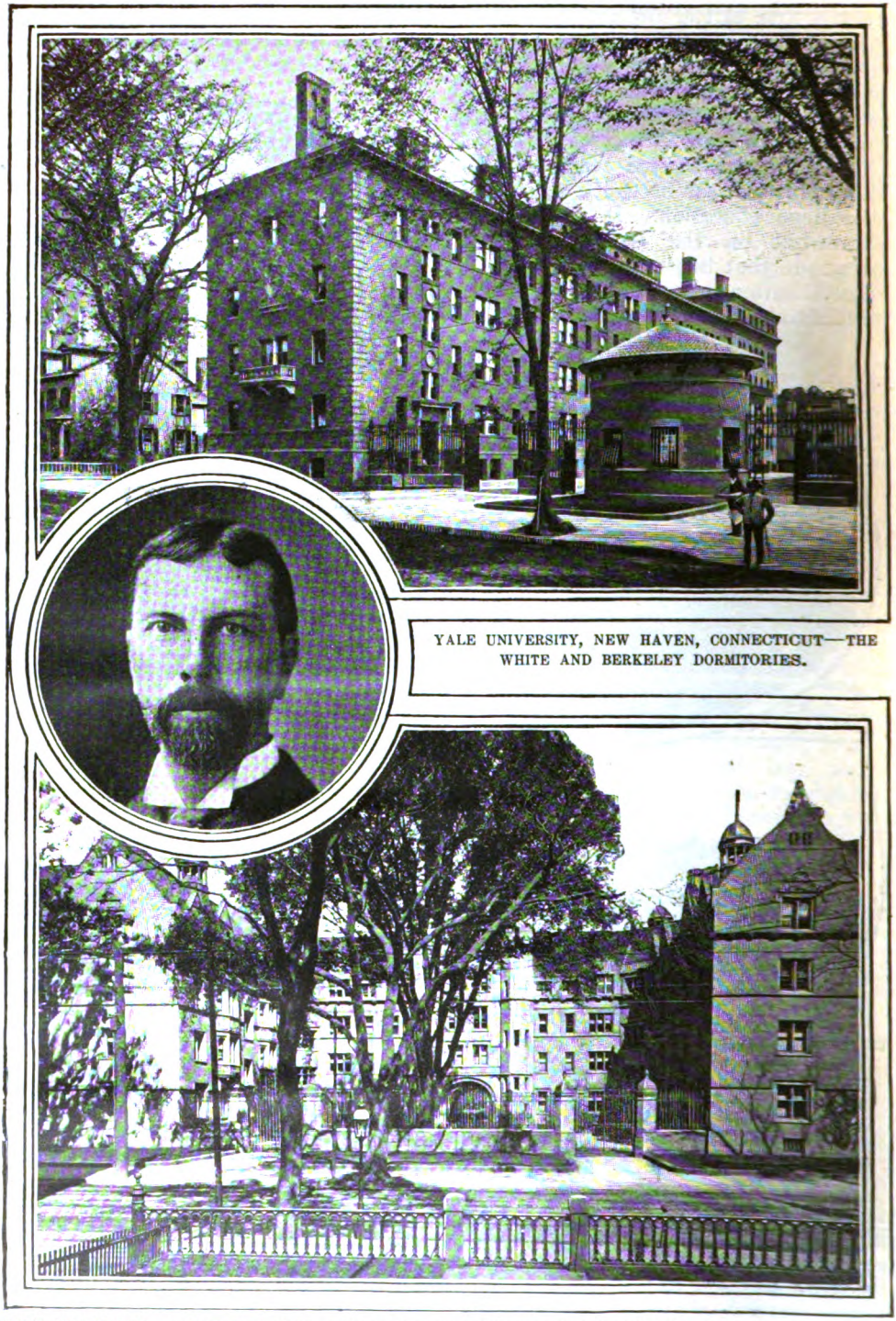
in the first half of the nineteenth century. They were not always properly connected, but as they were more and more widely accepted, it became necessary for educational reformers to unite them.

The first to become really dominant was the necessity of a college education. It was somewhat on the economic principle that in the progress of civilization luxuries precede necessities. Where few enjoyed this distinction, it was highly valued. The energies of an entire family were devoted to the proud purpose of giving the most promising son the privilege of "going to college." As the privilege was rare, the most unusual knowledge acquired was the most highly valued. Hence, instead of the colleges being degraded to the practical requirements of a new country, they were stimulated to maintain an honorable eminence as intellectual leaders in communities that were rapidly advancing in wealth and material progress.

THE UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA—THE UPPER ENGRAVING SHOWS THE INTERIOR OF THE LIBRARY; BELOW, ON THE LEFT, IS COLLEGE HALL; NEXT IS THE BUILDING—



—PRESENTED TO THE SCIENTIFIC DEPARTMENT BY GEORGE W. DAWSON; BELOW, THE NORTH END OF COLLEGE HALL. THE PORTRAIT IS THAT OF THE PROVOST, CHARLES C. HARRISON.

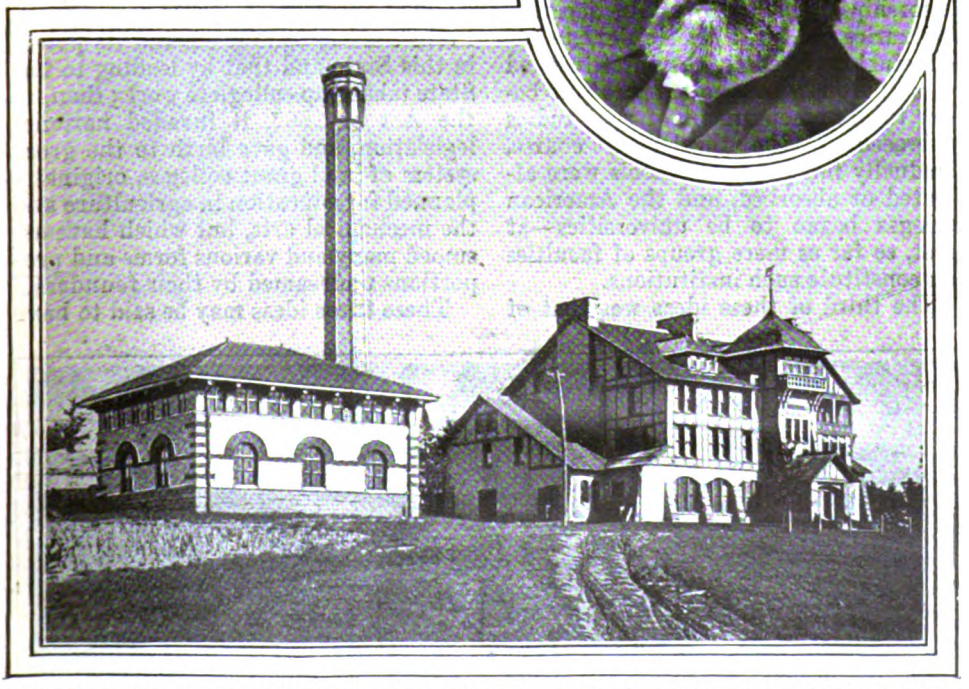


YALE UNIVERSITY, NEW HAVEN, CONNECTICUT—THE WHITE AND BERKELEY DORMITORIES.

YALE UNIVERSITY—VANDERBILT HALL, THE FINEST COLLEGE DORMITORY BUILDING IN AMERICA. ABOVE IS A PORTRAIT OF THE PRESIDENT OF YALE, ARTHUR TWINING HADLEY.

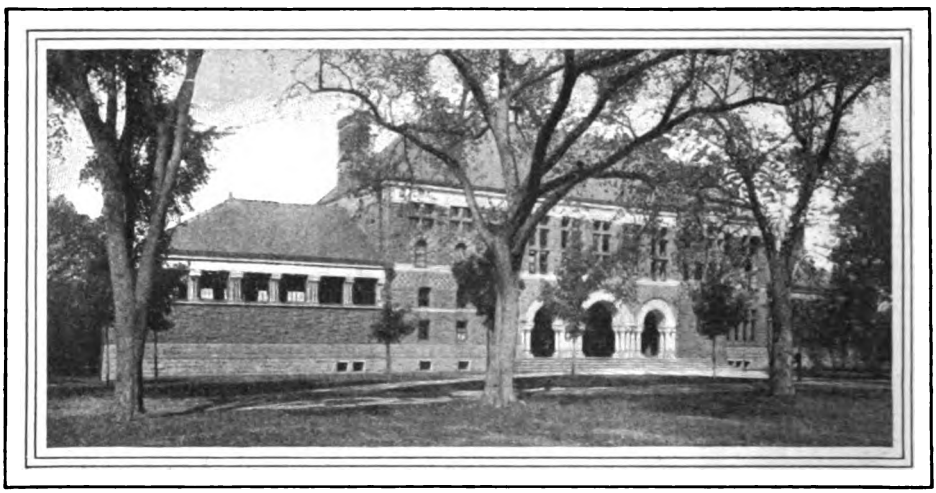
From photographs by Pach, New York, and Randall, New Haven.

THE UNIVERSITY OF WISCONSIN, MADISON, WISCONSIN
—THE LIBRARY BUILDING.



THE UNIVERSITY OF WISCONSIN—THE AGRICULTURE AND DAIRY BUILDINGS, WITH THE POWER HOUSE. ABOVE IS A PORTRAIT OF THE PRESIDENT OF THE UNIVERSITY, CHARLES KENDALL ADAMS.

The portrait of President Adams from a photograph by Curtiss, Madison.



HARVARD UNIVERSITY, CAMBRIDGE, MASSACHUSETTS—THE LAW SCHOOL.

The second was the growth of professional schools, often independent of college connection, sometimes connected with colleges. The early training in the professions was obtained by the sending of young men to study under preceptors. The clergy first departed from this method, to establish theological professorships, which grew into separate seminaries. Always the leaders in intellectual movements, they first insisted on a thorough college preparation before the commencement of the studies embraced in the theological course. Gradually independent schools were affiliated or absorbed, and the American colleges began to be universities—at least, so far as mere groups of faculties can constitute such institutions.

The third of these ideas was that of the public obligation to provide free schools—an idea of vast possibilities, many of which have been realized, and the end is not yet. It flourished first in New England. Gradually it carried the free school over the Northern States and made steady conquests in the South. From primary it advanced to secondary education, then to normal training. From time to time it showed its power in this State and that by leading to the State taking up collegiate work; then, in the Act of 1862, it invaded national legislation, and gave birth to the great system of land grant colleges, originally planned for education in agriculture and the mechanical arts, but which have assumed many and various forms and proportions undreamed by their founders.

These three ideas may be said to have

HARVARD UNIVERSITY—THE COLLEGE YARD AND TWO OF THE OLDER BUILDINGS, STOUGHTON AND HOLWORTHY HALLS.

been the great shaping influences that have given form to American university development. They have been combined in endless variety; they have been reinforced by many other influences; yet these have been fundamental. In general, we may say that university growth has been due to a wide spread popular estimate of the value of a college education, to the bringing together into a single system of independent schools, and to a great public system of free education, which has prepared students for collegiate and professional courses, and has set up rivals for the older institutions in a great number of State colleges and universities.

HARVARD UNIVERSITY—THE LIBRARY, WHICH IS THE BEST COLLEGE LIBRARY IN AMERICA, CONTAINING MORE THAN HALF A MILLION VOLUMES.

WHAT CONSTITUTES A UNIVERSITY?

But university expansion in America has had some very unique features, which need to be especially noted. Those under the influence of the more formal type of German thought are wont to define a university as an institution of higher education which has faculties of arts, law, medicine, and theology. This is a poor definition, setting form above substance, and the body above the spirit; yet it has had a great influence in university growth. Thus Harvard, chartered in 1636, maintained its faculty of arts alone till 1783, when it first added a medical faculty. The law department dates from 1817, and the divinity school from 1819. The sister university in Connecticut, in many ways a contrast to Harvard, developed in this direction more slowly, and always with great conservative loyalty to the arts course as the center of Yale life. Yet Yale entered, by affiliation, into the medical field in 1814, into law in 1843, and divinity in 1867.

It is interesting to note that Columbia, situated in the metropolis, while following a similar course with the opportunity of affiliation almost thrust upon it, did not incorporate departments of law and medicine till so late as 1858

and 1891, and has now only very slender ties with the nominally affiliated theological faculties. The University of Pennsylvania only recently provided a law school, and is still without any sort of theological faculty. It is yet more striking to observe that, of the three great American colleges, Princeton has steadily resisted the temptation to add professional faculties, and has advanced to the university rank and name by virtue of its claim to do university work in intention rather than in extension, in spirit rather than in form.

WILLIAM R. HARPER, PRESIDENT OF THE UNIVERSITY OF CHICAGO.

From a photograph by Gibson, Chicago.

BENJAMIN IDE WHEELER, PRESIDENT OF THE UNIVERSITY OF CALIFORNIA.

From a photograph by Wilcox, Berkeley.

CHARLES WILLIAM ELIOT, PRESIDENT OF HARVARD UNIVERSITY.

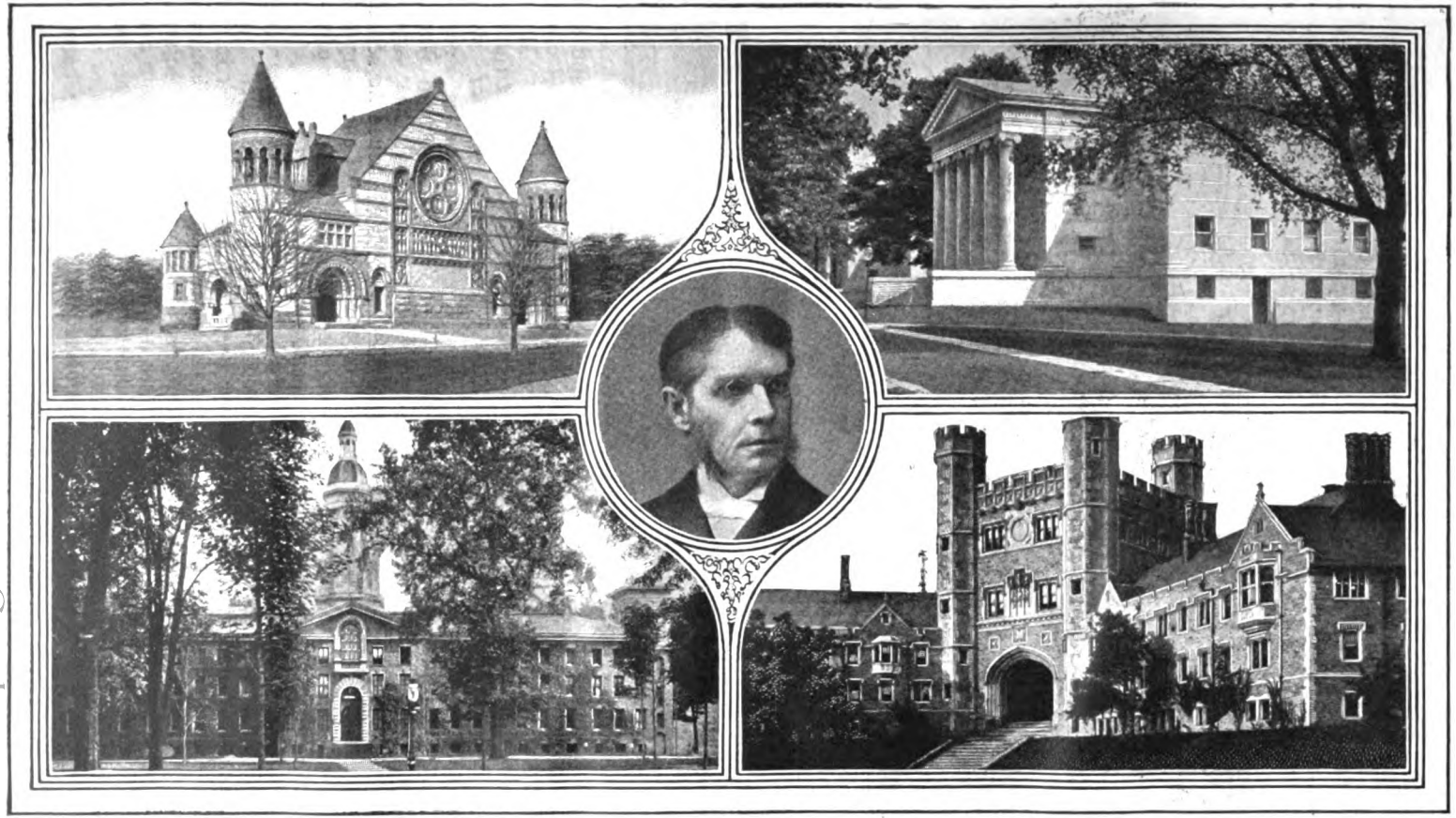
From a photograph by Notman, Boston.

THE ASCENDANCY OF SCIENCE.

Perhaps the most potent influence in that university expansion which appeals to the eye, and which has found expression in the magnificent buildings that adorn so many of the college grounds, has yet to be mentioned. This is the progress of science and invention, and the material wealth which has come forth from it since the middle of the century. Before it began to be felt, the colleges were largely classical and philosophical. The branches of science taught were dealt with in the most elementary way; the instruction was from text books, there were few experiments and no laboratory work. As science began to advance, provision was gradually made for its teaching. A few feeble polytechnic schools came into existence to meet the practical demand for civil engineers. Men of practical taste and adequate wealth, finding an illiberal spirit in the college faculties of instruction, offered to endow coördinate faculties for scientific teaching. Thus the Lawrence School was established at Harvard by a gift of a hundred thousand dollars in 1847, and a similar school, afterwards the Sheffield School of Science, at Yale, the same year. In due time, as the various forms of engineering and applied science grew in importance, these schools began to take on the distinctly polytechnic type, and similar schools were added in many places, as the John C. Green School, at Princeton (1873); the School of Mines, at Columbia (1864); and the Pardee School, at Lafayette (1866).

THE INSCRIPTION ON HARVARD HALL, HARVARD UNIVERSITY, RECORDING THE ORIGINAL AIM OF HIGHER EDUCATION IN NEW ENGLAND.

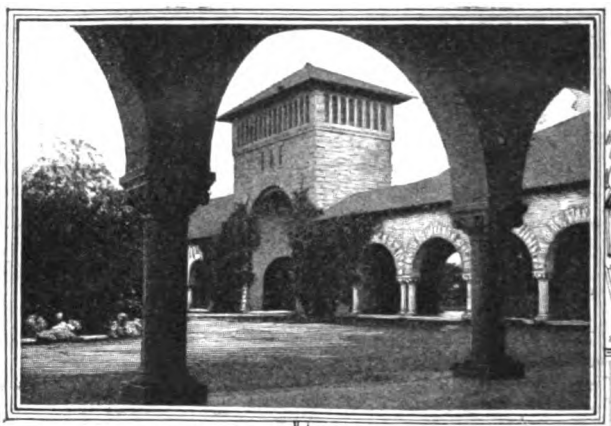
This marked the adoption, in the fullest sense, of scientific thought and purpose into the academic field. As yet it was as a separate faculty, and, from the European point of view, one out of place

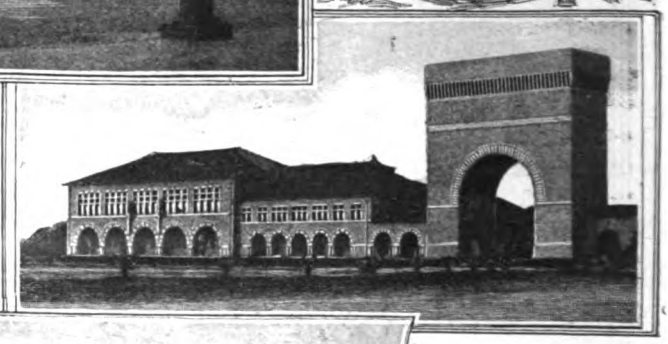


PRINCETON UNIVERSITY, PRINCETON, NEW JERSEY, AND ITS PRESIDENT, FRANCIS LANDEY PATTON—ABOVE, ON THE LEFT, IS ALEXANDER HALL; ON THE RIGHT, CLIO HALL, THE BUILDING OF A LITERARY SECRET SOCIETY. BELOW, ON THE LEFT, IS NASSAU HALL ("OLD NORTH"); ON THE RIGHT, BLAIR HALL, AND THE MAIN GATEWAY LEADING TO THE COLLEGE GROUNDS FROM THE RAILWAY STATION.

The portrait of President Patton from a photograph by Rose, New York.

in a university. Indeed, the complete assimilation of the departments of applied science is far from adjusted now. Yet the claims of these practical callings of engineering and chemistry, supported as they were by the wealth that they had brought to their votaries, accompanied by gifts for laboratories and endowments for professorships, took precedence over the pure sciences in receiving university recognition.





LELAND STANFORD JUNIOR UNIVERSITY, PALO ALTO, CALIFORNIA—THE CENTRAL ENGRAVING SHOWS THE LIBRARY, ASSEMBLY HALL, AND MEMORIAL ARCH; ABOVE AND BELOW ARE VIEWS OF THE INNER QUADRANGLE. THE PORTRAIT IS THAT OF THE PRESIDENT, DAVID STARR JORDAN.

The American mind is at once practical and liberal. The English are less open minded. Conservatism, to them, is not a means to an end; it is, as often as not, an end in itself. So Oxford has failed to identify itself with the greater England of today, and is content to influence that part of English thought which it molded in the seventeenth century. The college of which I was a member in my student days has now the same buildings and the same plan of instruction it had when William Penn obtained his grant of Pennsylvania. He who seeks classical and historical training may find it there, vital and in touch with contemporary scholarship, but the college knows nothing of the culture and the force to be gained from the natural and the physical sciences. It is proud of the careers of such sons as Sydenham and Wren, but has established no school of chemistry and biology in memory of the one, or of architecture in honor of the other.

As soon as graduates of American colleges realized that they had failed to get what they needed for their work in the dear old college days, they set about securing for others what they had missed. It was not long before there was a response from the professors of pure science, and, in due time, chairs were established and equipments purchased.

THE ELECTIVE SYSTEM.

Then a new and difficult question presented itself. The old college course

was a well tested and closely articulated curriculum. Every part was nicely adjusted to every other part. The great staple was the historic humanities—the classical languages, with their literatures, embracing philological, philosophical, and historical teaching. The modern languages, some little physical science in a more or less narrow place, mathematics, enjoying considerable favor as far as the elements of calculus, and very humble applications in simple mechanics and surveying, completed the curriculum. The course was planned for boys, and was well adapted to develop them into strong men. It was not fitted to make scholars, and the new ideas demanded more knowledge as well as a wider curriculum.

An intense struggle began and is still going on. President Eliot, of Harvard, became the leader of the party which demanded the admission of the sciences on an equal footing with the old subjects. The practical method by which this was to be secured was the so called elective system, which allowed the student to choose from large groups what courses he would pursue. At first this choice was confined to the last year of the college course. Then time was gained by raising the entrance requirements, and the choice was extended into the junior year. From year to year the program of this school of educators became more and more radical, until it has finally taken up a position which practically asserts that all branches have an equal educative value if pursued for equal periods with equal earnestness. The result has been that Harvard practically asks nothing of its students in the college department, when once admitted, except a fairly definite purpose in the choice of studies made from its various and highly diversified courses. This tendency was met elsewhere by a more moderate use of the elective system, and by the arrangement of a number of parallel courses, definite in conception and leading to different degrees.

Two things have grown out of the elective system everywhere. The newer sciences have come into the colleges with a growing demand for more teachers, more time, more equipment, and the amount of study given to each subject has greatly increased. This has reacted on all the teaching in all the departments, creating a demand for more Greek and more Latin, and better teachers of both.

SPECIAL KNOWLEDGE AND GENERAL CULTURE.

In the older days a single professor taught Greek and Latin, and often some other subject, such as philosophy. In the department of science, the natural and physical sciences were sometimes all in a single teacher's charge. While the teaching was often admirable, most of the sciences were but half developed, and all the instruction was elementary. But when the whole field of learning was being worked with marvelous results, specialists were naturally produced, and even humble students, who had no room in a busy life for research, were kept alert and active in merely following the researches of others. The teacher became a living worker, and longed to impart what he was daily learning. In consequence, the colleges gave themselves heartily to the movement for higher entrance requirements, and more extensive courses in every branch of learning.

It was plain to many wise teachers that this too eager pursuit of special knowledge was breaking up the power that had so long worked through a broad and thorough curriculum, without replacing it by a real mastery of special subjects. The true nature of the university became a great subject of discussion. It was made plain that the American college was not the equivalent of the philosophical faculty of the German university, and that the too eager Germanizers were wrecking the most vital factor in American education in a rash attempt to bend it to a new and alien end. These leaders began the advocacy of graduate courses, conducted on the true university principle of high specialization, extended investigation, and absolute freedom of choice. In 1876 Johns Hopkins University was opened. Working on this plan of supplementing, instead of supplanting, the admirable college course, it has done a splendid service to American education.

It has become clear that the univer-

sity purpose is best fulfilled in this country through the professional schools, on the one hand, and the graduate courses on the other. These courses are now conducted by the ablest specialists in America. They cover the widest possible range of scholarship, and are well supported by endowments and admirably supplied with laboratories and libraries. Professor Munsterberg of Harvard, looking through German glasses, thinks they do not as yet possess much fruit in "productive scholarship," but he has his eyes too much on books and academic performances, too little on men and economic and social forces. Though in their first age, and in some things too conscious of their own importance, the graduate faculties of American universities have accomplished a great deal in making plain the value of research and specialization as the real university work, and in discrediting the imitation of university work which has in some places been palmed off on a too credulous public in connection with the teaching of boys in colleges.

THE EDUCATIONAL DEPARTMENT STORE.

It remains to note the extension of universities by the addition to them of other faculties not historically connected with them, and the final extension of the name to cover the great "department store idea" in education. Thus, the medical school in this country early developed a very useful offshoot in the school of dentistry. A school of pharmacy followed, and the science and its application went a step farther in the school of veterinary medicine.

Some of the newer institutions, catching the popular feeling in favor of the combination suggested in the development of the medical field, at once began to make the standard of the university the old but somewhat discredited one, of a *studium generale*, in the sense that any one could learn in it anything conceivable. Thus, the prospectus of the Leland Stanford University announced that provision would be made for the instruction of any one in any subject demanded, and that the only qualification required would be a letter setting forth clearly what the writer wished to learn. This can scarcely be regarded as a step in university expansion. It was rather university degradation.

The University of Chicago has taken up the idea of making a university a universal educational institution, and has achieved a popular success. It has had enormous financial resources, a remarkable executive, and a great field. At present its organization consists of five divisions. The first of these contains the professional schools, graduate schools and colleges of arts and science, and also an academy. The fourth contains the natural adjuncts to the schools and colleges, the libraries, laboratories, and museums. When we pass beyond these divisions we are in a position of doubt as to the attitude the remaining divisions bear to the university idea, or, indeed, to any sound educational scheme. The second division, for example, is that of "university extension," and includes a correspondence study department; the fourth is "the University Press," with a "department of purchase and sale"; the fifth consists of "the university affiliations," and includes "the work done in institutions which, although not forming an organic part of the university, have entered into the relationship of affiliation."

The wide scope of such an institution makes it possible for it to give great service, but it may be doubted whether the highest service of university leadership is not lost in an attempt to carry on too many of the departments of approved and unapproved educational work.

THE NEED OF A MORE PERFECT SYSTEM.

And here is the great weakness in the university development in America. On the foundation of the college and the "land grant" school of agriculture and mechanics we have erected splendid groups of buildings, and have peopled them with capable professors and eager students; but each in turn has followed a policy of rivalry instead of coöperation, of repetition instead of supplement. Clark University stands out as a lonely attempt to do a few things supremely well. Why is it not possible to avoid the endless repetition of costly equipment, and secure a cordial coöperation? Some work admirably done in one university

may well be supplemented in another. A system of migration, such as is common in Germany, would enable a graduate student at Princeton to spend part of his time at Columbia or Johns Hopkins with due credit. An eminent foreigner, who is now a professor in one of our universities, made this experiment not long ago. The trustees deemed his act a blow at their claim to absolute and final possession of all knowledge, and made it the subject of a formal rebuke.

The growth of the past half century is remarkable from every point of view. It is to be hoped that the next half century will place a higher value on the university spirit in all forms of work, will more clearly recognize the limitations of the university as an institution, and of individual universities as effective forces, and develop a spirit of coöperation which will place learning above local reputation, and productive scholarship above the number of students.

Insects as Carriers of Disease.

BY SMITH ELY JELLIFFE, M. D., PH. D.

HOW THE PLAGUE, CHOLERA, CONSUMPTION, AND MALARIA ARE SPREAD BY FLIES, MOSQUITOES, AND OTHER INSECTS—WHAT CAN BE DONE TO GUARD AGAINST INFECTION.

UNTIL a quarter of a century ago imperial Satan was held personally responsible for most of the ills that Providence mysteriously permitted human beings to suffer. Today the microbe is king of evil; plagues and pestilences, pox and murrain, are laid to its door.

In the reign of Satan, the afflicted were perpetually asking why. Why should the just suffer with the unjust? Why should the devout man be smitten by smallpox, regardless of his godliness? Why should the missionary contract cholera along with the unregenerate heathen? The answer of modern science is by no means irreverent when it establishes the fact that prayer will not take the place of antiseptics, and that the microbe is no respecter of persons.

In this era of the microbe, the scientist is continually asking how. How does the cholera blow out to sea, and breathe death to a passing ship? How do the vapors of the stagnant marsh cause the blood to become full of malarial germs? How do cattle contract Texas fever by simply grazing in meadows where other sick cattle have been? How can one sore eyed child in a little Florida schoolhouse give sore eyes to another child, and to the whole community besides, without leaving its bench?

MANKIND'S MICROSCOPIC ENEMIES.

The microbes of disease are such minute and inoffensive germs of life, they lie so innocently in little groups of pink and blue stained dots or scratches under the microscopist's three hundred magnifying lens, that we wonder how they can be capable of so much evil. Even though we accept the statistics that each one can run up into the billions every twenty four hours, and that they devour the elements of human blood, leaving poisonous toxins behind, we cannot see how they can leap from one person to another, how they can jump across a river, or up three stories in the air, or survive boiling and sunlight and chloride of lime.

The "how" question may be answered in almost the same words as the how of the botanists, who used to wonder how the pollen of plants got from one blossom to another. It has long been evident that just as the pollen of the pine could be blown from tree to tree, so the germs of consumption could be carried by the wind; and just as the cocoanuts of the palm could be washed down