

the leaders of the masses. That position is achieved but slowly, and in the face of the prejudice which is perhaps cognate with the belief that all men are equal. The power must be demonstrated, and the place gained, ere the superiority is acknowledged.

The force with which these results are outwrought, swaying and moving the moral world, and through it the physical, finds its fulcrum in the school-room, and its lever in the press. Through these two agencies are accomplished all that is worth doing in the government of the masses. The first develops the mind, and the latter influences and tones its action. The daily issues of the press are the great exponents of popular thought and motion, and are always resorted to by those who would change or vary the popular mind and will. In the hands of the really able man, the newspaper is an engine of great power; it not only records, but it stimulates; it tells what has been done, and sets men to thinking on what might have been accomplished, and what ought next to be done. It is at once an epitome of the present and an index of the future. It treats alike of national policy, municipal progress, commercial development, and social improvement. It indicates, with equal accuracy and facility, the peculiarities of all that comes within the sphere of observation, and unearths facts not hitherto observed; while it also points out the pecuniary, sanitary or moral capital which lies couched in certain conditions and locations, like gold in the unwrought mine, and incites to improvement of the opportunity.

The life record of WILLIAM BROSS contains all these elements of power, manifestation and action. His physical powers were first cultivated by hard labor in the lumber regions; his mental faculties were then improved by a course of assiduous study; while his self-reliance and perseverance were early taxed

to the utmost, by the fact that his education was achieved in the face of debt. We next find him laboring as the instructor of youth, laying broad and deep in the juvenile mind the foundations of true worth; and soon thereafter he steps forth into his more matured sphere of labor as the newspaper editor. How well he succeeded in the latter capacity, the present condition of Chicago and the great Northwest tells faithfully; for to him, perhaps more than to any other man, is due the fact that Chicago is known to all the world. In each and every position, he has been noted for informing the people and inciting them to think and to act. His recognition by his adopted State, as a man worthy to hold high office, was the natural sequel to his labors.

Mr. Bross is the eldest son of Deacon Moses Bross, who has resided for many years past in Morris, Grundy county, in this State. He was born in New Jersey, in the northwest corner of Sussex county, about two miles from Port Jervis. He first saw the light on the 4th of November, 1813, in an old log house situated in a romantic spot, which has recently been placed on canvas by the well known Sontag. Mr. Bross spent the first nine years of his life in Sussex county, and then removed with his family to Milford, Pennsylvania, where he lived till he attained to manhood. When work was commenced on the Delaware and Hudson Canal, his father entered on the lumbering business near Shohola, in Pike county, and furnished the timber for the locks and bottoms for a good portion of the canal. WILLIAM accompanied the "Deacon" to the woods, and there labored with the axe for many months. The work was severe and monotonous, but it was of the greatest value in shaping the future man; it developed his muscular power to a high degree, and fitted his constitution to bear, uninjured, the heavy tax subsequently imposed by his mental labors.

His classical education was commenced in 1832, at the Milford Academy, under the charge of Rev. Edward Allen. He entered Williams College two years afterwards, and was soon known as a promising student, though his preparatory studies had been materially interfered with by his labors in lumbering and rafting. He graduated with honor, in 1838, but was then in debt for his education to the extent of six hundred dollars. With this load he began life, and his first earnings were religiously set aside till the incubus was lifted. He was then a young man, struggling up the hill of Difficulty; but he traveled along the right path, and manfully mounted step by step. Twenty-eight years afterward—in 1866—having proved himself one of the worthiest among the many worthies who had graduated there, he delivered the address to the alumni of "Old Williams." He had conquered the toilsome ascent, and was looked up to by the hundreds who had little more than begun the journey, as an illustrious example of what can be achieved by one who is determined to excel.

Mr. Bross became principal of Ridgebury Academy, near his birthplace, in the Autumn of 1838, and taught at Chester for another five years, then terminating his career as a teacher by embarking in another sphere of action, but leaving behind him much valuable seed, which afterward fructified most worthily. Many of his pupils have since won for themselves a fame worthy of their master. Mr. Bross was known as a thorough classical scholar, and a great lover of the natural sciences. He was also an ardent student of natural history, and his teachings were marked by a broad acquaintance with American history.

In October, 1846, Mr. Bross started out West; not with the intention of settling, but to increase his stock of knowledge of the American continent. He visited Chicago, St. Louis, and other

Western cities. Chicago, though then an apparently unimportant town—not a commercial emporium, but literally a "Garden City"—was recognized by his cultivated eye as the future focus of the great Northwest, when that Northwest should unfold its manifest destiny. He decided to make it his home. He returned to the East, closed his school, and moved to Chicago, arriving here on the 12th of May, 1848, as the active partner in the bookselling firm of Griggs, Bross & Co. The firm was composed of S. C. Griggs, WILLIAM BROSS, and the house of Newman & Co., of New York, each of the three parties having an equal interest.

The business was commenced here by Mr. Bross, who continued it alone till autumn, when Mr. Griggs came here from the East. He continued in the firm about fifteen months, and then signified his wish for a dissolution of the partnership, on the ground that the profits were too small. The house of S. C. Griggs & Co. is now known as one of the leading book houses of the United States. E. L. Jansen, Esq., the youngest brother of Mrs. Bross, has been for many years past a leading member of the firm.

In the fall of 1849, Mr. Bross commenced the publication of the *Prairie Herald*, in conjunction with Rev. J. A. Wight. He continued the issue of this paper for about two years, with but moderate success, and soon after united with the late Postmaster, John L. Scripps, to publish the *Democratic Press*. The first number was issued September 16th, 1852, with a list of about one hundred subscribers to the daily, and two hundred and fifty to the weekly.

This paper was "started" with a definite object—not as a mere shift. The proprietors had carefully canvassed the situation, and come to the conclusion that Chicago and the West were about to enter on a rapid and tremen-

dous growth. They saw that this was inevitable; but they also recognized that the extent of that growth would largely depend upon the impression which Chicago should make abroad. Mr. Bross at once bent himself to a study of the resources of this region, and then set about, with equal diligence, to let the world know their character and extent. He felt that all that was necessary was to exhibit the facts; that the inference would be irresistible; that the brain and muscle, the energy, enterprise and capital needed to develop this fruitful scene, would roll in like the tide of ocean, if the world was posted in regard to what was being done here, and what could be done. He resolved to make the *Press* a good commercial and statistical paper. With him to resolve was to do.

That year was really an epoch in the history of Chicago; it marked the beginning of her real prosperity. In 1852 the city was opened up to direct relationship with the East, by the two great iron arteries known as the Michigan Southern and the Michigan Central Railroads. The roads now leading westward from Chicago were also all projected, and some of them begun; the Galena road being pushed as far as Elgin, and the Rock Island road to Joliet, while workmen were busy on the track of the Illinois Central. Our city was emerging from the lethargy which had weighed her down since the panic of 1837, and was asserting her claim to be the great railroad and commercial focus of the Northwest.

The *Press* was established as a political paper, as well as with a commercial object, and it took the side indicated by its name—the *Democratic Press*—but in the conservative way, and in especial opposition to the considered intense abolition doctrines advocated by John Wentworth. When Douglas brought out his bill to repeal the Missouri Compromise, in the winter of 1853-4, the

new paper opposed him and it with all the energy of which its editors were capable, and probably operated more powerfully against him in the discussion of the Nebraska question than any other influence that was brought to bear on the issue.

But the *Democratic Press* soon changed its politics. When the Republican party was formed in the autumn of 1854, Mr. Bross at once embraced the doctrines enunciated in its Springfield platform, and thence forward labored hard and eloquently, both with voice and pen, in advocating them. He delivered his first political speech at an impromptu meeting held in Dearborn Park, to endorse the nomination of John C. Fremont, on the evening of the same day on which the General was nominated. That was the first public endorsement the Pathfinder received in the West. Mr. Bross now took the stump in earnest, going into Southern Illinois, where the darkness of Egypt reigned supreme, and attacked democracy in its stronghold. He made the only speech delivered in Cairo in favor of Fremont. He has taken the stump in every subsequent canvass, generally going through the central and southern portions of the State, where the opposition was most bitter; and his labors during the fifteen years which have now elapsed since he made his maiden effort have been of great value to the Republican party.

Mr. Bross wrote as powerfully as he spoke, and the *Democratic Press* was soon recognized as one of the ablest political journals of the day; but it was as a commercial paper that it took the lead, being, in fact, the beginning of the commercial literature of the city. The first financial article that ever appeared in a Chicago newspaper, was written by Mr. Bross in the *Democratic Press*, and it was followed by a consecutive series of reports, which quickly established it as the commercial paper

of the city, and formed the foundation of the full and accurate commercial reports in the Chicago dailies, which are conceded to have no superior in the world.

There was comparatively little of quotation to do in those early days, for long thereafter the attendance of members of the Board of Trade was so fitful that it was necessary to provide daily "refreshments" as a means of drawing a quorum on 'Change. But there was plenty of the more valuable and general work to be done, and here Mr. Bross was in his element. He never wearied in writing up Chicago and the Northwest. He was satisfied that if the people of other sections could be brought to understand the extent of our natural and acquired advantages, wealth of money and muscle and brain would flow hitherward like a torrent. His every spare moment was devoted to this end. He was indefatigable in the collection of facts and statistics, and his pen was ever kept busy in collating them and giving them verbal shape. These facts and figures were not only published as newspaper articles, but were thrown into pamphlet form. The first of these pamphlets was issued in 1854, and contained a full description of the railroad system which had then been prospected out, with radiating lines from Chicago to every point of the compass except those lying lakeward. The latter part of the pamphlet contained a brief but comprehensive history of the city from its origin to date, and a review of its trade and commerce for the year then just closed. This pamphlet was widely circulated over the East and in Europe, and first told to thousands the fact that there was such a place as Chicago. This was the first of a series of annual summaries, which for many years served to let the whole world know what was being done in this section of the globe. Very many of those who read those statements have since traveled hundreds

and thousands of miles to make this place their home, and have materially aided in building it up to its present greatness.

Mr. Bross loved to write of Chicago in the then present; but he also delighted to sketch its inevitable future, as it appeared to him. Many, even among those who believed that Chicago would be a great city, regarded him as a visionary; but the most skeptical have since confessed that he saw and thought accurately, judging really of the future from the causes then operating around him, and not fondly guessing or lazily dreaming out visions of grandeur. Our subsequent history has realized almost all that he dared to predict; and all would have been long since actualized, but that the war for the suppression of the Rebellion, which none could foresee, interfered for several years with the internal improvement of the West. In his pamphlet of 1854 we find such words as these: "We are now in direct railroad connection with all the Atlantic cities, from Portland to Baltimore. Five, and at most eight, years will extend the circle to New Orleans. By that time, also, we shall shake hands with the rich copper and iron mines of Lake Superior, both by canal and railroad; and long ere another seventeen years have passed away, we shall have a great national railroad from Chicago to Puget's Sound, with a branch to San Francisco." On another page of the same pamphlet, after speaking of the advantages of the situation, glancing at the light death rates, and alluding comprehensively to the position of Chicago at the head of the great chain of lakes, as guaranteeing to her the focal point from and to which should flow, for all time, the articles consumed by, and the productions raised in, that immense region of country lying to the westward, he points confidently to the "free navigation of the St. Lawrence, by which means vessels

loaded at our docks will be able to make their way to the ocean, and thence direct to the docks of Liverpool." Looking around on the great coal fields of Illinois, the lead mines of Galena, and the grand copper mines of Lake Superior, he wrote that they all "point to Chicago as the ultimate seat of extensive manufactures." In the light of our present knowledge we might almost be tempted to think that these expressions were mere antedated history. Our railroad system now connects Chicago with every part of the continent. Long before the seventeen years have passed over his head, he has lived to see the great Pacific Railroad completed, and ship navigation around Niagara Falls almost a fixed fact. We are already manufacturing Lake Superior iron in our city, and our vessels carry its copper to the East; while our grain and pork trade have long since mounted far up into the millions. The position and character of Mr. Bross were recently summed up by a contemporary editor, in the following well merited words: "His commercial and railway articles, though often appearing to border on the fabulous, have been more than verified by the facts and figures gathered by the sober, careful statistician. He is, in fact, one of the best statisticians in the West; and this, together with extensive travel and careful personal observation, enabled him the better to foresee that wonderful progress destined to be so fully realized."

Mr. Bross also early foresaw the needs of our growing Western commerce, and advocated the extensions which would soon be imperatively demanded, though few then were willing to class them among the possibilities. The Georgian Bay Canal was one of his earliest projects. Studying the map of the Northwest as it then was, in the winter of 1854-5, his eye rested on the narrow strip of land which divided Lake Ontario from the Georgian Bay,

with rivers running in each direction from Lake Simcoe. He was familiar with the difficulties which had been experienced in passing the St. Clair Flats, and thought of the still greater obstacles they would offer to the augmented navigation of the future. He went down on South Water Street, where he met Colonel Hubbard, who had passed from near Toronto to the Georgian Bay with his canoes in 1818. He discussed the character of this route with him, and afterwards gathered from him and Captain Dorchester the facts from which he wrote up an article embracing the main points of the subject. The late George Steel was so well pleased with the article that he distributed copies of it all over the Canadas, and enlisted the interest of thousands in the project. The scheme for a canal was so favorably received that a convention was held in Toronto in September, 1855, to take action in the matter; and the feasibility of the proposed route was fully demonstrated by the resulting survey, made by Kivas Tully, with Colonel R. B. Mason as consulting engineer. It is due to Mr. Bross to say that he furnished much of the statistical matter embodied in the report, and collected the funds necessary to pay for its publication.

In the year 1855, he was elected a member of the Common Council of the city of Chicago, in which capacity he served the public two years. His best energies were always employed in furthering the interests of the city, and the development of our commercial resources were advocated in every possible way during his term of office.

The panic of 1857, and the long period of depression which succeeded it, operated very disastrously upon the newspaper interests of the West. The *Democratic Press* was materially affected, and the *Tribune* also suffered somewhat. The proprietors of the two papers effected a consolidation on the

1st of July, 1858, and for two years thereafter the one paper was issued under the combined name of the *Press and Tribune*. The former part of the name was then dropped, and since 1860 *The Tribune* has been the title of the paper. The "Consolidated," as it was then called by the *Times*, was owned by six gentlemen—Messrs. Scripps, Bross and B. W. Spears, from the *Press*, and C. H. Ray, J. Medill, and A. Cowles, from the *Tribune*. Messrs. Bross, Medill and Cowles are the only ones of that number now connected with the paper.

Mr. Bross continued to work on the consolidated paper as he had done previously—with all his might. He devoted his principal attention to the commercial and statistical departments, while writing also on the political issues of the day. Down to a very recent date he furnished the daily financial article. Hence the course of the *Chicago Tribune* has been that of Mr. Bross; and we can scarcely sketch his course of life for the past ten years, without reference thereto—especially as the tendency of modern journalism has been to sink the individuality of the newspaper writer. So far as we speak of Mr. Bross, therefore, in his journalistic relations, we may be understood as speaking of his able associates. Under his and their management the *Tribune* has become one of the very best newspapers in the United States, and is acknowledged to be one of the most influential, as its corporation is now one of the richest. A good idea of its pecuniary status may be gathered from the fact that the company has erected, within the past twelve months, the just-completed magnificent fire-proof building on the corner of Madison and Dearborn Streets, in which the *WESTERN MONTHLY* is now published, and that the whole cost of the structure—more than a quarter of a million dollars—has been paid out of

the current profits of the paper, without calling for a dollar from the stockholders.

The contrast between "then and now" is forcibly shown by a reference to the fact that in his earlier Chicago days Mr. Bross published the *Tribune* for the then proprietors, Messrs. Stewart, Wheeler & Scripps, and the *Prairie Herald*. These papers were printed on an old Adams power press, the first ever brought to Chicago. It was driven by an old blind and black Canadian pony. Now the *Tribune* Company own two presses, each having eight cylinders, and the power is furnished by a magnificent steam engine.

The *Tribune* was one of the earliest supporters of the lamented Lincoln. It published, in full, the celebrated debates between him and S. A. Douglas, in the contest for the Senatorship of this State, and believed that Mr. Lincoln would be the best man to oppose Douglas in the subsequent presidential contest. It was, in fact, the first paper to publicly announce him as the man best fitted to fill the highest office in the gift of the people. After Lincoln had received the nomination, the *Tribune* did its utmost to ensure the success of the Republican ticket; and Mr. Bross bent all his energies of voice and pen to aid the cause, laboring night and day, notwithstanding the threats of secession which were even then heard from the entire South. And when the attack on Fort Sumter showed that the rebels were in earnest, Mr. Bross threw himself into the work of opposing the movement and compelling the rebels to surrender. He was active in stimulating recruiting, and advocated a war which should be "short, sharp and decisive," waged on the high platform of "liberty and union." He was one of the first to recognize the liberation of the bondsmen as the result of the war, and urged that measure with all his might, even while the lamented Lincoln was doubt-

ing that to issue that Emancipation Proclamation which has since made him immortal, would not be equally as futile as the "Pope's bull against the comet." Till the close of that long and bitter war, Mr. Bross was the unswerving friend of the Union cause, and gave largely of his personal means to help it forward, in addition to his more public and official aid. We may add that the discovery of the rebel plot to burn Camp Douglas and sack the city of Chicago, in November, 1864, was in no small degree attributable to him; and that he took the lead in raising the 29th United States Regiment of Colored Volunteers in Illinois and the adjoining States, paying nearly all the expenses incurred in its organization. That regiment was commanded by his brother, Colonel John A. Bross, who was killed on the 30th of July, 1864, while bravely storming the rebel stronghold at Petersburg, Virginia.

The people of the State of Illinois showed their appreciation of his exertions in behalf of the Union cause by electing him, in November, 1864, to the position of Lieutenant Governor, giving him a majority of over thirty thousand votes.

In 1865, Mr. Bross made the celebrated overland trip to California, in company with (now) Vice-President Schuyler Colfax and a few others. They passed across the extensive and fertile plains of the Platte Valley, through the Great Salt Lake Basin, over the snow-topped Rocky Mountains and Sierra Nevadas, and down the California slopes, taking the wild and majestic Oregon scenery in their way, studying the habits of the people and making themselves acquainted with the character and resources of the country through which they traveled. Mr. Bross spoke often to the people on the subjects in which they were most interested, and his visit is still gratefully remembered by thousands. The world is already

familiar with the details of that trip, its incidents, the observations made, and the lessons learned on the way. Mr. Bross has related them to crowded audiences in all parts of the country—before the Chamber of Commerce of New York, the Legislature of this State, the Chicago Academy of Sciences, and many other literary and scientific associations, East and West.

In September, 1867, Lieutenant-Governor Bross departed from Chicago on a European tour, accompanied by his daughter, and visited the points of greatest interest, sketching his impressions and experiences in a series of letters to the *Tribune*. Among the places passed through we may note in the order visited: Liverpool, Dublin, Belfast, Glasgow, Edinburgh, London, Calais, Paris and the Great Exposition, Brussels, Berlin, Munich, Vienna, Rome, Florence, Naples, Genoa and the lava-covered cities of Herculaneum and Pompeii. He returned home through Paris and England, after an absence of six months.

Just before he left for Europe he was elected president of the Manufacturers' National Bank of this city, in place of his old friend, W. H. Brown, Esq., then deceased. This bank is one of the rising institutions of the city, and there is no doubt that under its present able management it will continue to be one of the leading houses of the city.

Mr. Bross was married, in 1839, to the only daughter of the late Dr. John T. Jansen, of Goshen, New York. His wife is still living—a most estimable lady; but the couple, though unintrusively happy in each other's society, have passed through much affliction. Four sons and three daughters lie 'neath the sod in Rosehill Cemetery, the resting place of their ashes being marked by a beautiful monument. Only one survives—a young lady of rare mental endowments, whose presence adorns the most polished circles.

Personally, Lieut.-Governor BROSS is a man of medium height, robust frame, square features, ruddy complexion, high forehead, luxuriant hair and gray eye. The accompanying portrait gives an accurate portraiture, while it is faithful also to the physiognomical expression. His look is one of resolution rather than firmness; his countenance is pleasant, but wide-awake-ative; his step brisk and easy; his carriage graceful. The opinion formed from a survey of his appearance, by ninety-nine out of a hundred, would be that he is a man of good, sound, sterling, practical common sense; not afraid of work, either bodily or mental; persistent in effort, quick in perception and temper, straightforward, sincere, a fast friend, a man with a large heart, clear head, quick eye, honest intentions, and dignified action. And they would not be far wrong. In his case, most emphatically, the face is the index of the soul. His character is all this, and more. There is nothing of the hypocrite about him, and he detests hypocrisy in others. He is warm-hearted and charitable, in a practical sense, though his left hand is often ignorant of that which his right hand doeth. He has always been liberal to the cause of science, and no one is more ready to take by the hand the young man who is struggling to make his way in the world in the face of difficulty. But he has no particular reverence for genius. He believes in hard work, energy, industry, honesty and economy. These traits have distinguished him through his own career, and he recognizes them as the true elements of greatness in others. Their possessor is sure of his esteem; mere brilliancy is no passport to his favor.

Socially, he is free and cheerful; as a husband and father, kind, affectionate and affable. In his management of a newspaper he was always just, and willing to give his most bitter opponent a chance of being heard. As

an employer he was always affable to those under him, always ready to hear their statements, and was regarded by them with almost filial feelings. He never expected a man to do a superhuman amount of work; but he always did require of him the faithful discharge of his duty, and in return was willing to treat him as an equal and to pay the highest wages. We may mention that the *Tribune* office is the only one in this city in which there has never been a printers' strike. His public duties have recently prevented him from continuing as the active head of the *Tribune* establishment; but his influence is still seen and felt as President of the *Tribune* Company, and the same principles of action now govern in its management as in the years that are gone.

Mr. Bross is an able writer; one of the few whose every stroke tells. He gained a good classical and mathematical education in his youth, and has made that the basis of a large fund of information. Hence he always knows exactly what he is writing about, and, if uncertain on any point, he always hunts out the exact truth before proceeding. He is not a florid nor strictly argumentative writer, but is at once pleasing and convincing; while his collations of the driest statistics were always interesting. He has a great ability in stating facts, and rapidly throwing them together, and giving the deduction. Hence his writings have always been widely read, and have carried conviction, striking home to the heart, and leaving just enough of a trace to enable us to follow the path of the hammer after the blow is struck. His statement of facts carries with it the major, and the minor lies couched in the *ergo*.

His oratorical powers are of a very superior order. His sentences are well rounded, his words to the point, his action graceful and not excessive; his

tones full, sympathetic and natural. He is fluent in delivery; not so rapid as to prevent distinctness of utterance, but "fast" enough to tax the energies of a first class phonographer to keep pace with him. He is eloquent and effective, carrying with him the ears and hearts of his audiences. He has spoken on a wide range of subjects; but is best known as a political orator, having been engaged actively during the past twelve years in every canvass in the State of Illinois, speaking often from the same platform with Lincoln, Lovejoy, Trumbull, Logan, Oglesby, Yates, Colfax, Washburne and other leading men of the West.

As President of the Illinois State Senate, Lieutenant-Governor Bross acted uniformly with great efficiency, much dignity and absolute fairness through the labors of two regular and one extra session comprised in his term

of office. When we say that his decisions were appealed from in only two instances and never reversed, we say enough to show the high estimate of his abilities held by those who are the best judges. The speeches of the Senators whose orations marked the close of his speakership were of an unusually complimentary character.

Mr. Bross is still in the prime of life, only in his fifty-sixth year, and is active as ever; capable of fresh triumphs as great as those which have marked his past career. But whatever may be his future, the work already done has placed his name in a high and permanent position in the great Northwest. The influence he has exerted for good can scarcely be measured, and he has set a bright and shining example of the great results which may be achieved by earnest, patient, conscientious and persevering effort.

IS MAN TO BE THE LAST OF INTELLIGENT INHABITANTS UPON OUR PLANET?

BY WILLIAM BRACKETT.

NOTHING serves to pamper the pride and vanity of men more than what Pope calls the "absurdity of conceiving themselves the final cause of the creation." Were there any champion to dispute with them this high prerogative, it is doubtful whether they would arrogate it to themselves with so much self-complacency. As it is, such illusions of their fancy and vain-glory have taken complete possession of their souls, and filled them with mental darkness and deceit; so that, were it not for their restless energy in seeking and exploring new avenues of knowledge, it is no exaggeration to say, they would never have stumbled on the truth with respect to their proper rank and position on the globe.

Among the higher class of speculations to which the genius of discovery may be said, in modern times, to have given rise, none seems to me more interesting than the question stated above. When the human family shall finally leave the earth, will it cease to be the dwelling place of other rational creatures, and thus be remanded back, as it were, to its primitive condition, with the countless variety of inhabitants, among whom man stood the master and the monarch?

That a solution of such a question as this, amounting to actual and absolute demonstration, can not be reached in the present state of our knowledge, is too obvious to need remark; but that a very strong probability of the truth of

the negative of this question is thrown upon it by the light of advancing science, seems to me just as certain, provided full force be given to the evidence, and no previous theories are allowed to warp the mind and stand in the way of conviction. It were needless to argue such a question with the man who wraps himself in the mantle of unreasoning faith, and shuts his eyes against the revelations of science, as if they were so many arrows directed against the cherished convictions of his life. And, indeed, such they may be; but then, science is not to blame, for this is but the revelation of the laws of the universe, which are nothing more or less than the laws of God himself.

I must further premise, that scarcely any thing else can be undertaken, or is practicable, within the limits of one or two magazine articles, upon such a subject as this, than a mere outline or epitome of the arguments. To go into the necessary details would require a volume.

That the Deity is capable of producing, and that there do exist, some where else within the realm of creation, beings of a higher capacity and higher endowments than ours, is the almost universal belief of civilized as well as savage nations. More than this, it is a favorite theory with probably a majority of reflecting men, that the other planets are peopled with races of beings suited to the various conditions of life which are supposed to obtain in each; and various ingenious arguments, drawn from the all-wise purposes of Providence and the analogy of nature, have been offered to sustain it. The actual existence, therefore, of superior intelligences, so far from shocking the general sense of mankind, is an article of faith little short of our belief in the existence of the Supreme Being. Accordingly, Bishop Butler, in his immortal work upon the Analogy of Religion, has expressed his opinion that there may be beings in the universe possessed of knowl-

edge and views so extensive that the scheme of the divine government shall strike them at once as being analogous or conformable to God's dealings with other parts of the creation. Nothing in the nature of things, therefore, renders our hypothesis improbable or incredible. It is only when we come to apply the doctrine to the earth and its inhabitants that the mind is slow to entertain it, and takes refuge in those early prejudices which we have imbibed from our infancy, and resorts to certain meaningless phrases touching the dignity and destiny of the race.

Prone thus to believe in spiritual existences of a type and nature so far above our own, why, it may be asked, should we assign them a perpetual residence in other spheres? Where is the inconsistency in supposing our own to be a fit dwelling-place for orders of intelligence equally high? Most assuredly, no one will pretend that it could not be made enduring, and even pleasant and commodious, for such superior inhabitants, and that, too, without any alteration of the natural laws which govern it; in other words, it can not be denied that the resources of nature around us, when properly understood and applied, are sufficient for the exigencies and demands of the most exalted beings. And if, on examination, it should be found that these resources are endless in their number, extent and variety, and thus running infinitely in excess of man's needs or powers of appropriation, a very strong presumption will be raised in favor of their being intended for the use and enjoyment of other beings, unless it can be shown they were made to subserve some other purposes. For God makes nothing in vain; but every thing, so far as we are able to interpret His plans, for the use or the pleasure of His creatures. Utility and pleasure, in other words, happiness—this seems to be the legitimate end and object of the

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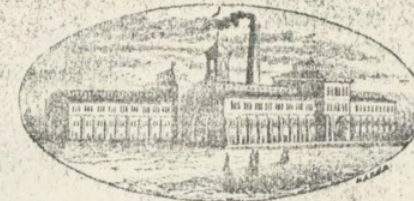
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Western Monthly vol. 1, 1869

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J. Young Scammon

THE WESTERN MONTHLY.

VOL. I.—MARCH, 1869.—NO. 3.

J. YOUNG SCAMMON

AND

THE DEARBORN OBSERVATORY OF CHICAGO.

BY T. H. SAFFORD.

I.

THE astronomical observatories of the world, about one hundred in number, are divided into three classes. The first class includes government institutions proper, like those of Washington, Greenwich, Paris and Pulcova, near St. Petersburg. Many—indeed, most of these—are on a very large scale; have very many instruments of the first class, especially meridian instruments, and employ the services of a numerous staff of astronomers. The second class is of observatories, like our own, attached to universities, or governed by boards of trustees, similarly constituted. These institutions are both scientific and educational, and have in fact, as a class, taken the lead in advancing the technical part of astronomy, in training observers, and preparing men to undertake the duties of astronomers in the richer and more extensive, but generally less progressive, establishments under government patronage. The rule is, without exception, that no observatory which is not at the same time an astronomical university—which does not teach both the principles of higher mathematics and the general outlines of astronomy itself, together with the special modes of using instruments—

will be permanently celebrated by anything more than a mere accumulation of facts, and these, too, generally ill-worked up.

For instance, the whole present system of observing astronomy grows out of the work done since 1814 by Bessel and Struve, at the two universities of Koenigsberg, in Prussia, and Dorpat, in the German province of Russia. The most celebrated astronomers now living—Airy, Argelander, the younger Struve, Hansen, Le Verrier—have studied in the school or after the methods of the two great men mentioned above; while in a similar manner the higher mathematics of astronomy is largely due to the celebrated Gauss, formerly connected with the university-observatory of Goettingen, in Hanover.

In our own country, the two colleges, Harvard and Yale, have trained up the majority of our astronomers; and in the West the University of Michigan called some years ago from Germany the distinguished astronomer Bruennow, who is now waking into a new life the old observatory of Trinity College in Dublin, but who has left with us pupils not unworthy of their teacher's fame. Of the third class of observatories, those be-

longing to private individuals, little need be said here. They have very often accomplished brilliant work, but always sooner or later pass either into the hands of trustees, and thus become of essentially the same class as our own institution, or else their instruments are dispersed and their buildings dismantled, when the property passes into the hands of heirs who care little for astronomy. Sir William Herschel and the late Earl of Rosse were fortunate in having sons who have inherited their fathers' taste for astronomy, and who have followed in their fathers' steps; but there are other private observatories no longer heard of.

Any university in this country which is to really be worthy of the name should have an observatory attached to it; for the very idea of a university requires that none of the sciences should be neglected or taught merely theoretically; and the science of astronomy has an exceedingly wide bearing. No first-class mathematician should be without something of an observatory training; and the very introduction of the higher mathematics into this country has been through the interest awakened in astronomical subjects. Mathematics, without its applications, is a noble science indeed, but seems foreign to the genius of the American people; and the highest and best of its applications, the one that requires the most of it and the deepest parts, is to astronomy. Newton and his contemporaries desired to solve the great astronomical problem of the solar system. One result was the differential calculus, which every good engineer employs now-a-days, at least in the more difficult questions. And so with the gradual improvements which have been introduced from time to time into mathematical science; they have generally come through astronomy; and from these elevated applications the problems of the universe have gradually come down.

It is very fit that the growing University of Chicago should have connected with it an observatory of the first class. The metropolis of the Northwest, great, and growing greater every day, is a most excellent center for the diffusion of ideas, as well as of agricultural products and manufactures; and the peculiar genius of the people of Chicago, combining the most active elements from many nations, is extremely favorable to the success of all well-judged attempts at higher culture.

Among the leaders of Chicago culture stands, quite prominent, the distinguished citizen, whose portrait is the frontispiece of this number, and his name is closely connected with the whole history of the Dearborn Observatory. It was decided, in 1862, that an Observatory should be attached to the University. It was found that a telescope by Fitz, of rather moderate dimensions, could be procured, and Mr. SCAMMON determined to build the tower for its reception, whose estimated cost then was less than ten thousand dollars. But shortly Prof. A. H. Mixer was sent to consult with Bruennow, then at Ann Arbor, and it was found that the great object-glass by Clark, the greatest refractor then existing, and with which the companion of Sirius had just been discovered, was for sale; and that other instruments, especially a first class meridian circle, were needed to complete the equipment of the Observatory. The Hon. Thomas Hoyne, also a distinguished trustee of the University, was sent to Cambridge, to negotiate for the purchase of the object-glass. He succeeded in this, by his energy and perseverance, in spite of considerable obstacles, as the Observatory of Harvard College wished to purchase the glass, and a subscription for that purpose had been set on foot; and the citizens of Chicago came forward and subscribed liberally for the glass and its equatorial mounting. The in-

creased size of the instrument made the tower for its reception necessarily of larger size, and more costly; an additional increase in cost to nearly \$30,000 was caused by the rise in the cost of materials and labor, and by unexpected difficulties in the working of the dome machinery. All this was paid by Mr. SCAMMON, and in addition he has continually supplied means for the carrying on of the Observatory, and advanced money necessary for other apparatus.

The principal building of the Observatory is the great Dearborn Tower, attached to the West side of the University. (The institution bears the family name of Mr. SCAMMON's first wife.) It is ninety-six feet high, and thirty feet in diameter; it is founded upon piles driven into the blue clay to a depth of nearly thirty feet. Similar piles sustain the central pier for the instrument, so that, though not founded on a rock, the whole structure possesses the necessary degree of firmness and solidity, though elevated to a considerable height.

In addition to this, a small but very neat building has been erected for the meridian circle, a first-class instrument, made by the Repsolds, of Hamburg, and bought with funds largely presented by Hon. W. S. Gurnee of New York City; funds which have become insufficient for the purpose only by the effects of the war in raising the cost of exchange, and in impelling our government to tax the instrument nearly a thousand dollars in gold as duties. The institution now possesses the main instruments necessary for a complete equipment on a grand scale. It still lacks some minor apparatus, especially a sidereal clock and a chronograph, also spectroscopic apparatus. It is under the control of the Chicago Astronomical Society, composed of the contributors, with a board of directors, comprising the principal contributors, and some other gentlemen selected from the general body on account of special qualifi-

cations or interest in science. Of this board and of the society Mr. SCAMMON is president, and Hon. Thos. Hoyne, secretary. Its independence from the immediate control of the Board of Trustees of the University, while yet the two institutions work harmoniously together, appeared desirable from general considerations suggested by experience. There are several examples in Europe of such arrangements, which have in general so worked that the mutual relations of the bodies are harmonious, while the details can be arranged by each for itself.

What the work of the Observatory has been was, in part, hinted at previously; otherwise, the subject of sidereal astronomy, on a large scale, has been the principal one studied, and in this the nebulae are included. The beginning of any institution of the kind requires the training of assistants and young astronomers; the forming of definite plans of work, and their steady and regular execution; and in that manner, after a time, the effectiveness of the observatory can grow steadily from year to year.

A revision of the nebulae has been begun with the Great Equatorial, since it came in 1866, which has brought to light a good many new ones before unknown, together with interesting facts about the old ones, which have escaped the notice of former observers provided with less powerful telescopes, or with the more cumbrous great reflectors, which take so much time to direct to any point. With the same instrument over 3,000 stars in the Milky Way have been catalogued with great accuracy, and there can hardly be set a boundary to its usefulness in both these directions, if it is employed steadily and consistently.

The meridian circle, on the other hand, has also been steadily worked since its arrival in October last, and the preliminary observations necessary at

first, upon a scheme for cataloguing the brighter stars originated by Argelander, and adopted by the German Astronomical Society; a society whose members are scattered all over the world, at least from Chicago to the eastern extremity of Europe, whose object is to combine the efforts of all astronomers in one grand whole. They will, it is hoped, take up the subjects which have employed the Great Equatorial in such a manner that those, too, may be pursued regularly in several observatories, dividing up the labor appropriately for each. In this case, the work which we can best do will be assigned to us; at present, the subjects

of observation would require a lifetime to complete.

In conclusion of the present article—which is to be followed by others more in detail—it may be stated that not merely the liberality which has equipped the Dearborn Observatory so munificently is to be commended, but that the breadth of the views which have brought forth the fruit of permanent institutions of higher culture in this city, is a most cheering sign that Chicago will continue to advance as well intellectually as in its material prosperity, as long as she can so proudly boast of such men at the mast-head of her various institutions as J. YOUNG SCAMMON.

THE DEVON PIXIES.

BY MRS. A. P. SWEET.

IN Devon dwelt the Pixies wild—
Long time ago, it was, I ween—
To careless maid, and new-born child,
Full elfin-like did they demean.

And honest yeoman, homeward bound,
At midnight hour, from drinking bout,
Did often hedge and stile go 'round
Ere he these tricksters all could rout.

His court the Pixy monarch holds
Within the shade of rocky glen,
And charges many there unfolds
That mischief bodes to mortal men.

Among the ores, deep in the earth,
These sprites the miners thwart or cheer,
Or from the dish beside the hearth,
Purloin the harvest mead and beer.

Sometimes beneath the tulip leaves
They sing their tiny babes to sleep:
Or on the grass the gossamer weave,
That gems of dew for morn doth keep.

But hammers' noise and sound of bells,
Doth ever drive the elves away,
And o'er the moor or in the fells,
No good man now need go astray.

The fairy wings no more enthrall;
No sprightly music, as of yore;
And wood, and vale, are silent all;
The Pixies haunt the glade no more.

MY PATCHWORK QUILT.

BY L. MATTIE FEULING.

FLOWERS, poetry, art and history I find here in my room in the diminutive compass of a patchwork quilt. Those uncompromising blocks have associations for me as sunny as Claude Lorraine's own colors, and in their light I go back to my childhood. I hear the voice of winds that sing of shadowy dingles and intricate woodlands. I see the daisies and violets flecking the grass; the lilies dabbled with dew; the flush of the morning—my home and the faces that made it a dear home. I marvel at the attractions of a picture painted by such unskilled hands, but the sunlight drifts across a brown unmeaning stripe, and I see the silver locks and dim eyes of my grandmother, and remember this tiny portion of chintz was a reward to a sleepy little girl so tired of rocking the baby one winter night, a long time ago. O the legends and rhymes that repeat themselves as I look at the faded chintz, till a little grass-grown grave drifts between, and I remember the tearful eyes that have turned to the empty cradle, and then to the hillock that "represents an angel in the sky."

This old stripe of pink and white, we are credibly informed, is a piece of father's first dress! Who could readily call to mind the circumstance that fathers ever wore dresses? Was there ever a time when they possessed no just appreciation of the dignity of the dominant element in every well established household? Were they ever serenely unconscious of the governing power vested in them, and therefore

innocently subjected to the biblical injunctions to obedience?

Here is a corner that brings to mind the little girls' sewing class, and Aunt Dolly who looked into the past and told us of the better times when girls learned to bake and brew and knit their pillow cases to the brim with stockings before they were considered competent to take the coveted last stitch at their merry quilting parties.

Here is a piece of little Freddy's blue checked apron. We used to sit together on grandpa's lap and listen to stories of Valley Forge, of Bunker Hill and Washington. Years after, I read alone of other battles; grandpa was gone. Freddy was gone and carefully put away. Among my treasures is an old rusty sword, and beside it a soldier's blue cap, a girl's picture, and Freddy's last letters.

Here, on this block, is a specimen of Charley Brown's needle-work. The corners are not so evenly fitted as might be, but that name, quilted with those fine flourishes, amply atones for any little inaccuracies. Charley and I contracted one of those "Ever Yours" friendship, that for fervor, devotion and durability might be commended to older articles as it "run smooth" several days. We exchanged gifts at parting. He gave me a brass ring and a candy heart. I lost the little ring in the ashes one day, and, to console myself, ate the heart.

There is a bit of our pastor's "dressing gown"—a donation from Aunt Prudence. I remember him well—a tall, slim man—a stern embodiment of

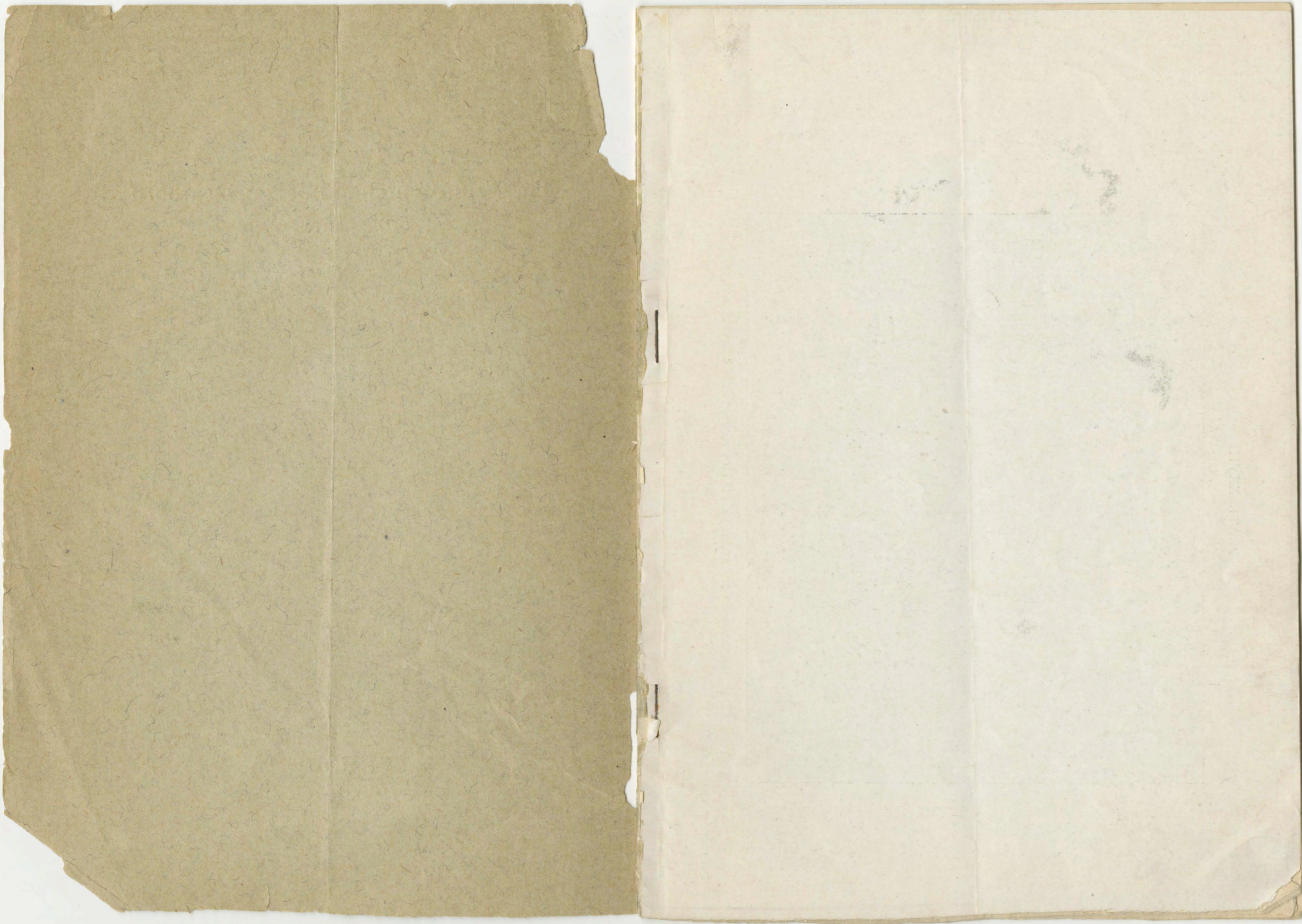
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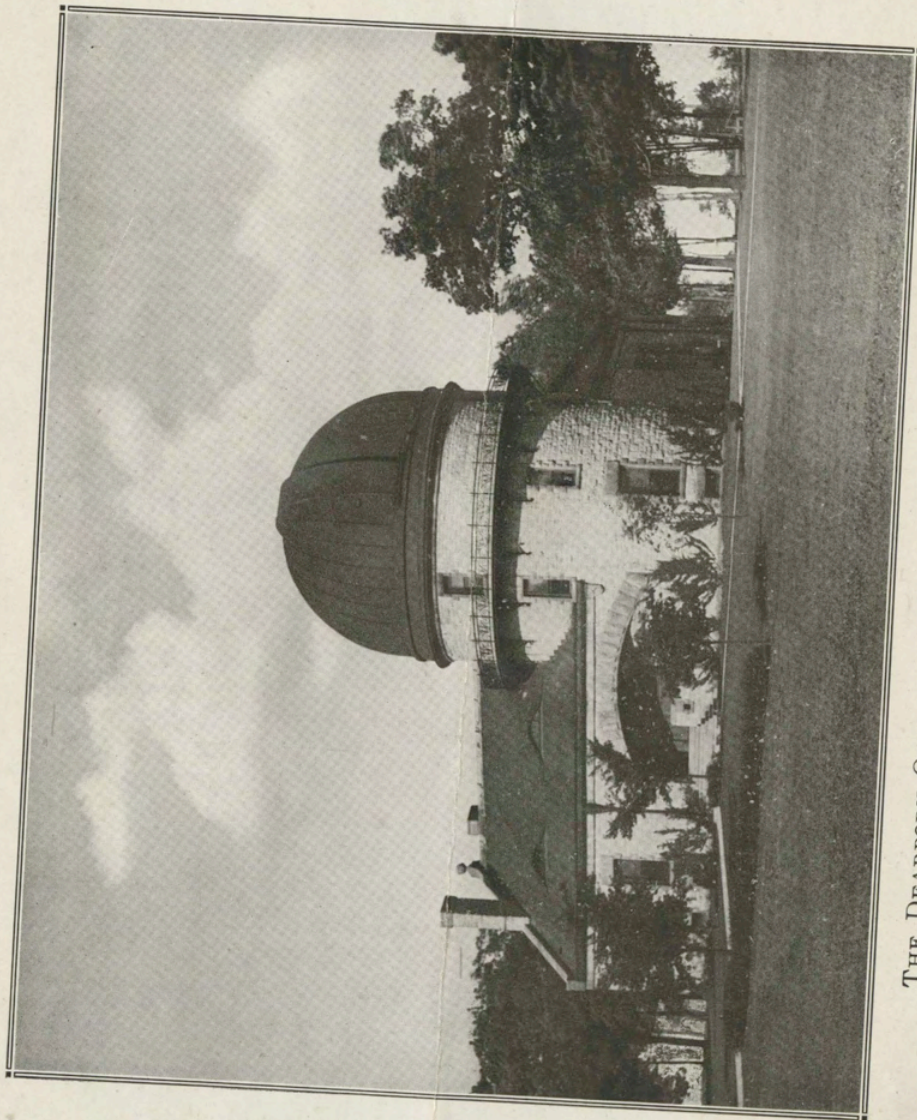
The Semi-Centennial of the Dearborn Observatory

See p. 10

BY
PHILIP FOX

REPRINTED FROM POPULAR ASTRONOMY, VOL. XXIV, NO. 8
OCTOBER, 1916





THE DEARBORN OBSERVATORY OF NORTHWESTERN UNIVERSITY

POPULAR ASTRONOMY, No. 238.

THE SEMI-CENTENNIAL OF THE DEARBORN OBSERVATORY.

PHILIP FOX.

On November 6, 1912 the Chicago Astronomical Society met at the Dearborn Observatory in observance of the completion of fifty years of its existence.* The foundation of this Society inaugurated the movement towards the erection of the Dearborn Observatory in Chicago. The Observatory was completed and the telescope in place on April 11, 1866, and on that evening the members of the Society and guests assembled with the Director, Professor Truman H. Safford, to make the first observations. This marked the end of the preparation and the commencement of the active work of the Observatory. On April 11 of the present year, the fiftieth anniversary of this event, commemorative exercises were held at Northwestern University.

Volume I of the Annals of the Dearborn Observatory, recently issued, contains a brief history of the Dearborn Observatory, so that here the account may be condensed to the following paragraph:

Under Professor Safford's direction the work of the Observatory went forward actively until the great Chicago Fire of 1871 prostrated the city and robbed the Observatory of its support. Shortly thereafter Safford withdrew and entered the U. S. Coast and Geodetic Survey, later going to Williams College. Professor Elias Colbert, who had been Assistant Director, assumed active charge, and with the exception of a few months in 1876, when Mr. S. W. Burnham was Acting Director remained in charge until the appointment of Mr. G. W. Hough to the directorship, on May 6, 1879. In 1881 the University of Chicago became involved in litigation over its property and, as a consequence, in July

* POP. AST. 21, 473, 1913.

1887 the Observatory was notified to vacate its holdings. On August 10, 1887, a contract between the Society and Northwestern University was made, and shortly thereafter the instruments were transferred to Evanston and placed in the Observatory built through the gift of Mr. James B. Hobbs. Professor Hough actively conducted the observing until his death on January 1, 1909. Professor Malcolm McNeill of Lake Forest University was in charge until the appointment of the present Director, on September 1, 1909.

The programme of the evening consisted in a series of addresses designed to review the progress of astronomy during the past fifty years, the lifetime of the Dearborn Observatory. They covered the four great phases: historical, observational, mathematical, and astrophysical, as will be seen by the programme and by the addresses themselves which are here reproduced in full. Professor Barnard's address was accompanied by numerous lantern slides. Unfortunately these illustrations cannot be reproduced here.

PROGRAMME

Greetings from the University

PRESIDENT A. W. HARRIS

The Early Years of the Dearborn Observatory

PROFESSOR ELIAS COLBERT

Some Reflections on the Progress of Astrophysics

PROFESSOR GEORGE ELLERY HALE

The Progress of Mathematical Astronomy

PROFESSOR FOREST RAY MOULTON

The Advances of Observational Astronomy

PROFESSOR EDWARD E. BARNARD

ADDRESS BY PROFESSOR ELIAS COLBERT.

THE EARLY YEARS OF THE DEARBORN OBSERVATORY.

It has been requested by the Director of the Observatory, that I glance briefly at the early incidents of the formation of the Chicago Astronomical Society, the acquisition of the telescope, and of the early years at the "First Dearborn Observatory." I accede willingly, because I believe that I am the only person now living who can speak from personal recollection of the earlier part of that history: though I am something like Fagin, when he said "A very old man, my lord."

Near the close of November, 1862, Professor M. R. Forey came from New York to the University of Chicago, hoping to sell a Fitz telescope for about \$8000.00. A conference with President Dr. J. C. Burroughs, Professor A. H. Mixer, Mr. J. Young Scammon, Mr. Thomas Hoyne, and a

few others, resulted in a meeting in Bryan Hall, then the largest in the city, on Monday evening, December 8. I was there, on the platform, but only as a reporter for the Chicago Times. Professor Forey addressed a full house. Then the Astronomical Society was organized, with Messrs. Scammon and Hoyne as President and Secretary. Subscriptions were liberal, for those days; \$500.00 paid for a life Directorship, and \$100.00 for a Life Membership; no astronomical knowledge being required from either members or officers. Members were to have the right to visit the Observatory one night in the week with their families.

William Harvey Wells was then Superintendent of Schools in Chicago. He was elected Vice-president of the Society (I think) at the first meeting. From him I learned that there was some reason to doubt the wisdom of buying the Fitz glass. I stated *that* (and some other things) in an article in the "Times" of December 20 following. "Quite a noise" resulted, including a visit to me by Mr. Hoyne at the office, and the belief that I knew more on the subject than they previously had given me credit for.

Then, January 23, 1863, our Mr. Hoyne paid a visit to Alvan Clark at his home in Cambridge, near Boston, who had for sale what was then the biggest and best refracting telescope in the world. Of course, it is well known that larger ones have been made since then: It was made by Alvan Clark & Sons (glass brought from near Birmingham, England) for the University of Mississippi: But the contract fell through because of the war of the rebellion, and now the glass was already famous, the companion to Sirius having been discovered through it about a year previously. It cost our Society \$18,187.00, including \$7,187.00 for mounting it here. It was understood to have an aperture of $18\frac{3}{4}$ inches and a focal length of 23 ft. 2 in. Then Mr. Scammon magnanimously offered to pay for the building of an observatory on condition that it be named "The Dearborn" after his first wife—a near relative of whom, General Dearborn, had been U. S. Secretary of War long before Chicago was a city.

I believe that a brother-in-law (name forgotten) of Elihu Burritt, the learned blacksmith, was Professor of Astronomy previous to May, 1865, when Professor Truman Henry Safford was chosen by the Directors of the Society as Director of the Dearborn Observatory, and became Ex-Officio Professor of Astronomy in the University. I met him a few times, but only as I was City Editor of "The Tribune". (Changed from "Times" to "Tribune" in 1863). Safford and I got acquainted easily and we two were together when, fifty years ago, Alvan Clark turned over the telescope to Safford as completely ready for use. I believe I took the very first peep through the tube after that. I wrote that up for the Tribune. The instrument worked all right, but the dome was a

mechanical failure. It worked badly from the start and was a working horror until I raised the money to build a new one in 1875. There was no Meridian Circle until, I think, 1868, when one, the gift of Ex-Mayor Walter S. Gurnee, was placed in position.

In August 1869, Professor Safford and I went together to Des Moines, Iowa to observe the total solar eclipse on the 7th of that month. As a sequence to that, he and I agreed to establish a time service in Chicago. I raised the money needed to build a clock in the City Court House tower, to be connected by wire with the Observatory and also with several local jewelers. Soon after that was begun, the Society declared me to be Emeritus Assistant Director of the Dearborn Observatory. We had built the clock in place and the reflectors to the dials were at Toledo on the way to Chicago on the night of the great fire of October 8, 1871, which burned down the clock with the Court House. The University and the Observatory building, were untouched by the fire. They were outside its limits.

The great fire burned up the records of the Society and its balance in bank. A large percentage of the property burned had been insured in "Home Companies" which could not pay, etc., etc., etc. There was no money with which to pay the salary of the Professor as Director of the Observatory, and he was obliged to find work elsewhere. In the two and one-half years succeeding the fire he taught astronomy at Beloit, Wis., and did some surveying work in the Western States for the U. S. Government.

March 16, 1874, the Society held its first meeting since the great disaster. At that gathering Professor Safford submitted a report giving the mean declinations of 981 stars for January 1, 1875, and was granted leave of absence for two years, as he had received an offer of an appointment by the Government of the United States. Then I was declared to be Emeritus Director of the Observatory. Early in the next month I began teaching in the University as Professor of Astronomy. I continued that for five years, giving to the work about all the time I could spare from daily work on the Tribune, the governing power of which paper had consented thereto without any request from myself.

In those five years I worked gratuitously to increase the membership of the Society, build up a new dome over the big telescope and build up a time service. I succeeded well enough to be able to inform the Society that it could well afford to pay a better man than myself to do the work, was assured that the same would not think of choosing another man if I would consent to take pay and do the work, and I refused the offer with thanks. Then I nominated Professor G. W. Hough as Professor Safford had obtained a situation in Massachusetts, which

he declined to leave. Subsequently I have had the honor to nominate Professor Philip Fox, the present incumbent, who succeeded soon after the decease of Professor Hough.

ADDRESS BY PROFESSOR E. E. BARNARD.

A FEW ASTRONOMICAL EVENTS OF THE PAST FIFTY YEARS.

The great civil war between the North and South placed the Dearborn telescope in Chicago. Its original destination was the University of Mississippi, for which it had been ordered before the outbreak of the war, but the consequent impoverishment of the finances of the University prevented the final purchase of the instrument.

In connection with this statement an interesting question might be raised as to what effect this change of destination had on the subsequent history of the telescope. The instrument is famous through the double star work of Burnham and Hough. With it they discovered many of the most interesting of the double star systems. Had there been no war the telescope would have gone south. Would it have found there a Burnham to immortalize it? In all probability no. It has always been an active instrument. Even now, though giant telescopes have risen in the later years of its life that far surpass it in power, it is still an important instrument and not only keeps up the traditions of the older astronomy in the observations of double stars but dressed in a new suit, as it were, and inspired by new accessories in the able hands of Professor Fox, it resolutely faces some of the most important problems of the newer astronomy.

But my time will not allow me to dwell upon the career of this telescope which the fortunes of war so greatly affected. Its career has been a brilliant one and really began before the instrument was actually finished, for it was while testing the telescope before its final completion that the younger Clark discovered with it the companion to the great star Sirius. This discovery was of high importance, mainly because it verified a theory that had been held for some time that such a companion star must exist to account for the irregular motion of Sirius through space.

Let me linger here for a moment on some facts connected with this discovery, for they are pertinent now. Four years ago marked the semi-centennial of the finding of this important star. Its period of revolution about Sirius is very close to fifty years, and it has made a complete circuit about the great star since its discovery. The event, therefore, that we celebrate today synchronizes with the period of this wonderful star. Thus is the life history of the Dearborn telescope woven in with the motions of some of the stellar systems.

Even when one necessarily leaves out the wonderful work of the spectroscope, it is impossible, in the time allotted me to more than briefly refer to a few of the remarkable things that have been done in the field of astronomy in the past fifty years. To recognize all of these, or even a considerable portion of them, would require a catalog of events. Such a dry compilation would be tedious to make and would be far more tedious to listen to. I have, therefore, thought best to confine myself to a recitation of a few of the more interesting facts and to make no attempt to cover the growth of astronomy in general in the time. It is difficult to crowd fifty years of anything into twenty minutes of time!

The advance of astronomy in the last fifty years is due mostly to new methods of research and to increase in optical power, but mainly to new methods and new accessories, all of which, however, depend upon the telescope. It is pleasing to see that the reflecting telescope, which had been relegated to the amateur, has again come into its own. It has, from many points of view, become one of the most important instruments in astronomy. It more readily lends itself to these various accessories of research in some ways than the refractor and it is all supreme for photographing the nebulae. Nowhere is this fact so splendidly shown as at the Solar Observatory of the Carnegie Institution at Mount Wilson in Southern California, where Professor Hale has erected the great 60-inch reflector, and where he is soon to have in operation a reflecting telescope of 100 inches aperture—a telescope over eight feet in diameter, the largest ever made. One of the most remarkable facts in connection with these two great instruments—along with others in use on Mount Wilson—is that they were made in the shops of the observatory in Pasadena. Some of these instruments, such as the great tower telescope, are unique, and show the wide diversity of Professor Hale's genius in devising extraordinary and successful means of research.

The work of the great telescopes of the Yerkes and Lick observatories under the direction of Professor Frost and Professor Campbell respectively has been of the highest importance in the advancement of all branches of astronomy. A large part of the work with these great instruments is spectroscopic and hence out of the reach of my subject tonight. Both these telescopes have contributed greatly to double star astronomy in the hands of Professor Burnham.

But if we speak of the progress of astronomy in the past fifty years, we must constantly refer to photography, for without it the progress would have been relatively small. It comes down really to a statement of what photography has done for astronomy. Photography as it was when the Dearborn Observatory was young could never have done

much for astronomy. It has passed through two periods, the wet and dry processes. It was in the earlier period at that time, where the plate must remain wet throughout the process of making the negative, and was relatively very slow in its action. As the plate must remain wet, long exposures could not be given to overcome the want of sensitiveness. At that time, in the hands of Rutherford, it had pictured the surface of the Moon and had recorded the spots on the Sun. In both these cases there was plenty of light. It had had a try at the stars but with little success. It had attempted to show the great comet of 1858 but had made a failure of it. No one had even hoped that it could register the forms of the fainter nebulae. It had made no promise to the spectroscope, which itself was just beginning to awaken to the marvels of astronomy. In a word, it had not yet risen to be the "hand maid" of all the sciences and to become a science itself.

In the application of photography to almost every branch of astronomy the Harvard College Observatory, under the administration of Professor E. C. Pickering, has attained to the very highest importance. The collection of photographs of the sky obtained there and at the Harvard Station at Arequipa covers the entire heavens many times over. In the case of the discovery of a nova (and many of the novae have been discovered there) its early history and the actual time of its appearance within close limits are always found on the plates of this one observatory. The entire history of a variable star can be traced back almost from day to day for many years and in some cases for over a quarter of a century. The great increase in the discovery of variable stars, as one example, is due almost entirely to the ease with which every part of the sky can be compared at different times—days or months or years apart—and thus any change in the light of the stars can be noted. It was by this means that Professor Bailey of the Harvard College Observatory found that some of the great clusters of the sky contained many variable stars, the period of whose light changes was, in most cases, short and regular. In the cluster M 5 most of the variables have a period of about half a day. Their normal state is faint, from which condition they suddenly begin to brighten, like one awakening from sleep, and rise rapidly in an hour's time to their full brightness and then slowly sink to rest again—their active period being only a small part of their entire light change. A large number of these small stars range through about one magnitude, from $14\frac{1}{2}$ to $13\frac{1}{2}$ magnitude. If one watches this cluster on any one night with a powerful telescope he will see some of the stars in it increasing in brightness while others are fading to obscurity, as if in it were scattered a number of fireflies! But what does it all mean and what is the wonderful mechanism in the far depths of space that makes so many

of these stars quickly awaken to life and then slowly sink to rest again? And why should their light variations and their periods be so nearly the same? Perhaps the most prolific of these clusters in variable stars are Omega Centauri and M 5. In each of these there are a hundred or more variables known.

Though no new worlds, in the ordinary sense, have been discovered, there have been added to the known worlds at least eight new moons, five to the planet Jupiter, one to Saturn and two to Mars. Five of these are due to the sensitive photographic plate. At least two of them have not yet been seen with the human eye.

The known asteroids, or small planets, which lie in a zone between the orbits of Mars and Jupiter, have increased rapidly until not far from a thousand are now known. The discovery of these small bodies since 1892, when Dr. Max Wolf first found one by the new process, has been almost wholly due to photography. New ones are constantly being found. Sometimes as many as five or six are shown on one plate.

The most interesting of these planets is Eros, whose mean distance is less than that of Mars and which can come within some thirteen millions of miles of the earth. This small planet has already given us a new and accurate value of the solar parallax and is destined at a favorable opposition to give a still more accurate value. A group of these small bodies has been found which have a mean distance greater than that of Jupiter. The smallness of many of these little planets thus found gives the impression that there must be many thousands of them, perhaps hundreds of thousands, ranging all the way from five hundred miles in diameter to the size of grains of sand.

Our knowledge of the Sun has increased tremendously in recent years. This has been due almost entirely to the spectroscope and to its application to the spectroheliograph. But this is being dealt with tonight by a master of the subject.

Perhaps the only department of astronomy not seriously affected by photography is that of the double stars, where the eye at the telescope is still greater than the photographic plate. The progress in double star work is due mainly to visual observations. In late years Aitken, of the Lick Observatory has achieved remarkable success in this department of the older astronomy. But the sensitive plate is even trying to encroach on the work of the double star observer. The most interesting systems, however, with one or two exceptions, are at present beyond its reach.

The spectroscope has introduced to us a new class of double stars, whose periods in many cases are only a few hours or a few days, and which will never be seen separately with any telescope.

The development of planetary astronomy has not been in keeping with the rapid progress of the science in almost all other directions. This has been due mainly to the fact that, as in the case of the double stars, the magnifying power of the telescopic eyepiece is a necessary factor in the work. The direct image formed by the object glass must be magnified before the components of a close double star can be seen—and the close double stars in general are the most interesting. In the same way the unmagnified image of a planet is so small—even in the largest telescopes—that the surface features either cannot be seen or are so crowded together that they become one on the photograph. To overcome this difficulty the direct image of a planet must be magnified before it falls on the sensitive plate. Much progress has been made in this direction by the use of a secondary enlarging lens which projects an enlarged image of the planet directly on the plate. This process was first used with considerable success by Professor W. H. Pickering at the temporary station of the Harvard Observatory on Mount Wilson in 1889. Professor Pickering secured fairly good enlarged images of Saturn and excellent ones of Jupiter at that time with the 13-inch Boyden telescope and a positive eyepiece to enlarge the image. The real advance in planetary photography, however, is due to Lampland at the Lowell Observatory, who has succeeded in making excellent enlarged photographs of the planets—especially of Mars. Similar work has also been carried out at Mount Wilson by Professor Hale and at the Yerkes Observatory. I think undoubtedly that this class of work, which is of the very highest importance, is going to see its greatest perfection with the reflecting telescope—especially with reflecting telescopes of relatively great focal length supplemented by secondary enlarging mirrors and lenses.

Astronomers with visual telescopes are greatly indebted to color-filter photography, as adapted by Ritchey at the Yerkes Observatory to ordinary refractors, which from their nature were not intended for photography. The splendid photographs of the Moon and of the star clusters made by him with the 40-inch telescope were a great advance over earlier work with regular photographic telescopes.

This simple application of the color-filter and the isochromatic plate has made the 40-inch telescope one of the most important instruments for the determination of the distances of the fixed stars. Photographic parallax work was first done with it by Dr. Frank Schlesinger, who showed the remarkable accuracy that could be obtained by this method. This work with the same instrument has since been carried on successively by Fox, Slocum and Mitchell. Dr. Lee, in conjunction with Professor Van Biesbroeck, is prosecuting this work at the Yerkes Observatory with the greatest success. Van Maanen has also shown

that parallax determinations made with the great 5-foot reflector of the Solar Observatory at Mount Wilson (a regular photographic telescope) are of the very highest accuracy. Astronomers now know quite accurately the distances of a large number of the fixed stars. In this way we find that it is not always the brightest stars that are nearest to us. A considerable percentage of the nearest stars are not visible to the naked eye.

There are perhaps (if we leave out the work of the spectroscope) no astronomical subjects that have been so vastly benefitted by photography as the nebulae and comets—the comets and the nebulae, which at times look so much alike and at other times are so wonderfully different, and which have no relationship in reality. Indeed half the life of the Dearborn Observatory would cover most of this class of work. The brighter nebulae were pretty well known before this, through the labors of Lord Rosse and others. Nor have we gained much in this line with the great visual telescopes that have come later. This can be said even more emphatically with respect to the comets. It is hardly too much to say that the bigger the telescope the less we have learned about these latter bodies. The comets and the nebulae were two subjects that the eye and the telescope alone could not do a great deal with, especially as the eye was not ordinarily supplemented by a skilled hand to draw what was actually seen. In reality the observer got much pleasure from his work, but he was not able, from the lack of artistic skill, to transmit what he saw to others. Furthermore, his eye lacked the power of seeing certain kinds of light in which the nebulae and comets were specially rich. He did not see all that was to be seen. In this perplexed condition there was given to him another eye that could not only see what he saw but much more, for it was especially sensitive to that other light with which the comets and the nebulae partly shine, and which combined with this power of seeing, a hand more skillful than that of any artist that ever lived. This was the photographic plate.

But let us separate these two subjects for a time and deal with them independently. Our common interpreter for both is the photographic plate.

The ordinary photographic plate is sensitive to a region of the spectrum to which the eye is almost blind. Many of the nebulae shine mostly with this light and thus the photograph has a great advantage over the eye, for though seen but dimly they are bright to the photographic plate. Furthermore, the eye becomes wearied after long gazing and one cannot see more by looking longer. The reverse of this holds with the sensitive plate—the longer it looks the more it sees, for its action is cumulative and it may be given many hours exposure, bring-

ing into view, successively, fainter portions of the object. Thus faint nebulosities whose light could never affect the eye, are finally shown as a clear and accurate picture which can be preserved and studied years afterwards for the detection of changes in these bodies. The photographic telescope, especially the portrait lens, has a very much larger field of view than the visual telescope, which is a very important factor in the study of the nebulae or comets and of the Milky Way. Vast masses of diffused and faint nebulous matter, covering large areas of the sky are thus revealed. Much of this is too feebly luminous for the human eye ever to see. Some of this obscure matter appears to be nearer to us than the distant stars, for it obscures their light. There are other masses of it that seem to be entirely devoid of light whose presence is only known by the blotting out of the light of the stars in their direction. These feeble and widely extended nebulosities are found more especially in connection with the Milky Way. Some of the individual stars of the Pleiades are centers of condensation of what appears to be nebulous matter, and all that region of the sky is covered with streaky masses of feeble light. Are these great beds of luminous matter really gaseous? The spectroscope in recent years has thrown much doubt on some of it, though there are many of them whose gaseous condition it confirms.

We used to think of these nebulae as being at vast distances from us, much beyond the limits of our universe of stars. Photography has shown in many ways that though their distances must be great indeed, they are often well this side of the more distant stars, and that many of them—perhaps most of them—are within our stellar system, and are no farther away than some of the brighter stars.

In looking at the nebulae (such, for instance, as the great nebula of Orion) and at photographs of them, one is impressed with a sense of supreme quiet, where changes must be slow and majestic. But this serene condition would seem to be only apparent. Astronomers have found with the spectroscope that in reality the great nebula of Orion is a seething mass of gaseous matter where there is no rest and over whose vast bulk relative motions of several miles a second are constantly taking place.* But the eye, after careful years of watching, sees no change in the face of this sublime object. Thus we had come to the conclusion finally that the nebulae would not change perceptibly in the lifetime of an individual, and this in general seems to be true, but very recently Mr. E. P. Hubble of the Yerkes Observatory

* This was long suspected by Vogel, and was proved by Fabry and Buisson by interferometer methods. It has recently been fully confirmed by Frost with the spectrograph.

has found remarkable changes in the form of another, but insignificant nebula, N.G.C. 2261. This object is the finest example of the comet-like nebulae that exists. The change in its form shown by the photographs is real and the interval required to show it is only half a dozen years. This change in the form of a nebula seems to be unique and is very important.

Add to these facts the enormous radial velocities observed in some of these bodies—especially in the spiral nebulae,—where motions of the order of a thousand kilometers per second have been found by Slipher and others—and we begin to look upon these objects with an awakened interest that is almost sensational.

If these evidences of change stir our emotions, what must we say of the comets where utter transformations may take place in a few hours time? These bodies, always mysterious, are sometimes the source of wonderful activity. Their stay with us is short and their period of activity is shorter still. Very few comets develop a tail and fewer still become visible to the naked eye. Bright comets are, therefore, always welcome visitors. They are even more remarkable than the nebulae in their preference for the photographic plate. A comet not visible to the naked eye, and which even in the telescope is faint and shows no tail, may present to the sensitive plate a long and elaborate tail full of structure and rapid changes. It may even discard that tail, which can be followed for days by photography as it drifts away, with a speed of many miles a second, and finally dissipates in space. In dealing with comets visually there is not only the lack of artistic skill in drawing what the observer sees—since accurate measurement with respect to a comet's tail as seen with the naked eye is not possible—but there is the further fact that he is blind to much of the light that some comets emit. There are really two sources of light in a comet. One is sunlight reflected to us, the other is light emitted by the comet itself. It is this last light which is peculiarly photographic and which must actuate all the changes in the features of a comet. Halley's comet, at its return in 1910 was in some respects a source of disappointment, though a beautiful and wonderful object to the naked eye. When it once became active, it presented few changes or peculiarities to the photographic plate, and there was little learned from it that would advance our knowledge of the physical condition of these bodies. But only two years before the advent of Halley's comet there appeared a small one (Morehouse's of 1908) which in the telescope was a rather insignificant affair, and which was only feebly visible to the naked eye for about one day. This object has given us a greater knowledge of the physical condition of these bodies than all other comets that have appeared. The photographic plate was especially sensitive to its

light, while the eye was not. A bewildering amount of structure was shown in its tail, which was frequently twisted and distorted in its rapid changes. Several times the tail was discarded and new ones formed in a few hours' time. All of these remarkable peculiarities would have been wholly unknown had it not been for the photographic plate. Through the information thus gained from this comet and others that preceded it we have learned that though comets are dependent on the Sun for most of their activity, they really take a larger part in the formation of the tail and the direction of the streamers than we had previously given them credit for. These photographs show that perhaps electrical conditions have much to do with the phenomena of a comet's tail. They also suggest that other forces are at work in the inter-planetary spaces than gravity alone.

Photography offers a ready means of determining the brightness of vast numbers of stars. But since the eye is sensitive to yellow and the photographic plate to blue light, and the stars are of all colors, large discrepancies are often found in comparing photographs of the stars with the sky. It is, however, possible to reconcile these differences and Professor Parkhurst of the Yerkes Observatory and other astronomers are at present engaged in the important task of this reconciliation. Photographic magnitudes can, therefore, now be made strictly comparable with the visual.

Stebbins with his selenium photometer and others with photo-electric devices have been able to measure incredibly small changes in the light of the stars. Even the heat of the stars has been measured by Nichols and others by the delicate methods of research employed today.

Time forbids an account of the remarkable investigations of Kapteyn on the star streams of the sky. His work gives us an insight into the makeup of our stellar universe that is new and impressive, and of the utmost importance.

ADDRESS BY PROFESSOR FOREST RAY MOULTON.

THE PROGRESS OF MATHEMATICAL ASTRONOMY.

You can imagine with what satisfaction I come before you here to explain in a few minutes the advances that have been made during the past fifty years in a subject nearly two hundred years old, and which more than a century ago was so advanced that it took a lifetime to master its complexities. However hopeless the task may be which I face, I can at least tell you about some of the things that are involved in these investigations.

Professor Hale has told you how the doctrine of evolution dominates all modern thought. In order that any doctrine shall be sound and applicable throughout the millions and probably hundreds of millions of years of celestial evolution, at least its fundamental laws must be correct. The one central law on which all discussion of celestial evolution is based is the law of gravitation, discovered by Newton over two hundred years ago. It was at once applied to explaining the motions of the Moon and the planets, and the results were satisfactory. The question then arose as to whether the law is exact enough to account for all the motions of these bodies for indefinite intervals of time. This question has been very prominent in the thought of mathematicians for more than a hundred years. In attempting its answer, difficulties were encountered of a character so serious that I cannot tell you about them fully, and I must confess that not all of them have been entirely overcome.

In spite of the difficulties, the law of gravitation, as it was expressed in 1688, by Newton, is correct to a degree of approximation that has not been attained in any other branch of science. The method by means of which its truth has been so exactly established can be illustrated by a simpler problem. One way to measure the force of gravity at the surface of the Earth is to determine the time in which a pendulum of given length, let us say a seconds pendulum, will vibrate, because the time of vibration depends on the force of gravity. We can measure with a certain degree of precision the time of one vibration and find the force of gravity with corresponding accuracy. But suppose the pendulum makes a hundred swings; the error in measuring the whole interval will be no greater than in the case of a single vibration, and hence gravity will be determined one hundred times as accurately. Since in a day there are 86,400 seconds, in a day the accuracy is increased 86,400 fold. In ten days the precision in the determination of gravity is 864,000 times that obtained from a single vibration. It is evident that accuracy is a result of the accumulation of the effects of the quantity which it is desired to measure. Something like this occurs in testing the law of gravitation by the motions of the heavenly bodies. We cannot verify it with any considerable accuracy by observations of one day or one year. But from observations extending over two centuries, we repeat that the law of gravitation is established with a degree of precision which is not approached in the case of any other scientific law.

Now, what has been accomplished in the last fifty years? What unexplained phenomena of fifty years ago have been shown to be consequences of the law of gravitation? Half a century ago there were only two outstanding questions, one, a small peculiarity in the

motion of the Moon, which only modern powerful instruments could reveal, and the other, an equally slight peculiarity in the motion of Mercury. These irregularities did not seem to follow from the law of gravitation and astronomers were at a loss to account for them. It was not known whether these discrepancies between theory and observation were due to imperfections in the mathematical processes or to an inexactness in the law of gravitation. The foremost mathematicians of the world from the time of Newton to the present have attempted to answer this question. The difficulties it presented were most formidable and the work required was appalling. For example, Delaunay spent twenty years computing the series for representing the motion of the Moon; his finished work, which was published about fifty years ago, was so extensive that several hundred quarto pages were required for the final answer alone. The work of Delaunay closed an epoch, and though monumental, was yet incomplete from a logical point of view.

In 1877, George W. Hill, of Washington, in a brilliant series of papers, inaugurated a new epoch in the Lunar Theory. From Newton to Hill's immediate predecessors there had been much in common in the methods employed. Hill broke loose from the processes which earlier astronomers had used and with rare originality marked out entirely new paths. Before his work on the theory of the motion of the Moon was completed, he was compelled to turn his attention to the theory of the mutual perturbations of Jupiter and Saturn. Fortunately, the young English mathematician, E. W. Brown, appreciated the importance of Hill's methods and carried them out probably about the same as Hill would have done if his attention had not been diverted. The completed Lunar Theory is a monumental piece of work, giving hundreds of agreements between theory and observation, and furnishing no hint that the law of gravitation is not a sufficiently exact expression of the forces between celestial bodies to be used safely for the long intervals of time involved in the problems of evolution in Astronomy. There are, however, very slight peculiarities in the motion of the Moon which do not follow from theory, but these outstanding discrepancies can be explained in a number of possible ways; and, in spite of the perfection of the work of Hill and Brown, there are still points in which its logic is not complete.

Following the work of Hill, came that of the great Frenchman, Poincaré, whose brilliant genius has dazzled the whole world. With excessive modesty he confessed that his work on the problem of three bodies owed its inspiration to Hill. Hill was highly original, but Poincaré added to originality and the highest order of genius a perfect command of all the resources of modern mathematics. Unquestionably, his work will stand out for centuries like that of Newton and Laplace.

One of the principal problems which he attacked was that of the exactness of the law of gravitation, and whether, under it, the solar system in which we live is stable; that is, whether the Earth will continue indefinitely to revolve around the Sun at approximately its present distance, or whether it will gradually wind in on the Sun and be consumed, or wind out and wander off into the night of space. He did not completely answer this question, but we hope that fifty years from now, at the hundredth anniversary of the Dearborn Observatory, it will have been settled. But we do know now that the Earth will continue to revolve around the Sun at approximately its present distance for immense ages.

One other great discovery whose applications, at least, have been made in the last half century I wish to mention. A little more than half a century ago the great physical principle of the conservation of energy was announced. In the discussion of the evolution of the universe it is as important as that of the law of gravitation. Professor Hale spoke of the possible evolution of a nebula into a star. In its contraction it developed heat energy in conformity with the principle of the conservation of energy. Helmholtz first applied this principle to contracting suns about sixty years ago, and his work was followed by that of Kelvin, Lane, and Ritter. This work shows us that if our own Sun has no other important source of heat, it cannot have supplied the Earth with heat for more than about 20,000,000 years. On the same basis, the Sun will not give the Earth heat more than about 10,000,000 years in the future.

These figures were derived on the basis that the Sun has no other important sources of heat than that produced by its own contraction. But physicists and chemists have recently found that some atoms break up into their constituent parts, and that in the process an enormous amount of energy is liberated. Possibly the sub-atomic energies are important sources for maintaining the heat of the stars. At any rate, most geologists believe, on the basis of geological evidence, that the Earth is many tens of millions of years, if not hundreds of millions old, and astrophysicists are generally willing to admit that the life of a star is many times 20,000,000 of years. And if this is true, we may reasonably infer that the Earth will exist and be suitable for the abode of life for tens of millions of years in the future.

So we see that mathematical astronomy for the last fifty years has not been devoted to applying the law of gravitation to current celestial phenomena, for that had been done with almost complete success a half century earlier, but to a rigorous testing of the fundamental laws and principles on the basis of which we shall unfold and come to understand the evolution of the universe from infinity to infinity.

ADDRESS BY PROFESSOR GEORGE E. HALE.

SOME REFLECTIONS ON THE PROGRESS OF ASTROPHYSICS.

The great national edition of the works of Galileo, published by the Italian Government under the skilled and devoted editorship of Professor Favaro, contains a page of unique interest in the archives of astronomy. Reproduced in facsimile from Galileo's note-book, the hasty sketches and rapid notes made during his first telescopic observations of Jupiter lie before us. Copernicus had already published his great work on the revolutions of the heavenly bodies, and Galileo, with a mind singularly free from the medieval prejudices of the day, had accepted the heliocentric view, and had become its chief exponent. But the true conception of Jupiter's system of satellites dawned slowly, and in the few notes made from night to night we can trace its development in Galileo's mind. First regarded as stars, whose changing configurations must result from the motion of Jupiter, the satellites were gradually perceived to belong to a wonderful system revolving about Jupiter as the planets revolve about the Sun. This splendid illustration of the views of Copernicus marked the downfall of the Ptolemaic system and the beginning of modern astronomy.

Of this new era, which arose from the invention of the telescope, it is not within my province to speak. But we must realize how the astrophysics of the last half century is deeply rooted in a more remote past. When Galileo discovered spots on the Sun he opened to investigation the problems of solar physics. In the same century Newton decomposed sunlight into its primary colors, though he failed to detect the dark lines of the solar spectrum. These were first seen by Wollaston and accurately mapped by Fraunhofer in the year of Waterloo. But although Fraunhofer discovered similar lines in the spectra of certain stars, and even detected the coincidence of the double yellow line of sodium in a flame with the double dark line which he called D in the solar spectrum, the significance of these observations was not perceived until 1859.

It is a remarkable fact that firm foundations for the study of both organic and inorganic evolution were laid in this same year. *The Origin of Species*, presenting a vast mass of evidence in support of the theory that new species originate by natural selection, raised the biological world out of the systematism of Linnaeus into the stimulating atmosphere of the Darwinian period. At the same moment the study of the evolution of the Sun and stars was made possible by Kirchhoff's law of selective absorption and his identification of the dark

lines of the solar spectrum with the lines of the chemical elements in the flame and spark. It became as easy to determine the chemical composition of the solar atmosphere as to analyse a common substance by the ordinary processes of the chemist. Sodium, iron, calcium, hydrogen: in fact, nearly all terrestrial elements, were found in the Sun and soon afterward in stars. If a new star blazed out in the Milky Way, its chemical constituents were seen to be of the very kind most familiar to us on the Earth. Thus a marvelous unity, embracing the most remote objects of the universe, was at length perceived. And the instrument that revealed it furnished also the means of tracing the life histories of the stars.

Secchi, Rutherford, Huggins, and Draper were the pioneers in this new field. The diverse spectra of the stars were at once recognized as indications of physical development. Huggins' discovery of the gaseous nature of certain nebulae was taken to point to a source of material from which stars might be formed. And thus was set on foot that splendid campaign, rendered possible by the effective use of the objective prism and the modern slit spectrograph, powerfully supplemented by the photographic plate, which has carried us well on the way toward a perception of the course of stellar evolution.

I cannot attempt to trace the tactics, or even the broader elements of strategy, in this great attack on the celestial hosts. Nor may I pause to show how one unit in the stellar ranks, placed as an outpost at the center of the solar system, has been subjected to the varied assault to which his proximity exposes him. The time at my command may be better devoted to a brief survey of some of the larger results achieved and a glance at the means which have made them possible.

So few are the principal types into which the stars may be resolved that Fraunhofer himself detected most of them. Disregarding certain special groups, and confining our attention to the more pronounced marks of distinction, we find that more than a hundred thousand spectra photographed at Harvard belong to the following classes; white stars, in which the lines of helium are conspicuous; stars, also white, in which hydrogen plays the leading role, while traces of the metals begin to appear; yellowish stars, like the Sun, in which the hydrogen lines, less conspicuous than before, are accompanied by thousands of lines due to metallic vapors; and orange or red stars, in which the still fainter hydrogen and stronger metallic lines are accompanied by bands characteristic of titanium oxide. These classes stand in an unbroken sequence, passing over by slow and barely perceptible changes from one to another, and marking out a line of development in which some single variable must undeniably play the dominant part. The differences in the spectra, indicated by the greater or lesser prominence

of one or another element, cannot mean fundamental differences in chemical composition. This might be proved in several ways, but is perhaps most clearly illustrated by the recently discovered fact that certain variable stars, of the Cepheid class, undergo a regular variation in spectral type in the space of a few hours, showing at the same time corresponding fluctuations in brightness and in temperature. Again, we know that the spectrum of a sunspot, a cooler region on the Sun, closely resembles that of a red star, which is essentially a cooler Sun.

Temperature, then, is the main source of the observed differences in stellar spectra. The white helium stars attain temperatures of perhaps $20,000^{\circ}\text{C}$, the white hydrogen stars may exceed $10,000^{\circ}$, the yellowish stars like our Sun measure about $6,000^{\circ}$, while the red stars range from $2,000^{\circ}$ to 3000° , thus falling within the limits attained by our electric arcs and furnaces. With these and certain laboratory devices we may test this temperature hypothesis, and prove its general validity beyond any reasonable doubt.

Thus in the gradations and sequence of their spectrum lines, in color differences corresponding with the shift of the maximum brightness in the spectrum toward the red with lowering temperature, and in other respects no less remarkable, the stars fall into an ordered series. Only recently has it been shown by Kapteyn, Campbell, and Boss that the speeds with which the stars are moving through space also vary in the same sequence: a condition so unexpected and so fundamental that it taxes existing means of interpretation.

At this point astronomy and astrophysics have joined hands in pushing forward the study of stellar evolution. The stars vary enormously in mass, in density, and in surface brightness, and if we are to discuss intelligently the differences in their spectra we must reduce them as nearly as may be to a common basis. A long step in this direction has been taken by classifying stars, not merely on the indications of their apparent brightness, but in terms of their actual brightness—the brightness they would have if they were all brought to the same distance from the Earth. To do this we must know their exact parallaxes, few of which have been determined until recently with the necessary precision. Fortunately a strong group of astronomers, including the director of the Dearborn Observatory, is coöperating most effectively in the photographic measurement of stellar distances. The number of parallaxes already determined has sufficed to yield some remarkable conclusions, when coupled by Hertzsprung and Russell with the results of spectroscopic and photometric investigations.

The first of these is that the white stars greatly exceed the Sun in actual brightness, while the very faint stars are invariably red. Moreover, there appear to be two great classes of stars: those of extreme

brightness, which have been called *giants* and those of lesser brightness called *dwarfs*, of which our Sun is a typical example. In the case of the red stars these classes are sharply separated into two groups, between which there seem to be no stars of intermediate brightness.

We may not pursue in their interesting details the conclusions and speculations to which this new conception of stellar classification has given rise. Some of them require the support of further observations before they can be finally accepted, but recent work strongly confirms the view that a point of inflection is likely to enter the time-honored path of stellar evolution. Lockyer, on other grounds, suggested long ago that the curve of development should have both ascending and descending branches, and advanced spectroscopic evidence in support of his conclusion. But his reasoning and results differ in many respects from Russell's.

According to Russell, the red giant stars of great diameter, low density, and low temperature, represent the early stage of sidereal life. Contraction following radiation of heat would give rise to denser and hotter stars, culminating in the intensely hot white stars of the helium class. Further contraction, attended by a reduction of temperature, would result in the dense dwarf stars, which occupy the declining slope of the curve of stellar development.

Whatever our predilections, we must welcome most cordially the new light which has been thrown on our central problem, even if we cling to the classic idea that the white stars are young while the red stars, irrespective of their absolute brightness, represent the period of decline. This older and more widely accepted view has the advantage of affording an unbroken transition from nebular to stellar spectra, which is lacking if we begin our sequence with Russell's red giants. Yet Adams has recently shown that for spectroscopic reasons the red stars should be divided into two groups and the progress of research may soon be expected to provide a reliable means of distinguishing between the old and new views.

Time fails me to show how the spectroscope has extended Bessel's "astronomy of the invisible" into a larger realm, and revealed a new department of double star astronomy, now connected without essential discontinuity with the classic field to which the Dearborn telescope, in the hands of Burnham, Hough, and Fox, has made so many contributions. Nor may I enter the great domain of star-streaming, which belongs primarily to astronomy, though the last wide extension of its boundaries has come from the work of the spectroscope. The old barriers between the physical and the structural problems have broken down, and the old and new astronomy are working together in the closest harmony. Adams has just demonstrated, for example, a simple

means of determining a star's distance from a knowledge of its apparent brightness and the ratios of the intensities of certain lines in its spectrum. Founded upon the indispensable parallax measures, which will ultimately extend both its range and its precision, the new method should prove a powerful ally in the further study of both the structure and the evolution of stellar systems.

Turning now to the instrumental side, we observe great changes in the observatory equipment during the last half-century. Telescopes have grown in size and in perfection, while their indispensable auxiliary, the photographic plate, has increased their efficiency a hundred-fold. The spectroscope, no longer the simple aid of the chemical laboratory, has taken its rightful place beside the telescope as an instrument of the most diversified possibilities and of the widest usefulness. No longer limited to the determination of chemical composition of flames and suns, it tells us in no uncertain tones of the motions, temperatures, pressures, magnetic properties, life history, and even the distances of the heavenly bodies. As a result of its growth and refinement the qualitative period of spectroscopy, once a reproach, has given place to an era of measurements which cannot be surpassed for precision in the entire range of science. Brought into closer contact with the physicist and chemist, the astrophysicist has profited without limit by their marvelous progress, and adapted their devices to his special needs. Thus the observatory has received from the laboratory scores of auxiliaries and methods, which have led its investigations into unimagined fields. The bolometer and radiometer, the perfected thermopile and the radiomicrometer, have given us precise measure of the solar radiation and detected its fluctuations, determined the heat of stars beyond the vision of the naked eye, and mapped the vast region of the infra-red spectrum where neither eye nor sensitive plate is of any avail. Selenium and photo-electric cells have proved stars to be variable which were formerly supposed to shine with unchanging light. The recognition of the electron and the rise of modern physics have been reflected in the work of the observatory. The phenomenon of Zeeman, showing the remarkable resolution of spectrum lines under the influence of a magnetic field, is now known to have been seen—though not interpreted—by the solar physicist long before it was detected in the laboratory. The relationship of hydrogen and helium, the effect of an electric field on radiation, and even the principle of relativity are applied or tested in the observatory while yet a novelty in the laboratory or the study of the mathematician. Thus by the use of many new agencies, the astrophysics of yesterday has become the new and broader subject of to-day.

But it is neither in multiplied resources nor in the construction of larger telescopes that we perceive the most significant advance of the half-century. The greatest difference between the present and the past lies in the broadened outlook of the investigator. No longer groping in the dark, or confining his attention to some minute specialty pursued without reference to a larger view, he has widened his horizon and entered into harmonious coöperation with others in his field. Thus the capacity of any single instrument has been multiplied twice, first by the use of the photographic plate or other auxiliary method, and again by the coördination of effort which does away with useless duplication. I have heard the great geologist Suess, a man of the widest interests and richest imagination, describe a certain astronomer as "one of those who busy themselves with those *vermin* of the skies—minor planets and comets." He did not mean that asteroids and comets, which have played such an important part in the larger problems of our solar system, are not worthy of study. What he objected to was the haphazard way in which they are sometimes observed. It is worth while to record, even without purpose, without reason, and without hope, the position of a chance asteroid or a passing comet. But it is far better to mix intelligence with industry, to plan observations in harmony with some central idea, to coöperate with others in pursuit of some large end. Thus each record may be greatly enhanced in value, and given a better chance of holding a permanent place in the archives of research.

Such is the change which has come over the spirit of the observatory. The accumulation of data is no longer pursued blindly, but is based upon an intelligent plan. Such vast problems as the structure of the universe or the evolution of the stars are now attacked in so sane a manner that progress has multiplied by leaps and bounds. And this is because of a freer and better use of the scientific imagination, acting under the inspiration which we owe in no small measure to Lyell and to Darwin and to others of their time. The theory of evolution is no longer bounded by the limits of the nebular hypothesis or the principle of natural selection. Rising out of these great conceptions, it has expanded into a vast and sweeping vision which embraces all nature. From the whirling electrons in the minute solar system of the atom to the globular star clusters, the spiral nebulae, and the great star streams of the sidereal world is now but a step. Without break of continuity, we study the nature of the electron and the composition of nebulae, the constitution of the atom and the formation of the stars, the organization of complex matter and the evolution of the Earth. We watch with Lyell and Suess, and others of our own day, the development of the Earth's face and the ebb and flow of molten and of aqueous tides. Deep

below the Cambrian rocks, embedded in those great sedimentary deposits which filtered during slow millions of years through the depths of prehistoric seas, we find the first signs of life. We isolate the unit of the biologist, and as we marvel at the complexity of the cell as contrasted with the electron, we admire the patience and perseverance which has brought order out of chaos in the intricate mazes of organic existence. We watch the rise of strange life forms, their transformations and effacements, the long intervals of stagnation and repose, the renewed appearance of life in other aspects, graceful and grotesque, gigantic and inconceivably minute. Surveying with Darwin the wide extent of the dead and living world, we perceive the play of a single principle in thousands of diverse organic forms, and see it restore the continuity of that evolutionary progress which is more easily traced among the simpler elements of inorganic nature. We observe the modern biologist, applying the experimental method and producing in his laboratory the variations and mutations which have occurred so often in the history of terrestrial life. We follow the prolific researches of the anthropologist, see him restore the missing links, and trace the marvelous advance which has developed man out of the low intelligence of the anthropoid world. Finally, we see the crude efforts of the first artist endeavoring to express his conceptions, the gathering together of peoples, and the rise of the earliest civilizations. And as we survey the long process of evolution, in its unbroken manifestation from electron to star, from Earth to man, we feel the impulse which has taught us no longer to be content with the limited view point of the specialist, but in whatever we do, howsoever restricted our field, to look out toward the widest expanses of nature and profit in our researches by the clarifying and inspiring example which has been set for us by the leaders of modern thought. Let me close with the words of the great geologist Suess* one of these leaders now unhappily lost to us:

"What a memorable half century we have lived through! During this time, under the influence of increasing knowledge of nature, all human conceptions of the Earth have changed. It is remarkable, however, to see how often the single inquirer, bent upon the object of his quest, fails to comprehend the broader aspects of a problem by whose details he is fettered, just as the stone-cutter clinging to a facade, cannot see the splendor of the structure on which he himself is engaged. And yet there is a special charm in geological studies precisely on account of the extraordinary range of accommodation that is demanded

* Spoken at the closing banquet of the Ninth International Geological Congress, Vienna, August 27, 1903. See Schuchert, *American Geologist*, Vol. 33, January 1904.

of the eye, of the same eye which now examines the disintegration of quartz in a thin slide under the microscope, now sweeps over snowy mountain peaks, over dark precipitous cliffs and verdant vales, and with commanding glance reads their structure in the features of the landscape. But not less is the demand on the adjusting powers of the mind. From the most subtle conclusions derived from an ingenious experiment the geologist must be able to lift the mental eye over hill and valley into the most distant parts of the universe. There the glowing spectra of nebulae teach him that even now the great processes of world making are not yet ended. With the aid of instruments he can daily witness the greatest eruptions of superheated gases emanating from the body of our Sun. Photography spreads before him the pictures of the desolate crater-fields of the Moon.

"Returning to his Earth he now perceives that the sum total of life's phenomena not only forms a single phenomenon, but that it is also limited by space and time. It occurs to him now that the stone which his hammer strikes is but the nearest lying piece of the planet, that the history of this stone is a fragment of the history of the planet, and that the history of the planet itself is only a very small part of the history of the great wonderful and ever changing Cosmos.

"His heart then thrills; he feels called as a co-laborer on the most sublime problems in which feeble, mortal beings can take part. Then, too, he sees that the fundamental lines of structure coursing over the Earth's surface have nothing to do with the political lines separating the nations. The vastness of the problem itself makes the concord of civilized nations natural, and they remain separated only through their emulation, all filled with the idea that mankind in general will most highly esteem that nation which is in the position to offer the most and the best of noble example, of new truth and of ideal worth."

To-day, in the midst of the great war, what a melancholy interest attaches to these last lines! Yet they express a lofty ideal, toward which we may hope that the world will continue to grope its way, even though final attainment must lie far in the future.

THE DAILY NEWS, TUESDAY, JANUARY 5, 1926
A GREAT INSTITUTION IN ITS MODEST BEGINNINGS.



The University of Chicago as It Appeared When Located at Cottage Grove Avenue and 34th Street, on the Former Site of Camp Douglas.

(Copyright, Interstate Photo Service)

CHICAGO DAILY NE

DAILY NEWS CO.

TUESDAY, JANUARY 5, 1926.

NO TRAFFIC COP OR HORN OF AUTOMOBILE DISTURBED T



Old University of Chicago

The Old University graduated, in its 25 classes, 311 men and women. At the time this letter was written (Feb. 2, 1891) there were 282 living alumni. Dr. Galusha Anderson, President of the Old University (1878-85) became head professor of Homiletics in the Divinity School of the University of Chicago. Nathaniel Butler, professor of English in the Old University (1884-86), was director of the University Extension Division in the new University. The alumni of the Old University were represented on the faculty of the new by Charles Richmond Henderson, class of '70; Robert Francis Harper, class of '83; Elizabeth C. Cooley, class of '83; David Judson Lingle class of '85. Theodore Morelle Hammond, class of '85, was the University Steward in the first year. Three members of the Board of Trustees were alumni of the Old University -- Frederick A. Smith, class of '65; Ferdinand W. Peck, class of '68; and Eli B. Felsenthal, class of '78.

From article by Alonzo K. Parker in U of C Magazine,
Dec., 1916, entitled The First Year: October 1, 1892, to
Oct. 1, 1893

The Old University graduated, in the 25 classes, 211 men and women. At the time this letter was written (Feb. 2, 1891) there were 282 living alumni. Dr. Falmes Anderson, President of the Old University (1873-82) became head professor of Hellenistic in the Divinity School of the University of Chicago. Nathaniel Butler, professor of English in the Old University (1882-85), was director of the University Extension Division in the new University. The alumni of the Old University were represented on the faculty of the new by Charles Richmond Anderson, class of '90; Robert Grosvenor, class of '85; Elizabeth C. Dooley, class of '85; and John D. Latta, class of '85. Theodore Roosevelt, class of '85, was the University President in the first year. Three members of the board of trustees were alumni of the Old University -- Frederick A. Smith, class of '85; Benjamin W. Peck, class of '88; and Eli J. Folsom, class of '78.

This article by Alonso K. Barber in U of C Magazine, Dec., 1916, entitled The First Year: October 1, 1892, to Oct. 1, 1893



HISTORIC STONES

By JOHN A. MENAUGH

ILLINOIS long has been famous for its institutions of higher education. Its great universities and colleges, among which is the University of Chicago, are known the world over. It may not be known, however, by some members of the younger generations that the present University of Chicago is the second institution to bear that name.

The first, or old, University of Chicago, existed from the late 50's until 1886. From the main building of this old school The Tribune obtained a stone in 1935 thru the courtesy of the late C. H. Koenitzer of River Forest, Ill. The stone now is part of the south exterior wall of the W-G-N studio building. A stone from the World's Columbian exposition of 1893 also is in the same wall. These two stones represent Illinois in The Tribune's collection of historic stones from various states of the Union.

• • •

The first University of Chicago originated in a grant of land by Senator Stephen A. Douglas, the site being on the west side of Cottage Grove av. between 34th and 35th sts. The site first was offered to the Presbyterians, but it failed to awaken interest among them. The Rev. John C. Burroughs, pastor of the First Baptist church of Chicago, however, obtained the gift for his denomination.

In 1856 Douglas deeded the site to the trustees of the newly formed university, which was incorporated in January of the following year, after a considerable sum of money had been subscribed. The panic of 1857 made it impossible for a number of the subscribers to make their payments, but in July, 1858, the trustees voted to resume work on a building which had been started and which

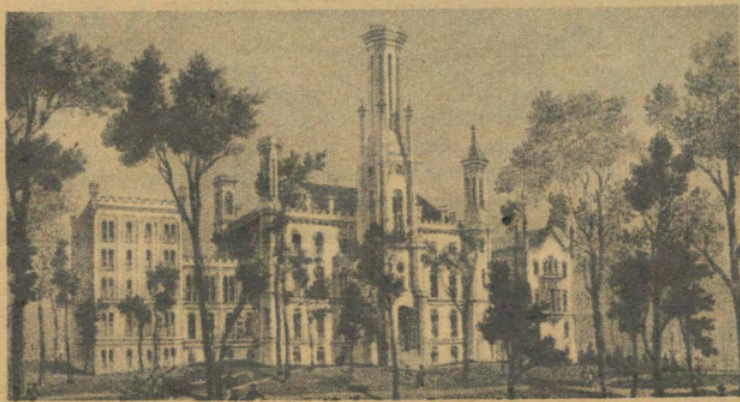
came to be known as Jones hall. The university opened its doors in the autumn of 1858, with Burroughs as president and with classes in St. Paul's Universalist church at Wabash av. and Van Buren st. Later the classes were transferred to Jones hall, which was dedicated in July, 1859.

After Douglas died in 1861 the trustees decided to erect a new and larger building and name it Douglas hall in his honor. Soon after this J. Y. Scammon offered to build an astronomical observatory in connection with Douglas hall. The observatory was erected at a cost of \$30,000 and in it was placed a \$18,500 telescope contributed by the Chicago Astronomical society. The observatory was named Dearborn tower, after Scammon's wife, a member of the family for which Fort Dearborn and Dearborn st. were named.

Work was suspended on Douglas hall after \$122,000 had been spent, and it was estimated that \$30,000 more would be needed to finish the building, a large and imposing stone structure with a lofty tower in front and the observatory in the rear. More money was raised and the university went in debt. It was necessary to place a heavy mortgage on the whole property to complete Douglas hall and meet other expenses.

The insurance company which held the mortgage foreclosed in 1885 and the university's last commencement was in June, 1886. The buildings were torn down, and the telescope removed for use by Northwestern university.

The stone from Douglas hall which is embedded in a wall of the W-G-N studio building was quarried at Lemont, Ill. A similar stone, also presented by Mr. Koenitzer, is in a wall on one of the structures of the present University of Chicago.



Douglas hall of the first University of Chicago at Cottage Grove av. and 34th st.

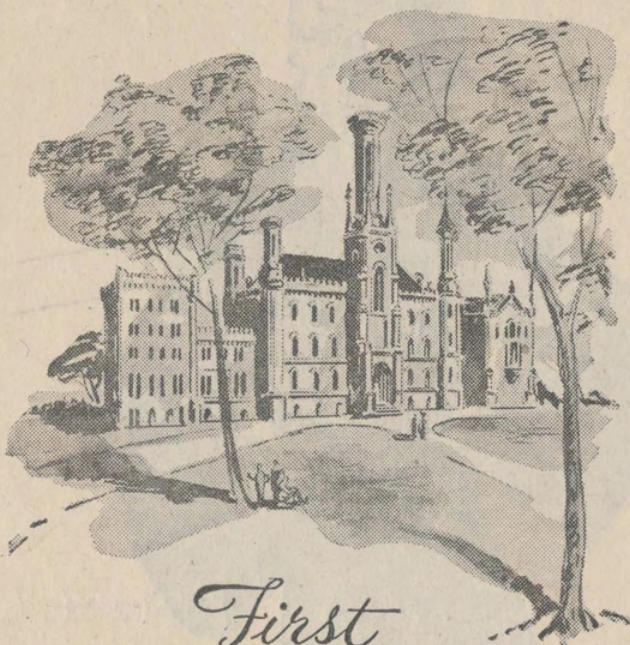


Houghtelling.



Ayres Houghtelling, the artist who painted the "Alice in Wonderland" mural reproduced at the top of the page, points out to Bambi Lynn, young star of the stage production of "Alice," the place where her mascot enters into the story.

FINE CLOTHES for MEN and BOYS



First Chicago University

THIS WAS the birthplace of the first Chicago University. Founded in 1857, it was located at Cottage Grove Avenue and 34th Street. From this grew the present University of Chicago, recognized for its high educational standards.

SINCE early in this Century, tradition has given A. STARR BEST recognition for the finest in men's and boys' clothing.

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March 24, 1946

When Chicago Got Its "Great Telescope"

By DELOS AVERY

COUNTING birthdays from 1837, year of incorporation as a city, Chicago was 19 years old when her importance as an intellectual center began.

For it was then, 1856, that the first University of Chicago (no relation to the famous institution now bearing that name) was made possible by a land grant.

Sen. Stephen A. Douglas was the donor. The land, a 10 acre tract on the west side of Cottage Grove av. north of 35th st., was first offered to the Presbyterian church, with the stipulation that it must be used as a university site.

The Presbyterians, aware, perhaps, of the difficulties that would be met, perhaps dubious about the possibilities of assembling a proper faculty and the still greater difficulties of financing and administration, hung back—and it was the Baptists who stepped in.

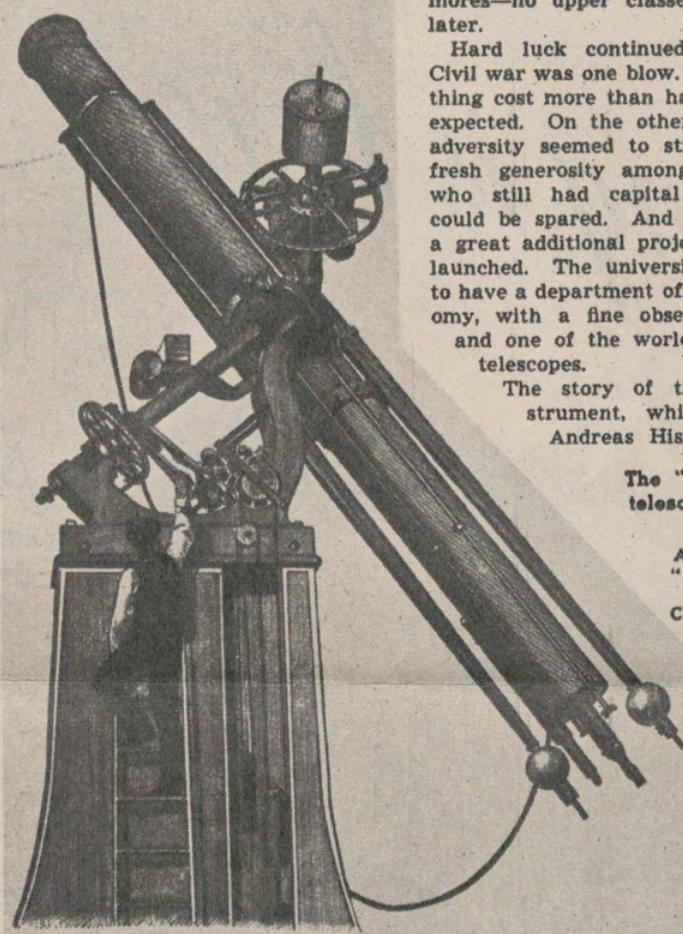
The Rev. John C. Burroughs, D. D., a scholarly man, pastor of the Baptist church, had just received a call to the presidency of Shurtleff college, Upper Alton, Ill. But he loved Chicago, hated the thought of leaving, and decided to approach Douglas.

The senator did not mind dealing with Baptists instead of Presbyterians, but he did demand assurances that his gift would be fruitful. The work of building must be started promptly, he insisted, and the initial structure must cost \$100,000.

• • •

Burroughs went to work to raise the money, and in three months he held pledges for the whole sum. In the following January the new institution was incorporated as the University of Chicago, chartered by the legislature, and on the Fourth of July the cornerstone was laid.

Trouble ensued almost at once. The depression of 1857 began. Depressions were called panics in those days, and this was a real one. Subscribers who pledged the money could not pay it because they did not have it. Construction work stopped short. Everything stopped—excepting Dr. Burroughs. He kept the trustees working. As a reward (or penalty) they elected him president. He declined. They elected him again,



The "great telescope."
(From Andreas' "History of Chicago")

mores—no upper classes until later.

Hard luck continued. The Civil war was one blow. Everything cost more than had been expected. On the other hand, adversity seemed to stimulate fresh generosity among those who still had capital which could be spared. And in 1863 a great additional project was launched. The university was to have a department of astronomy, with a fine observatory and one of the world's best telescopes.

The story of that instrument, which the Andreas History of

the world to Chicago's doorstep.

Presently a tip came from Ann Arbor concerning a "super" telescope, brand new, built at Cambridge, Mass., by Alvan Clarke & Sons. Was it really a good one?

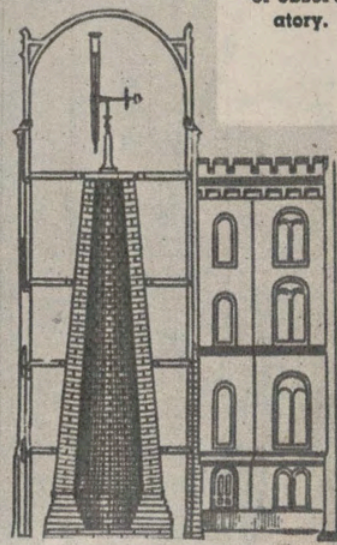
It was. It already had won world-wide recognition because thru its huge objective lens its maker had discovered the "twin" of the star Sirius. The existence of such a twin had long been suspected by astronomers, but nobody had ever seen it. The discovery created such excitement that the French Academy of Sciences had awarded the La Lande prize to Alvan Clarke. The prize was worth 500 francs—no great sum even in those days, hardly the price of a dinner now. But the greatness of the honor was compensation for the smallness of the prize.

• • •

The Chicago committee decided that the Clarke telescope was the one to acquire if it could be done. It was learned that the instrument had been designed for the University of Mississippi—but delivery there was impossible; reason, the war. The southern state's lost opportunity was Chicago's big chance. A stroke of luck.

The committee appointed a sub-

Cutaway drawing of observatory.



committee of one resourceful man, Thomas Hoyne, who started at once for Boston. He reported that the Clarke telescope was not only the largest refracting instrument

ever made (up to that time) but was by far the best of its kind in the world in every technical way. Its objective lens had a working aperture of 18 1/4 inches, three inches more than the diameter of the celebrated instrument at Cambridge. It was greater even than the one at Pulkowa in Russia, largest refractor in Europe.

Hoyne worked fast and got it for Chicago at the very time Prof. G. P. Bond was circulating a subscription list to acquire it for the Cambridge observatory. Hoyne, the man from the west, acted while the east talked. He reported that Chicago could have the telescope for \$11,187. But that would be only the beginning of the cost. Such an instrument would call for something very special in the installation line. It would cost a great deal, but it would be worth more as a contribution to Chicago's world prestige.

The committee promptly sup-

ported Hoyne and the deal was made. The money was raised. William B. Ogden, Chicago's first mayor, headed the subscription list with an offer of \$5,000. J. Y. Scammon, another wealthy citizen, did better still. He pledged himself to erect the building in which the telescope would be housed. It cost him \$30,000 to build the observatory tower, and it was named Dearborn tower in memory of his first wife, whose maiden name was Dearborn.

Building towers for big telescopes is something special in architecture. The details in the case of Dearborn tower are recorded by Andreas:

"It consisted essentially of two independent buildings, the central and the outward portion. On account of the sandy nature of the soil, 105 oak piles were driven 27 feet into the earth, penetrating

the underlying clay and hardpan. An excavation was made 15 feet deep, 10 feet below the water level, where the piles were sawed off and capped with square oak timbers. The interstices were filled with concrete and then the entire surface was floored over with oak timbers. The masonry was then commenced on top of this foundation, consisting of solid blocks of stone from four to five feet square and from 12 to 18 inches thick. This was carried up to a height of 12 feet above the timber platform, and on this was built the central column, erected like the frustum of a cone, 27 feet in diameter at the base and 82 feet high to the top of the floor of the astronomer's room, where it is 10 feet in diameter."

Around the lofty column which bore the weight of the instrument the outer shell of building was erected, octagonal, 35 feet in diam-

The "Great Telescope"

(Continued from page two)
ford, formerly of the Harvard observatory, became the first director of the Dearborn.

At first the salary of Safford as director of the observatory was paid by Scammon, president of the Chicago Astronomical society. But what with war, the great Chicago fire, and the subsequent depression, a time came when Scammon could no longer bear the financial burden, and Safford, who could not afford to work without pay, was obliged (1874) to find an outside job.

His successor as director was Prof. Elias Colbert, who had a paying position as commercial editor of The Chicago Tribune. He earned his living by day and gave his nights to the observatory and the Astronomical society. He raised

money to rebuild the damaged dome of the observatory. For five years he kept up this life of day and night toil. And then Prof. George W. Hough, formerly of the Dudley observatory at Albany, N. Y., became the new director at the Dearborn.

When the old University of Chicago went broke (in the early '80s) the great telescope was at first held by the courts to be the property of the university and therefore one of the assets which creditors might seize. But on review the title was recognized as belonging to the Astronomical society. And in 1886 Northwestern university bought the instrument for \$25,000, erected a fine new tower for it, and has been using it ever since. Its wonderful lens is now as good as it ever was.

eter, so constructed that the shell nowhere touched the column, thus making sure that neither the swaying of the shell in the wind nor the unequal expanding of its parts by the varying heat of the sun would have any effect on the central shaft.

The focal length of the telescope was 23 feet. There were four astronomical eyepieces, giving magnifications from 135 to 900 diameters. The instrument weighed almost three tons and its tube was of mahogany. Its total cost was \$18,000 and the building cost \$30,000. So it was quite a costly gift to the university, considering that millionaires were scarce in those days.

The telescope reached Chicago from Boston on March 24, 1866, and was mounted April 12 under the supervision of Alvan Clarke himself. Prof. Truman Henry Safford (Continued on page seven)

as much even the Bill still
tes tops." Probably the main thing wrong
th this three cornered friend-
ip of yours is the fact that
u're going steady at all. Going
eady is supposed to be a pretty
finite arrangement in which a
low and gal decide, after dat-
g a large share of other char-
acters their age, that they would
ce to make their twosome a
rly permanent arrangement.
If a girl agrees to go steady
th a fellow even tho she likes
her boys almost as well, it
n't a particularly honest ar-
angement. Going steady should
ean that you don't want to
te other boys, that you'll wear
s ring wherever you go, and
at you're looking forward
guely to home and hearthside
ans. Otherwise, why bother to
steady at all? So be honest
ith both the fellow and your-
lf. You'll admit that you're
ot ready to start dating the fel-
w on a completely exclusive
asis, so now is a good time to

along well with the girls in my
classes. Every one seems to like
me as well as any of the other
fellows. In fact, recently I was
elected treasurer of our senior
class. But the truth is that I'm
a pretty unattractive looking fel-
low. I'm not exactly a Franken-
stein, J. G., but I won't give Van
Johnson a great deal of compe-
tition either. And so I've hesi-
tated about asking a girl to spend
the evening with me. I wouldn't
like to be refused the first time
I tried.

We've said it before, but ap-
parently it can bear saying again
--and again. Looks are helpful,
it's true, but they certainly aren't
essential to an interesting date
life. If you are well scrubbed
and shiny faced, well groomed
and neatly put together, no gal
will ask anything more. So fer-
ret out your best bow tie and
get ready for a big date with
your favorite gal next Friday
night. You won't have any trou-
ble at all. All those votes for
treasurer didn't come from your

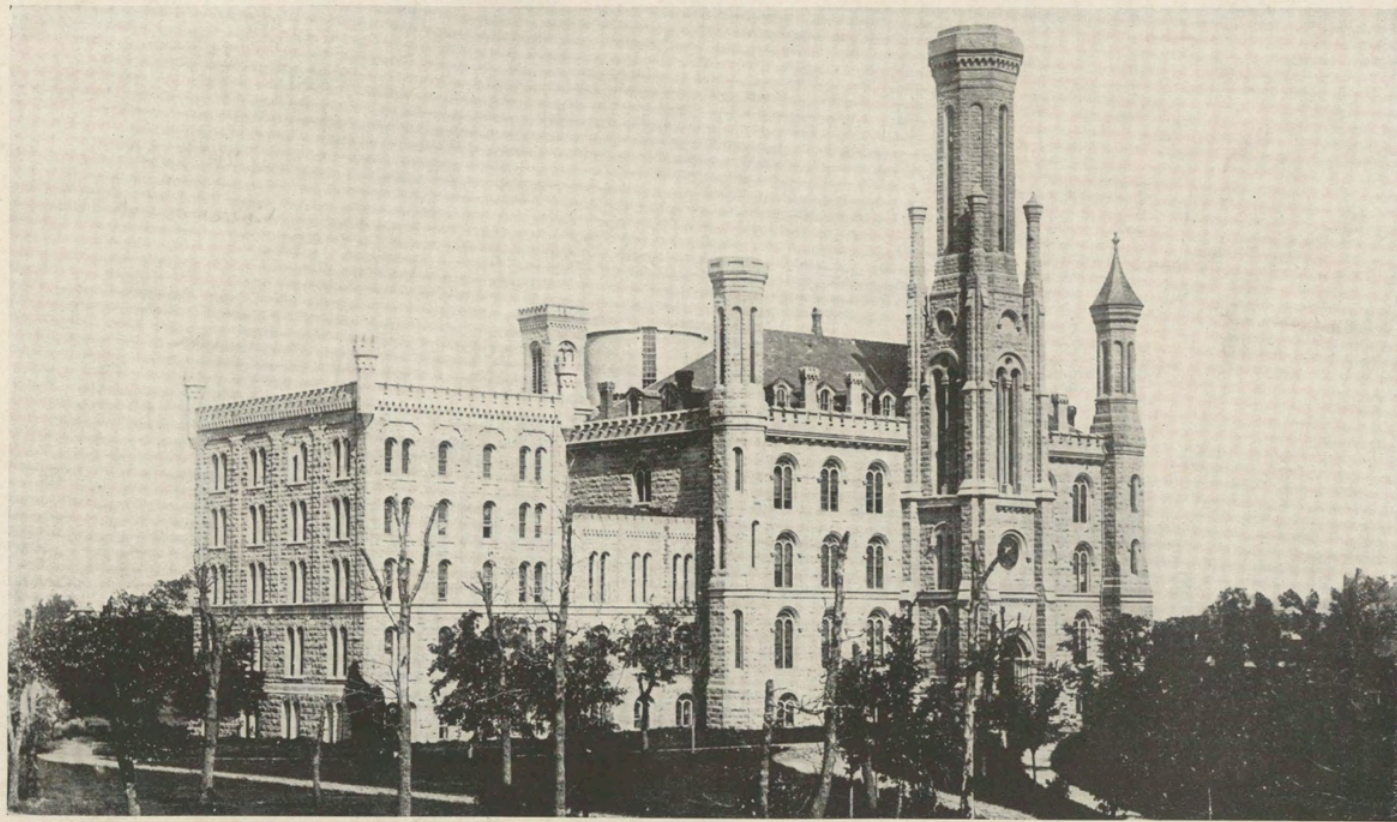
Spring is here . . .

AND the Tribune
color camera re-
cords typical scenes in
the countryside near
Chicago.

TRIBUNE COLOR
STUDIO PHOTOS



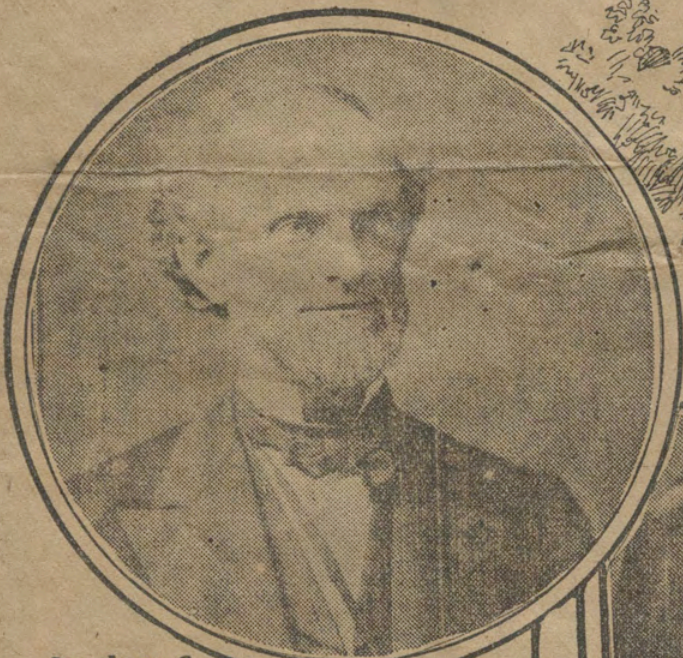
A horse chestnut tree with its candlelike blossoms.



THE OLD UNIVERSITY OF CHICAGO BUILDING IN 1885
Situated near Cottage Grove Avenue and where Thirty-fourth Street is now extended



THE PASSING OF THE OLD UNIVERSITY OF CHICAGO



DR. JOHN C.
BURROUGHS,
THE "FOUNDER" AND FIRST PRESIDENT.

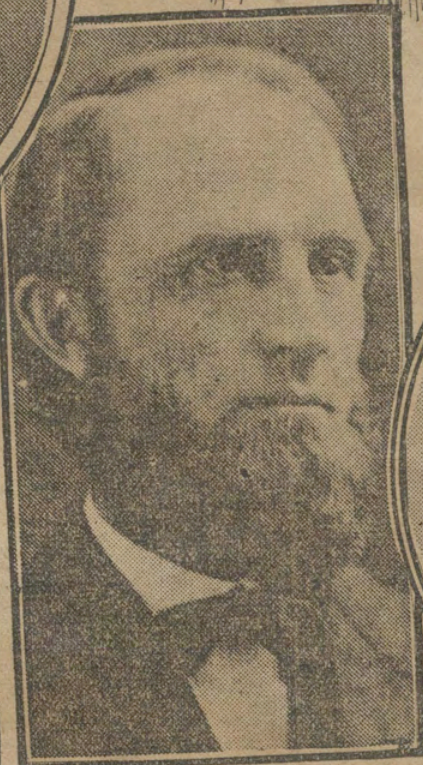
THE old order changeth" and disappears.

The last building of the old University of Chicago, founded by Stephen A. Douglas in 1837 and discontinued in 1866, will shortly undergo its final change. The structure at Thirty-fourth street and Rhodes avenue, in the latter stages of its long life occupied by the Chicago Baptist Hospital, and now vacant, will shortly be sold and probably turned into a charitable institution.

The landmark, known in its days of prosperity as the Baptist Union Theological Seminary, the divinity school of the old university, stands in the midst of that historic portion of Chicago, the Douglas tract. It was built in 1869 on the site of the burying ground where rested the victims of the pestilence that broke out during the war among the prisoners at nearby Camp Douglas.

This, probably the oldest institutional building in the city, has been used as tenement and apartment house for many years.

For athletics the youth who had perhaps shaken the horny head of Lincoln at a levee in the Tremont, played soft-



ALONZO J. HONE, PROFESSOR OF MATHEMATICS
DURING THE WHOLE CAREER OF THE UNIVERSITY.
HE DIED WHILE WORKMEN WERE
TEARING DOWN THE TOWER.



ALICE
BOISE
THE FIRST
WOMAN GRADUATE.



CALUSHA
ANDERSON
THE LAST PRESIDENT.

Reminiscences of a Former South Side Generation Recalled by Sale of the Last Remaining Building—Days When Flower-Gatherers Got Lost in the Woods South of Thirty-First Street, Athletes Played Soft-Ball Baseball, and Young Bloods Journeyed Across Town to Pay Their Respects at the Aristocratic Homes of Park Row

Dexter, Miss Lizzie Forsythe, daughter of Colonel Forsythe, long of Groveland Park; Miss Florence Hershey, Miss Belle Richmond, Misses Alice and Susan Mitchell, and Miss Fannie Richardson were other co-eds of the '70s.

Among the men students we find Charles Richmond Henderson, '70; Ellis S. Chesborough, Fred Perry Fowers and E. Hartley Pratt, all of '71; G. M. Lambertson, J. Frank Rumsey, O. B. Clark, C. H. Hall, of '72; Edward Olson, afterward a member of the faculty and one of the most distinguished educators of his time; N. E. Wood and Jacob Newman, '73; Gilbert E. Bailey and C. H. D. Fisher, '74; Richard B. Twiss, John Riddell and Herbert E. Howe, professor of astronomy in Denver University and a graduate at the age of 16, in '75; John Jackson, John E. Rhodes and "Tommy Roney," student organist at the old University Place Church and afterward president of Armour Institute, '76; Nathaniel K. Honore, president of the class of '77; Eli B. Felsenthal, trustee of the present university; Frank A. Helmer, J. D. S. Riggs, afterward instructor in mathematics, of '78; Cyrus Bentley, Edgar B. Tolman, Walter Comstock, William Wirt Mandeville, Homer Carr, John Sutherland, founder of the town of Pierre, S. D., and Joseph Kirkland are others whose names appear on the student rolls of the '70s.

With the '80s the old university entered upon the winter of its life. Among its last trustees were N. K. Fairbank, president of the board for an extended period; Mayor Carter H. Harrison the elder, Edson Keith, A. M. Billings, John Cramer, Ezra B. McCare, Chief Justice Melville.

the moon, to receive the signal for the lighting of the lamps.

The shop of Frank and Lewis, the barbers, was a favorite resort, and, when accompanied by a fair one with a taste for ice cream, there was the "Old Lady's." Four Greek letter fraternities—Delta Kappa Epsilon, Phi Kappa Psi, Psi Upsilon and Zeta Psi—held forth. Of formal society there was none.

In those days football was yet to be; the boys played baseball near the old willow tree, and produced some of the best teams in the state.

But the occasions which took the place of our football games for intercollegiate discourse were to be found in thrilling oratorical contests. Eight other colleges took part in contests of eloquence with the college founded by the "Little Giant," most eloquent speaker of his time. They were Rockford Female Seminary, Illinois College of Jacksonville, Knox College at Galesburg, Blackburn University of Carlinville, Illinois Wesleyan of Bloomington, Monmouth College of Monmouth and Illinois Industrial School at Champaign. At a memorial contest with Rockford Female Seminary in '82, at which Miss Catharine Waugh was a delegate for the woman's school—she was afterward to enroll in the University of Chicago law school and marry a fellow student, Frank McCulloch—the young ladies came up to Chicago 125 strong, with the result that there was such a minimum of study and such a prevalence of heart trouble among the young men of the entertaining school for weeks after the "44" at Chicago cut off, came.

learned how to do it. In the late '50s Stephen A. Douglas, recognizing the need for higher learning in the great and rapidly developing Northwest, offered a tract of ten acres from the Douglas farm to the southeast of the city for a university. Dr. John C. Burroughs, Yale, '42, and from Troy, N. Y., who was then pastor of the First Baptist Church, at Washington and LaSalle streets, accepted offer for the Baptist denomination. So, July 4, 1857, the cornerstone of the first university of Chicago was laid. William Boynton drew up the plans for the new building, which comprised Jones Hall in the south wing, the gift of William Jones, brother of Fernando, and the main hall called Douglas Hall. It stretched across the center of the block between Thirty-third place and Thirty-fourth place, giving to those two thoroughfares their familiar names of College and University places. Thirty-fourth street was not then cut through. Latitudinally the university stood midway between Rhodes avenue and Cottage Grove and faced the east and the lake. Several miles removed from the fashionable residence districts of lower Michigan and Wabash avenues and that then most important and central of commercial thoroughfares, Lake street, the pioneer seat of learning rose, an outpost of civilization—at least of metropoliticism.

In a financial and worldly way the old university was unfortunate from the start. Hardly had it opened its doors, with its hopeful and able faculty of three—consisting of Dr. Burroughs, Professor Alonzo J. Howe, teacher of mathematics, and one other—when, on Oct. 13, the panic of '37 swept the country. Without leaving the country sufficient time to recover from the havoc of the panic, the war broke.

Dr. Goodspeed's Reminiscences.

But of the period intervening, of the short ante-bellum history of the college, Dr. Thomas W. Goodspeed, registrar of the present University of Chicago, is able to give a personal account. "Tommy" Goodspeed entered the university, a slight, fair-haired boy, in September, '59. Among the trustees at that time were Mayor Julian Rumsey, Charles Walker, father of Charles C. Walker, who gave to the present university the museum bearing his name, and J. Young Scammon, banker, president of the Astronomical Society, insurance promoter, buyer of "Long John" Wentworth's Democrat—the first paper in Chicago—and a power in the city and the northwestern territory. Scammon Gardens were called after this staunch friend of the early university. Charles Trufant Scammon, his son, was a classmate of "Tommy" Goodspeed. Prof. Albert H. Mixer, teacher of Greek and modern languages, had by this time been added to the faculty.

Dr. Goodspeed describes the campus and surrounding country as a series of ridges topped by small oak trees, with depressions between. One of the events of the early '60s was an excursion made by Miss Eva Burroughs, daughter of the president, to gather flowers in the woods south of Thirty-fifth street and beyond Stanton avenue and being lost in the same woods. Clearville was a Carcassonne out Cottage Grove way. When one's Greek parsing became hopelessly knotty one threw up one's book and declared the intention of starting for distant, misty Clearville. Another outstanding point of fascination for the student was in his flat-rimmed "stovepipe" and long scarf was at Hyde Park, and the location was the Young Ladies' Seminary at town. The walk thither—indeed, was no other way to reach it except frequent bus days—constituted a proof of devotion often demonstrated.

Another popular diversion was Sunday afternoon at the residence of Charles Boggs, on a prairie at Thirty-fifth and State. Boggs possessed a number of famous for their oyster. Boggs girls afterward T. Gassette and Mrs.

and made the most of an old reconstructed lean-to gymnasium with crude apparatus. A boat club flourished, and it was considered a great jaunt to make for Park Row, pick up a number of favored young ladies, row out to the lighthouse and back to the university at starry midnight. Afterward the name of the community boat owned by this early rowing club was adopted by the university paper. The Volante. The first student organ, which flourished contemporaneously with the boat club, was called the Index Universitatis.

One of the historical pranks of which sedate old graduates will tell you with mouth curving and eyes twinkling behind spectacles and in which 'tis rumored "Tommy" Goodspeed was implicated, was the nocturnal placing of a wagon, beam upward, upon the roof of the old barn southwest of the university.

The First Graduates.

Then the great war cloud broke on the hopeful little college. Developments came thick and fast, so that the first class graduated in June, '61, to the whistle of the fife and the beat of the drum. Thomas Worcester Hyde, who, with Charles T. Walker, composed the first class, doffed the cap and gown for Union blue, put aside his sheepskin, belted on the sword and hurried from the campus to the southern battlefield, whence he returned with the rank of general. Mason Brayman, another pupil, attained the same honor.

A student military company was at once formed, sixty strong, and drilled rigorously under Orderly Sergeant "Tommy" Goodspeed and Captain J. H. Tucker. The latter, however, soon yielded to the call and left for the front. Others of the students who early volunteered were Judge Fred A. Smith and A. A. Abernethy, both of whom were destined to return after the peace and take their degrees with the class of '66. Abernethy subsequently became president of his alma mater.

One of the earliest and saddest duties of those of the brigade who remained behind was that of acting as a guard of honor at the burial of the founder of the first University of Chicago. Stephen A. Douglas died in 1861, and the remains were brought from Washington for interment in Douglas Monument Square, next the senator's summer home and within sight of the college whose existence he made possible. It was in this same summer home that Volk, the sculptor, lived for many years, subsequently constructing the Douglas monument.

At the end of the first year of the war, in June of '62, two others of the student company were no longer to be detained. John Saxton Mable appeared for his degree at commencement, and with Oscar McClellan at once enlisted. The two recruits are shown on the eve of leaving for the front in an old photograph preserved by Dr. Goodspeed, with himself and two members of that second class, James Goodman and George Washington Thomas.

In the preceding March classes had been dismissed to view the procession down Cottage Grove avenue and into Camp Douglas of its first prisoners sent up in box cars from Fort Donelson, then just captured by Grant. And many more came in the months and years following. The students organized a service society to work among the prisoners. Many an alumnus later visited the South to be hailed and rewarded by some forgotten old confederate soldier as his youthful preserver back at Camp Douglas.

The camp had its effect upon the topography of the land around the university for many years, and, indeed, its marks have not yet altogether disappeared. The homes of many members of the faculty were reconstructed barracks, and the Old Soldiers' Home, with the famous eagle of Wisconsin, "Old Abe," stood at Fairview station, at Thirty-fifth street and the lake, for a long time.

Among the graduates for '64 and '65—there were only two in each—we see the names of Temple S. Hoyle, son of Mayor

Thomas Hoyle, one of the trustees, and Joseph F. Bonfield, a brother of the police inspector.

The class of '65 showed nine names. With the cessation of hostilities the university prospered and the faculty increased. In March, '66, through the "munificence of J. Young Scammon," as recorded in the old catalogue, the Dearborn Observatory was started and called in honor of the donor's wife, and the telescope was put in place, with Truman W. Safford as professor of astronomy. The back tower, as the observatory was familiarly named, rose from the site where now stands the residence of Mrs. Orlo W. Richardson. Edson Bastin taught natural science, A. J. Sawyer, a son-in-law of Elihu Burritt, mathematics; C. Gilbert Wheeler, a pupil of Liebig, chemistry, and A. A. Griffith, elocution.

Professor James R. Boise, the Greek scholar, came to Chicago from the University of Michigan in '67. Some of the standard text-books he compiled were "Boise's First Lessons," "Demosthenes' Oration on the Crown" and "Notes on Xenophon's Anabasis." The professor's little daughter, Esther, for a long time implicitly believed her father wrote "Xenophon's Anabasis." Dr. Boise—he was honored with the degree of doctor of laws by the University of Tübingen—shared with Hadley of Yale the distinction of being the foremost Greek savant on the western continent. A story is told of a time when Dr. Boise, traveling in Europe, came upon a new name for Venus. He wrote his colleague, asking his opinion, and received the following reply: "Dear Boise:—I know nothing of Venus. You're going to Paris. Ask him."

Charles Gardner assisted in Greek. Ferdinand W. Peck, Adrian C. Honore and Edward F. Stearns, who later became an instructor and married Miss Eva Burroughs, daughter of the president, graduated in '68 and '69. John J. Herrick, Patrick W. Snowhook and Arthur H. Bissel took their law degrees from the Union College of Law, affiliated with the university, and under Judge Henry Booth at the same time. Judge Dorance Dibell studied there until 1897.

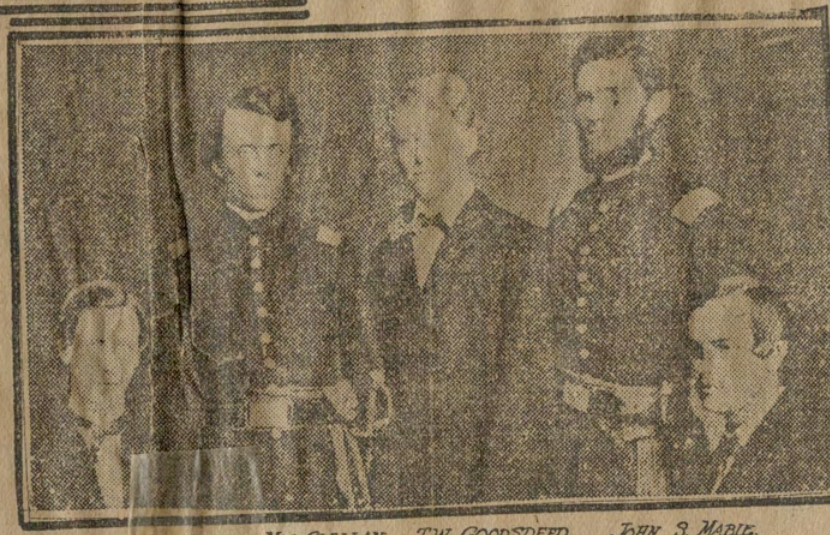
In 1869 the Theological Seminary, the sole survivor to this day, was built, a half-block back and a trifle southwest of the main building. Instruction in divinity had been given some years before, however. Rev. W. W. Everts had graduated in 1867. Professor G. W. Northrup was president, with J. B. Jackson and G. W. Warren as a contributing faculty.

An Anecdote Anent the Fire.

Among the trustees in the '70s were Mayor William B. Ogden, president of the board for a long time; Senator John R. Doolittle, who at one time acted as president pro tempore of the university; Arthur B. Meeker, W. F. Coolbaugh, Fernando Jones, Rev. E. J. Goodspeed, Murray Nelson and H. O. Stone. On the board of regents appear such significant names in Chicago history as Governor John L. Beveridge, Rev. David Swing, Judge Lambert Tree, Bishop Cheney and General John A. Logan. Lyman Trumbull, James R. Doolittle and Judge J. B. Bradwell were on the faculty of the law department in the mid '70s.

The fire of '71 is the next great guidepost. A favorite story of old-time alumni

THE SEMINARY BUILDING—STILL STANDING



OSCAR MAC CLELLAN - T.W. GOODSPEED. JOHN S. MABLE. GEORGE WASHINGTON THOMAS.
A WAR-TIME GROUP OF STUDENTS - THE TWO IN UNIFORM LEFT IMMEDIATELY FOR THE FRONT.

is that of Professor Alonzo Howe's attempt to convince Dr. Burroughs that the city had burned. Professor Howe went to the president's home early in the morning to have him open an old long-unused well behind Douglas Hall as, with the municipal waterworks burned there was no water at the university. Dr. Burroughs refused to believe the story of a conflagration. Nonsense! Overstudy!—until he went for his unprinted morning paper. Then the doctor opened the well, with the comment by some campus wit, "In pure veritas." On the same morning Professor Elias Colbert, journalist and director of the Dearborn Observatory, mounted to the "back tower" to take the time by the sun, and carried the computation back downtown.

Dr. Burroughs resigned the presidency in 1875. Lemuel Moss, a graduate of Rochester University, and A. A. Abernethy of Iowa filled the space until the coming of Dr. Galusha Anderson, who took the chair in 1878 and remained with the university until its end. Professor Denslow, a botanist who introduced modern methods of classifying plants and Louis Dyer of Oxford, professor of Greek and a brother of Mrs. Stella Dyer Loring, also taught at this period.

Young Chicago was going through the process of reconstruction and the college flourished in the '70s as much as its poverty ever permitted it to flourish. The catalogue for 1873 lays stress on the fact of its having been printed on a steam press, and boasts of the vast college library of 3,000 volumes. Graves' trotting park, just north of the campus at Graves' farm, became a center of sport. It was Old Man Graves' immortal cow that was hoisted, on one never-to-be-forgotten occasion, to the imposing front tower.

The appearance of the main building of the university at this time is described as a "majestic, bare, great hall, with a flight of stone steps and ten wooden ones, leading up to the wide door. Inside one stepped into the reception-roc carpeted with a smart Brussels weave boasting wreaths of gay pink roses. The windows had leaded diamond-shaped panes of pinkish tinted glass. A great square piano loomed up most important in the few articles of furniture. The walls looked down rich old

When he was to meet one, a shadowy figure would appear. Old Jones is dead, that good old man! He built Jones' Hall, they say. When suddenly there came a wind and blew old Jones a-way.

University's First Co-Ed.

The hope of the university, the north wing, never materialized, although Dr. Anderson was wont to talk of it as an existing thing, and an imaginative artist painted it on in several catalogues.

To Miss Alice Boise, daughter of Profes-

Judge Gwynn Garnett.

Professor Lewis Stuart of the University of Glasgow came to teach Latin about this time and remained till the end. Professor George W. Hough had succeeded Professor Colbert, whose journalistic duties called him away from the post he had served without financial compensation in the Dearborn Observatory for many years. In '83 came to the chair of English Professor Nathaniel Butler, the only man who was on the faculty of the old university and is a member of that of the new.

Among the pupils whom these men taught were Edward Manierre, George E. Foster, Charles Stuart, Rueben H. Donnelley, William H. Dyrenfurth, Thomas W. Prindle, Miss Bessie Bradwell, a student in the law school, daughter of Judge and Myra Bradwell and afterward wife of Frank A. Helmer, her schoolmate. Miss Bradwell delivered the valedictory at the graduating exercises of the law department at Central Music Hall in '82. Douglas Dyrenfurth, Sigmund Zeisler, Isaiah T. Greenacre, William Hefferan and Edward P. Maher were law students the following year. Mr. Maher delivered the commencement oration of the law school on "The Courage of the Advocate" in '85. In the same year, at the exercises of the preparatory department, Fred A. Templeton gave a graduating oration. Mr. Templeton was a freshman in the old university at its close. Robert F. Harper, professor in the new university, was graduated in '83, and A. J. Lichtstern and Herbert G. Goodman were among the students.

Coeducation had become popular. Miss Carrie L. Ryan and Miss Lucy Waite were graduated in '80. Miss Ruth May Edger-ton of '81 renewed the strain of campus romance by marrying J. P. Gardner of her class. Miss Gertrude Fuller of '84 became the wife of E. F. Anderson, Dr. Anderson's son. Among the girl editors of the Volante were Miss Grace Reed, '84, and Miss Elizabeth Faulkner, '85. Miss Jessie Waite, in '76 had been the first woman editor of the student organ, with Miss Carrie Howe and Miss Florence Holbrook following her. Miss Susan E. Colver, daughter of a member of the faculty of the Theological Seminary, and Dr. Northrup's daughter, Alice, were graduated in '82. Miss Elizabeth Cooley and Miss Ella Haigh in '83. Miss Lydia Dexter in '84 and Miss Daisy May Springer the year following.

A majority of the students "worked their way" by taking gas meter statements, lighting street lamps and carrying newspapers. They would go to the engine-house on Cottage Grove avenue to wait for the delivery of their papers, and on cloudy nights, when they could not be guided by

Other ambitious girls who followed in the trail to the college classroom that Alice Boise broke were her sister Esther, now Mrs. Julius Johnson, who was awarded an honorary degree in 1879; Miss Lilly Grey, 1876; Miss Jessie Waite, 1877, two Hyde Park girls and Miss Florence Holbrook, 1879, whose family came from Joliet and occupied the house built by Professor Howe on University place during the daughter's college career.

Miss Carrie Howe, daughter of the veteran teacher of mathematics, graduated in June, 1879, at the age of 19 years, married a schoolmate, Rev. C. B. Allen, in July, and died in October. Carrie Howe was an Annabel Lee, "a faultless student, beautiful in character and in appearance." Miss Lizette Clarke, the daughter of another professor, John Clark, an Englishman, who had come from England to teach geology, died while her parents were at sea and was buried from the university. Miss Clara Boise, daughter of Professor Boise, and sister to the "first co-ed," started a strain of college romance when she married Rueben G. Bush, 1875. Miss Anna Coon of 1879 became the wife of a student, Mr. Johnson, while her brother James, of the same year, married Miss Julia Hawley, a student.

Miss Jennie Jones, daughter of William Jones, was a belle of college parties where young men with burnusides and open-front collars recited "The Bells" and "Webster's Second Reply to Hayne" and sang about "the bullfrog on the bank." The popular Miss Jones left school to study the oratory of woman suffrage in Paris. Miss Aurea

William Jennings speaker at many of these contests. Frank J. Walsh of '86, who pleaded at the last meeting at Carlinville in '85, and Gilbert Hauchette were among the home prize winners. Miss Myra Follard was a noted "co-ed" orator.

Last Class of 13 Members.

One of the most exciting events of those last days was the trap door romance. A young German student, mentally unsound, constructed cunningly at night an underground ditch connecting with a covered pit from the gate of the present Baptist Hospital Building, where he lived, up to the back of the university. His object, as near as ever ascertained, was to trap a young woman student with whom he was infatuated. The plot was discovered just in time to save the girl from serious harm.

The old university did not so easily escape. By this time, in spite of the unexampled zeal of an admirably unselfish faculty, who hung on to the shell with dauntless courage, and the staunch loyalty of its students, the mass of debt that saddled it grew too great, and the Union Mutual Life Insurance Company of New York foreclosed its mortgage on the gift of Douglas.

It has been said, "It was not lack of scholarship nor energy nor love that killed our old university, but lack of money."

The last class went out in '86 with thirteen members, and on class day it rained—evil signs, and some speak of the Douglas luck! In that last class were Miss Izzie Gibson, the only girl member and heroine of the last old university romance, for she married her classmate, Edgar A. Buzzell; August Anderson, Guy Brockway, William Burnap, Lincoln M. Coy, Henry J. Furber, George F. Holloway, George E. Newcomb, Edwin R. Rundell, Rufus A. Sage, Francis J. Smith and Thomas Robinson Weddell, famed author of "Burn Mathematics."

Professor Howe and a few others remained and taught classes in the present Baptist Hospital Building for a short, sad time. But the old order was doomed. Douglas Hall and Jones and the mirage of the north wing that never materialized came down, stone by stone—all but the beautiful great tower! They let that stand a little while. Then it, too, passed. And when election day, 1887, Elias Colbert and Professor Hough came out to dismantle the Dearborn observatory they were taking down the tower, the soul of the old university, Alonzo J. Howe, who had seen it born, lived with it and struggled for it through its life, lay dead, too, in his home across street.

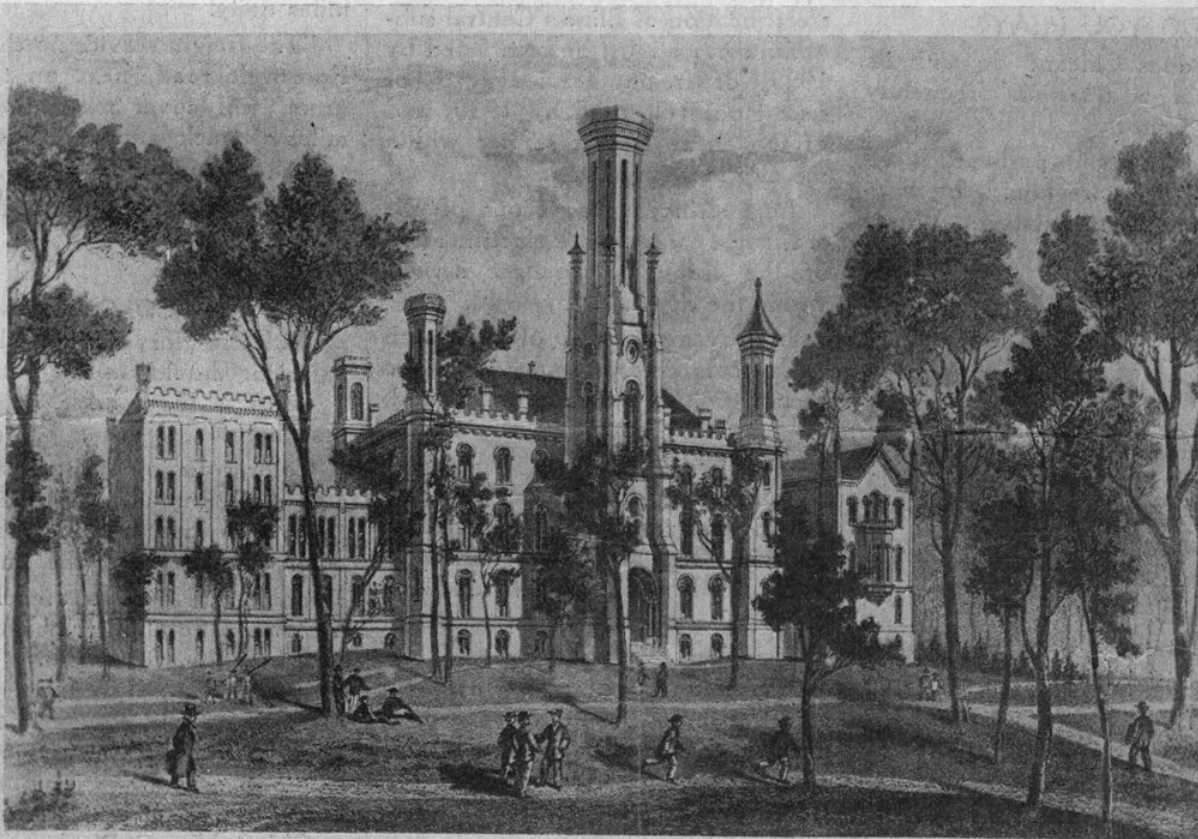




Sisson BREEZE

SEPTEMBER-OCTOBER, 1922

CHICAGO



Courtesy Chicago Historical Society

THE OLD UNIVERSITY OF CHICAGO—SO-CALLED—ON COTTAGE GROVE AVENUE, ABOUT THIRTY-FOURTH STREET

WHAT OF HYDE PARK A Tale of the Lake

(Continued from July-August Breeze)

UNIVERSITY OF CHICAGO

The development of the University of Chicago parallels the development of Chicago as a city, growing with it until it is a foremost factor in education in the world. This institution stands as a monument to the civic interest of many citizens

whose generosity of support is almost unparalleled.

A university was founded in 1854 by the Hon. Stephen A. Douglas on land west of Cottage Grove Avenue at Thirty-fourth Street. It was named the University of Chicago but was sometimes spoken of as Douglas University. This institution was forced to discontinue in 1886, owing to financial difficulties. Shortly after this Thomas W.

Goodspeed and others began to formulate plans for a collegiate foundation in Chicago. The American Baptist Educational Society of which F. T. Gates was secretary had formally resolved to found a college in Chicago and Mr. John D. Rockefeller, who was interested in founding a university in New York or Chicago, immediately subscribed \$600,000 toward an endowment fund for

(Continued on Page 4)



Sisson BREEZE

To record some of the interesting things in and about your city.

Additional copies at ten cents may be had on application to the hotel.

Advertising rates on application. Comments, corrections and contributions should be directed to

SISSON COMPANY

Lake Michigan at Fifty-Third Street, CHICAGO
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DO YOU PLAY?

What does Chicago do with its leisure? is a question frequently asked by visitors.

The busy Loop, perhaps, looks deserted at the week-end, on Sunday or even of an evening. Where are the people?

Chicago loves the outdoors! The Lake is a great example, with its fresh inviting expanse, its cool breezes, and its sparkling beaches.

Along it glide the boulevards, where the motorists scurry in and out in search of good fresh air.

Here and there green grass slopes down to meet it, and there golf, tennis and horseback are the watchword.

A great hotel like the Sisson, builds a Roof Garden overlooking the rippling surface, where the moon mirrors white shadows and the stars peer down—and here they dance and chatter in the open. Later, the roof becomes a ballroom with the great heavens drooping on all sides about it.

If you are wise, you'll play, too, in the sunlight and the moonlight! Health is a grand thing—and healthy pleasures are good for the soul of Chicago.



NOT EVEN HYPHENATED

A bootblack in City Hall Park is a sociable chap, and conversation is inevitable.

"You are a foreigner?" he was asked.

"Not foreigner," he answered. "American from de other side."—New York Evening Post.

CITY BORROWS FROM LAKE MICHIGAN FOR NEW BOULEVARD

Markham O. K.'s Electrification Plan Of I. C. R. R.

With mammoth dredges, pile-drivers, steam shovels, and barges already dotting the lake front scene of a project that will ultimately connect Grant and Jackson parks, final plans for electrification of the Illinois Central railway service within the city limits were formally approved yesterday by Charles H. Markham, president of the road.

Under the tri-party lake front ordinance of 1919 which settled disputes as to riparian rights of the railway, electrification of Illinois Central suburban service must be completed by 1927, of freight service north of East Roosevelt road by 1930, and of the entire freight service within the city limits by 1935.

Less stringent provisions of the ordinance contemplate electrification of the through passenger service within the city limits by 1940.

Improvement aims of the south park commission, including the reclamation of 1,240 acres of land, go hand in hand with the electrification scheme.

The Illinois Central railway already has received authority to issue \$50,000,000 in preferred stock. From sale of this will come funds for the work.

President Markham's O. K. of electrification plans was withheld until yesterday, pending receipt of recommendations from a commission he appointed in 1920 to study the project.

The lake front ordinance requires the Illinois Central railway to erect a new terminal depot at East Roosevelt road. This, officials of the road said yesterday, will be more pretentious than the Grand Central station in New York. Commenting on the project as a whole, President Markham said:

"The lake front ordinance, to which the city of Chicago, the Illinois Central railroad, and the south park commission were parties, settled the common boundary lines so long under discussion, provided for additional subways and viaducts across the railroad north of 50th street, and bound the railroad com-

pany to extensive improvements, including a new station at East Roosevelt road and the electrification of certain services.

"The suburban passenger service will cover the main line from Chicago to Matteson, 28 route miles; the South Chicago branch, 4.5 route miles, and the Blue Island branch, 4.4 route miles. The track miles involved are 125. In a short time after electrification is completed it is estimated that 240 cars electrically equipped will be required. These cars as equipped will cost in the neighborhood of \$35,000 each. The number of trains per day will be about 350, making about 5,000 train miles daily.

"The freight service north of East Roosevelt road, next on the program, will cover more than forty miles of track, and as this is mainly yard trackage, involves difficult problems to properly electrify it."

(Reprint from Chicago Tribune—Oct. 4, 1922.)



COLOR

With the glory of the fall around us, color should be the watchword.

Color is the sparkle in gray atmosphere!

Color is the joy of the bleachers at a football game! You've seen the red, blue, purple and delightfully colored chapeaus in the sunlight.

Color will add to the charm of the Sisson Football Luncheons, and will help to welcome our visitors. For each Saturday there will be maroon for Chicago, and then the Red and Black for Georgia on October seventh—the Purple for Northwestern on October fourteenth—Old Gold over Black for Purdue, October twenty-first—Orange and Black for Princeton the great Saturday of October twenty-eighth—Orange over Blue for Illinois on November eighteenth—and Red on White for Wisconsin on the last football day, Saturday, November twenty-fifth.

Color—the symbol of spirited contrast over the ordinaire!



COLOR NO OBJECT

Girl for light housework, no washing, no objection to green or colored girl.—Classified Ad in the Hartford Times.

THE OLD UNIVERSITY OF CHICAGO

See parts on Old U of C in Parts IV and V of Jesse L. Rosenberger's THROUGH
THREE CENTURIES: Colver and Rosenberger Lives and Times, 1620-1922 (University
of Chicago Press, 1922)

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of Chicago Press, 1933)