

Fr. Wm. F. Rigge, S.J.

MEMOIRS

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( Parts 10, 11, & 12 are in the second volume. )

( This set contains Fr. Rigge's original camera obscura [*sic*] drawings. )

THE LANDSCAPE  
AS SEEN  
FROM THE COLLEGE

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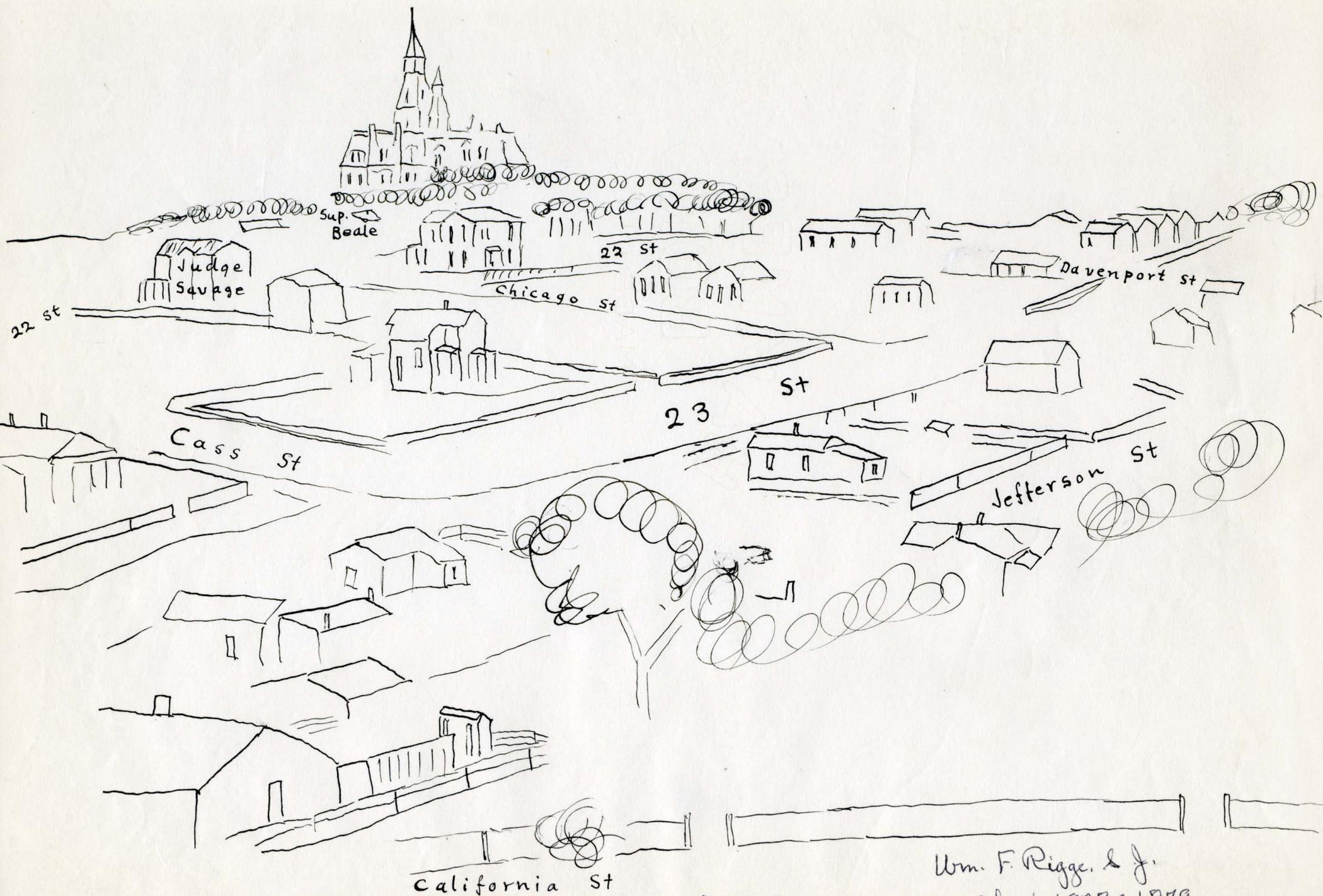
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<sup>1</sup> Please be advised that the tables of contents from the original manuscript, such as the one here, are no longer accurate.



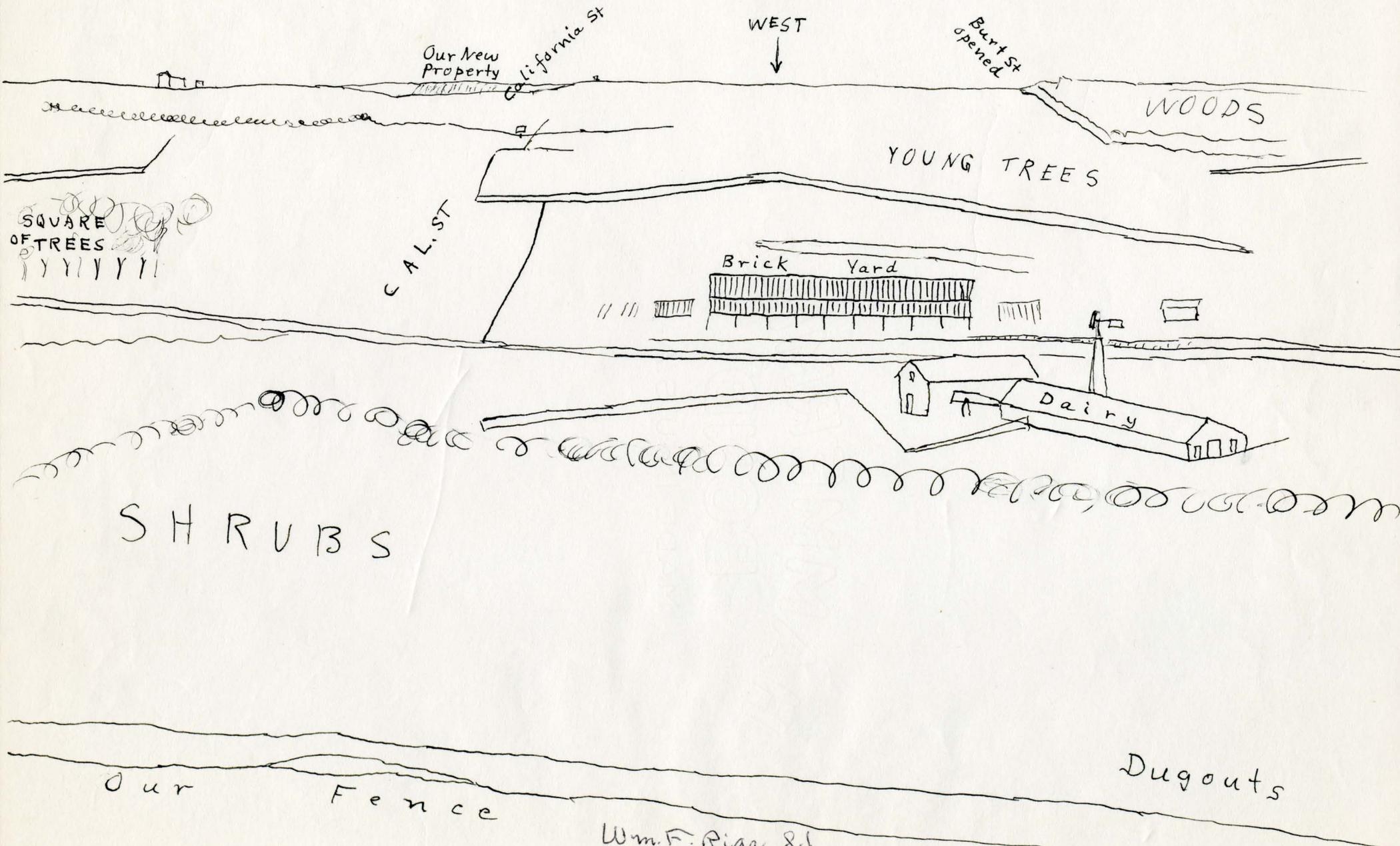
Camera obscura pictures



California St

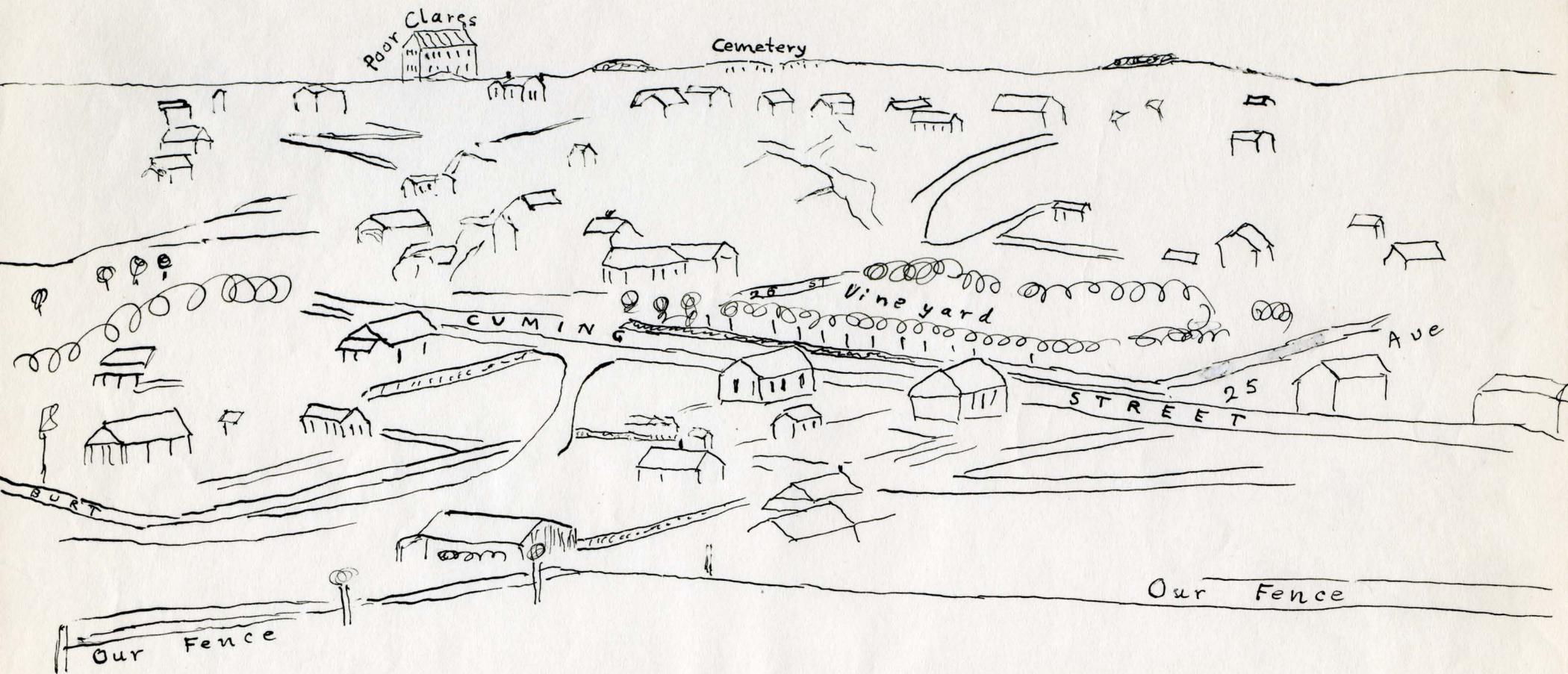
Looking South-East.

Wm. F. Rigge, & J.  
about 1878 or 1879.



Wm. F. Rigge, S. J.  
 about 1878 or 1879

Looking West



Looking North-West.

In. William F. Rigge, Sg.  
about 1878 or 1879

## The Landscape As Seen From The College

Those of us who know Omaha and Creighton University only as they are today, or even as they were twenty-five years ago, will not be able to visualize the appearance they presented as far back as fifty years ago, in 1878, when the University first began. As the writer was one of the pioneers of those early days, this conviction was at the time very strong in his mind, that future generations would be intensely interested in the pictures of the days of yore, of the year One, as he has been in the habit of styling it. He therefore urged the Powers that were to have photographs taken of the college and of its interior and of its environs, especially a series of panoramic views from the top of the tower. As his suggestions and arguments met with no response, he attempted in his own limited way partially at least to solve the problem. He made a few camera obscura pictures, which are presented to the reader. Before describing them, the modus operandi will be in order.

As the word indicates, a camera obscura is a dark chamber, it is in all respects a photographic camera without its sensitive plate. It was built in the regulation style that used to be given in old text books of physics. An empty soap-box was taken and set up on a table or high chair so that its open end was directed to the object to be sketched. A hole was cut in the top, and in this was set an old man's spectacle lens, that is, a lens thicker in the middle and giving a real image. The one used had a focal length of about twenty inches, so that it made the camera a large one and gave a good-sized picture. A bit of broken looking glass was supported over the lens so as to direct the rays of light from the distant objects through it upon the paper in the bottom of the box, which was then properly focussed by raising it on a board until it gave a distinct picture.

In use, the operator seated himself with his back to the landscape, put the professional black cloth over his head and copied with his pencil whatever parts of the picture he thought proper. One who has never used such a simple contrivance, will be delighted at his first trial of it to see on his paper the beautiful picture of the landscape in all its natural colors, and with its stationary and moving objects. The expense is zero, but the pleasure immeasurably great. One has the satisfaction that he draws the picture himself, and does not merely push the button and let others do the rest. The picture drawn is of course not<sup>2</sup> as perfect as that given by a kodak, but it is much larger, and, as said, the fruit of one's own genius. This picture is also optically correct in that up is up and right is right. In later years when the writer taught physics, he always kept such an inexpensive camera obscura<sup>3</sup> in the cabinet. It was a perpetual and simple application of optics, and was a continuous source of interest, especially during the Summer Schools.

The camera obscura pictures here presented were, strictly speaking, not drawn in the year One, 1878-79, but mostly towards the end of the year Two in June 1880, and a few even in 1881. This trifling delay was unavoidable, but it makes no appreciable difference in them.

The author offers them as valuable records of ancient days. His tastes in drawing were in the mathematical line and not in the artistic, so that he did not have the patience to draw the many trees, but contented himself with their general and group outlines, leaving it to some

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<sup>2</sup> "not" added by hand.

<sup>3</sup> "obscura" added by hand.

future landscape artist to fill in details. But even as they are, they give a good idea of the appearance of things as seen from Creighton College in the beginning.

After the College had acquired its own photographic camera on October 1, 1883, but probably not until after the spring of 1884 when the conveniences of a dark room were available, this camera was put to very multitudinous use. According to the old adage, what is easily won is easily lost, all these early pictures have disappeared. Fr. Thomas Smith, however, rector of John Carroll University, Cleveland, Ohio, and brother of Edward Smith, the Omaha attorney, who was in the College in the year Two, sent the writer sometime in 1924, to his intense delight, four precious old photographs of the early days. As Father Smith himself<sup>4</sup> knew no more about them than that they were views seen from the College windows, which is too evident to need any proof, it was then a positive pleasure to elicit from the pictures themselves the date of their taking. And this is what was found.

Fr. Charroppin in St. Louis was known to be the best photographer of the Missouri Province. And he richly deserved the title. Now as the college camera was ordered from Hyatt of St. Louis, it is very likely that Fr. Charroppin was consulted in the matter and that he made the selection. That the camera actually came from New York, presents no difficulty, because the bill was paid to Hyatt in St. Louis.

The college historian records that Fr. Charroppin arrived in Omaha on July 22, 1884 at 6:45 A.M. to give a retreat. He, or the college authorities had probably suggested this Omaha retreat in order that he might try the new camera and the new dark room. The retreat began that same evening, the 22nd, and finished on the morning of the 31st, on which day he is said to have dined at the College, an indication that this was an infrequent event and that the retreat had kept him too busy to do this often, if at all. He could therefore begin to try the camera only on July 31st.

As the southeast view, not here reproduced, shows a grading team at work and some board sidewalks piled up on the college grounds, and as moreover the grading of the street gives evident signs of having only begun, and thirdly as the date of the beginning of the grading of California street is recorded as August 7, it follows that this photograph was taken most probably on that day or the following one, that the south view which shows no signs of grading must have been taken before that date, and the other two about that time.

The excellence of the prints proves that only an expert could have produced them. Fr. Lambert could not have done it, first because he was no photographer worthy of the name, secondly, because he arrived on July 23rd along with "cases of instruments and minerals for cabinet and museum," the unpacking of which would have interested him more. And thirdly he is recorded to have arrived again on August 19th from Davenport, whither he must have gone two weeks before to give a retreat.

Mr. Gartland also, who arrived on August 12th, was no photographer.

It is evident therefore that Fr. Charroppin took the pictures during the first week of August 1884 or thereabouts. When he departed is not stated. That the photographs were taken with the college camera will probably be granted without a demur. This is proved conclusively however from the scale.

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<sup>4</sup> "himself" added by hand.

Of the four views taken three are duplicates of the writer's camera obscura pictures. While, of course, as photographs they are decidedly superior to drawings, only one of them however will be given here<sup>5</sup> for that reason, but the other two will be omitted because they show two or three times as many houses. The fourth photograph will be reproduced because it is not among the writer's original drawings.<sup>6</sup>

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<sup>5</sup> Originally typed "will here be given," but changes are indicated by handwritten editing marks.

<sup>6</sup> Editor's note: The photographs to which Fr. Rigge refers are not found with the manuscript.

## 1. EAST VIEW

The east view, a camera obscura drawing, was taken on June 12, 1881 at about 6:30 P.M. and completed on June 17th at 5:00 P.M., from the northern of the two windows in the small room under the tower on the third floor, directly over the main entrance. This place, eleven feet square, was the living room of the writer for three years, 1878-81. There was then no 24th street in front of the college, but parts of 23rd, 22nd, California and Webster streets were in plain view,<sup>7</sup> not a single street in town being then paved. There was then no house at all between 22nd street and the college north of California as far as the alley, except the one which was being moved to other quarters from its former place on Webster street.

Directly in front the Union Pacific shops may be noticed with the outline of their wooden tower to the right of the alley. This tower was on the fire engine house of the shops, and was a landmark for many years. Beyond the shops is the river, and on the horizon are the bluffs beyond it, with the Council Bluffs High School as another prominent landmark. On 19th and California is the old St. Barnabas Church, still standing in 1926, in which Father Williams was pastor for so many years. Beyond this was the Cass street public school, and to the right at 18th and Cass is St. Catharine's<sup>8</sup> Academy, now St. Rita's home for working girls. Beyond this are the Smelting Works, and across the river the old Council Bluffs Union Pacific Depot, still existing, the terminus of this road and of all others to the east of it, for none of these at the time were allowed to enter Omaha.

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<sup>7</sup> Comma added by hand.

<sup>8</sup> Other versions of the memoirs have "Catherine's".

## 2. SOUTHEAST VIEW

This picture was drawn on June 28, 1880, from the south side and its easternmost window, the south window in Room 341 in the modern notation. All the views were taken from the third floor of the main building, which was then the only structure on the campus. Here 23rd street is plainly visible, with parts of Cass, Chicago and Davenport, and even a small piece of Jefferson street, the present 24th. Overtowering<sup>9</sup> the whole view is the old Omaha High School,<sup>10</sup> the most conspicuous landmark in the city and visible for miles and miles, eleven at least from the north by the unaided eye, as the writer can attest. It was a handsome building in its day, and marked the site of the capitol when Omaha was the capital of the state. The present high school was built with its eastern section almost touching the front of the old building. Just across the street to the north of it, on Davenport near 22nd,<sup>11</sup> was the residence of superintendent Beale, at the time as prominent in his line as the building was in its. A block further to the north lived Judge Savage, a well-known official.

In the 1884 photograph of this view, Cass street had already been cut down considerably between 22nd and 23rd, and the grading of California street near the college had just begun. This last fact fixes the date upon August 7th or very shortly after.

## 3. SOUTH VIEW

This is a photograph taken in 1884 from the easternmost of the windows of the present chemical lecture room on the second floor. The time of the exposure must have been near to 10 A.M.,<sup>12</sup> as is proved by the shadow of the nearest chimney. The day was during the last week of July or the first one of August, and certainly before August 7, because there is no sign yet of grading California street. The long street so plainly in view is 25th, and the one in the foreground is California. The site of the present Dormitory, or St. John's Hall, or "Beanery" as the students prefer to dub it, was then occupied by Shaller's house. The father and his two daughters and his little boy, not to forget their little dog, whose delight it was to tease cows by hanging on to their tails, were a continuous source of interest, especially for the affectionate way that papa was bidden goodbye in the morning and welcomed back in the evening. Afterwards when their father had died and their brother also had died<sup>13</sup> or had gone away, the two women lived alone in the house. A set of more helpless creatures can hardly be imagined. They let everything go to rack and ruin. They did not know how to go about it to have the weather boarding repaired, how to fix the window shutters which began to hang awry<sup>14</sup> on one hinge or to fall off, or even to cut the tall weeds which obstructed their walks. After California and 25th streets had been cut down twelve feet, the Shaller house remained an unsightly and scarcely approachable place high up on the bank for years. It exhausted all the diplomatic skill of Fr. Dowling for two years to induce these old women to sell their house and lot to the University. They did not know how to do it, and were always afraid of being defrauded outright. When they had finally sold their possessions in August 1905 and vacated them, the writer seized the first opportunity to see the neglected place at close range. He will not write down what he saw, because the reader will scarcely believe it.

<sup>9</sup> Earlier drafts have "overpowering".

<sup>10</sup> Comma added by hand.

<sup>11</sup> Comma added by hand.

<sup>12</sup> Comma added by hand.

<sup>13</sup> "had died" added by hand.

<sup>14</sup> Corrected typo, with "r" handwritten above "a", which is crossed out by hand, to change "away" to "awry".

To make room for the Dormitory the old house was moved to 2614 Cass street, where it may still be seen without any noticeable outward change, except, of course, that it is now kept in repair.

On 25th and Chicago streets is the home of old Mr. Smith, the father of Thomas and Edward mentioned before. This house is still standing. No camera obscura picture was taken in this direction. If it<sup>15</sup> had, it would have shown scarcely one-fourth as many houses.

#### 4. WEST VIEW

The west view is the most interesting, as it shows the site of the present boulevard with a brick yard west of it and a large dairy to the east. This picture was the drawn on June 26, 1880 from the northernmost window on the west side, in what was then the college library, but is now the photographic dark room. Scarcely a house is visible in this view. California street west of the boulevard had only a legal existence, and Burt street had just been extended towards 40th. South of California and near the present and 36th, Father Shaffel had invested \$1200 of his unused income in a little real estate, which later on in the boom days was sold for \$35000.

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<sup>15</sup> Corrected typo, with "it" handwritten above the word "I", which is crossed out by hand.

## 5. NORTHWEST VIEW.

This picture was sketched on June 26, 1880 from the easternmost window on the north side, the north window in Room 342. Cuming street is very conspicuous. The writer can still picture to himself the regulation prairie schooners, drawn however by horses and not by oxen, wending their way along this street which was then and for a long time called Military Avenue. The way then led obliquely up the hill along the road marked on its west side by a long row of trees, and now permanently preserved for posterity by a paved street called the Oregon Trail. A large boulder below had even before that indicated this great highway to the west.

It was along this same Cuming street, even as late as 1900, that a herder was wont to collect the cows in the morning, lead them to the western hills for pasturage, and bring them back in the evening.

Conspicuously high up on the horizon is the Poor Clares Monastery which was then being built on its present site, at 29th and Hamilton street. The rafters of the roof had just been placed in position, when a high wind on June 5th demolished the whole structure, after a previous wind had thrown down its north wall. The monastery was rebuilt and strengthened with interior brick walls which it did not have before. This house is not however the present one, because the deep cut in the grading of 29th street and its close proximity to it, necessitated its demolition. Before this was done, however, the Sisters had in 1901 wasted the dowry of one of their novices in underpinning it and in laying the foundations and basement of a large chapel along Hamilton street. They were confident that as soon as Mr. Creighton would return from Europe, whither he had gone in July, and see the unfinished structure, he would surely complete it for them. Fr. Dowling, however, who knew John Creighton well, had advised them to the contrary and had told them that while John was extremely liberal, he generally took his own time about it and resolutely refused to have his hand forced. And this proved true in this case also. When Mr. Creighton returned in October, he at once realized the state of affairs. He then suggested to the Sisters to tear down the old building and uproot the new foundations, and to grade the hill. He would then erect a new and better Monastery for them. This was done. Mass was said for the first time in the new structure on September 8, 1904, and it was solemnly dedicated a week later.

As the old Monastery had been wrecked three weeks before this northwest view was sketched, and did not therefore exist at the time, its outlines were drawn from memory, and are probably somewhat exaggerated. To the right of it Prospect Hill Cemetery, which is in existence even today, was for a long time plainly visible from the college, until the buildings and trees began to obliterate it.

A photograph was taken of this same region in 1884, but although it gives a better picture, it is not as ancient and shows about three times as many houses.

## 6. NORTHEAST VIEW.

A camera obscura drawing of this view was made on June 17, 1881 at 5:30 P.M. from the same spot as the east view, that is, from the room on the third floor under the tower. In 1884 a photograph was taken from the northern of the two east windows in the adjoining room (342) to the north. As the difference between the two pictures is not an essential one, the photograph is herewith reproduced because of course it is the better of the two. The time of

its taking must have been about 6 P.M. and the day during the first week of August. Besides the evidence given before,<sup>16</sup> this is proved by the fact that the sun is shining on the north side of the house and is still pretty high in the sky.

The most prominent feature in this view is Mr. Wells's house, which was such an objectionable structure in front of the college for ten years. For the particulars the reader is referred to the chapter on The Growth of the Campus and the Buildings. The small house in the right foreground with the one brick chimney was called the laundry. At the extreme lower right corner a part of the eyesore of a stable may be glimpsed. East of the large house, but close to it, is a fence marking<sup>17</sup> the eastern boundary line of the property. To the left of the house is the gate leading to Webster street. The dwelling next to it was Leary's, which was removed in April 1909 when 24th street was cut through.

In the distance the river is visible with the outlines of Horse Shoe Lake, now Carter Lake, but at the time much longer and yet in connection with the river when this was high. To the left the building with the pointed tower is the North School, and to the left of it a fire engine house. The trees beyond Wells's house had in 1884 grown so large that they hid a famous landmark, the roof of which is discernible in the camera obscura picture of 1881. This was the Governor's residence, in the middle of the square between 21st and 22nd, and Webster and Burt streets.

It was built in the old colonial style with tall white columns in front running through two stories.<sup>18</sup> This square became many years later the property of Creighton University, but was sold in May 1925 with the houses on it for \$40,000.

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<sup>16</sup> Comma added by hand.

<sup>17</sup> Corrected typo, with "r" handwritten above to change "making" to "marking".

<sup>18</sup> Corrected typo, with "ri" handwritten above "n", which is crossed out by hand, to change "stones" to "stories".

## OTHER FEATURES

It may be of interest to mention a few features that are not shown on the pictures here given.

At 23rd and California street there was a bridge, perhaps wooden culvert would be a better word. A small creek, which took the drainage from the hill southwest of it, ran across this place towards the northeast. There was a one-story frame cottage on the southeast corner for many years. It was afterwards raised and a brick story built under it. Now the site is occupied by The College Terrace.

Cass street was raised between 23rd and 25th. As no provision had at first been made in regard to drainage, a pond soon began to form on its south side, to the great delight of the small boys.

West of the college campus and almost touching its fence in one place there<sup>19</sup> was a creek along which squatters had built primitive dugouts for their homes. The ground was low and somewhat marshy, so that in later years concrete piles had to be sunk here for the dental building and the stadium. The creek mentioned ran towards 25th Avenue and Cuming street,<sup>20</sup> then northeastward towards the present fire engine house on 24th street. There were bridges at both of these places. The northwest corner at 24th and Cuming was a deep gully, and the writer often wondered how the present brick buildings could have been erected there.

The original level of the ground near the college was that under the present shrubs at its main entrance. This terminated at the Observatory, from which there was an abrupt descent in all other directions, especially towards the north. Towards the southwest of the college the crest of the hill ran back of Shaller's house, where the Dormitory is now, and then<sup>21</sup> gradually ascended.

The first walk "to see the town" that we three young men, M.M. Eicher, Beile and myself, took,<sup>22</sup> was in this direction as far as Hanscom Park. And it was a pleasure to repeat this walk again and again in later years, as much as this was possible, and note the growth of the city.

The walks in other directions, notably towards the north and the west, were not less interesting. In Father Dowling's days vehicles could be used, and at times the whole faculty joined Mr. Creighton and his friends on private picnics at Courtland Beach and at Priess Lake. The writer well remembers the northern part of 24th<sup>23</sup> street, which now boasts of being the prettiest mile in town, as an almost impassable mud road in the bottoms.

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<sup>19</sup> "there" added by hand.

<sup>20</sup> Comma added by hand.

<sup>21</sup> "then" added by hand.

<sup>22</sup> Comma added by hand.

<sup>23</sup> "20th?" handwritten above "24th".

## PANORAMIC PICTURES

It is commonly said that everything comes to him that waits. This is most probably true in most cases to one who lives long and works hard for the object sought. It did thus come true in regard to the writer's youthful dream of panoramic views to be taken from the college tower. But he had to make several attempts and to wait thirty-seven years.

When the writer arrived in Omaha towards the end of August 1896 and found himself in supreme command of the scientific department, he felt that the realization of his pet idea had come within his grasp. The season had at that time advanced too far, however, to do anything except preparatory scouting until the following spring. Mr. G. A. McGovern, who had just finished his course of philosophy in St. Louis University, then came here in the beginning of May to anticipate his vacation<sup>24</sup>. As he was a free lance and knew something about photography, I engaged his services at once. After a little preliminary practice on the Observatory and its instruments, we climbed the college tower on the afternoon of May 16, 1897 and took three views, northeast, east, and southeast. Why more were not taken I do not now remember. The reason was probably that these had first to be developed to see what they looked like. And as they did not turn out well, it was judged best first to practice at less inconvenient heights. The weather also was of prime importance, the class examinations were coming on apace, and on July 1 Mr. McGovern departed for a two-months vacation elsewhere. When he returned he was probably too busy getting himself and his laboratory in shape for his first attempt at teaching chemistry. And finally another item may have outweighed all the others, that funds were not obtainable for such large (8 x 10) plates and for so many of them, especially for their experimentation.

Of the three views taken by Mr. McGovern, I have prints only of the first and third. Photographically they were very poor. The south-east<sup>25</sup> picture shows however that the post office, New York Life Building, city hall, and old high school were prominently visible almost in their entirety and that even the distant St Joseph's Hospital may be identified. The north-east picture is worse yet, and does not at all show what was most desirable, Horse Shoe Lake, the river and the bluffs. In addition, the camera slipped when the plate holder was inserted, so that a piece of the ornamental railing obliterated nearly a fourth part of the view.

As no interest was taken in my scheme by higher Powers, and as I did not have the requisite photographic skill myself, I had to be content with the assistance that members of the faculty could and would give me. Accordingly I had to wait twelve years, until Mr. C. J. Pernin arrived upon the scene in 1909. He was an artist and a genius in his own way, but like such most unbusinesslike. He was most probably not aware of it, but I soon came to learn it by experience, that his promise meant nothing. All I ever got out of him was two small pictures of the work going on at the retaining wall then being built about the Observatory, so that I was finally forced to call upon a professional photographer and pay him a royal price for a few views urgently needed.

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<sup>24</sup> Corrected typo, with "a" handwritten above "o", which is crossed out by hand, to change "vocation" to "vacation".

<sup>25</sup> Originally, the word "southeast" was hyphenated and split between two pages. A handwritten addition starts at the hyphen: "[south-]east picture shows however that the post office, New York Life Building, city hall, and old high school were prominently visible almost in their entirety and that even the distant St Joseph's Hospital may be identified. The north-".

Mr. Pernin was succeeded the next year by an equally erratic genius, Fr. I. H. Bosset, whom I eventually induced to take a set of panoramic views from the observatory with a kodak. The set was complete, but I never saw a print, and even the negatives could not be found. A second disappointment.

In 1912 Mr. (now Fr.) Alphonse R. Schmitt arrived. He was a first class photographer and has produced pictures that a<sup>26</sup> professional cannot surpass. He was willingly entered into my ideas. Towards the end of his first year, on June 8, 1913 he took a complete panoramic set from the Observatory in eight directions, towards the cardinal points and towards points halfway between them.

When the prints were made, the circles of the celestial sphere at five-degree intervals were drawn on the back, so that they could or could not be seen according as one held them up to the window or not.

We found, however, that the photographs did not have the<sup>27</sup> vividness and distinctness that such out-door views should have. This we attributed to the east wind that was blowing at the time, for although this showed the landscape clear visually, it did not do it photographically. After his return from his vacation, Mr. Schmitt then took another series, 8 x 10 inches as before,<sup>28</sup> on August 22, 1913, but this time with a northwest wind. The excellence of this set leaves nothing to be desired. The circles of the celestial sphere were now drawn on the face of the prints, and 5 x 7 copies made of them. These were published in Popular Astronomy<sup>29</sup>, in May 1914, under the title "Astronomical Panoramic Views from a City Observatory." They had been presented before the Astronomical and Astrophysical Society of America at its Atlanta meeting the preceding December.

These pictures were then much enlarged and mounted in an octagon eight feet across in the physical cabinet, so that one standing at the centre could have the identical view he would have from the Observatory, with the addition of the circles of the celestial sphere, which showed how the stars moved near the horizon.

The final complete set of panoramic views, this time in twelve directions in order to secure a sufficient overlap, was taken from the top of the college tower on June 7th and 8, 1915, also by Mr. Schmitt. The perfection of these pictures could not be surpassed. Some of these views were published in the Creighton Chronicle at different times, but the entire set was never reproduced. The negatives of the three panoramic sets are kept in the vault of the Observatory, and will probably increase in value as the years roll by.

Conceived in 1878, realized in 1915! Everything comes to him that waits. Yes, if one lives long enough and works hard.

As 1915 is practically as ancient a year to many students of Creighton University as 1878 when this institution was founded, it will interest them, and to a greater degree their successors in the coming years, to have a few items in these pictures called to their attention, some of them already in existence, and others only bare sites of present conspicuous edifices.

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<sup>26</sup> "a" added by typewriter above the line with mark to insert.

<sup>27</sup> "the" added by hand.

<sup>28</sup> Comma added by hand.

<sup>29</sup> Underlining added by hand.

The first thing that strikes the eye on all the pictures is a feature, that some people have always spoken of contemptuously as betokening a frontier town, but in reality adding much beauty to our city. This is the great abundance of trees everywhere, which besides beauty give a most welcome protection against the summer heat. They hide ever so many houses, it [is]<sup>30</sup> true, but the sight of these in the treeless sections of our large cities is as monotonous and uninspiring as that of a rocky and grassless plain. The big buildings, however, are not hidden, and these are of greater interest than a tumultuous jumble of mere dwelling houses.

Beginning with the south view, 24th and 25th streets are well seen. So is the Swedish Church at 23rd and Davenport, and even the old-time Krug's brewery on Vinton street is discernible.

Passing on to the next<sup>31</sup> picture, the "Beanery" is conspicuous and a large part of the parish school.

In the following one, the parish school is there, with the roof of the church as it was until 1923. The boulevard is well seen, but there is yet no Blackstone on the horizon.

On the west view the former north terminal of the church is conspicuous, together with the smokestack of the heating plant north of it and the lawn tennis courts to the west, the site of the present Law building. California street may be followed almost to 40th, the Webster street school is there with the present Duchesne College and the stumpy towers of the Cathedral then just rising above the roof line. West of 26th street is the ground which the University acquired during the following year, with a row of dwelling houses near the site of the present Dental building, at its southern end, and a circus encamped for that day, June 8, 1915, on its northern end.<sup>32</sup>

The circus tents, together with the whole length of the football field and its grandstand to the west and its bleachers to the east, are very conspicuous in the next photograph, which shows also Burt street, the empty hill slope north of Cuming street now so thickly set with elegant residences. The house with the tower which is so prominent a landmark when seen from the college campus, where it has served so well for our young surveyors, is scarcely discernible from the college tower. The Poor Clares Monastery, invisible from the ground, is now looming into view behind the house with the tower. What a change will come over this view when it is photographed again! How conspicuous the stadium will then appear!

In the succeeding picture, the present carbarn on 26th and Cuming street is wanting. But the day, the 8th, is plainly marked on a billboard and the circus as "Hugo Bros. Shows." In the distance are two tall smokestacks indicating brick yards northeast of Prospect Hill Cemetery.<sup>33</sup>

In the north view the site of the present gymnasium, on which grading was begun on the following August 2 and the foundations on the 30th, is yet occupied by a grassy hillside. The Observatory is prominent in the foreground, but the marble statue west of it at present had not

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<sup>30</sup> "It is" in earlier draft.

<sup>31</sup> Should be "next"; correct in earlier draft.

<sup>32</sup> Handwritten note by unknown writer at end of paragraph reads: "Aug. 1972 Our sole copy of this view was borrowed (1969 or '70) by Fr. James Fitzgerald S.J, but never returned though he had promised to do so in two weeks, but did not do so, though often asked return it."

<sup>33</sup> Originally "smokestacks <sup>3</sup>(northeast of <sup>2</sup>(brick yards <sup>1</sup>(indicating) Prospect Hill Cemetery." The numbers and parentheses were handwritten to indicate changes desired.

yet been erected until June 3, 1921, six years later. 24th street may be followed a long way. This view towards the north extends to a greater distance than any other visible from the college tower. Even the bluffs beyond the river and far beyond Florence, may be seen for about fifteen miles.

The succeeding pictures are increasing in grandeur. The distant bluffs across the river are well marked. Two elevators and the brewery at 16th and Grace streets rise above the trees. In the foreground the deep cut on 24th street may cause astonishment to future generations after the grading east of it will have obliterated it.

The northeast view is also fine with the bend in the river. In the middle Holy Family Church and<sup>34</sup> the enormous elevator north of it, are easy to identify.

The east picture shows the bend of the river to greater advantage. It also presents an extended view of the Union Pacific Shops and of the Smelting Works. With a magnifying glass some details even of the city of Council Bluffs may be discerned, especially the water tank, which is so conspicuous, that several classes of college students used to find its distance with a telemeter with no other datum than its known diameter of twenty-five feet.

Coming now to the business section of Omaha, we can see only three of its skyscrapers, the Union Pacific headquarters, the Woodmen of the World building, and the Fontenelle Hotel, the first one built on 16th and Harney not being visible. The Post Office is also easily identified. But the present tall telephone building is not yet there, nor the Medical Arts on 17th and Dodge.

The last photograph repeats some of the buildings shown before, and gives in addition the present fine Omaha High School. While this last has gained in size and all modern requirements, it has lost heavily in conspicuousness as a landmark. And lastly just beyond it to the right on the horizon is the present St. Joseph's Hospital, without, however, its Nurses quarters.

The reader may now be left to his own musings in comparing the ancient views of 1880 and 1886 with those of 1915. Then let him add the accretions since 1915, and predict what will follow.

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<sup>34</sup> "and" handwritten above "with", which is crossed out by hand.

THE STREETS  
AND STREETCARS<sup>36</sup>  
NEAR  
THE CAMPUS

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<sup>35</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

<sup>36</sup> "AND STREETCARS" added by hand.

## THE STREETS NEAR THE CAMPUS

### 1. California St.

During the first ten years of its existence, the campus of Creighton University abutted only on one street, California. There was at that time not a single street in the city that was paved. In wet weather the mud was almost unbelievably deep and sticky, so that there is a good foundation for the words of John G. Saxe, quoted on page 71 of “The Reminiscences<sup>37</sup> of the First Twenty-Five Years of Creighton University.”

“Has’t<sup>38</sup> ever been to Omaha  
Where rolls the dark Missouri down,  
Where six strong horses scarce can pull  
An empty wagon through the town?”<sup>39</sup>

After a spell of hot dry weather, the opposite condition prevailed, so that at times the town could not be seen from the college on account of the dust.

In 1884 California street was graded, with a cut of twelve feet at 25th street. In 1886 the college grounds between the Main Building and the street were shaved down to the grade of the street. In October 1888 California street was paved. It was paved a second time, in 1906 to the boulevard.

### 2. 25th Street

The year of the grading of 25th street is not recorded in the College Annals, which however give October 21-28, 1905 as the time it was paved.

### 3. 25th Avenue

This was opened by the city in 1888 immediately adjoining the present auditorium to the west. It ran only from California to Burt streets. As it was on line neither with the present 25th street south of California nor with 25th avenue north of Burt, but nearer to the latter, it was called an avenue and not a street. It was never even graded. Its condition at all times, and especially after heavy rains, was such as to repel [*sic*] all fancy vehicles and heavy traffic. After the College had bought the property west of the street on August 15, 1907, the City closed the street on January 27th following, so that it thereafter formed part of the campus.

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<sup>37</sup> Corrected typo to remove additional “i”; was “Remiiniscences”.

<sup>38</sup> Originally typed “Has’nt”. “n” has been crossed out to read “Has’t”. Should be “Hast”.

<sup>39</sup> These are the opening lines of a poem that first appeared in *Harper’s Magazine* (September 1869), reprinted in full on page 33 of *The History of Creighton University, 1878-2003* by Dennis Mihelich (Omaha: Creighton University Press, 2006). In that original version, the word “draw” appears in place of “pull” so that the end of line 3 rhymes with the end of line 1 (“Omaha”).

#### 4. Burt Street

Burt street seems never to have interested the College very much. One reason for this is the fact that it became the northern boundary of the campus as late as 1907. All that the historian can find about it is that it was paved west of 26th street a month or two after June 10, 1913, when a photograph showed it still in its unpaved condition.

#### 5. 24th Street

From the very beginning of the College in 1878, and probably long before, there had been talk of opening 24th street. Only three blocks had to be cut through, from Cass to Burt streets. This street held out the hope of becoming one of the most important ones in the city, and this hope, together with the hill and the extensive view towards the east and north, were the controlling reasons in making the College building face this street, although it was at the time not yet cut through, and the front of the campus was blocked by a piece of property that could not then be purchased. The eastward facing is a solid motive even today, but that towards the street proved to be disappointing for the reason that its grade had not been duly considered.

The need of cutting 24th street through became more urgent as the years passed and the city grew. But it was not until August 6, 1907 that the City Council passed an ordinance to that effect. In anticipation the Street Railway Company on April 11, 1908 extended a double track on 24th street from the south all the way to Cass street. On January 5, 1909 the opening of the street was declared to be certain. It was however only on July 23rd following that the street was staked off. A few days later a couple of fine trees on California street that stood on the right of way, were cut down.

On August 2nd the great grading began, and the University at once shaved down its front lawn in conformity. The street graders at first used old-fashioned "stick wagons," but soon realized that this method was too slow and expensive. They then got a regulation plow drawn by eight horses and pushed by four. For a few days the horses were replaced by a steam tractor, but this, although more efficient on the straight pull, lost more time at the ends in turning around, so that horses were again employed.

Winter interrupted the grading between November 23rd and March 23rd. On April 23, 1910 the work was finished. From June to September the Front Retaining Wall along the college property was concreted, and from October 27th preceding to April 22nd that of the Observatory where the lawn had been lowered ten feet. By October 1 the Webster street steps were completed. They give a good idea of the height of the lawn above the street. They soon however proved to be so unpractical that an iron gate was placed on them and is now kept permanently locked.

On September 26, 1910 car tracks were laid on 24th street, and service began on October 16th. But it was as late as August 7th in the following year that the street was paved and ready for general use.

Twenty-fourth street is fulfilling the expectation that it will become an intensely busy thoroughfare. It is probably the longest and straightest street in the city, and the proposal to widen it to one hundred feet has been mooted for years. This widening would not affect the College campus, because it would here be entirely to the east on the other side. Whether this

widening would bring with it the removal of our front retaining wall and the terracing of the front lawn, is a question left to the future to settle.

#### 6. 26th Street

Twenty-sixth street became the western boundary of the campus on August 15, 1907 and remained so until April 21, 1915. When it was graded and paved is not mentioned by the College historian.

#### 7. 27th Street

This has bounded the University grounds to the west since April 21, 1915. It was at that time already graded and paved. It was at first called 26th avenue. It is only two blocks long, from California to Burt, and not in line with streets to the south and north of it.

## STREETCARS NEAR THE CAMPUS

In the beginning, 1878, the nearest carline to the College was a horse-car line on 20th street. Strictly speaking, the line which ran on 24th street north of Cuming, and then on Cuming east of 24th, was equally near, but this was practically ignored at least by the faculty, especially on the return trip, because it necessitated the climbing of a steep hill, while California street from 20th to the College had an easy grade.

There were then only two lines in the city, a red and a blue one. By August 1886 when the writer visited Omaha again after an absence of five years, there was a cable line on 20th street and another on Dodge street as far west as 26th. On June 20, 1887 a single horse car track was laid on 25th street from Dodge to California. Three years later on June 11 this line was electrified. But only on October 13, 1897 was the turntable near the College replaced by a Y. On July 19, 1902 the track was doubled on 25th street, and extended westward on California to 33rd and then northward. On August 6th this was in service.

On October 16, 1910 cars began to run on 24th street.

These two lines, the Harney line on California street and the Cross Town line on 24th, are the only lines that run on streets adjoining the University grounds. But as transfers in all directions are readily obtainable, there is no need whatever of more lines. At the foot of the hill on Cuming street there are two other lines only one block away from the grounds.

As a matter of history it may be of interest to mention that the first electric line ran on Burt street. Electric traction was at the time in its infancy. Dr. Mercer, who lived in what was then a palatial residence at the northeast corner of 40th and Cuming streets, was one of its ardent promoters, and sank a good part of his fortune in it.

GROWTH  
OF THE CAMPUS  
AND  
THE<sup>41</sup>  
BUILDINGS

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<sup>40</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

<sup>41</sup> "THE" added by hand.

<sup>42</sup> "-" added by hand.

## **GROWTH OF THE CAMPUS AND THE BUILDINGS**

The growth of the campus of Creighton University and of the number of the buildings erected upon it,<sup>43</sup> is herewith presented in a series of maps which formed the plans of the grounds at successive times in its history. These plats give only what may in the restricted sense be called the campus, and has ever been so understood, that is, that connected area north of California and west of 24th streets. It does not therefore include the Colleges of Medicine and Pharmacy at 14th and Davenport streets, nor those of Law and Dentistry as they were at 210 S. 18th street, nor the College of Commerce and Finance at 25th and Cass streets, nor even the Dormitory just across California street and the tennis ball courts near the boulevard. The addition of all these would have made the maps too bulky, would have reduced their scale too much, and would have added but little to their interest.

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<sup>43</sup> Comma added by hand.

## FIRST PERIOD. 1878-1887

These maps are five in number, and denote in a way as many epochs or periods in the history of the institution. The first epoch covered the first ten years of its existence from 1878 to 1887 included. The grounds then consisted of a rectangle measuring 526 feet from north to south and 561 from east to west. This rectangle however was not complete until March 1887. In 1878 a piece 208 x 104 feet was wanting in its eastern border. The reason of the break was most probably due to the impossibility of securing this portion at the time, all the rest having been purchased in sections in 1877. That the College securely hoped soon to acquire this section so necessary to the integrity of its campus, is fully evinced by the fact that its main building, already erected, and its contemplated entire front, faced this coveted piece. Anyone acquainted with the circumstances would fully approve of thus orienting the building, because it was erected on the brow of a hill which sloped away to the east and north, thereby commanding an extensive view in these two directions, and moreover it faced what was then and is even now expected to be one of the most important thoroughfares of the city, that is, 24th street, which was not then cut through but would be in the near future.

Near the northern end of the mentioned property stood a large frame dwelling house, probably fifty feet square, with two stories and a high basement. When the occupant, Mr. Wells, (<sup>44</sup>according to Fr. Eicher, Reilly was the owner, and Wells the tenant,) <sup>45</sup> in March 1880 started to build a stable near the southern end of his grounds, Father Shaffel, the first president of the College, succeeded in purchasing fifty-six feet, extending from the southern boundary to the south side of the twenty-foot alley. This alley (see map) Mr. Reilly then occupied because he owned the property on both sides of it, but it would fall to the College when this obtained the rest of his possessions. Now, however, that the owners on both sides had become different, the alley had to remain open. This made matters very much worse in a way, because the stable was now built at the southwest corner of Mr. Reilly's property, about fifty feet from the main entrance of the College, on the present circular driveway just north of the fountain, where it remained a galling eyesore for seven years together with its cul de sac of an alley. As this pointed directly to the College entrance from 23rd street, it must have chagrined the occupants, and especially the drivers of carriages, to come up this blind alley and land at a stable, where a four-foot fence barred the passage to the College. When the passengers belonged to the sterner sex, they frequently climbed this fence, much to the astonishment and even the amusement of the on-lookers.

No agreement could be secured in regard to the rest of Mr. Reilly's possessions, because he asked \$8000 for it, while the College would not pay more than \$6000. The latter's hope was that the property would soon become undesirable for the reason that it was exposed on three sides, north, west, and south, to the pranks of noisy students. Bishop O'Connor, however, who was universally regarded as one of the shrewdest real estate men of the city, at once declared the action of the college authorities as a mistake. And this soon proved to be the case. Mr. McCreary bought the property in question, and it was an open secret that he speculated to get a handsome return for his outlay from the College some day, and that our great benefactor, Mr. John Creighton, would foot the bill. The latter knew this also, and was therefore very averse to the deal. Finally Fr. Dowling's tact induced Mr. Creighton on March 7, 1887 to exchange a piece of property of his at the northeast corner of 19th and Chicago

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<sup>44</sup> (“ added by hand.

<sup>45</sup> “)” added by hand.

streets, which was valued at \$15000, while the College paid an additional \$2000. A month later the fences and other objectionable features were removed. The rectangle of 526 x 561 feet was now complete, and the area of the campus 6.774 acres. The eastern border line was now straight, although 70 feet of it blocked Webster street and the remaining 456 feet abutted on private property. But in the expectation that 24th street would some day be cut through, this state of affairs caused no concern. This expectation however had to wait for its realization thirty-three years, from 1877 to 1910, and when at last 24th street was opened for use and cars ran on it, the steepness of the grade nullified all its advantages.

During this First Period, 1878 - 1887, the only large structure on the grounds was what has ever been known as the Main Building. It had (or has) a frontage of fifty-four feet and a length of one-hundred and twenty-four. It presented an isolated appearance, but was considered to be one of the finest buildings in the city. It was handsomely finished in St. Louis pressed brick and trimmed with Kansas limestone, and is today as fine and strong as on the day it was built. That the best material was used in its construction was due to the vigilance of James Creighton, popularly called "Long Jim" (because there was also a "Short Jim"), a nephew of John A. Creighton. One proof of this may be seen in the oak steps which run from the basement to the third floor near the front of the building. After fifty years of service they scarcely show any signs of wear, although they have never been protected in any way, such as by metal strips or linoleum covers.

The frame house on the Reilly-McCreary property had always been tenanted. Some months, however, after the College had obtained possession of it, it was vacated<sup>46</sup> so that its interior could be remodeled and a part of the College faculty reside in it. Steam pipes were also run into it from the College. When the southeast wing of the College was built and occupied, the frame house was sold on July 12 for \$900 cash on the condition that it was to be removed immediately.

In 1884 our great benefactor, John A. Creighton, donated about \$10,000 towards the purchase of scientific apparatus, principally in physics, chemistry, and astronomy. A one-story frame building, 30 x 60 feet, was then erected southwest from the college, on the spot now occupied by the church. This building had a porch ten feet wide on its east side. The southern half, 30 x 30 feet, was the chemical lecture room and laboratory, the middle part had a sky light for photographic purposes and served also for the storage of chemicals, while the northern part consisted of a dark room and a work shop. The physical outfit was kept in the Main Building.

The next building to be erected was very small, only fifteen feet in diameter, but was destined to shed great lustre on Creighton University. It was the round house of the Observatory, in which the five-inch telescope was mounted in 1886. The transit room followed the next year, 1887.

In concluding this First Period, attention may be directed to two other features on the map. The first is indicated by the long parallel lines in the western part. They show the terraces or banks which had been formed by the material that had been cut away from the central parts in levelling. These banks remained prominent landmarks in the campus for many years, to about the year 1900. The ground west of these terraces was low and sloping, and not devoted to any use, except perhaps as pasturage for the college cow. A small piece was cultivated as

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<sup>46</sup> "vacated" added by hand.

a vegetable garden for a while. A handball alley was also erected on it directly west of the Main Building.

The second feature is the well, with its "old oaken bucket," sixty-six feet north of the building. This gave the faculty and the students their drinking water until August 28, 1882 when city water became available. The exact location of this well, which never ran dry and always furnished clear and cool water, is marked by the eastern column of the two that now support the balcony in the Students' Chapel in the north wing. The well was filled with stones and earth, and a concrete arch built over it to hold the iron pillar.

The ground to the north and south of the Main Building was fairly level. Its height was that of the lowest stone in the front steps directly connected with the main entrance. This level extended to what is now the upper concreted walk about the Observatory. To the south it ran across California street, towards the southwest where the present Dormitory is. Towards the east the ground sloped downward. There is today no vestige remaining of the original surface in 1878 except that now covered by the shrubbery directly in front of the Main Building, and north and south of its stone steps.

The athletic field, or play grounds, as it was then called, was to the north and south of the building. The northern part was rather narrow, only sixty-six feet wide, being limited by a fence that ran directly west from the well. When the old-fashioned football was played here, the ball was frequently kicked over this fence. When at first one student was placed here to return the ball, he generally took his time about it, because he was sure he would not be interfered with in trying to get a good kick. This delay exasperated the rest, so that two boys were stationed across the fence. This solution did not remedy matters, because the two would frequently lock each other with an unyielding grasp. Finally three boys were stationed beyond the fence, and the ball was always returned promptly.

During the first years of the College there were only two lines of cars, horse cars, in the city. The nearest one ran along 20th street. For a long time the track was single with run-arounds in various places. In June 1887 a single track was laid on 25th street, from Dodge to California, right to the college grounds, the "Harney Line" as it is now called. This has ever been of the greatest service to the College, as it connected it directly with the business center of the city and with the depots. At the College end of the line there was a turntable which the light cars occasionally overshot. Three years before this, that is, in 1884, California street had been graded down twelve feet.

## SECOND EPOCH 1888-1901

As the acquisition of the Reilly-McCreary property and the obliteration of the alley in front had set the College at ease in regard to the integrity of its campus, the Second Epoch, 1888-1901, was begun by the erection of permanent substantial buildings, the church in 1888 and the southeast<sup>47</sup> wing of the College in 1889. The church however was only half completed, first for lack of funds, and secondly because it was sufficiently large at the time for the purpose intended. This was that it should serve as Collegiate Church, and release the large hall on the third floor of the College from its dual character as a chapel on Sundays and as a place of commencements, plays, and other public student activities on other days. The corner stone of the church was laid on June 26, 1887, and the edifice was dedicated on May 6, 1888.

It remained a Collegiate Church until January 10, 1897 when it became a regular Parish Church, the parish extending from 20th to 30th street, and from Dodge to Grace and Parker streets. In the following September the parish school was opened.

The southeast wing of the College was begun in September 1888, and permanently occupied by the faculty on February 28, 1889. It contained eighteen living rooms, together with kitchen etc, access to the latter being had from the western circular driveway shown on the map. The driveway on the front lawn had been laid out in 1888. In October of that same year California street was paved.

As there was then no street running north and south for a considerable distance west of 23rd street, the City in 1888 ordered 25th avenue to be opened to the west of the College grounds. For this purpose the College ceded twenty-nine feet, half the width of the street. The campus was now bounded by two streets, one to the south and the other to the west, with a prospective one to the east, and with an alley to the north. This alley had then only a legal existence, its grade being so steep that it tempted the mountain-climbing proclivities of the students.

Fr. Dowling's business ability and winning tactfulness had been the efficient cause of all these improvements. He had purchased the Reilly-McCreary property with its objectionable alley, had built the Observatory, the Church, and the Southeast Wing of the College, all the buildings in fact except the Main Building and the temporary frame Chemical Laboratory.

When he laid down the keys of office on March 12, 1889, and departed for Detroit to erect a college building there also, enterprise and success departed with him.

A period of great financial depression now set in, so much so that Creighton University seemed doomed to extinction, and there was serious question of closing the school for a while or forever, or of handing it over to another organization. It was only upon Fr. Dowling's resumption of the reins on November 12, 1898 for his second term, that the University began again vigorously to lift its head and to awaken to a new life, the only building that had been erected in the interim having been that of the present Medical College on 14th and Davenport streets, which was opened the year before on September 27. Fr. Dowling began with<sup>48</sup> little things, with a telephone, electric lights in the College and in the church, frescoing the latter and renovating it, and replacing the old wooden steps in front by the present stone ones with

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<sup>47</sup> Corrected typo, with "s" written above "w" to change "woutheast" to "southeast".

<sup>48</sup> "the" followed "with" but has been crossed out by hand.

their small retaining wall and its four large flower vases. Within almost his first month he had brought to his knees a dishonest debtor who was trying to repudiate a \$20,000 mortgage with its unpaid interest.

THIRD PERIOD.<sup>49</sup> 1902-1907

More important and essential plans were maturing behind closed doors, and the first we knew was that a new era of prosperity had dawned, we heard that John Creighton had given \$100,000 for new buildings, and a few days later, on April 9, 1901 we saw the ground broken for the Southwest Wing on California street with its seventeen living rooms and the Library. The North Wing was begun about two weeks later and was to contain eleven class rooms, everyone of which was<sup>50</sup> in use as soon as completed, the Students Chapel, extending from the basement into the first floor, and the Physics Department on the third floor. The Auditorium, seating nearly a thousand people, and the Heating Plant with three boilers, also arose at the same time. The northwest part of the campus was graded for a ball field. The Chemical Laboratory now occupied a space of 50 x 60 feet on the second floor of the Main Building, and its frame building was sold for \$100 and removed to the south side of Burt street just across the alley. It was later on in 1915 carried to the north side of the street, directly north of the west front of the present Gymnasium. Its porch was taken from the side and placed in the front and in the back, and other minor changes made, but and<sup>51</sup> old-timer will find no difficulties in identifying it.

On August 19, 1905 the Shaller property was bought for \$7000, the old house removed to 2614 Cass street, where it still stands, the hill was graded away and the present Dormitory erected, and made ready for occupancy in the following June. In May 1905 Mr. Creighton donated \$140,000 towards the Edward Creighton Institute, 210 So. 18th street, just opposite the City Hall, into which the Law and Dental Departments moved on September 26 of that year. This same year also saw the formation of the School of Pharmacy. Its building, adjoining the Medical on Davenport street, was finished in 1907.

On his 75th birthday, October 15, 1906, Mr. Creighton presented to the University two buildings valued at \$400,000. He fell sick shortly after and died on the following February 7. In his will he had given nearly half his fortune to the University.

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<sup>49</sup> Period added by hand.

<sup>50</sup> Corrected typo to read "was".

<sup>51</sup> Typo; earlier versions have "an".

FOURTH PERIOD.<sup>52</sup> 1907-1924

The Fourth Period was conspicuous by territorial expansion and by the erection of buildings on a large scale. This long interval of seventeen years might have been more properly divided into two periods, 1907-1915 and 1916-1924, but their plats would not have differed enough to warrant the introduction of another drawing.

Athletics was<sup>53</sup> coming into greater prominence and, along with the need of future buildings, was clamoring for more territory. Accordingly on August 15, 1907 a piece of property extending from 25th avenue to 26th street, and from fifty-one feet north of California street to Burt street, 636.6 x 255 feet, was purchased by Fr. Dowling for \$18,500. This increased the area of the campus to 10.151 acres. On the following January 27, 1908, the City Council closed 25th avenue, so that this became the property of the College. The area was then 11.066 acres.

This large purchase was Fr. Dowling's last great act. He resigned definitively on February 22, 1908 and departed for Kansas City, where his abilities displayed themselves in the erection of Rockhurst College with comparatively much less abundant financial means.

Not only in his business ability but also in educational advancement, which is outside of the present account, Fr. Dowling was undoubtedly the greatest president Creighton University ever had. In business he never went beyond his means and<sup>54</sup> incurred heavy debts. He spread his money far, although most people, and John Creighton also, would have desired greater solidity and ornamentation in his buildings.

Of course, as no man is perfect, he made mistakes, and some of his works had to be done over again, even by himself. But the greatest praise due him is that he won the heart of Mr. Creighton, and induced him to be so munificent to Creighton University.

The football field could now be laid out more in accord with the professional shape. The first game played upon it at which an entrance fee was charged,<sup>55</sup> occurred on October 1, 1910.

In 1909 the College ceded thirty feet from its eastern boundary for more than half the width of 24th street, which was graded from August 1909 to May 1910. Cars began to run on it on October 16, 1910, but it was not paved and ready for use until August 7, 1911. The area of the campus thus slightly reduced to 10.700 acres, was increased sectionally by the gradual purchase of property along Burt street between the years 1910 and 1915. This extended 502 feet from 24th street to what had been 25th avenue, and was 141.6 feet deep, which together with the alley then made 161.6 feet, thus increasing the area to 12.566 acres.

In 1915 the campus thus extended 687.6 feet from California to Burt streets, and 815 feet from 24th to 26th streets, except a small portion, 51 x 255 feet, along California street between the Auditorium and 26th street.

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<sup>52</sup> Period added by hand.

<sup>53</sup> "was" handwritten above "were", which has been crossed out.

<sup>54</sup> An earlier draft has "nor" handwritten above "and", which has been crossed out.

<sup>55</sup> Comma added by hand.

As the lengths just given, 687.6 and 815 feet, are not so far from being equally one above the other below 762 feet, the base of the Great Pyramid, it occurred to the writer to compare the ground plans of both. He found that if the Great Pyramid were placed upon the College grounds it would fall 26.5 feet short of the east and west lines, but go 37.3 feet beyond the north and south limits.

The height of the Great Pyramid is 485 feet. Let the reader stand near the lowest point of the College property, on the sidewalk at 26th and Burt streets, and look up at the tower on the main building. This tower is 267.2 feet above the city datum plane, and the ground at his feet is 84.9 feet above it, so that the top of the tower is 182 feet above the northwest corner of the grounds. The top of the Great Pyramid is two and two-thirds times as high. To reach it we would have to climb the hill and the tower twice and the building a third time. (Creighton Chronicle IV[, ] 249[, ]<sup>56</sup> January 1913.)

The largest addition to the College campus came in 1916. It comprised the space between California and Burt streets and between 26th and 27th streets, 687.6 x 255 feet, or 4.026 acres, that is, very nearly four acres exactly, so that this portion may be used as a measure in estimating areas. The campus now comprised 16.592 acres. The property mentioned was purchased on April 11, 1916 at a price of \$52,500. But it was not until October 17, 1921 that 26th street was closed from fifty-one feet north of California street to Burt street, giving an increase of 636.6 x 57 feet, and making the area 17.425 acres.

The last addition was in June 1923 when 51 x 120 feet were secured along California street, next to what had been 25th avenue.

The extent of the College campus north of California street and west of 24th street, was then (in 1923) and is yet the largest in its history. It comprises a square 687.6 feet long from California to Burt streets, and 1127 long from 24th to 27th streets, all except a part fifty-one feet deep and 192 long along California street. The area is now 17.565 acres.

The rapid growth of the campus was equalled by that of the buildings. With only a reference to the purchase of ground adjoining the Medical College to the north on 14th street on April 2, 1909 for \$12,000 and the erection on it of the Medical Laboratory in the following year, the first building to rise on the campus proper since the great boom in 1902, was the Gymnasium, 94 x 254 feet, which was opened for use on September 30, 1916. This was followed in 1921 by the new Law and Dental Buildings, their former home, the Edward Creighton Institute on 18th street, having been sold on September 15, 1919 for \$250,000.

On September 2, 1923 there was the solemn dedication of the completed Church, which doubled the seating capacity of the incomplete one of 1888. The small rectory of the Church had been built two years before.

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<sup>56</sup> Earlier drafts had commas before and after "249".

FIFTH PERIOD.<sup>57</sup> 1925-<sup>58</sup>

The Fifth Period in the history of the campus and of its buildings began in 1925 with the erection of what in the eyes of the students is the most important structure on the grounds. This is the Stadium, with a seating capacity for 15,000 spectators, and a running track a quarter of a mile long around the football gridiron. It was officially opened for use on November 21, 1925, the Home-Coming Day of the Alumni, and the third day in the festivities of the Inauguration of President Grace. It had cost very nearly one-third of a million dollars. With it all territorial and structural expansion was brought to a halt, until the University shall have sufficiently recovered from this supreme drain upon its resources.

The plat for this Fifth Period, 1925-1928, is the only one of the set to give the contour lines, that is, the lines that indicate the altitudes above the City Datum Plane. This last is the plane of the lowest low water in the river, and is 962.7 feet above sea level. The contour lines were indeed measured in a general, and often in a very careful way in previous years, but as they were so frequently wiped out by the repeated and repeated gradings, the draughtsman lost courage and also wiped them out or rubbed them off his maps. Their numerical data have, however, been preserved.

The altitudes are generally given at intervals of five feet, except when they would be too much crowded. From these it is seen that the highest altitude on the streets is 145 feet, at 25th and California, and the lowest 85 feet, at 26th and Burt, where our Pyramid comparer is supposed to stand. The greatest height on the grounds is 162 feet, next to the lowest step at the main entrance under the College tower. The lowest is that of the football gridiron, about 100, if we except the slopes towards Burt and 27th streets.

Towards the southeast of the College Building the slope is pretty gradual, but it becomes very steep near the front retaining wall and on both sides of the Gymnasium. The north and northeast lawns are fairly level. To the north of the Law and Dentistry Buildings the ground is terraced, as the steps indicate. To the south and west of the latter building the lawn slopes gradually. The space south of the South Stand, and that between the Law Building, the Auditorium, and the Gymnasium is not graded definitely, as several large buildings are destined to occupy parts of it.

The contour lines are made up of alternate dots and dashes. When not numbered, they denote the beginning or end of a slope. The property lines consist of dashes, the fence lines of a series of one dash and three dots, and the walks and roads of dots. The curb lines of the streets are like those of buildings, full ones. The little cross south of the Observatory marks the site of the sixty-foot flag pole donated by the High School Class of 1914, the cross in the southeast corner of the South Stand of the Stadium signified a similar flag pole (which happens to be 24 feet south and 32 feet west of the geographical center of the grounds), and the third little cross at the north end of the North Lawn denotes the marble statue of the Sacred Heart which the students set up as thanks-offering because not one of them had died of the flu during the war year 1918.

In summing up the characteristics of these five periods in the growth of the campus and of the buildings of Creighton University, it may be said briefly that the first, 1878-1887, denotes its

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<sup>57</sup> Period added by hand.

<sup>58</sup> Hyphen added by hand.

infancy and a struggle for existence; the second, 1888-1901, a first attempt at growth in the erection of the southeast wing and the church, followed by a long period of rest; the third, 1902-1907, a vigorous growth in the completion of the north and south wings with the library, the auditorium, heating plant, and first ball field; the fourth, 1907-1924, by gigantic growth of territory and buildings; and the fifth, from 1925 onward, by the supreme effort of the stadium, followed by a long rest.

The last plat of this series may be called a real estate map. It groups into one drawing the successive extent and growth of the grounds from the beginning 1878 up to the present 1928. The first shape of the campus in 1877, which was a rectangle 526 x 532 feet with a smaller one 208 x 104 feet cut out of its eastern border, is drawn in full lines, all the rest in a variety of broken lines. These lines all denote property lines. The small numbers<sup>59</sup> affixed to them give the lengths in feet. At present the over-all length from north to south is 687.6 feet, and from east to west 1127 feet.

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<sup>59</sup> “s” added by hand to change “number” to “numbers”.

T H E  
LIBRARY

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<sup>60</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

## THE LIBRARY

The library began its existence on January 13, 1880 when twenty boxes of books arrived. They had formed part of the Bardstown College library, and ever since that institution had been dissolved at the beginning of the Civil War, had lain in the basement of the old church at 9th street and Christy avenue in St. Louis. As the theological department of the Missouri Province, for which these books had been destined by successive provincial superiors, showed no signs as yet of maturing, Fr. Higgins offered four thousand of them at dollar a piece to Creighton College. Fr. Shaffel then went to St. Louis to make his selection. The classical part having been donated to St. Stanislaus Seminary, Florissant[,] <sup>61</sup> Missouri, <sup>62</sup> the theological and historical sections were the only ones left. Both have been pronounced very good for the time at which they were boxed up, the first, for example, containing the complete Latin and Greek <sup>63</sup> Patrology by Migne <sup>64</sup>.

Of the four thousand dollars, Mr. Creighton then paid two, Fr. Higgins remitted one, and Fr. Shaffel <sup>65</sup> paid the remaining one.

A room was then built on the third floor of the Main Building at the north end of its rear corridor, where the present photographic dark room is, and fitted up with shelves along its walls. The books were placed on these and the Library was ready for use on February 14.

As this room could not be heated and was rather far from the living quarters of the faculty, the library was by October 27, 1885 removed to the second floor in front over the north parlor <sup>66</sup>. This is Room No. 242 in the present notation, the office of the college dean. Alcoves jutted out like buttresses, so that there was scarcely room on the floor for one table and a couple of chairs.

The students library then began to grow. It was at first kept in glass cases in the southeast class room on the second floor, the present chemistry lecture room. In May 1899 it was transferred to the northwest room on the first floor, which then became also a reading room. Folding doors connected this room with the northeast one, which was used as a domestic chapel by the faculty. When these doors were opened along the whole length of the partition, the chapel was doubled in size and could be used to great advantage during retreats of the clergy.

It will be of interest to mention here in parenthesis that the space 50 x 60 feet between the front and rear corridors, <sup>67</sup> had been originally divided crosswise by glass partitions into four equal rooms on the first and second floors. On the third floor there was the large hall, with its

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<sup>61</sup> Some earlier versions have a comma.

<sup>62</sup> Comma added by hand.

<sup>63</sup> "and Greek" has been crossed out, with a handwritten note, apparently from a later editor since the handwriting does not match that of Fr. Rigge, that reads: "Early records show that only the Latin set was then obtained. Much later a woman gave the Greek set in memory of here [*sic*] deceased husband."

<sup>64</sup> Corrected typo, with a handwritten "n" over "u", which has been crossed out, to change "Migue" to "Migne".

<sup>65</sup> Corrected typo, with a handwritten "a" over an "e", which has been crossed out, to change "Sheffel" to "Shaffel".

<sup>66</sup> Some earlier versions state "south parlor".

<sup>67</sup> Comma added by hand.

ceiling twenty-one feet high, the height everywhere else<sup>68</sup> being fourteen feet. A glass door at the far end of each glass partition gave access from one room to another. The glass partitions running east and west were built like ordinary, although very wide,<sup>69</sup> windows so that the lower half could be raised and the upper half lowered, and in this first arrangement one professor could keep studies in both classrooms at once. Of course, it goes almost without saying that the lower halves of the glass partitions were painted, and that the small boy soon scratched his peepholes in them. While these glass partitions had the advantage of light and of ventilation on warm days, they were objectionable on account of sound. The only remnant of these partitions to be seen today is in the chemical laboratory on the second floor in which the north one has been entirely removed and the other three only modified in a minor way.

To reach a west classroom one was obliged either to pass through an eastern one on his way, or to go up to the third floor or down to the basement or run around outside of the building. This soon proved to be very unpractical, especially so to Fr. Dowling. Within two weeks of the day he began his first term on July 18, 1885, a narrow corridor was sliced off the north rooms on the first floor in the middle of the building, the lower part of both partitions being built of wood and the upper of glass, the lower glass from one side being transferred to the top of the other. Later on the second floor was similarly treated, except that, strange to say and unpractical as it turned out, the corridor was run only half the length and cut out of the southwest room only, so that this necessitated passing through the southeast room to reach the western ones. This southeast room was used for a while as a physics lecture room and the cabinet crowded into the northeast one.

As the auditorium had made the large hall on the third floor of the main building unnecessary for public purposes, this hall was in July 1907 divided into its present four rooms and its ceiling lowered from 21 to 14 feet. The same mistake however was made here as on the second floor, of cutting a corridor through only half the length, so that like some other of Fr. Dowling's works,<sup>70</sup> this corridor had to be remade and continued through the whole length in July 1924.

To come back to the Library. When its present quarters were erected during the great boom of 1902, the books were all transferred here by February 13 of that year. All the present alcoves on the ground floor were built at once, and every book could be reached without a ladder. These books at the time were by no means sufficiently numerous to fill the shelves, even exclusively of the upper level of the room, so that when the photograph was taken, they were all placed in visible positions, and it is a fair wager that the Library at the time did not contain more books than those visible on the photograph.

Books that were seldom or never used, such as those of the Congressional Record, were then brought down from their shelves in the southeast attic, but later on were crowded out of the Library again to the southwest attic. By the beginning of 1926 the Library had become so congested that four alcoves were built on the upper level.

The Library had always been devoted to the exclusive use of the faculty. But in 1921 it was thrown open to the students also. As space was at a premium, the central part of the Library

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<sup>68</sup> "else" handwritten above to replace "also", which has been crossed out.

<sup>69</sup> Comma added by hand.

<sup>70</sup> Comma added by hand.

itself was used by them as a reading room. This brought with it their direct access to the shelves, or to the stacks, as a librarian would express it. The evils of this procedure soon made themselves felt in the mutilation and disappearance of books and in other ways. Accordingly by the summer of 1925, the large Assembly Hall on the first floor, from which its glass partitions had been removed as far back as 1902, and in which<sup>71</sup> the Students Library had been<sup>72</sup> arranged along the south wall,<sup>73</sup> was again divided, this time by an opaque partition, so that its<sup>74</sup> eastern half became a study hall for the high school with the Students Library remaining along the south wall, while the western half was transformed into a reading room and made accessible from the west by means of an iron stairway on the outside. Access to the stack room was now no longer permitted, much as a few writers bemoaned and fought to regain this privilege in the college paper, the Creightonian.

It was also in 1921 or thereabouts that the books were put in charge of a professional librarian with several assistants, who could devote their whole time to the work. The library has thus been for some time thoroughly up to date, not only in its management, but also in the purchase and donation of books, magazines, etc. In 1925 it was said to contain 31,000 volumes, besides Federal Government and State Publications. The Omaha Public Library, at 19th and Harney streets with its 164,000 volumes, is also available to our students.

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<sup>71</sup> “in which” added by hand.

<sup>72</sup> “had been” added by hand.

<sup>73</sup> Comma added by hand.

<sup>74</sup> “its” added by hand.

COLLEGE  
PUBLICATIONS

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<sup>75</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

## COLLEGE PUBLICATIONS

It was the custom about fifty years ago for colleges to publish and distribute after the annual commencements, which the Law of the Medes and Persians required to be held on the last Wednesday of June, a pamphlet called a Catalogue, which contained a prospectus, the names of the professors and students, the from four to eight best in every branch in every class, the first and second of whom received a book, and similar matter. The first Catalogue of this kind issued by Creighton College did not make its appearance until at the end of its fourth year of existence, in 1882, so that it is now impossible to determine the names of the students in the various classes during the first three years, from 1878 to 1881.

As the University expanded, these Catalogues increased in size and in number, one being now issued for each department and called a Bulletin. The list of those distinguished in the various branches is now no longer given even for the High School, and the whole publication is entirely recast. The awards of books were dropped long ago, and there<sup>76</sup> are now only gold or silver medals of excellence,<sup>77</sup> one for each class only, and for special subjects like prize essays<sup>78</sup>, elocution, etc.

While the foregoing remarks were given merely as a matter of history, the first college publication in the modern and restricted sense of the term was "The Creighton Chronicle" which began to appear in October 1909. It was in pamphlet form, 6½ x 9½ inches, and was issued monthly from October to May. It was ably edited for ten years by Mr. Paul Martin, Dean of the Law Department. It had a wide range of articles, contributed mainly by members of the faculties of the various departments.

The need of another publication in which the students could display their literary propensities, then began to be felt, so that in January 1920 the Chronicle was taken over by them exculsively<sup>79</sup> and run under the old name for a little while, although somewhat spasmodically. It last appeared in November 1922. In the following month it changed its name to "Shadows," but the volume number proceeded as usual, so that the first issue of "Shadows" is marked "Volume 14, No. 3." Its shape also was altered considerably, and there were only four numbers in a year.

The high school department began the "Creighton High" in September, 1921, as a quarterly, and changed its title to "The Creighton Prep" in 1923.

The "Creightonian," which first appeared on<sup>80</sup> October 4, 1922, has the shape and character of a newspaper and is issued weekly. It was awarded the first place in competition with college newspapers of the North Central Press Association in 1925.

But it was as early as June 1, 1912 that "The Creighton Courier" was issued, sometimes every month, and again only four times a year, its object being mainly to give the college news to the alumni and friends of the institution.

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<sup>76</sup> "there" added by hand.

<sup>77</sup> Comma added by hand.

<sup>78</sup> Typo corrected, with "s" handwritten over an "a", which has an "x" typed over it, to change "easys" to "essays".

<sup>79</sup> Typo in original; should be "exclusively".

<sup>80</sup> "o" handwritten above "i" to change "in" to "on".

All these publications are illustrated.

The "Bluejay" appeared as an annual for the first time in May 1924. It is almost exclusively pictorial, and its shape is that of a large book in an edition de luxe. It is edited conjointly by all the departments of the University except the high school. The high school however had started the custom, and in 1922 had issued "The Creighton High School Annual." There seemed to be great difficulty in finding a name for this publication, because the following year it was called "The Creighton Prep," in 1924 "The Omega," in 1925 "The Creighton Preparatory Record," and in 1926 "The Blue Jay Junior."

COLLEGE  
COMMENCEMENTS

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<sup>81</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

## COLLEGE COMMENCEMENTS

Like all other things college commencements have undergone a profound change during the last half century. Fifty years ago there were two so-called commencements during the year, the annual one which no power on earth seemed able to dislodge from the last Wednesday in June, and the semi-annual which was held sometime in February. To these two it was the custom for a while, in the eighties especially, to add a third, one in May,<sup>82</sup> which was scientific, and in which two or three students gave lectures on some scientific topic and with the help of a few companions<sup>83</sup> illustrated them<sup>84</sup> with experiments. These were the only occasions in which students handled scientific apparatus personally.

The annual commencement was generally conducted in this way. Speeches were delivered by the graduates mostly on some philosophic subject. If the number of the graduates was not too great, every one of them made a speech: if it was too large, of course only the best were selected, and if too small, students from other classes assisted. The college orchestra, of<sup>85</sup> if there was none, a hired orchestra, relieved the strain with a few pieces of music. The last speech was always entirely or partially a valedictory.

Then followed the long list of premiums. A book was given to the first, and also to the second,<sup>86</sup> in each branch in each class, and three or more who were next in merit were read out as distinguished, three distinctions then being rewarded with a book. When a bright student received an armful of books in this way one by one, the audience always showed its interest by loud applause. The books were of various sizes, and when several were given to the same student they were generally connected volumes by the same author. The matter treated in the books was generally literary or historical. I remember that I myself, when a student, received a year before I finished my stay at the college, Figuier's "Insect World,"<sup>87</sup> and there was hardly a book that I did not read and study more thoroughly.

Happening to mention the fact that the books were of various sizes reminds me of what took place here in Creighton College at its Second Commencement in 1880. Major John B. Furay (the father of Edward, John, Harry, Guy, etc.<sup>88</sup>) presented a Webster's unabridged dictionary to the boy that had made the most progress in reading. This was a fact difficult to decide, and as the premium went to my class I designated the best reader. I think his name was Fred Delone. His name and that of the donor, the reason of the reward, etc. were then stamped in large gold letters on the front cover of the book. And it was amid the thundering applause of the audience that the little fellow succeeded in successfully carrying his big premium off the stage.

The distribution of the books at the commencement threatened to lengthen out into an uninteresting and interminable proceeding. It was then shortened by first calling upon the stage all the recipients, and then handing to each his whole set at once with words like these "John Smith, first in Latin, Rhetoric and Mathematics, second in Greek and English Prose

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<sup>82</sup> Comma added by hand.

<sup>83</sup> "gave lectures" was originally in text but has been crossed out by hand.

<sup>84</sup> "them" added by hand.

<sup>85</sup> Typo; appears correctly in earlier versions as "or" instead of "of".

<sup>86</sup> Comma added by hand.

<sup>87</sup> Quotation marks added by hand.

<sup>88</sup> Period added by hand.

Composition.” While this abbreviation saved<sup>89</sup> much time, it gave the audience however little or no chance to applaud a heavily-loaded premium carrier.

I should perhaps have mentioned that the order in which the classes received their premiums was from the highest to the lowest, and that the graduates came first. Their diplomas were the same as at present. The president of the college often read one in the Latin in which it was written, and then translated it<sup>90</sup> into English. These diplomas were rolled up, and an old custom, which was observed like a law, was that the bishop should hand them to the graduates.

Now here is an incident which will interest the reader. Our graduates were always notoriously awkward and clumsy when receiving their diplomas. While a few bowed gentlemanly to the bishop and then to the audience, the most of them almost tore their diplomas out of the bishop’s hands, some even genuflected towards the bishop or the audience or in any other direction, and in fact seemed to show that the solemnity of the proceeding had robbed them of all self-possession. Of course, the audience was in a titter, and at times burst out in an uncontrolled applause.

While these commencements were generally held at night, it happened on the occasion of which I wish to speak that this time one was held in the morning in our present auditorium. That same afternoon the bishop, Scannell, with many of the clergy went to the commencement of Mount St. Marys, at 15th and Castellar<sup>91</sup> streets. Fr. Dowling went also, and so did I. After distributing the premiums, crowns, scarfs, books, etc. the bishop rose to say a few words. His theme was that the girls were so graceful and the boys so awkward. He could not help reiterating “The girls, oh, the girls are so - graceful, and the boys, oh,<sup>92</sup> the boys are so - awkward.” As he had referred to the College Commencement of that morning, he began to realize that he might have given offense to Fr. Dowling, who was there listening to him. To make amends for this attack, he considered it only fair to give Fr. Dowling a chance to defend his students. This was a noble motive in principle, but it proved to be disastrous in practice. Everybody, and Bishop Scannell also,<sup>93</sup> was painfully aware of the fact, that he himself had no tact and was as<sup>94</sup> awkward in his ways as our boys were in theirs, and that Fr. Dowling was immeasurably his superior in practically everything.

As Fr. Dowling began to speak, everybody was in high expectancy of what was going to happen. He frankly admitted that boys were awkward when compared to girls, but he said, “there is a certain grace that befits a boy and another that befits a girl. Nobody, and not even Bishop Scannell himself, I am sure, would want the boys - to be as graceful as the girls.” The speech was short, masterful, tactful, and to the point.

It is of importance to state here that the custom of giving books as premiums, especially in such abundance, was very wisely never introduced into Creighton College, the only book thus given being the big dictionary mentioned before. The reason was twofold, first, it was judged unbecoming the dignity of a college, and secondly,<sup>95</sup> it was a great expense. It really

<sup>89</sup> “d” handwritten above “s”, which is crossed out, to change “saves” to “saved”.

<sup>90</sup> “it” added by hand.

<sup>91</sup> “Castelar” in 2007.

<sup>92</sup> Comma added by hand.

<sup>93</sup> Comma added by hand.

<sup>94</sup> “as” handwritten above to replace “so”, which is crossed out.

<sup>95</sup> Comma added by hand.

is astonishing how the custom still prevails in many places, and how, to avoid the possibility of offense, the poor Sisters, that conduct these institutions, manage for one reason or another to give every pupil without exception a book of some kind.

The semi-annual commencement, or exhibition as it was often called, differed from the annual one in that, first, there were no graduates, and secondly ribbons were given instead of books. These ribbons were generally about an inch wide and six inches long, of different color, and sometimes had the words First or Second Premium printed on them. I have often been told by my relatives that my big brother Joseph when a boy at college one time received so many premiums that the bishop could find no more room on his breast, but began to pin the ribbons on his back.

Besides the two public commencements or exhibitions, there was a distribution of premiums every month before the faculty and students only. Ribbons were given, and the best student in each class had a silver medal pinned on him which he was expected to return in a few days. This practice of distributing ribbons was introduced into this college in the very beginning, but I cannot determine when it ceased.

Now all these things have changed. The monthly distribution of premiums has given way to a quarterly publication of the notes a student has earned in the examinations just concluded. These he ascertains from his professor or the office. There is only one commencement early in June, which is now generally held in our gymnasium,<sup>96</sup> to which all the members of the faculty and all the many graduates walk in procession in cap and gown. While the diplomas are given privately at the office, the names of the graduates are read out publicly. The president generally gives a short address in which he speaks of the policy, needs and plans of the University, and then some man of distinction, as a rule not a member of the faculty, makes a speech on a subject of his own selection, the general topic, of course, being appropriate to the occasion. All the departments of the University, except the high school, take part in this annual commencement. The high school has its own a few days later, in which one or two speeches are delivered by students and sometimes a class poem read, diplomas or certificates are handed to the graduates, and some outsider also, as a rule, makes an address.

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<sup>96</sup> Comma added by hand.

A. M. D. G.

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THE FIRE

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<sup>97</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

## A. M. D. G.

### THE FIRE

On the early morning of Monday May 8, 1911,<sup>98</sup> Creighton College was afflicted by a fire, which threatened to demolish its entire main building with its connected north and south wings. It was discovered shortly after two o'clock in room 361 on the third floor of the north wing by Frs. F. Meyer and Bosset who were awakened by the crackling and the red glare of the flames. While they, together with Mr. L. Meyer, were trying to extinguish it with the fire hose which had hardly strength enough to send its stream to the ceiling, Fr. A. Tallmadge turned in the alarm, which,<sup>99</sup> it seems, a neighbor had just also done. The fire department came very promptly.

The fire had originated in the door lock of the elevator which ran through the room mentioned. The doors of this elevator were then ordinary wooden doors with their upper panels replaced by glass. As the door frames were also of wood, much trouble had been experienced, especially in wet weather, with the proper closing of these doors. The 500 - volt<sup>100</sup> direct current which operated this elevator, ran in series through the locks of all doors, so that the car could not start unless the door was closed. It did do it however at times with an open door, so that one of the members of the faculty, on seeing the door open in a dim light and supposing that the car was there, almost fell down the shaft.

In addition to the flimsy construction of the doors, the lock on the third floor had given cause for apprehension in the occasional formation of an arc or flame with a terrific heat in which the current flowed through the air for an inch or two. The three fire-fighters mentioned, together with an examination after the fire, proved that the fire originated in this door lock, from which it then mounted to the ceiling and the attic and then, as this place was at the juncture of the main building and the north wing, it spread to both roofs.

Now this arc could not form by itself in the door lock, nor do we know that anybody used the elevator at that hour of the night. Our night watchman, old Mr. Beveridge, whose services had been engaged just three days before, was unfortunately unwell that night and did not come to the college. What then caused the arc? My explanation is that the lightning started it, and that the elevator current followed and kept on flowing and thereby set fire to the house, and I have reasons for judging so.

First, our elevator wires were strung on poles and stretched from 20th street along Dodge and then along 25th street. They entered our grounds between the college and the church, passed the main building to a pole, and then ran up to near the cornice of the roof that is nearest the elevator. The line was thus about 3500 feet long, and if it was struck by lightning at any spot, the bolt would run to earth through our elevator which had one wire permanently grounded. Now there had been a severe thunderstorm a few hours before our fire, and the lightning, to

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<sup>98</sup> Comma added by hand.

<sup>99</sup> Comma added by hand.

<sup>100</sup> Rigge's draft contains spaces before and after the hyphen.

my knowledge, had actually struck our wires at least on two former occasions. There is thus a great probability that it struck this night.

Secondly, this probability is changed to certainty by the fact that on that night I had a lecture table galvanometer standing under the 500-volt<sup>101</sup> marble switchboard in the northwest corner of the physical cabinet. This instrument was actually struck by lightning that night and its coils burned out. This same accident had happened once before to the same instrument in the same spot.

Thirdly, and more conclusively, the two elevator wires passed through the brick wall of the building each in its own iron conduit pipe. The wires, of course, were covered with rubber insulation. After coming through the wall the wires ran about 18 inches apart upward for about 4 feet. They then emerged from their conduits and made connexion with a meter, which was placed between them in such a way that its top was about a foot below the top of the iron pipes. After the fire the meter was found wrecked, the air part of the wires stripped of insulation, and – and this is the convincing part of the proof – there was a hole in each pipe on the level and on the side of the meter, and on the lower edge of the holes there was a lump which could only come from a sudden and melting heat. A 500-volt pressure could never make these holes at these<sup>102</sup> places, it would take the terrific voltage of a lightning flash to do it. A current of 500 volts would follow the wires, it would never pierce two iron pipes so near their terminals. And to this every electrician will subscribe.

The fire, as said, spread from the elevator room to both attics and roofs. It did so unchecked, because the firemen could not get at it. The only way to reach the attic of the north wing was a stair case in the extreme northwest corner, which was far from the fire. The ceiling of the entire north wing had lately been plated with steel, so that finally an opening had to be broken through it, a ladder inserted and the hose drawn up. In the main building the conditions were much worse, although its ceilings were only of plaster. The only access to this attic was a narrow staircase in the tower over the main entrance. But worst of all, when the large hall had been divided into four class rooms in 1907,<sup>103</sup> its 21-foot ceiling had been lowered to 14 feet, that is to say, the old ceiling was allowed to remain and the new one built below it and supported by the wooden partitions of the rooms. The fire was under the roof and above the old and upper ceiling, and as it gave no signs of its presence on the third floor, it was not believed to exist. It was only when the lower ceiling began to burn that the fire could be seen. Holes were then broken in the plaster and the stream directed through them. Seven fire companies had come, and at one time there were as many as 14 streams of water thrown upon the fire. This was then confined above the ceiling of the third floor, so that nothing below that level was touched by the fire except the room through which the elevator passed.

When the fire was out and the bright morning sun allowed us to view the scene of destruction, it was found that the entire roof of<sup>104</sup> the main building had been burned, together with the two ceilings mentioned before, but that the fire had fortunately been prevented from entering the tower. In the north wing the entire roof of the east front was

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<sup>101</sup> Hyphen added by hand.

<sup>102</sup> Typo corrected, with “s” handwritten above “r”, which has been crossed out, to change “there” to “these”.

<sup>103</sup> Comma added by hand.

<sup>104</sup> Typo corrected, with “f” handwritten above “r”, which has been crossed out, to change “or” to “of”.

gone, and there was a large hole, one half of one of its four panels, in the steel ceiling below it, but the northwest end was safe and sound.

But the water had done and was going to do as much harm as the fire. The entire north wing had steel ceilings and was merely wet, so that the students lost only one day of class. But the rest of the house had then only plaster ceilings, and except for the southwest wing on California street, all the plaster everywhere either fell down of itself, with several hair-breadth escapes on the part of the faculty, or had to be knocked down for safety's sake.

The physics department was then, and is yet, located on the third floor on the east front of the north wing. As its ceilings were of steel, the fire did no damage directly. But the water came down on the cases and into them on the instruments. In order to improve upon their "cheap" appearance, these cases had been lined internally with painted<sup>105</sup> burlap. This now held the water and kept them moist, so that much harm was feared. The instruments were left in their precarious condition for three days, because we did not know whether the insurance men would demand a personal inspection on their part of the state of affairs or not. As soon as this essential item was settled, the whole physical outfit, except its largest and heaviest instruments, was carried to the attic over the southwest wing, where shelves had been built for its reception, the heavy and bulky apparatus being moved to the corridors of the southeast and southwest wings on the same floor. The students lent willing hands, and it is a pleasure to record that not even one instrument was missed or injured.

The work shop 369 next to the physics lecture room did not have a steel ceiling. Although some plaster fell, water did the most damage. As the door was locked, a fireman skillfully pried it open with so little damage that a carpenter could easily repair it. As the shop contained many fine tools, a special policeman was put on duty to guard them day and night for a week, and then only by day from 9 A.M. to 5 P.M. for some time longer. In spite of this however<sup>106</sup> a number of small fine and handy tools disappeared.

Restoration began at once. But before the roof could be closed several heavy rains drenched the building. The wires were now everywhere throughout the house enclosed in iron conduits, and it was a debated question for sometime as to whether our insurance would pay merely for the former installation or the new one. The narrow stair case in the tower was removed, and the double front stair case continued from the third floor into the attic of the main building. The 14-foot ceiling of its four class rooms was restored, but directly over it a substantial floor was laid and hung from the main trusses of the roof, so that thereby a large and formerly useless space could be devoted to storage.

Skylights, which seemed to have been undesirable before, were now put in, so that one can find his way easily in all the attics by day, and by means of electric lights at night. A fire door plainly marked was put in the ceiling of the corridor of the north wing. A touch with a pole or a ladder will release the latch of the steel plate, after which the door in the attic floor above it can be raised by the same ladder or by a man climbing up on it. Automatic fire doors, which a fire will close, now connect the attics, and the brick walls between the sections are run up above the roof.

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<sup>105</sup> Typo corrected, with "a" handwritten above "r", which is crossed out, to change "printed" to "painted".

<sup>106</sup> "y" added by hand to change "hand" to "handy".

The elevator was the last to be repaired, or rather renewed, since everything is new except the motor. The doors are now of iron, and although the door frames are still of wood they are lined with iron bars. All the wires, that is,<sup>107</sup> 500 volts direct for the elevator, 110 and 220 volts alternating for lights, and 220 volts three-phase for motors, now come from a pole on California street, from which they descend in appropriate conduits underground to the rear of the main basement. The church and auditorium current is also controlled here.

The ceilings have everywhere been plated with steel except in the southwest wing. The physical instruments were all replaced in the cases, which were now merely painted and not lined again with burlap or canvas, by August 11. As the students were not here to help me, I had to do it all by myself. I could not call upon any workmen for aid, for fear they would do more harm than good. When classes reopened in September all traces of the fire had been wiped out.

While the College did not receive all the insurance money that it considered itself entitled to, the physical department was allowed its full claim. The instruments upon the whole were not injured, even the triple lantern, the binocular microscope, the galvanometers and the like, showed no traces of the water or the moisture. Nor did the enormous summer heat to which they were subjected in their temporary quarters in the attic, and which on one occasion at least rose to 114 degrees, seem to have done them any harm. Cardboard models and diagrams, and especially a large number of photographic negatives were however a total loss. In addition much glass was broken, mostly through the carelessness of the workmen. Then there was the labor of removing, cleaning and restoring the instruments and the minerals, and of making a detailed inventory of the whole outfit.

The table in the lecture room suffered no injury whatever. Thanks to the groove cut below its overhanging top, not a drop of water had entered the drawers. And as to the workshop, there was of course some damage done by the rust. But I did not need to worry about the missing tools. I soon bought more and better ones.

There were other fires at times in the College, but they did not amount to much, although one which occurred in the basement might have done more harm than the great one of 1911.

The first fire recorded happened on January 6, 1887 in the room on the south side of the second floor of the main building,<sup>108</sup> which is now the corridor east of the chemical lecture room. The college historian writes<sup>109</sup>: "Mr. Meloy's books on fire - cause not known - match box and waste basket burnt to cinders - papers and books in great disorder always in that room - gas often left at full blast for hours when occupant was absent - Insurance agent called to survey the ruins - (some valuable books, valise and trunk.)"

The second fire occurred on Thursday February 23, 1905. Fr. M. Ryan in room 125 was awakened at about 4:40 A.M. by the noise of falling plaster and by the heat and smoke of a fire directly under his room in the basement. He awoke Fr. Dowling who at once turned in a telephone alarm, and then ran to all the rooms in succession to awaken the faculty. Nobody knew where the fire was, because the smoke in the house was stifling. The firemen found and fought it at once from the outside. They had it under control in a few minutes.

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<sup>107</sup> "for" appears in original but is crossed out by hand.

<sup>108</sup> Comma added by hand.

<sup>109</sup> Typo corrected, with "s" handwritten over the top of "r" to change "writer" to "writes".

The room in which the fire happened was used at the time for storage. The origin of the fire remained a mystery. One queer fact was that a wooden box containing a gross of matches was taken out unhurt. A short newspaper account of the fire contained at least eight errors. The loss was not great, but as the place was in the basement of the living quarters, the fire might have proved to be very dangerous.

Scared probably by this fire,<sup>110</sup> Fr. Dowling once saw smoke coming down into the open court between the main building, the southeast and southwest wings and the library, and without more ado immediately<sup>111</sup> turned in an alarm. But it was only the smoke from the kitchen chimney.

At another time some ruffians had set fire to paper under the wooden grandstand, which then began to burn.

Once a wooden sidewalk on 25th avenue caught fire, and Fr. Coppens could not tire of narrating that a hook and ladder company came to put it out.

During the building of the stadium a small house in which the carpenters kept their tools burned one night with great loss to the tools. On Easter Sunday April 12, 1925, just as the faculty was coming from dinner at about 7 P.M.,<sup>112</sup> defective wiring in the tunnel had set fire to a piece of wood which had not been removed after the concrete had set.

There were other minor fires in the Dormitory and in the Medical College, where one however on October 10, 1906 caused a damage of two thousand dollars.

Once the new law building was struck by lightning which bored a hole through a foot of concrete on the roof on its way to the elevator at the west end. The old college buildings, and especially the high tower, although much more exposed, have never been struck by lightning. And this ought to finish the chapter on fires.

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<sup>110</sup> Comma added by hand.

<sup>111</sup> "immediately" handwritten over "at once", which is crossed out by hand.

<sup>112</sup> Comma added by hand.

DURING<sup>114</sup>

THE WAR

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<sup>113</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

<sup>114</sup> This section in the original has editing marks in pencil that do not seem to be Fr. Rigge's handwriting. The editing includes crossing out large sections and adding some titles. Handwriting on the back of one of the pages suggests that this section was reproduced as an article in a Creighton alumni publication at some point. We have ignored changes in this version that do not appear to have been made by Fr. Rigge.

## DURING THE WAR

The few scattered notes set down here about what happened in Creighton University during the great war are confessedly very incomplete, and only of a character that affected or came to the notice of the writer. Unsatisfactory as they are, they may however present some facts unknown or not well known to the reader which he may consider worth recording.

The United States formally declared war against the Central Powers, Germany, Austria and their allies, on Good Friday April 6, 1917. Creighton University began to participate in the conflict within a week, when five out of its ten senior medics, who had sent in their applications, were examined and accepted as navy surgeons.

On Tuesday June 5th there was a registration all over the United States of all young men between 21 and 31 years of age. This affected three out of our six scholastic teachers.

As there were to be no villas this vacation in which our young teachers generally spent their vacations, the scholastics were distributed among the various colleges and required to give much time to study. In addition to our own six men who remained here, fourteen others came to join them. They were lodged mostly in the class rooms.

Friday July 20th was the great day of conscription drawing. Of the twenty young men here, three were drafted.

The schools opened as usual in September, but military training was to be obligatory. The first step was the drilling of volunteers for officers in the high school. In the Aksarben<sup>115</sup> parade on the afternoon of October 4th our students marched in uniform but without guns.

On November 12th Fr. Corboy departed for Camp Funston as a Knights<sup>116</sup>-of-Columbus military chaplain. On November 29th, Thanksgiving Day, he returned with four officers and took dinner with the faculty in his military uniform.

Fr. Kane, also of our faculty, became a military chaplain (in January.)

On Saturday afternoon, April 6, 1918, the anniversary of the beginning of the war, there was a great Flag Parade as ordered by President Wilson. Every organization marched, even the clergy. Out of our twenty-four fathers seventeen were in the parade. Everybody was on foot and carried a flag;<sup>117</sup> there were no autos and no floats. The parade lasted three hours. As a reminder of the great event I hung up my flag in the observatory, where it has been ever since.

The school year 1917-18 passed without weighing too heavily on the college in a military manner. By the end of August however things began to take on a sinister hue. A telegram on August 30th from the government said that the existing Students Army Training Corps (called S.A.T.C.) was to be done away with, and that certain colleges, ours among them,

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<sup>115</sup> Handwritten corrections to change "Aksarben" to "Ak-Sar-Ben". Unclear if correction is Rigge's or other editor's.

<sup>116</sup> "s" added by hand to change "Knight" to "Knights".

<sup>117</sup> Comma changed to semi-colon by hand.

would be practically cantonments in which the government would prescribe the studies, and that the other colleges would be practically suppressed. And on the following day the Man Power Bill passed, which called to the service all between 18 and 46 years.

There was much uncertainty as to what the coming college year would amount to, and notably as to whether Latin, Greek, and other branches would be thrown out altogether and replaced by modern languages and war studies. The government was to<sup>118</sup> pay us a dollar a day per student for board, and all the students were to<sup>119</sup> be boarders, it was<sup>120</sup> said.

September 12 was the great day of registration of all men in the United States between the ages of 18 and 46 years. Fr. Reilly was within eleven days, and our president, Fr. McMenemy, within ten days of the limit. Seven other fathers were included.

On October 1st the students took the Oath of Allegiance to the Flag, and were formally inducted<sup>121</sup> into the Students Army Training Corps.

The ceremony took place in our auditorium at 11 A.M., the commandant presided, the president of the University made an address and mayor Smith also. The students will get their uniforms as soon as possible, and are to live in the dormitory and in the gymnasium in a few days.<sup>122</sup>

Another feature now came over the scene. As the Spanish influenza, commonly called the "flu", was beginning to spread and to claim many victims, the city health officer on October 4 ordered all parish and public schools to be closed until further notice, although he permitted the colleges to go on as usual. On the following day he closed all theatres and churches. The consequence was that the masses in the church on Sunday October 6, Holy Rosary Sunday, were all private masses as on week days, and the people were not admitted to them. There was, however, one open-air mass, at 8 o'clock, at the observatory west of the round house and on the upper level. It was said by Fr. McNeive, the pastor. Although the people had been notified only after 7 P.M. on the preceding day, and the newspapers were supposed to have printed a notice of the fact, there was a large gathering of worshippers who packed half the available space on the north lawn.

The day after, Monday, the college and high school were closed, first for a couple of days, then for the rest of the week, and after that for an indefinite time.

On the following Sunday, October 13, as the churches had not yet been reopened, masses were said at 7,8,9,10 o'clock just outside the main entrance of the college, Holy Communion being distributed in the church after the 8 o'clock mass.

The next Sunday, October 20th, the four outside masses were the same as on the preceding one. On the following day the governor forbade all, even outdoor meetings until November 2.

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<sup>118</sup> "was to" handwritten over "will", which is crossed out by hand.

<sup>119</sup> "were to" handwritten over "will", which is crossed out by hand.

<sup>120</sup> "was" handwritten over "is", which is crossed out by hand.

<sup>121</sup> Typo; earlier versions have "inducted".

<sup>122</sup> An earlier version read: "The ceremony took place in our Auditorium at 11 A. M. The commandant presided, the president of the University made an address and Mayor Smith also. The students were to get their uniforms as soon as possible and were to live in the dormitory and in the gymnasium in a few days."

Our Medical, Pharmacy, Law and Dental schools, which had been going on as usual, now also closed.

On Friday, November 1, the feast of All Saints, masses were said in the church as on week days. Many people came, although the prohibition did not expire until midnight. On the following day all public gatherings in and out of doors were again permitted.

On Saturday night, November 2, the Students Army Training Corps went into barracks, about 270 in the gymnasium and 150 in the dormitory. The students slept in blankets on cots. The doors were taken off the rooms, and unless my memory deceives me, the windows were either removed or kept open. Guards patrolled the buildings day and night.

Two days later, Monday November 4, all the schools were reopened, after they had been closed four weeks.

As fuel was becoming scarce, we were not allowed to heat any part of our buildings except the one in which our living rooms are located, although we had heaped up about five hundred tons of coal under a temporary shed northwest of the auditorium. The city authorities even intimated that they might come and take some of our supply.

The classrooms<sup>123</sup> therefore were cold, and so were the science departments. There was no inducement to enter them even with an overcoat, much less to try and spend a part of the enforced idleness of a month in the workshop, otherwise so very attractive, because cold tools and material, benumbed fingers and a chilly atmosphere congealed all enthusiasm, and even made a prolonged stay dangerous to health.

At noon on November 7 all the whistles in town tooted for an hour or two at the most welcome news that the great war was over. This rejoicing was, however, premature. It was caused by the Omaha Daily News which said it had learned it from its Ouija board. For a long time after, this paper had to put up with the teasings and pleasantries of the other papers in regard to its Ouija board.

Four days later, however, on the 11th, as early as 1:50 A.M. the news was authentic and proclaimed to the city by the big Union Pacific whistle, which blew repeatedly the prearranged signal of one long, one short and one long blasts.

The people gave vent to their joy that afternoon by a great parade, the chief features of which were noise and rejoicing. What affected the college more directly was the good news that the S.A.T.C. would break up soon, and that some courses of studies, such as surveying and the like, might be dropped at once.

In this last item I was concerned personally. It was an open secret that the only reason that our classes were so large was that life in a college appeared more agreeable than life in an ordinary military camp or cantonment.

Accordingly I had fifty-two, I will not say students, but young men in my class of surveying. For lecture purposes, of course, all could come together, but in handling instruments in the field the class had to be divided. I think there were only two divisions, but although the

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<sup>123</sup> Corrected typo, with "ss" handwritten above "rr", which is crossed out by hand.

Union Pacific Railroad through Mr. Bennewitz kindly loaned us several of their old instruments, these were not sufficient for twenty-six men at a time. How things would have worked themselves out in practice I cannot imagine. Fortunately for me the class was dissolved after I had had one division only once doing chaining.

While one half of the class would be out in the field, the other half was to study trigonometry. This was like teaching the beginning of Greek and translating Homer at the same time to the same students. And still, this was so ordered by the government.

At night for about an hour or more the young soldiers were supposed to give themselves to study. They met in the dining hall on the first floor of the dormitory. While their own officers were charged with keeping order, a professor was there also to assist all that called upon his help. I was there once, and was only once<sup>124</sup> called upon for a few minutes. The vast majority of the boys wasted their time in reading newspapers or periodicals and in talking, which last the guards were supposed to prevent but made no effort to do.

The much-desired demobilization of the S.A.T.C.<sup>125</sup> began on December 8th. By the 11th all were mustered out, and on the day following, all selection of courses of studies became optional as of old. About two-thirds of the young men left the college. My surveying class of fifty-two dwindled down to five, but of those five I am happy to state that three were among the best students I ever had with clean 100 merit mark in every examination, the fourth following with an average of 90, but the fifth just passing with 71 notes.

As the flu had claimed many victims everywhere, our students, under the inspiration of Fr. Cassilly, had made a vow that if they were spared, they would erect a marble statue of the Sacred Heart on the college grounds as thanksgiving memorial. Now, although many of our young soldiers had fallen sick, and a large number of them, with, however, only one professor, had been carried to the hospital, still not one of them had died, On the afternoon of April 11, the students therefore held a mass meeting to see about raising the necessary funds. The expectation was that five hundred dollars would be subscribed, but this was doubled in fifteen minutes.

Finally on the feast of the Sacred Heart on June 3, 1921 the statue was dedicated<sup>126</sup>. It had been set up on a neat pedestal with the inscription "Thank-offering of the students for protection in the world-wide plague of the war year 1918." At 9 A.M. two dozen acolytes marched with the President of the University to the statue which had been placed in a prominent position on the north lawn, and were followed by the rest of the students. After a hymn sung in common, a student gave a short account of the vow and of its fulfillment. The statue was then blessed, a hymn sung, and all marched back in good order.

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<sup>124</sup> "once" added by hand.

<sup>125</sup> Typo corrected, with "S" handwritten above "R", which is crossed out by hand to change "R.A.T.C." to "S.A.T.C."

<sup>126</sup> Typo corrected, with "e" handwritten above an "i", which is crossed out by hand to change "dedicated" to "dedicated".

The number of  
Creighton men  
enlisted.<sup>128</sup>

	Faculty	Students	Alumni	Total
Law	1	65	138	204
Medicine <sup>127</sup>	12	97	253	362
Dentistry	2	137	53	192
Pharmacy	1	29	52	82
Arts	5	194	197	396
High School		15	70	85
Total	21	537	763	1321

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<sup>127</sup> Corrected typo, with “i” handwritten above an “e”, which is crossed out by hand” to change “Medecine” to “Medicine”.

<sup>128</sup> This sentence and the entire table is handwritten in the original at the bottom of the page, following all text for this section.

COURSES OF  
STUDY

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<sup>129</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

## COURSES OF STUDY

In the archaic days there were generally four departments or grand divisions of courses of study. The first consisted mostly of only one class which was called Preparatory or Rudiments. Qualifications for entry were a meager knowledge of reading, spelling and arithmetic. For the most part these students had not yet made their First Communion, but made it that year. The lower age limit was about ten years. Shortly after Easter there was an influx of boys who had just made their First Communion in their own parish church, and had attended its parish school. I remember that when I applied for admission to St. Xavier College in Cincinnati in April 1870, I had just made my First Communion and been confirmed in St. Joseph's Church, and that in the examination, which was generally public before all the applicants, I was asked to spell "cat." I felt insulted at this low-grade test, after having been in the parish school five years and gone through all its classes. The pastor of the parish used even to oblige us to hand in a written synopsis of the sermon at the Sunday high mass. This demand I always considered excessive, and so did my oldest sister, who was seventeen years my senior. She was teaching in the same school, and always generously wrote the required synopsis for me. In Creighton College this class of Rudiments was dropped in 1892.

The second grand division of the curriculum was called the Commercial Course. It extended through three or four years, and its chief characteristic consisted in the omission of Latin and Greek. This was discontinued here in 1884.

The third section was named the Academic Department. Latin and Greek were its distinctive features, and it embraced three years, the lowest class being called the Third Academic.

After this there was the college proper with its four years of Humanities, Poetry, Rhetoric and Philosophy. In 1904 the class of Humanities was in this institution taken out of the college course and added to the academic, so that this now counted four years. At the same time its name was changed to the High School, the lowest being First High, and after the insertion of another class in place of the old one of Humanities, the College classes received their present designations of Freshman<sup>130</sup>, Sophomore, Junior and Senior.

In the old arrangement<sup>131</sup> the branches of study were affixed to the classes. There were no electives, except vocal and instrumental music, and sometimes German or French. The branches were divided into essential and non-essential. Failure in two essential branches debarred the student definitely from going up with his class. Failure in one of them allowed him to take a second examination at the end of vacation. Failure then kept him down. The essential branches were Latin, Greek, English, Mathematics and Astronomy. The non-essential branches were the modern languages and the sciences of Physics and Chemistry,<sup>132</sup> in which a successful examination was not necessary. This last was especially hard on me personally, because the only motive I could hold out to my students was the knowledge of the matter itself and its utility and necessity for later life. What these motives amounted to in the case of lazy students, every teacher will know.

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<sup>130</sup> Corrected typo, with "a" handwritten above "e", which is crossed out by hand, to change "Freshmen" to "Freshman".

<sup>131</sup> "arran" handwritten over "mana", which is crossed out by hand, to change "management" to "arrangement".

<sup>132</sup> Comma added by hand.

Another fact must not be omitted here, which used to weigh like an octopus on teachers. It was that at the final examinations no professor could examine his own class. Why? We never knew. And there was no getting rid of this obnoxious and, as everybody pronounced it, unjust law. Here again, I was obliged to witness many an iniquity, especially in the examinations of the mathematics of the last two college years, when students, no, they cannot be called students, who I was certain could not possibly merit 40 per cent, often got 80 or 90 or more! And to crown this injustice, I had to sign their diplomas! Oh, let's bury the past. It sets my blood boiling whenever I think of it.

Let me at once dispel a misconception which the reader may have. This state of affairs, in which the final merit marks were controlled by the arbitrary power of the prefect of studies, was not the trait of Creighton College exclusively<sup>133</sup>. Far from it, it was universal all over the country, and remnants of it persist to this day in some places. Indeed,<sup>134</sup> it was a notorious fact that sometimes degrees were given in branches the student had not studied at all; and degrees could even be bought.

To put an end to this lamentable situation some of the institutions formed themselves into an association. As their numbers grew and they began to feel their strength, they<sup>135</sup> deputed committees to personally inspect the schools of the association, they introduced greater uniformity in the courses of study, and they refused to recognize the credits given by other institutions. At the same time, while a few states admitted the professional students of some others to practice at once, many now have their own boards, before which the graduate students of other states, or even of their own, or all without exception must appear and be examined. It is then an honor to a college to have a small, and especially, the smallest percentage of failures before these state boards. And it is to the glory of Creighton University that its students have always been in the front ranks.

Along with this salutary revolution came a feature which is not in its entirety without some objections. While before, a student was obliged to take all the branches of the class he was assigned to, whether he liked them or not, now the other extreme was introduced, every branch in the college, except those necessary for certain courses<sup>136</sup> or degrees, was made optional and left to the free choice of the student, the high school, however, still using the old method. While this system favors the talents and inclinations of the student, it has its drawback in the fact that as a rule the student is not capable of forming a sound judgment in the matter, and is prone to prefer the easier and more showy branches to the fundamental ones that he really needs.

I have had experience in both methods. The first was in some classes almost a martyrdom for the professor. This was notoriously the case with the class of the calculus, the highest class of mathematics in the college, which was held five hours a week during the first half of the graduating year. A study of this branch supposed a fair knowledge of all the mathematics that had preceded it, Algebra, Geometry, Trigonometry and Analytical Geometry. To a student who had studied these moderately well, the calculus offered no more difficulty than any of its preceding branches. And I often had students who won 100 per cent. But when

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<sup>133</sup> Handwritten marks to change "exclusively of Creighton College" to "of Creighton College exclusively".

<sup>134</sup> Comma added by hand.

<sup>135</sup> "y" added by hand to change "the" to "they".

<sup>136</sup> "s" added by hand to change "course" to "courses".

some of them did not know the very elements of Algebra, when they said the sum of a and b was ab, what could a professor do with them? What could they do? How did they ever get to this class? Yes, how did they ever get there? And still they received their diplomas! Enough said.

The modern elective system, and especially the examination of the graduates by boards not in any way connected with the institutions, have enforced a great deal of honest effort, and have made the deans prefer to have a student fail before his own professor in their own college rather than publicly before a state board. I am happy to relate, therefore, that in the evening of my life, the merit marks I assigned were no longer tampered with. My judgment was always taken exactly as I gave it, and an<sup>137</sup> incompetent or dishonest student rejected without more ado. The necessary disciplinary<sup>138</sup> support was then also imparted, so that I had no more trouble with unruly boys.

This modern system, however, includes credits as its essential. It replaces the widely divergent, personal, and often ridiculously absurd judgments of examiners by the prosaic fact of a student's having attended a certain branch a certain number of hours. While this last has its shortcomings, it is<sup>139</sup> the lesser evil.

When Creighton College opened its doors in September 1878, three of the four grand divisions of the courses of study were set going together, all, that is, except the college proper, for which the city was not yet ready. The Class of Rudiments was taught by Mrs. B. M. Hall, the only lady teacher the college had, and that for one year only, until 1904, when two Sisters of Mercy, Sister M. Bonaventure and Sister M. Camillus, taught for five years parallel divisions of the Third Academic or First High in the western end of the Dormitory on the first floor.

The Class of Rudiments of the year 1 truly deserved its name. It was what we would now call almost a Kindergarten. Some of the children in it, - they surely were not students, - were barely six years old. The reader need not therefore be told what they did in the classroom.

The Commercial Course started with two classes, First Grammar being taught by Mr. Eicher, and Second Grammar by Mr. Edward A. O'Brien (not a Jesuit.) I do not remember which of the two was the higher.

The Classical Course began with one class under Mr. A. J. Beile and studied Latin.

Although only seven years, three in the academic and four in the collegiate department, were required for the course, it actually took Creighton College thirteen years to produce its first graduates. This is readily intelligible in an incipient institution in a frontier town. It should, however, really have been one year less, but for the principle that the highest authority in the Province considered it his duty to enforce. The circumstances were these.

Towards the end of August 1889 the three oldest Furay boys, Edward, Charles, and John were about to begin their last year at college and enter the class of Philosophy, as it was called. Fr. Fitzgerald, who had succeeded Fr. Dowling as rector in the preceding March, had

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<sup>137</sup> Corrected typo, with "an" handwritten above "and", which has been crossed out by hand.

<sup>138</sup> Typo in this and earlier versions; should be "disciplinary".

<sup>139</sup> "is" typed above, with typed insertion mark.

offered himself to teach them philosophy, Fr. Joseph Rigge was there for mathematics and astronomy, and Fr. Kinsella for evidences of religion and other smaller branches. As the Furays were especial friends and even relatives of our great benefactor, Mr. John Creighton, it was particularly gratifying to him that these three boys, together with a fourth whose name I cannot remember, should be the first graduates of the college which he had so much at heart.

Father John P. Frieden, or “John P.” as he was called colloquially, who was at the head of the Missouri Province at the time,<sup>140</sup> did not approve of these<sup>141</sup> aspirations, on the principle that no graduating class should ever be formed with less than six students. Of course, he was alone with this view, because I know of a graduating class in Chicago with only two members, one of whom was Carter Harrison, son of the mayor, and himself mayor later on. And<sup>142</sup> surely, under the conditions the Furay boys were the equals of a mayor’s son. But as Father Frieden was the supreme authority, there was no evading his orders.

Of course, great displeasure was manifested in Omaha, so much so that Fr. Frieden made a special run up here from St. Louis on August 31<sup>143</sup>. He then had an interview with Fr. Fitzgerald, Mr. Creighton and Major Furay, the father of the boys, and laid down his principle with great determination. He said decisively: “Mr. Creighton, if you are not satisfied with the way with which we are running this college, we will pick up our baggage and go away.” The order therefore stood, no graduating class with less than six members. Accordingly, in a day or two after that the Furay boys went to St. Mary’s, Kansas, and graduated there in June 1890.

If Mr. Creighton had nor been so thoroughly good at heart as he really was and as this incident proves, he would have lost all interest in Creighton College, or at least would have enormously diminished his benefactions to it. But his heart was true as gold. With his innate clearness of judgment he saw that this was the mistake of an individual who happened to be in authority, and not that of a whole Order, nor even that of the present faculty. He recovered quickly and completely from the shock, so much so that frequently afterwards he would delight to mimic “John P.” shaking his big right index finger with authority and vehemence while laying down his law, and then laugh heartily at the occurrence.

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<sup>140</sup> Comma added by hand.

<sup>141</sup> “e” handwritten above “o”, which is crossed out by hand, to change “those” to “these”.

<sup>142</sup> Change by hand from “on, and”, with comma changed to period by hand and a capital “A” handwritten over the lowercase “a”.

<sup>143</sup> An earlier draft has August 13.

T H E<sup>145</sup>  
C H E M I C A L  
D E P A R T M E N T

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<sup>144</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

<sup>145</sup> "THE" is not centered in original.

## The Chemical Department

The first of the scientific departments of Creighton College to come into being was that of chemistry. Its birth occurred on the night of November 14, 1883 when Fr. Lambert gave the first chemical lecture in the hall on the third floor of the main building. The historian of those days gives us only three lines. “Wednesday, 14. Magnificent weather. Night lecture by Fr. Lambert well attended—all went off well. Bishop and many of the clergy present.” This is all, not even the subject is mentioned. This was recovered from *The Omaha Herald* which says that it was “Combustion” and that it was illustrated by experiments.

A month later, December 14, authorization was received to build the chemical laboratory. This was a frame structure 30 x 60<sup>146</sup> feet. Its southern half 30 x 30 feet was the lecture<sup>147</sup> room with a rather diminutive lecture table 2 x 6 feet in the northwest corner. Along the east and west walls were long tables about eighteen inches wide with a trough, gas and water pipes, and three narrow shelves. There was also a wide shelf underneath, no lockers in the modern sense in which a student could securely lock his apparatus. As may be imagined, the stopcocks of the water pipes were sometimes accidentally or otherwise turned on with full force, so that the water was squirted across half the room.

There was also a fume chamber about three feet square, made of four sets of ordinary upper and lower windows with their iron balancing weights. Its upper part was in connexion with the stove pipe, coming from a self-feeder in the room, its only source of heat. This was woefully inadequate for the purpose—on January 3, 1884 the thermometer sank to 34 degrees below zero, the lowest on record in Omaha—so that all the chemicals that would be injured by the cold had to be carried into the college building every winter.

The entrance to the laboratory was from the south. Another door back of the lecture table led into an adjoining room in which material was stored. This room had also a skylight for photographic use, the dark room being in the northwest corner of the building. The<sup>148</sup> northeast end was a mechanical workshop. The store room, that is, the one with the skylight, had a smaller one east of it. This could be entered only from the outside, the reason being that the chemical fumes should not injure the large telescope which was kept here before the observatory was built. When the telescope was transferred to its present home, of course, a door was cut between the two rooms.

On March 10, 1884 fourteen boxes of chemical goods arrived, and on the 18th there was another lecture by Fr. Lambert “very well attended—everything went off splendidly” in the laconic style of the historian.

On April 25 “an evening course of lectures was started. Very fine gentlemen came.” A chemical lecture on April 28 in the laboratory, and one on the microscope on May 1, the latter “well attended,” and a third on May 28 in Boyd’s Opera House<sup>149</sup> which “went off well,” is all that is recorded of this lecture course.

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<sup>146</sup> Corrected typo, with “6” handwritten over the top of a “3” to change “30” to “60”.

<sup>147</sup> “half 30 x 30 feet was the lecture” added by hand.

<sup>148</sup> “northwest corner of the building. The” added by hand.

<sup>149</sup> “H” handwritten over “h” to change “house” to “House”.

On November 10, 1884 evening classes in chemistry were begun. They were taught by Mr. H. D. Gartland,<sup>150</sup> as Fr. Lambert was no longer on the staff. He had been on it only one year 1883-84 during which he was officially the vice-president, or principal or dean, in our modern phraseology.

These evening classes in chemistry seem to have run on for three years. On November 30, 1887 they were discontinued, because only five had paid their fee of six dollars. After a week however they were started again and made free. How long they continued is not stated.

On account of the building of the church, the site of which it occupied, the laboratory was moved on April 1, 1887 to the northwest corner of the main building, and so placed that this corner just touched the southeast one of the laboratory. The orientation of the latter remained the same, the porch being as before on its east side. At the northern end of this porch, facing eastward, a wood handball alley was built, on which Fr. DeSchryver had later on had the American flag painted in the fond hope that respect for the flag would deter the students from carving their names into it.

The laboratory remained in this second position until June 29, 1902. It was then sold, moved to Burt street and remodelled into a dwelling house. During this year of building 1901 - 02 there was no chemistry, as all the materials had been taken out of the frame laboratory and stored on the first floor of the main building in its southwest class room.

By the end of June 1902 the second floor of the main building between its front and rear corridors had been fitted out as the present home of the chemical department.

The southeast room is the lecture room and seats seventy-two students. The lecture table is 12 x 3 feet with a fume chamber near it jutting into the next room which is the general store room. A small apartment in this was built as a photographic dark room, and was used as such until the larger one on the third floor was ready. The entire north side, 25 x 60 feet,<sup>151</sup> is the students laboratory with one-hundred and twenty lockers, and a fume chamber. The apparatus is up to date in every way.

When the distinction between college and high school became sufficiently pronounced, chemistry was taught to the college students only. One year 1924-25, it was offered to the high school also, but so very few availed themselves of it, that the offer was not repeated. There was always a laboratory in which the students themselves performed experiments. This has<sup>152</sup> gradually advanced in grade, so that now analytic and organic work is carried on, the spectroscope and delicate balances<sup>153</sup> are used, and the like.

Besides the college chemical laboratory, of which there was question exclusively so far, there are similar laboratories in the medical, pharmaceutical, and dental departments. It is the intention of the University, as soon as the means become available, to erect a building north of the dental department and as large as this, and devote it entirely and exclusively to chemistry.

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<sup>150</sup> Comma added by hand.

<sup>151</sup> Comma added by hand.

<sup>152</sup> "s" handwritten above "d", which is crossed out, to change "had" to "has".

<sup>153</sup> "s" added by hand to change "balance" to "balances".

## PROFESSORS OF CHEMISTRY

It may be proper to add here a few words about some of the professors of chemistry. The first was Fr. A. A. Lambert 1883-84, in the year six of the institution. Upon him the pleasant duty devolved of turning Mr. Creighton's generous offer of ten thousand dollars into scientific instruments and material, and so to lay the foundation of the physical, chemical and astronomical departments of the University. The College catalogue of 1884 groups this scientific outfit under seventeen heads. Three of these<sup>154</sup> are astronomical and nine physical, and will be mentioned in their own proper chapters. Three or four pertain<sup>155</sup> to chemistry.

They are:

- <sup>156</sup>13. An entire outfit for Chemistry, all the chemical glassware and apparatus of the latest and most improved form, besides a full set of chemicals.
14. A complete Photographic outfit.
15. A New Building, containing the chemical laboratory, with its furnaces and apparatus, having a complete outfit for each student; the astronomical department, the photographic gallery and the physical workshop.
16. The best of the most recent works on Science, especially chemistry."<sup>157</sup>

In the private history of the college there is a statement at the end of June 1885, based on bills in the treasurer's office and therefore as accurate and as authentic as one might desire, that the laboratory building and shelving (by P. J. Creedon) cost \$2770, the chemical apparatus and chemicals<sup>158</sup> (from Bullock and Crenshaw, Philadelphia) 613, the laboratory furniture 230, the photographic camera and material (from Hyatt, St. Louis) 150, the mechanical tools 180, mineralogical specimens 150, thus giving for the laboratory building and its contents, a total of about 4093 dollars.

Judged<sup>159</sup> by the standards of its day this was a very liberal outfit. It was however only a beginning, because Mr. Creighton in subsequent years more than doubled his gifts to this department of chemistry alone. Later on when the needs of the University in its entirety were brought home to him, his benefactions to the departments ceased, only to be replaced by very much greater ones for buildings.

To come back now to the first scientific man of Creighton College, Fr. Lambert, and to his private character, we might style this meteoric. He acted quickly and did not see difficulties. His learning however was not profound, and he sometimes resorted to subterfuges and tricks to cover up his failures. Experts, and men like Mr. Creighton who were good judges of character, soon lost their admiration of his brilliancy and placed him on his proper level. It is most probably for this reason that he was on the staff of Creighton College only for one year, although his immediate successors were inexperienced young men. Persons of this stamp, of course, cannot brook restraint. The obedience, which the Jesuit Order demands as its first essential, then became too irksome for him, and some years later he severed his connection with it.

<sup>154</sup> "e" handwritten above "o" to change "those" to "these".

<sup>155</sup> Corrected typo, with "s" crossed out to change "pertains" to "pertain".

<sup>156</sup> Quotation mark added by hand.

<sup>157</sup> Quotation mark added by hand.

<sup>158</sup> "s" added by hand to change "chemical" to "chemicals".

<sup>159</sup> "Judged" written by hand to replace "Indeed", which is crossed out.

The second professor of chemistry was Mr. H. D. Gartland. He was at the college from 1882 to 1886, but taught chemistry only the one year after Fr. Lambert had gone '84-'85. He was present during the incipency of the scientific departments, and had the pleasure of opening the boxes as they arrived and feasting his eyes on the marvels they contained. All the chemistry he knew he probably picked up under Father Lambert. His predilections were for work that required muscle, especially plumbing, and his highest accomplishment was "wiping a joint." By a strange fatality he also left the Jesuit Order some years later, but his reasons for doing so did not become known publicly.

When Fr. Dowling was installed as rector of Creighton College on July 18, 1885, the first demand that he seemed to have made upon his higher superior, Fr. Bushart, the provincial of the whole Province,<sup>160</sup> upon whom the apportionment of his subjects rested,<sup>161</sup> was that he would detail Father Joseph Rigge to Omaha to take charge of the science departments. Father Joseph,—and now the writer wishes to speak in the first person—was my brother, doubly so, first natural brother fifteen years older, and secondly spiritual brother in the same Society of Jesus, my vocation to which under heaven I owe to him. And thirdly I have had the happiness to be his successor in all his scientific departments and to use the identical instruments that he used. And I could fill a big book with what I know of him and his work.

Father Joseph Rigge taught chemistry during all the nine years he was here from 1885 to 1894, but physics only intermittently for four years. What he did in physics and astronomy must be reserved for other chapters. In character he was the antithesis of his predecessors, quiet, unassuming and learned. He won renown at once as a popular lecturer; for he had a wonderful ingenuity in devising new and bold experiments to illustrate old and seemingly well-worn principles, and of adapting his subject matter to the capacity of an unprofessional audience. His own lectures on sound, music, oxygen and hydrogen<sup>162</sup>, and those of his students on the steam engine, the blood and chemical reactions were especially fine.

Father Rigge's thoroughness as a scientist displayed itself also in many other and more substantial ways than in popular scientific lectures. His predilection was for chemistry, and it was in his laboratory and at his hands that the first analysis of the vast petroleum springs and lakes of Wyoming was made. An able article from his pen on this subject appeared in the *Scientific American Supplement*, (No. 651 June 23, 1888) under the title "The Wyoming Oil Fields." The *Omaha Daily World*, for December 4th, 1886, contained a long article written by him on "Omaha as a Coal Point." It was illustrated by many drawings and maps, and gave a complete scientific view of the whole question, together with an analysis of the coal recently found in Omaha. He said that coal exists beyond all question but he is not convinced that its quantity is great or its quality valuable. A similar article appeared later in the *American Catholic Quarterly Review*, January 1887.

It was at the earnest invitation of the Board of Public Works that he took an active part in investigating<sup>163</sup> the origin of the fire which completely wrecked the Boston Store. In an elaborate report to Major Furay, then a member of the Board of Public Works, he points out, after exhaustive experiments with the trolley current in his laboratory, the causes of the extensive corrosion of water and gas mains, and concludes by suggesting remedies for the

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<sup>160</sup> Comma added by hand.

<sup>161</sup> Comma added by hand.

<sup>162</sup> Corrected typo, changing a "u" to a "y" by hand, to change "hudrogen" to "hydrogen".

<sup>163</sup> Corrected typo, with handwritten editing marks to change "invesitgating" to "investigating".

evil. The Scientific American gives him due praise for having been the first in this line of investigation. His public lecture on the same subject, June 19th<sup>164</sup>, 1894, is still remembered.

It is no wonder, therefore, that Mr. Creighton, with his keen insight into character, quickly recognized Father Rigge's ability, and followed up his plans with pecuniary encouragement. Accordingly, for many years afterwards the College catalogues mention Mr. Creighton's scientific donations. The first of these in time and in importance was the observatory. Amongst the many minor gifts we may mention two fifteen-foot gas tanks, two six-foot parabolic reflectors, an organ, a vertical attachment to the stereopticon, a micrometer eye-piece for the equatorial telescope, glass cases for minerals, expensive platinum and graduated glassware for special chemical analysis, a Becker analytic balance, an electric master clock and dial, assay and combustion furnaces, anatomical models, a dynamo, a water motor, and a large number of smaller instruments, and scientific books.

Much as I loved and esteemed my big brother, I differed radically from him on one point. This was that gradually at first, and then permanently,<sup>165</sup> like so many others that<sup>166</sup> I knew, he shifted his affections from science to the ministry. The latter is of vastly greater importance, I grant, but then there are very many more workers in its field than in that of science. Of course, neither he nor all those that he benefitted spiritually will agree to this, nor will many others, and it is useless to argue about it. But the number of scientific men, catholic, clerical, and Jesuit, especially of his ability, is even now lamentably small. They are necessary in their own line. And so convinced was I ever, and am yet, of the glorious work that can be done in natural science by willing and earnest men, even when they have inferior talents, that I cast the die early in life irrevocably for science, as far as my more important duties permitted. While I took my turn like the rest of my brethren to do ministerial work in the college church, in the city and in its neighborhood for many miles, whenever I was sent,<sup>167</sup> I never offered myself for it and persistently refused it no matter how strongly I was urged to it by those who were not my superiors. My choice of science was just as pure, if not as noble, as my brother's for the ministry. He has long ago gone to his reward, exceedingly great. May I follow soon and sit at his feet.

While in Omaha my brother Joseph frequently visited the jail and the county poor farm. Many a girl whose virtue was exposed, he sent to the Good Shepherd, his inseparable companion on his raids of mercy being "old Mr. Lee."

After leaving Omaha in 1894 he went down to British Honduras to minister to its half-savage natives. Ill health drove him back to this country. But he returned again, until he was finally forced to relinquish his missionary work. He was then an assistant pastor at St. Xavier Church, Cincinnati, and died there on April 17, 1913 in his seventy-first year.

After Father Joseph Rigge's departure from Omaha in 1894 chemistry was taught by a different professor every year until 1900. They were Fr. C. J. Borgmeyer, Mr. B. J. Otten, Mr. C. F. Crowley, Mr. C. F. Wolking, all of them Jesuits except Mr. (now Dr.) Crowley. In 1900 Fr. William Rigge assumed the reins for three years. He built the present quarters of the chemical department, but hastens to add that he had requested and had obtained minute

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<sup>164</sup> Corrected typo, crossing out "e" to change "19the" to "19th".

<sup>165</sup> Comma added by hand.

<sup>166</sup> "at" handwritten over "en", which is crossed out by hand, to change "then" to "that".

<sup>167</sup> Comma added by hand.

specifications for it from Fr. Borgmeyer, then considered the best chemist of the Province. But as Fr. W. Rigge had neither the training, nor the ability, nor the taste for this branch of science, he was glad to relinquish it into the hands of Mr. E. Calhoun who taught it for four years. Then Mr. J. E. Knipscher was at the helm for two years, Mr. D. F. Hickey for five and Mr. L. J. Puhl for three. In 1917 Fr. J. A. Krance took charge for three years, to be followed by Mr. F. M. Brown for one year, Mr. F. P. Keenoy and Mr. P. M. Regan, each for two years. Since 1921 Fr. D. F. Hickey, who had taught it before from 1909 to 1914, has been at the head of the department, with M. M. Keenoy and Regan as associates the first for one, and the other for two years.

Fr. Hickey has fitted himself well for his position by his previous studies and experience. He has successfully raised the standard in his science. He lectures also as occasion demands outside of his own laboratory. He is an active member of the American Chemical Society, and of the Omaha Engineering Society.

T H E  
P H Y S I C A L  
D E P A R T M E N T

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<sup>1</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

## The Physical Department

The physical was the second of the scientific departments of Creighton College to receive its existence, and owed this, like the others, to the munificence of Mr. Creighton. The electrical and optical instruments were bought from J. H. Steward, 406 Strand, London, for \$3400, and the rest of the outfit from E. S. Ritchie &<sup>2</sup> Sons, Boston, for \$1659, thus totalling over five thousand dollars. The London consignment was received in perfect condition on May 7, 1884 and on July 23. While during the following September a class was started and taught by Mr. P. J. Mulconry<sup>3</sup>, it was only on April 25, 1885 that the long-expected instruments from Boston arrived.

In his selection of the instruments Fr. Lambert did his work excellently. As physics was understood in his day, these were intended exclusively for lecture demonstrations, because there was then no thought of a students<sup>4</sup> laboratory for physics, as there was at once for chemistry. Perhaps the only adverse criticism that may be passed upon Fr. Lambert's selection, was that in some cases his choice was too showy, as it was in regard to the electrical and optical parts. However as<sup>5</sup> these were almost all used to great advantage in public lectures, his reason was probably the best in those days. Now that such public lectures by professors and students alike seem to have fallen into disfavor, the showy part of the physical outfit is lying idle, some of it in addition having become antiquated on account of modern progress.

In the enumeration of Mr. Creighton's donations to the scientific departments, and their distribution under seventeen heads in the College Catalogue of 1884, it was said before that nine pertained to physics. All of these are deserving of special mention, because they were the wonder of their day.

“<sup>6</sup>4. Malden's Triple Lantern, with the Chadwick Steward dissolving system, the first one of the kind in this country. It has no superior for dissolving views and mechanical effects.”

This statement is not overdrawn, although the modern movie lantern now does all that and much more and in an enormously much simpler<sup>7</sup> way. But in 1884 things were different. This Malden Triple Lantern consisted of two lanterns firmly built together with one over a second one, and a third one which could be placed above the other two or alongside or used independently. The body was of mahogany with an interior metal lining. The light used was the calcium or lime light. This was produced by burning hydrogen gas, reinforced by oxygen, impinging upon and rendering white-hot a piece of unslacked lime shaped like a common candle. As the brilliancy of the light was under perfect control by regulating the supply of the gases, and as the source of the light was also practically a point, this old lime light has never yet been surpassed in its optical qualities, although of course it has been set

<sup>2</sup> “&” handwritten above “of”, which is crossed out by hand.

<sup>3</sup> Corrected typo, with “n” handwritten above a “u”, which is crossed out by hand, to change “Mulcoury” to “Mulconry”.

<sup>4</sup> An apostrophe added by hand in pencil (to change “students” to “students'”) appears in the manuscript, but since all other corrections in pencil do not appear to be Fr. Rigge's handwriting, this apostrophe likely was not Rigge's.

<sup>5</sup> “as” added by hand.

<sup>6</sup> Quotation mark added by hand.

<sup>7</sup> Corrected typo, with “p” and “e” handwritten over letters (illegible) to result in “simpler”.

aside mainly on account of the one great inconvenience of the employment of the necessary gases.

A sufficient supply of the gases had to be stored beforehand, and when in use subjected to the pressure of about ten inches of water. The hydrogen was always replaced by ordinary illuminating gas, and was therefore easily obtainable. But the oxygen had to be prepared by subjecting a mixture of powdered potassium chlorate and manganese black oxyd in a closed iron crucible, with a pipe outlet, to the heat of a large bunsen burner. Later on the gases could be bought in high-pressure tanks with a stop cock that reduced the pressure. A few times these tanks were ordered from Chicago.

At first the gases were stored in rubber bags. Steward's bill of December 21, 1883 mentions two 42 x 30 x 26 inches. These bags were kept between hinged boards and loaded with window weights. And here an incident is worth recording. My brother was to give a public lecture on the night of October 15, 1885 on "The Royal Work of Oxygen." Sometime before the lecture Mr. Gartland nosed about the gas bag with a burning match to see if he could find a leak. He found one. Those who are acquainted with oxygen can imagine the rest. In a moment the bag was burning with a white heat and dropping a fiery rain upon the floor. As Mr. Gartland relates it, he with rare decision threw the burning bag out of the window. Bravo! but what about the lecture on oxygen? History did not record what my brother said, but as I never saw or heard of his losing his temper, the accident surely was a powerful provocation. Of course Mr. Gartland helped at once heroically to make some more oxygen and collect it in glass jars.

Before the next lecture a week later on "The Queen Element Hydrogen", the gas bags were replaced by two galvanized iron tanks with a capacity each of about fifteen cubic feet. The container proper was about two feet in diameter and four feet high. It was inverted over water in a somewhat wider tank. It was counterbalanced by weights, which could be removed, and water added to its flaring top to give the desired pressure. These two gas tanks were set up in what is now the balance room at the east entrance to the present chemical laboratory on the second floor. Gas pipes ran from them along the ceiling westward, with descending outlets in the physics (now chemistry) lecture room, and then up to under the floor in the middle of the large hall where the lantern was generally placed. Modern progress or ideas afterwards relegated the tanks to the attic. In my time I set them up in the southwest storeroom<sup>8</sup> of the chemical department. They then travelled back to the attic. They ended their days, one east<sup>9</sup> of the present law building and the other north of the gymnasium, where they were used as furnaces for burning paper and refuse.

The Chadwick-Steward dissolving system consisted of a stop cock on each lantern interconnected with rods and levers in such a way that by the mere turning of a handle the flow of the gases and the brilliancy of the light was under perfect control in each lantern separately as well as conjointly with one or both of the others. Dissolving meant, in its general definition, a replacement of one picture by another without sliding them, as must be done with a single lantern. This was done very easily by having two slides, as they are called even today, one in each of two lanterns, one light burning brightly and the other off,<sup>10</sup> and then turning the light

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<sup>8</sup> An "s" is crossed out by hand to change "storerooms" to "storeroom".

<sup>9</sup> Corrected typo, with "e" handwritten above an "i" to change "iast" to "east".

<sup>10</sup> Comma added by hand.

off the first and on the second. The first picture would then fade<sup>11</sup> on the screen and the second appear in its place.

In a more restricted sense dissolving meant having two pictures on the screen at the same time. For example the first picture showed a mother by the deathbed of her child. Then the light was turned on the second lantern and an angel appeared. He looked like a spirit because the furniture of the room could be seen through him. Of course, great care had now to be taken to remove the angel first, and then to replace him by the next picture in the series.

Fr. Lambert bought a great number of such dissolving views, which were always colored, in addition to hundreds of the ordinary kind on the Old and New Testament, and many other subjects. One of the finest of these dissolving sets was The Mill. There was an old mill, a creek and a bridge. Then the wheel began to turn. This was done by having the wheel alone centered on a circular piece of clear glass and turned by a special crank. Then the scene darkened, night came on, the moon appeared from behind a cloud, and there was a ripple on the water in the creek. This ripple was the grandest effect produced in comparison to the means employed. The creek was painted on opaque black in this night scene, and then with a pin somewhat parallel, but by no means perfectly parallel, scratches were made in it. A second piece of clear glass on the same slide was painted black in the same place and scratched in the same way. When this last piece of glass was raised and lowered at one end, the interference of the two sets of scratched lines produced such a natural rippling effect that one must needs see it for himself and be delighted at its apparent reality.

Fr. Florentine Boudreaux, who taught chemistry for 29 years at St. Louis University, and indoctrinated me into many of these devices, used to tell me that when he was a boy he was so much interested in these lantern effects, that he would willingly have allowed the operator to cut off one of his little fingers if he but told him some of the secrets. He said he often looked quickly from the screen to the operator to see how he did things. But he invariably found the operator looking at the screen but moving his hands and fingers in a mysterious manner, so that such detective work never netted him any results.

After the lights had been turned on in the mill by merely sliding a third piece of glass with its opaque shutter aside, and then turning them out again and hiding the moon behind a cloud, the scene gradually grew lighter, and spectators began to realize that they were looking at a winter scene. The creek was now frozen and the wheel at rest. A man crossed the bridge, came to the house, opened the door and walked in, closing the door behind him. Then there was a fall of snow. This last effect was produced by an opaque rolling curtain in the second lantern with a large number of pin holes punched in it in an irregular way.

With three lanterns still more marvelous results could be produced. Thus The Emigrant Ship, after leaving the harbor enjoys a gorgeous sunset with superb cloud effects, their "fleecy skirts being tinged with gold." Night approaches, a storm comes up, lightning strikes the ship and sets it on fire. The sailors and passengers save themselves on a raft, and are finally picked up by a passing ship.

A good collection of these high-class dissolving views is still to be found in the College cabinet. But as the modern movie lantern now produces all these effects and more wonderful ones besides, the old pictures like the old operators have passed out of memory. Now the

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<sup>11</sup> "a" handwritten above "or", which is crossed out by hand, to change "forde" to "fade".

operator may be a child, as all that is required is to insert the film and turn on the switches. Then the operator may sit down and enjoy the pictures like one of the audience. He gains enormously in convenience but loses in knowledge. He does not know, or at least need not know, how the effects are produced. His greatest loss is the satisfaction of having done most of the work himself.

The second physical item in the College Catalogue of 1884 is “5.<sup>12</sup> Steward’s Improved Lantern Microscope, with double spring stage and three extra powers.” This was the best in its day, but has now been superseded by modern forms, whose superiority however is very questionable to an old timer who has used both. One defect of the present make of lanterns is that too much light leaks from them into the room, thereby calling for greater brilliancy in the projecting apparatus to offset it.

Besides the many and various microscopic objects that could be shown by the lantern, the Silver Tree, or Arbor Dinaie<sup>13</sup>, never failed to elicit<sup>14</sup> the admiration of the students. A tank containing a solution of nitrate of silver had a platinum wire in it, which looked like a stumpy post<sup>15</sup> on the screen. When this was made the cathode of a two or three volt current, silver was deposited on it in a way that resembled perfectly the growth of a tree with the branches and leaves.

There was also a slide ruled to tenths, hundredths, and thousandths of an inch, so that the magnification could easily be measured.

“6. A very large Oxy-hydrogen Polariscope, with large nicol prism, crystal stage and extra fittings.” This also was excellent and is not surpassed today. The light from the lantern was polarized by a series of parallel thin panes of glass. There was a fine series of natural and artificial objects. Among the latter were especially a dolphin, a tulip and butterfly whose colors could be beautifully varied. In ordinary light these were only white and black.

“7. Patent Aphengoscope for pair of lanterns<sup>16</sup>.”

In modern terms this would be called an opaque lantern, that is, a lantern for projecting opaque objects. These objects however had to be small. With one lantern only the apparatus was easily attached, but with two the connexion was awkward. Modern apparatus is more convenient. I used the old one frequently for projecting the face of a watch on the screen.

“8. Patent Lantern Kaleidoscope.”

This was very good for projecting kaleidoscopic colored objects. The angle between the mirrors however was only 45 degrees, instead of the customary 60, so that the many reflections made parts of the picture comparatively too dim.

“9. A full set of slides for the Lantern, Microscopic and Polariscope.”

The adjective “full” is very elastic. Still the collection of slides of all kinds was very great, and one might say that it sinned in its abundance rather than its penury. For the microscope

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<sup>12</sup> Period added by hand.

<sup>13</sup> Corrected typo, with “a” handwritten above a “c”, which is crossed out by hand, to change “Diance” to “Dianae”.

<sup>14</sup> “e” handwritten above “so”, which is crossed out by hand, to change “solicit” to “elicit”.

<sup>15</sup> An “f” has been crossed out by hand and a “p” handwritten over the top of an “r” to change “frost” to “post”.

<sup>16</sup> Likely a typo; should be “lanterns”.

especially there was, and is yet, a mahogany case with twenty-eight drawers, each of which contained about fifteen mounted objects as an average, thus making a total of about four hundred. This collection has been pronounced by experts to be very comprehensive.

“10. A magnificent Binocular Microscope, with the highest powers, and complete outfit for dissecting and mounting.”

The College Catalogue of ‘85-‘86 on page 13 says that this microscope was “pronounced by members of the London and American microscopical societies the completest in the market.” And this appears to be the truth.

There were<sup>17</sup> (and are) three cases. The first with a glass front contains the instrument itself without any accessories. It is mounted in the usual way. The tube bifurcates near the top so that one or both eyes may be used. By turning a milled head and, when necessary, also inserting extension pieces, the eyepieces may be separated to the exact distance between the eyes of the operator. By then pushing with unequal pressure two opposing buttons near the objective, a prism may be moved in or out and one or both eyes used at pleasure. The slide or object to be examined may be held securely on the stage, and moved in any direction and rotated by milled heads. The tube is rather long according to modern styles. There is the usual double mirror below, plane on one side and concave on the other.

The second case contains the attachments. There are three sets of eyepieces and ten objectives, each properly marked and kept in its own dust-tight metal box, so that there are thirty combinations. Three Lieberkühns<sup>18</sup> may be fastened to these objectives, that is, concave mirrors for reflecting the light upon the top of opaque objects. There is also a polarizing sub-stage arrangement, and an analyzing eyepiece, as well as a camera lucida<sup>19</sup> for sketching. Then there are tanks of all sizes and shapes for holding live objects in liquids or in gases and for light filters. There are forceps and other tools for manipulation. The lower drawer has places for quite a number of them. But I saw only a few, even as early as 1886, so that they had either never been ordered or had been purloined.

The third case contains the slides mentioned before with everything necessary for mounting objects. While by far the greater number of these slides show objects flattened in the usual way so that light can pass through them, a few are three-dimensional, just as if a common fly had been killed by a gas, set with its feet in some sticky substance, and then walled in with a glass cover over it.

It may be well to answer here the question that everybody asks, and to say that the highest power of the microscopic is 1500 diameters.

This magnificent microscope, as may well be imagined, was for a long time the envy of the professors in the medical department. But as it was a kind<sup>20</sup> of heirloom in the college physical department, there was no prospect whatever of their getting it, at least, during the lifetime of John Creighton. But when in 1917 a large 16-plate Toepler-Holtz machine was discarded by the doctors and brought up to this college, the old question was reconsidered.

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<sup>17</sup> “we” handwritten above “a”, which is crossed out by hand, to change “are” to “were”.

<sup>18</sup> “ü” handwritten above “ii”, which is crossed out by hand, to change “Lieberkiihns” to “Lieberkühns”.

<sup>19</sup> “a” handwritten above “er”, which is crossed out by hand, to change “lucider” to “lucida”.

<sup>20</sup> “d” handwritten above “g”, which is crossed out by hand, to change “king” to “kind”.

For the reason that this large electric<sup>21</sup> machine would be very much more<sup>22</sup> serviceable for the class of physics than the microscope which not one of our professors here ever had the leisure to use, it was judged best to offer the microscope in exchange. But after the doctors had had it for some time<sup>23</sup>, they returned it because, in spite of its many points of superiority, its make was so different from the ones they were accustomed to, the tube was too long, and—well I did not care for more reasons. I now had both, the microscope and the electric machine. The microscope however,<sup>24</sup> as usual,<sup>25</sup> has always been idle, except once for a few months when it was used without success.

“11. A complete set of Electrical Apparatus, comprising three induction coils - the largest giving a spark of twenty inches - also a full set of batteries, Geissler tubes, Aurora tubes, etc.” As the electricity in those days was practically all static, as it was called, or high-potential is we might call it now-a-days, and as dynamo or current electricity was yet in its infancy, it is no wonder that almost all the apparatus was designed for the first kind. The Geissler tubes, barely mentioned in the above enumeration, were very numerous and varied and beautiful. There was a five-gallon Leyden<sup>26</sup> jar, with its inner and outer coating arranged in the form of lozenges or diamonds, which did not touch each other, but sparkled<sup>27</sup> beautifully when the jar was being loaded.

All this rich outfit is now practically ignored. The large induction coil or Ruhmkorff<sup>28</sup> coil, as it used to be called, was said to have been used by Tyndal, although I could never verify the statement. It was abused by separating its terminals beyond the sparking distance, and had to be rewound. The longest spark I could ever get out of it was eleven inches. It seems to be in good condition, and is kept under a special glass cover and on a special support. The coil next in size is first class and has always given the best service. The third was a diminutive<sup>29</sup> one with a quarter inch spark.

In the early days, in fact, almost during the first twenty-five years, visitors to the college were always led into the physical department, and its professor called upon to enlighten and entertain them at times even with experiments. I remember during the hard times under Fr. Pahls, a certain Mr. Ward came who had arranged the scientific display at the World's Columbian Exposition in Chicago in 1893. After I had pointed out the fine microscope to him and discoursed<sup>30</sup> upon its excellence, Fr. Pahls remarked with a sigh “I wish I had the cash for it.” “Yes,” rejoined Mr. Ward, “and if you had the cash, you would turn it back into instruments.”

It is worthy of record to state that almost the entire physical outfit with many minerals was taken down to the Exposition Hall on 15th and Douglas streets on September 1, 1886 and

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<sup>21</sup> “old question was reconsidered. For the reason that this large electric” added by hand.

<sup>22</sup> “more” added by hand.

<sup>23</sup> Handwritten line inserted to change “sometime” to “some time”.

<sup>24</sup> Comma added by hand.

<sup>25</sup> Comma added by hand.

<sup>26</sup> “e” handwritten above “o”, which is crossed out by hand, to change “Leydon” to “Leyden”.

<sup>27</sup> Typo in original; should be “sparkled”.

<sup>28</sup> Corrected typo, with “m” handwritten above “rn”, which is crossed out by hand, to change “Ruhnrkorff” to “Ruhmkorff”.

<sup>29</sup> Corrected typo, with “i” handwritten above a “u”, which is crossed out by hand, and “u” handwritten above an “I”, which is crossed out by hand, to change “dimunitive” to “diminutive”.

<sup>30</sup> “our” handwritten above “ur”, which is crossed out by hand, to change “discursed” to “discoursed”.

placed on exhibition for two weeks. Students were at hand to explain the apparatus and perform experiments,<sup>31</sup> and at night there was a free outdoor display by the lantern upon a screen on the other side of the street. At frequent intervals a slide was inserted bearing the words “Creighton College Exhibit.” A twelve page catalogue, half of it giving a detailed enumeration of the physical outfit, had been printed<sup>32</sup> and distributed gratis. This display by the College of its scientific apparatus met with universal praise. The Omaha Herald lauded<sup>33</sup> it, the manager of the Exposition, says the College historian “gave \$25.00 to pay for gas of magic lantern besides other favors, and to crown success, John A. Creighton offered to pay for a new transit instrument for the Observatory, to cost \$1600.”

When I came to Omaha in 1896 to take charge of the physical department, the only modern electrical measuring instruments that I found here were a poor pendant ammeter for ten amperes, a fine voltmeter with scales of 5 and 150 volts, and an excellent Wheatstone’s bridge. That was all. There was not even a rheostat of any kind. With practically no funds, times were hard. The students were supposed to pay ten dollars a year for scientific apparatus and supplies. Whether any effort whatever was made to collect this, or whether the income went into living expenses, I could never find out. I know I was dependent absolutely on the good will of Fr. Dowling who was by no means liberal in the cause of science even after his means had increased. The result was that I appealed to my classes for donations. I am thankful to report that after the first year their contributions began. It was only in this way that I could procure large and necessary apparatus, such as three arc light regulators for the lantern, a surveyor’s transit, a grating spectroscope, a motor-generator.<sup>34</sup> Individual students also lent a hand. Then as prime necessities had been<sup>35</sup> procured, the purchases ascended to an electric gyroscope, a gas meter, wireless apparatus.

I could write a book on the struggles of a pioneer and his fight for the necessities of existence. When I came in 1896 the only electric current in the house was the diminutive one produced by salammoniac<sup>36</sup> batteries and employed to ring the bells. There was not even a telephone, much less electric light. I could narrate many an incident connected with the gradual introduction of modern conveniences and opulence<sup>37</sup>. But the modern generation that expects to get everything by the mere touch of a button will take as little interest in the struggles of a scientific pioneer as now-a-days a speeder will care to know anything about an ox-drawn prairie schooner.

“12. A complete Physical Cabinet, bought from the old and reliable firm of E. S. Ritchie and Sons, Boston, Massachusetts. The set embraces all that be desired for illustrating lectures on any part of physics.”

Although this part of the physical apparatus cost \$1700, the foregoing electrical and optical parts by Steward having been \$2800, it has ever since proved to be much more serviceable in its entirety in the classroom than the other. Almost every instrument of it is in use today, but of course it has been added to so largely that it would be impossible to identify the original

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<sup>31</sup> Comma added by hand.

<sup>32</sup> “prin” handwritten above “knit”, which is crossed out by hand, to change “knitted” to “printed”.

<sup>33</sup> “u” handwritten above “n”, which is crossed out by hand, to change “landed” to “lauded”.

<sup>34</sup> In original draft, this was the end of a paragraph, but Rigge’s handwritten marks indicate that it should be combined with the following paragraph.

<sup>35</sup> “been” added by hand.

<sup>36</sup> Corrected typo, with “a” handwritten above an “o”, which is crossed out by hand, and “niac” handwritten above “mac”, which is crossed out by hand, to change “salommomac” to “salammoniac”.

<sup>37</sup> Typo in original; should be “opulence”.

pieces, as is so easily done in the case of those purchased from Steward. The chief reason is, of course, that the Ritchie outfit was not by its very nature as showy.

The above nine headings were, as said, taken from the College Catalogue of 1884. The original purchase of those days has been added to very liberally of late years when the students fee was devoted to it and when individual students and whole classes made donations, the latter generally leaving their breakage fee unclaimed.

A physical laboratory in which the students themselves performed experiments and wrote reports on them, was begun on October 1, 1911 in the high school, and two years later in the College. Both have continued without interruption ever since.

From 1884 when the outfit was first acquired, until the great building expansion of 1902, the physical cabinet was located in what is now the eastern half of the students chemical laboratory. With apparatus cases along the east, south, and west walls, and three wide so-called show cases for minerals in the middle, together with things too large for the cases, the room 25 x 30 feet was pretty tightly crowded.

The lecture room adjoined the cabinet to the south. The arrangements were rather primitive or none whatever. The lecture table hardly deserved its name, and while there was illuminating gas in the room, there surely was no water, no drainage, and no electric current, no tiers of seats.

At my advent in Omaha in 1896 I found that the lecture room had been transferred farther east, to Room 241, over the south parlor. It had no conveniences of any kind. But where there is a will there is a way. In spite of the hard times, it did not take me long to introduce into this room the 500-volt direct trolley current, the 110-volt<sup>38</sup> alternating current now universally used for lights, and also gas, water, and drainage. The so-called lecture table was 3 x 6 feet and very low. With this in the southwest corner, a glass case in the northeast, and at times nearly forty students in or outside a room only seventeen feet square, affairs were almost as packed as in a box of sardines. To darken the room for some optical and electrical experiments, black curtains had to be hung on the windows over their internal burners in a way that dissuaded one from doing in often.

At the great building boom of 1902 the present quarters on the third floor along its entire eastern front became available in the north wing. The lecture room, No. 368, measures 33 x 26 feet. It has eighty-one seats arranged in tiers in five rows. The lecture table 12 x 3 feet is twice the size of the old one. It was extended to twenty feet in 1910. It has every convenience that could be desired. It contains a water tank 3 x 3 feet wide, 2 feet deep for about one-third of its width, and 6 inches deep for the remaining two-thirds. At its front is a large plate glass, through which the experiments can readily be seen by the audience. An inlet pipe near the top may be used to supply the water as well as to drain it off. This tank has proved to be especially serviceable in hydrostatics. When not<sup>39</sup> in use, it may be covered up so completely that the very existence may not be suspected. The rest of the space under the table is filled with drawers of all sizes and with shelves. By the mere turn of a valve or a switch, the professor can operate water, drain, blast, suction and gas pipes and direct and alternating currents of electricity of any desirable voltage.

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<sup>38</sup> Hyphen added by hand.

<sup>39</sup> "not" added by hand.

Back of the lecture table is a thirty foot blackboard, over which a screen may be lowered and pictures projected. The six windows have the old-fashioned internal shutters, but these are backed up with thin slabs of wood, so that it is the work of a few moments only at any time to darken the room.

Back of the lecture table a door leads into the cabinet 33 x 54 feet, whose entire south, west, and north walls are lined with glass cases, already crowded with apparatus. Their construction is an enduring example among many others of how Fr. Dowling spread his money. The glass doors of half of the north and south cases and of the middle west one were transferred here from their old quarters. This was quite right. But those of the upper part of the entire west side used to be the windows in the glass partitions between the classrooms on the first floor in the main building, as described in the chapter on The Library. In these cases as well as in the lecture table, an observant visitor cannot fail to notice the entire absence of all ornamentation.

There is now an excellent wireless receiving outfit which uses inside or outside antennae or a loop an pleasure. It is operated by Fr. Schmitt and is thoroughly up to date. In my time, that is as late as 1921, the only wireless communication was by means of the telegraphic dot and dash system. I was too old to learn that. But my interest was aroused by the time signals, especially those of 1913-14 that were being exchanged between Washington and Paris. After that I used to get the Arlington time signals frequently. After I had dropped out of the ranks, the modern broad-casting stations begin to operate, and music and human speech could be heard. But I doubt if I would now spend much time at listening-in<sup>40</sup> to them.

In the middle of the cabinet there were at first the old mineral show cases, and three upright ones on the east side between the windows. When a laboratory class was begun here for the College students in 1913, three long tables were introduced at the north end and the minerals crowded to the south. There were then also two large Toepler-Holtz machines, one the sixteen-plate<sup>41</sup> mentioned before and the other an eight-plate<sup>42</sup>. During my second absence in the hospital in November 1921, all the minerals and electric machines were relegated to the attic by my successor. A number of laboratory tables of a new design were introduced, and then the old ones cut in half and transferred to the high school laboratory, which has since its beginning in 1911 been over the present chemical lecture room.

My last lecture in physics was on October 25, 1921. It was on surface tension with its interesting soap-bubble experiments. Two days later I was carried to the hospital. At my return I realized at once that I had become an old fossil.

Adjoining the physics lecture room on the west a workshop was built 12 x 18 feet. The tools and material from the<sup>43</sup> old one in the frame chemical building were brought up here, new things were gradually purchased until the variety and abundance and excellence of both tools and materials made this place a veritable paradise for one who was fond of mechanical work. Very efficient work was done in the course of years in repairing apparatus and in constructing new instruments, especially with that king of all tools, a screw-cutting lathe, on which I would never connect an electric motor for fear of maiming or losing my fingers. Thus to pass

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<sup>40</sup> Hyphen added by hand.

<sup>41</sup> Hyphen added by hand.

<sup>42</sup> Hyphen added by hand.

<sup>43</sup> "the" added by hand.

over hundreds of smaller things, the heliostat was so improved that it is even now placed fifty feet away and adjusted in one minute, without<sup>44</sup> a knowledge of the time or the sun's declination, to hold a beam of sunlight steady for hours. The crowning glory of this little workshop was however the Compound Harmonic Motion Machine. With an outlay in material scarcely over fifty dollars, this machine will<sup>45</sup> draw over seven thousand million curves. For its description, illustration and products the book on "Harmonic Curves" must be consulted.

On May 8, 1911 a large fire which burned away the entire roof and the attic over the physics department, threatened for a while to annihilate it entirely. It passed safely however through the ordeal, and emerged more vigorous than ever. As the particulars of this great fire are given in a special chapter, it is needless to repeat them here.

A few words on the professors of physics will conclude this sketch The first to enjoy this title was Mr. P. J. Mulconry<sup>46</sup> in '84-85. My brother came next for one year, Mr. F. X. Mara for two, then my brother for two, and Mr. Mara again for one. Fr. F. A. Moeller taught physics then for two years, and then my brother, Fr. C. J. Borgmeyer, and Fr. Mara, each for one year. Then the position fell to me for twenty-five years, from 1896 to 1921.

In 1911 the course of physics was divided into two, one for the College and the other for the high school. I had both. The high school course at once included laboratory work, but that of the college had to wait two years longer for it until 1913. Then I had college physics only until 1921. The high school section in 1913 devolved upon Mr. A. Schmitt for four years, passing then to Mr. E. J. O'Leary for two and Mr. LeMay for one. Mr. L. M. Perk then conducted it for three years from 1920 to '23, and college physics also from '21 to '23. In 1923 Fr. A. Schmitt took charge of college, and Mr. E. S. Preusch of high school physics.

In 1926 an essential change came upon the faculty of the physics department, in that, owing to the scarcity of Jesuit professors, high school physics was taught by an<sup>47</sup> non-Jesuit.

During the years that Creighton College has existed a radical change has gradually affected its method of teaching physics. This has been the transition from the lecture to the laboratory form. When the apparatus was bought and for many years after, the professor was<sup>48</sup> the only one to use the instruments. He alone performed the experiments. To make the subject interesting, especially in public lectures, which were then given frequently, these experiments were made showy or "brilliant" as they were called. To do this the lecturer could appeal only to the two senses of sight and hearing. The experiment had to be very visible by its brilliancy or its magnitude, or by being projected upon the screen. Or it had to be so loud that everybody in the room or hall could hear it. For example, what I would put down as my own personal most brilliant experiment, was the "Crown of Glory". A wire hoop with six or more tiny electric lamps strung upon it was suspended from the ceiling. In the darkened room only these lamps were visible, and the hoop hung with its plane vertical. When the upper end of the cord was now twisted by an electric motor, the hoop gradually assumed a horizontal

<sup>44</sup> Corrected typo, with "t" handwritten above "g", which is crossed out by hand, to change "withoug" to "without".

<sup>45</sup> Correction in original, with an additional "draw over seven thousand million dollars, this machine will" crossed out by hand.

<sup>46</sup> "n" handwritten above "u", which is crossed out by hand, to change "Mulcoursy" to "Mulconry".

<sup>47</sup> Typo in original; should be "a".

<sup>48</sup> "only" is crossed out by hand.

position, and its rapid rotation made the tiny lamps appear as a<sup>49</sup> stationary circle of light. When the current was turned on and off the lamps rapidly, these lamps appeared to run in short straight lines, like the edges of the teeth of a coarse circular saw.

While, of course, every experiment could not be made as elaborate as the one described, a professor interested in his class, especially when this was a good one according to his ideas, could make the matter he was teaching most attractive and even fascinating. This called for great labor and preparation on his part, but that was no deterrent factor.

This lecture method illustrated the fundamental facts and laws of physics in a very clear way. And I have always maintained that the students of those days got a better and more comprehensive knowledge of physics than the present generation.

In the laboratory method of teaching physics used today the students themselves handle the instruments and perform the experiments. While this is intended to impart to them dexterity in the use of scientific apparatus, this hope is often frustrated in those who have no natural talent of manipulation. The greatest disadvantage is that experiments and apparatus must be designed that can be employed practically by students. These then are frequently of a kind that do not in a striking manner illustrate the principle or law in question, or that deal with comparatively useless facts, such as the moment of inertia, the coefficient of rigidity or of expansion, elastic and inelastic impact, and the like.

As the laboratory when the number of students is large, is by itself a great burden on the professor, it tempts him to give little attention to the hours of lecture which remain in the method. He is apt to omit all experiments in his lectures which require considerable labor, or even to omit every experiment except the simplest. An additional motive for thus acting is often the fact that he cannot enter his lecture room until the bell rings, either because it is occupied by another class<sup>50</sup> or because he himself is teaching at the time in some other room. In the same way he must generally vacate the room as soon as the hour is up. The consequence of all these inconveniences is that most professors of physics bring no apparatus whatever to the lecture room, so that the lecture is apt to be very dry and uninteresting.

I myself have fought strenuously for years after this laboratory method had been introduced, to be able to enter the lecture room the hour before the lecture and set up and adjust the apparatus. I did not always succeed in obtaining what I considered so necessary, and I dare say if I taught physics now I would never succeed. If I was obliged to choose between the old lecture and the modern laboratory methods, I would surely select the former, and I feel confident that anyone who has had experience of both, as I have, whether professor or student, will agree with me.

As a consequence of this disuse of lecture experiments and the concomitant purchase of more laboratory apparatus, the cases have been overcrowded and the antiquated and undesirable instruments forced out of them, generally to the attic. Some very valuable ones have thus been relegated to the scrap heap and to the indiscriminate handling of workmen and all comers, such as a large induction coil out of which I elicited an<sup>51</sup> eleven<sup>52</sup> inch spark, a \$250

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<sup>49</sup> "a" typed above, with a typed insertion mark.

<sup>50</sup> Correction in original, with an additional "or because it is occupied by another class" is crossed out by hand.

<sup>51</sup> "n" added by hand, to change "a" to "an".

Ritchie rotary air pump which needs only good oiling to make it worthy of any physical cabinet even now, not to mention fancy Geissler tubes, and the like. What feelings come upon an old timer when he sees his old pets thus thrown into oblivion and abuse, I will not express. Education is now a business matter, there is no sentiment in it any more.

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<sup>52</sup> “eleven” handwritten above “thirteen”, which is crossed out by hand.

T H E  
  
O B S E R V A T O R Y

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<sup>220</sup> Handwritten in upper right corner; may not be Fr. Rigge's handwriting.

## THE OBSERVATORY

Amongst the many fine instruments with which the generosity of John A. Creighton, our great benefactor,<sup>221</sup> had enriched the scientific departments of Creighton University in 1884, there was a large telescope made by J. H. Steward and Co. of London. The lens had a clear aperture of five inches and a focal length of eighty-four inches. The tube was mounted equatorially and was provided with a driving clock, graduated circles, clamps and slow motion screws on both axes; and it had one terrestrial, and one diagonal,<sup>222</sup> and five astronomical eyepieces, and a helioscope. The whole instrument was mounted upon a stout brass column, and this again upon a<sup>223</sup> oak tripod, which in its turn stood upon an oak base provided with three pairs of large castors. The total weight was considerably over two-hundred pounds. The telescope was kept in a room specially designed for it in the new chemical laboratory which had been erected during the preceding winter. A double door on the outside afforded the only access to this room, the inner partition walls having been purposely unprovided with doors in order to prevent the injurious action of chemical fumes.

On Steward's bill of December 21, 1883 the cost of the telescope is put down as 105 pounds, or about 525 dollars. On May 31, 1884 the driving clock is marked at 20 pounds or 100 dollars.

At this time, that is in 1884, no idea of an observatory,<sup>224</sup> or even of a permanent position for the telescope,<sup>225</sup> was entertained by the College authorities. The instrument had been purchased rather for occasional, popular, and educational than for continuous technical use, as was the custom then and is most probably even now in similar institutions of learning.<sup>226</sup> As such the Creighton telescope was a large one in its day, and would not be outclassed in this respect even at present.

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<sup>221</sup> Comma added by hand.

<sup>222</sup> Comma added by hand.

<sup>223</sup> Typo in original; should be "an".

<sup>224</sup> Comma added by hand.

<sup>225</sup> Comma added by hand.

<sup>226</sup> In original, the paragraph ended here and the next sentence formed its own paragraph. Rigge's handwritten editing marks indicate the paragraphs should be combined.

## ROUND HOUSE AND ITS EQUIPMENT

With Father Joseph Rigge's arrival in Omaha on August 21, 1885, affairs began to take a turn.<sup>227</sup> He saw at once that rolling the large and heavy telescope out upon the ground at a distance from the tall college building, was not only very injurious to the instrument itself, but also very prohibitive to the observer. He therefore designed to give the instrument a permanent mounting, so that its circles and driving clock, which had thus far been only expensive and unusable ornaments, could be made to serve to their full advantage. A brick foundation under the tripod and a shed with a removable roof would have satisfied his desires. Fr. Dowling however pronounced such a paltry mounting as unworthy of the dignity of Creighton College. He therefore "properly approached" Mr. Creighton upon the matter, with the result that the latter promised to contribute towards the erection of a fifteen-foot brick round house with a revolving hemispherical dome, to cost about 1200 dollars. Action was then very prompt, so that as early as October 6th the foundations were dug for the house and for a central pier six feet deep. By December 17 the building was practically finished, although it was not until the 6th of the following May that the telescope was mounted upon its pier. This pier was one massive block of stone in the shape of a truncated pyramid, six feet high. At the level of the floor it was three feet eight inches square, and it tapered to eighteen inches square at the top. It was capped by a cast iron bed plate one inch thick, so that the brass column under the telescope, the bed plate and the stone pier were all firmly bolted together. A short experience however showed at once that the taper of the pier prevented the telescope from being directed to stars directly overhead. The instrument was then dismantled, the east face of the stone was cut down vertically to within fifteen inches of the floor, and the telescope set up again by the beginning of June. Later on when the driving clock was attached, a vertical well had to be cut on the west side to allow the weights to descend.

In the meantime, on February 7, 1886, Mr. John A. McShane had offered a thousand dollars for the purchase of a clock, a chronograph and the necessary electric outfit. The clock was bought from the Howard Clock Co. of Boston for 500 dollars, and is yet one of the best of its kind. It is today as bright and as serviceable as on July 6, 1886, the day that it arrived. It runs eight days, and is driven by two independent weights, each of which, in addition to a maintaining spring, drives the clock while the other is being wound up. It has a 24-hour dial, and breaks an electric circuit<sup>228</sup> every even second, omitting however for the sake of identification the 58th second of every minute,<sup>229</sup> and also, if one so desires, the last 20 seconds of every five minutes.

The chronograph was purchased from Fauth & Co., Washington, D.C., for 350 dollars. It consists of a cylinder about seven inches in diameter, and fifteen inches long, covered with a sheet of paper and rotated with uniform speed once or twice a minute by clock work of its own. A fountain pen, attached to the armature of an electromagnet through which the current from the clock is flowing, draws a spiral line on the paper, so that this line is notched every even second by the breaking of the circuit. When any sudden event, such as the beginning and end of an eclipse, the transit of a star across a thread in the field of view of the telescope, and the like, is to be recorded, the observer presses an electric key in his hand, and in so

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<sup>227</sup> In original, this sentence formed its own paragraph, and the following sentences formed a second. Rigge's handwritten editing marks indicate the paragraphs should be combined.

<sup>228</sup> In original, the word "circuit" is repeated and crossed out by hand.

<sup>229</sup> Comma added by hand.

doing makes an additional notch on the chronograph. Measurement of the distance of this notch from a clock mark then gives the second and the fraction of the second. Two clocks may also be allowed to record their times simultaneously and automatically with all the precision one could wish. In fact the Western Union Telegraph Company sent the beats of the clock of the Naval Observatory in Washington, D.C., to<sup>230</sup> our Observatory on every week day at 11 A.M., from January 1887 to about the end of 1894. The cost was seventy-five dollars a year paid in advance, with no rebate when the signals did not come, which happened very often. This expensive luxury is now relegated to the scrap heap since the invention of wireless.

July 27, 1886 was a red-letter day in my life, for on that day I received permission to avail myself of the generous offer made me by Fr. Dowling and my brother to revisit Omaha after an absence of five years, to see with my own eyes all the wondrous<sup>231</sup> scientific instruments of which I had heard so much, and, since my brother would not return until August 27, to superintend the setting up of the clock and the chronograph and to adjust and use the big telescope. It was not however until August 14 at 8:15 P.M. that I could actually arrive.

### FIRST OBSERVATIONS 1886

As I had less poetic than mathematical blood in my veins, I did not care so much for looking through the telescope at the wonders of the heavens as I did for finding the latitude and longitude of the place. Not knowing how serviceable the Omaha theodolite would be for my purpose, I brought a reflecting circle along with me from Chicago in order to find the time and the latitude. The longitude I hoped to obtain from a series of occultations<sup>232</sup>, that is, eclipses of stars by the moon, which was to take place shortly after midnight on August 22, and the elements of which I had computed in advance.

I found the theodolite in usable condition. This instrument, which is listed as costing forty pounds or 200 dollars, had seven-inch horizontal and vertical circles reading to ten seconds, a reversible axis, a compass, striding and surveyor's levels, a diagonal and a terrestrial eyepiece, and field illumination for night work. The field of view contained one horizontal, five vertical and two diagonal wires. It had been designed by its maker, Steward of London, to serve for both terrestrial and astronomical purposes, and as was then generally the case, while it had the bare essentials for both uses, it procured them at the price of many inconveniences and some absurdities. Thus its weight of forty-two pounds on its mahogany tripod did not meet favor with surveyors, while its axis of soft brass instead of steel, its eccentric striding level, its one support only for its field lamp, and the like, made it in fact little more than a practice instrument for an astronomical student. To add to these defects, the, to my mind, unpardonable mistake had been made by somebody - I am glad I do not know his name - of letting this heavy instrument stand on its tripod on an oiled floor, with its stumpy feet, and without any provision for preventing their spreading. The consequence was what should have been easily foreseen, it fell down on the floor. It was sent to an instrument maker to be repaired. This man deserves all praise for his work, but as he was never asked to regraduate the circles, their readings are not reliable.

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<sup>230</sup> "to" added by hand.

<sup>231</sup> Corrected typo, with "e" crossed out by hand to change "wonderous" to "wondrous".

<sup>232</sup> "t" added by hand to change "occulations" to "occultations".

However, as no astronomer takes for granted that his instrument is perfect or will remain so, the Steward theodolite, or altazimuth, as it should technically be called, nobly redeemed itself. Its errors, or rather its constants, were all determined, and with these known, it became practically a perfect instrument. A post was planted just outside of the Observatory and provided with a small board as a table top and as a support for the altazimuth. On the third night after my arrival adjustments and observations began.

The next morning, August 18, the Howard Clock man came and set up the clock on the two large cast iron pipes in the round house west of the telescope. The chronograph was mounted on a table between the clock and the south entrance. On the 21st seven wires were strung from a curved beam on the Observatory to the top of the window in the college which is now the north door to the northeast classroom on the third floor of the main building, so that the necessary batteries could be kept in the college basement especially in the winter time, and connection could be established with the city and the outside world.

On the night of August 20 I tried to begin my program of observations with the altazimuth. But as the wind insisted on blowing out the tiny lard oil lamp I had to use for field illumination, I was forced to give up much dispirited.

In searching through the house I at last found a solitary coal oil lamp which, strange to say, Steward had sent to be used with his binocular microscope. Its chimney was in three pieces. It was commandeered into service. It was supported on a high chair and a box so as not to touch the theodolite or its post, and it had to illuminate the field, the chronometer, and the notebook, and the whole contrivance had to be moved about according as the telescope of the altazimuth was turned or reversed.

On the night of the 22nd I could begin in earnest. The altazimuth was first put into the meridian by the transits of four stars, and then turned at right angles to it in the prime vertical for Gamma and Nu Cygni. This method of finding the latitude is the very best for a small instrument. After midnight until 3 o'clock seven of the predicted occultations<sup>233</sup> were observed and three missed. Mr. Mara faithfully helped me all through the night, and noted the times on the chronometer.

This chronometer was a regular ship chronometer. It was made by H. H. Heinrich and numbered by him 502. It was bought second hand from John Baumer in Omaha for 200 dollars. It beat half seconds and ran fifty-six hours. It was and is yet an excellent time keeper.

On the following two nights, and on the 30th also, the observations were continued. The average of 19 determinations gave a latitude of  $41^{\circ} 16' 10.''7$ <sup>234</sup>. This was only 5."1 larger<sup>235</sup> than subsequent observations made it with a much superior instrument surrounded with all modern conveniences. This error,<sup>236</sup> which is most gratifyingly small in view of the circumstances, amountes<sup>237</sup> to a distance of 515 feet, which is equal to that now between the

<sup>233</sup> "t" added by hand to change "occulations" to "occultations".

<sup>234</sup> Fr. Rigge used a symbol of a double prime mark (") over a period. Given the limitations of Microsoft Word, I have recreated that symbol here (and elsewhere) by placing the double prime mark immediately following a period.

<sup>235</sup> "ar" handwritten above "on", which is crossed out by hand, to change "longer" to "larger".

<sup>236</sup> Comma added by hand.

<sup>237</sup> Typo in original; likely should be "amounts".

south fronts of the faculty building and the gymnasium, or between the west wall of the auditorium and the front retaining wall on 24th street.

That I was overjoyed at my four weeks stay in Omaha is expressing myself very mildly. I considered it therefore only appropriate to pay for this great favor in the only coin that I had. I wrote a description of the Observatory and of its instruments in a series of three articles which appeared in the Omaha Herald under the titles Creighton Observatory, An Observatory Clock, and A Valuable Instrument (the chronograph) on the dates respectively of September 4, 13, 27, and were the following June incorporated in the College catalogue as having been written "by a scholarly gentleman friendly to the College." These articles were my first that ever appeared in print.

In order that they might make a creditable appearance, I submitted them for criticism to Fr. O'Meara who was known to have a good command of language. But he was one of that class that cannot correct, but must entirely rewrite. When accordingly I saw my first article in print and found in it alterations and expressions that I did not approve of, I learned my first lesson and ever after stipulated that I was to have the last look at my production. This of course was then always granted.

#### THE TRANSIT AND SIDEREAL CLOCK

Before bidding adieu to Omaha on the night of September 9, I urged my brother to get a good transit and sidereal clock and a building for them, since the intention of the College was to give time to the city, and this was manifestly impossible without such necessaries. The realization came sooner than my fondest hopes could have led me to expect. Only four days later, September 13, Mr. Creighton was so pleased with the display of the college scientific apparatus in the Exposition building, the details of which are given in the chapter on the Physical Department, that he promised to give 1600 dollars for a transit instrument.

On October 4 he redeemed his promise by a check of 1500 dollars, as the makers, Fauth and Company,<sup>238</sup> deducted 6 per cent for advance payment. Three days later the foundations of the present transit room were dug adjoining the round house on the east. Brick was laid in them on the 21st, and the building was finished in the following May, on the 17th of which the transit arrived.

This transit consists of a telescope with a 3-inch lens and exactly one meter focal length, and turns only in the meridian. As the sidereal time at any moment is equal to the right ascension of the star on the meridian, and as sidereal time can readily be translated into solar or standard time, a transit gives not only the most convenient but also the most accurate way of determining<sup>239</sup> the time and the error of the clock. The stability of the mounting adds another vital element.

In the field of view of the College transit there are seven vertical and two horizontal wires or threads. The telescope is so adjusted that a star is made to run between the horizontal threads, while its transit or passage across the vertical ones is recorded on the chronograph by the observer's pressing an electric key. The two systems of wires are controlled by

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<sup>238</sup> Comma added by hand.

<sup>239</sup> Corrected typo, with "ni" handwritten above to change "determing" to "determining".

micrometer screws, by means<sup>240</sup> of which their positions can be known to the one hundred-thousandth part of an inch.

In addition to its adaptation for the accurate measurement of the time, the College transit is provided with a sixteen-inch circle, which is read by two micrometer microscopes to the tenth of a second, so that it can find its own latitude within ten feet. It has also several levels so sensitive that as a plain matter of fact, the height of an inch forty miles away can be indicated by them.

This superb instrument was handled barbarously by the local express company. Fortunately however no essential injury was inflicted. But the sidereal clock, which had been ordered of Fauth for 450 dollars and which arrived at about the same time, was thrown down so heavily that several arbors in it were bent, and its marks on the chronograph were so irregular that it had to be rejected. The College brought suit against the company for the full price of the clock, but the maker declared himself to be satisfied with 140 dollars, which would enable him to put in new works. The new clock arrived on Christmas eve 1887. It has not only ever since given perfect satisfaction, but has fairly rivalled the Howard solar clock as an accurate time keeper.

In passing is<sup>241</sup> may be of service to remark that a sidereal clock differs from a solar or ordinary one only in this item, that it gains about four minutes (more precisely 3 minutes, 56 seconds) a day. It thus always shows the right ascension of the stars on the meridian, which is not only an enormous convenience but even a prosaic necessity for astronomical work of almost all kinds. Further particulars would be out of place here. The sidereal clock was set up in the southeast corner of the transit room, bolted to two iron pipes like the Howard clock. It, that is, the present one breaks the circuit every even second, but instead of omitting the 58th, like the solar clock, it inserts the 59th, so that the two clocks are readily distinguished on the chronograph.

#### VACATION WORK OF 1887

As the reader may surmise, I was back again in Omaha on July 1, 1887, this time to spend my whole vacation of two months with my brother in the Observatory. The new transit and the sidereal<sup>242</sup> clock, permanently set up inside of a building, with the conveniences of gas light and even of some tiny electric lamps fed by a storage battery, held out the brightest prospects to me. There was work, plenty of it, computing, observing, adjusting, etc., but all this is pleasure when one's heart is in it, for the same reason that athletics is called sport, although it may call for much physical endurance and self-control.

The first thing to be done was to repair, that is, practically to entirely renew, the system of nine wires in the transit. These wires were ordinary cobweb,<sup>243</sup> most inexpensive, it is true, but so delicate that one must needs do such work to realize that the price of two dollars for only two wires at right angles, as one maker charges, is a very moderate one. But here there were nine wires, one-hundredth of an inch apart.

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<sup>240</sup> Corrected typo, with handwritten editing marks to change "menas" to "means".

<sup>241</sup> Typo in original; likely should be "it".

<sup>242</sup> Typo in original; should be "sidereal".

<sup>243</sup> Comma added by hand.

The chronograph was removed from the round house to the northwest corner of the transit room. This room was 16 feet square, and had glass doors and roof shutters arranged in such a way that the entire meridian was free, without so much as a chain or a rope across it. This amounted practically to putting up two houses 18 inches apart without touching each other, and presented quite a<sup>244</sup> unusual problem to the builders.

Then a level was found to leak, the<sup>245</sup> tube of the telescope had been loosened by the rough handling, the values of the divisions of the levels and of the turns of the micrometer screws had to be determined, the axis of the telescope had to be levelled within an error of less than one-millionth of its length, the whole instrument brought within a hair's breadth of the meridian, and so on. All these things were preliminaries to the regular use of the transit in the determination of time and latitude.

It was fascinating work for a young astronomer. And the very same is before any young man that desires such a training, not only in the verification of the constants of the Fauth transit and in its uses, but also in those of the rehabilitated Steward altazimuth and the veteran Würdeman transit, of which mention will be made later. But this race of astronomers seems to have died out. Of this also later.<sup>246</sup>

#### TELEGRAPHIC LONGITUDE 1887<sup>247</sup>

By the end of the first month I proposed to my brother to bring about an exchange of clock signals for longitude with the Naval Observatory in Washington, D.C. This would not only be a big "ad" for the Creighton College Observatory, but also superb astronomical practice. The signals were really not necessary, because a triangulation connection with the station of the United States Coast and Geodetic Survey on the high school grounds would give us our longitude more accurately. And so Washington telegraphed us, declining the signals as not needed. But I kept on urging "Please, oblige, anyhow." And so it did.

As it was cloudy either at Omaha or at Washington on August 2, 3, 4, the first exchange of signals could not take place until the 5th. The method of procedure was this. Each observatory found the correction to its clock as accurately as possible by the transits of about ten or twelve stars. Then from 8:55 to 9:00 P.M. central time,<sup>248</sup> the Washington clock broke the circuit every second except the 29th and the last five of every minute, and these breaks were recorded on our chronograph along with those of our own clock. The signals had hardly begun when everything seemed to go wrong. First our pen refused to write because the ink was too thick. A lead pencil was substituted, but its marks were scarcely legible. Then the new catgut cord on the chronograph weights got all twisted up so that they could not operate. It was of course at once untwisted, but had to be held so by hand. By this time the five minutes were up, and it was now the turn for our injured sidereal clock to send the signals through Chicago, Pittsburgh and Philadelphia into Washington. Like the Washington clock our first sidereal clock broke the circuit also every second, and omitted only the 59th.

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<sup>244</sup> Typo in original; should be "an".

<sup>245</sup> "the" typed above line, with a typed insertion mark.

<sup>246</sup> Period added by hand.

<sup>247</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "7".

<sup>248</sup> Comma added by hand.

Then the telegraph relay kept on chattering its dots and dashes in a language we could not understand. After a few minutes Br. Duggan came running over to us from the College in great excitement and all out of breath, and said something about coincidence and arbitrary signals. I rushed over to the telephone but had some difficulty in getting the Western Union office. I then understood that both clocks beat coincidentally in Washington, and that we should send some arbitrary signals. I promised to do so in a minute. I found on my return to the Observatory that Fr. Joe had got a glass pen to work on the chronograph. Setting this going again with our clock, I then pushed the observing key about a dozen times at random between the clock marks. Upon enquiry at the Western Union, I was told everything was satisfactory.

The coincidence of both clocks at Washington and not at Omaha illustrated very nicely that it took the electric current some measurable time to run 1500 miles and energize the relays on its way. For let us suppose that in absolute time the Omaha clock beats were one-tenth of a second ahead of those of the clock at Washington, and that it took also one-tenth of a second for "the wave and armature time." Then when the Washington signals arrived in Omaha, they were one-tenth of a second late, and therefore two tenths later than those of our clock. Upon our returning the signals, these were also late in Washington by one-tenth of a second, but here they cancelled the one-tenth that our clock was fast, so that both clocks beat together.<sup>249</sup> The Washington observers would have said that the clocks agreed, we would have said that they were two-tenths of a second apart. The average of no tenths and two tenths is one tenth, which was the fact. This shows the necessity of sending the signals both ways.

The arbitrary signals had to be read very carefully on both chronographs, they were not as convenient to use as the uniform clock marks, but there was no difference in principle, and in the case of coincidences of clocks they were absolutely necessary.

On the following night, August 6, there was a second exchange of signals, and a third and last one on the 7<sup>th</sup>. Everything passed off successfully. The Western Union had suggested that we should have a telegraph operator in the Observatory, but we could not get one and fortunately did not need one, as there were no more coincidences.

On the 13<sup>th</sup> and 16<sup>th</sup> also we learned that our signals had been received in a satisfactory way at Washington.

This brought our observatory work to close for the summer. I had gathered enough data to keep me busy<sup>250</sup> computing during my leisure hours for months to come. But before leaving Omaha I wrote a long article on the transit, which appeared on August 28 in the Omaha Republican under the title "By Studying the Stars." On the 30<sup>th</sup> I bid adieu.

I was bound for Woodstock, near Baltimore, to begin my four years<sup>251</sup> course of theology. In passing through Washington on my way I observed for personal equation at the Naval Observatory with Professors<sup>252</sup> Skinner and Winlock, who had determined the time and read

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<sup>249</sup> This was originally the end of the paragraph, but handwritten editing marks indicate that the following paragraph should be connected.

<sup>250</sup> "y" added by hand to change "bus" to "busy".

<sup>251</sup> "s" added by hand to change "year" to "years".

<sup>252</sup> "s" added by hand to change "Professor" to "Professors".

our clock signals on the three nights. As one person may not press the key until he actually sees the star in the wire, while another may get ready in advance to do so, there will be a difference of time between them, which may amount to half a second. As long as the observations of each person are kept by themselves, this is of no consequence, but when those of two or more persons<sup>253</sup> must be combined,<sup>254</sup> their difference or “personal equation” must be known and applied. In order to find it, there was an instrument in Washington in which the transits of an artificial star were recorded automatically, while the observer pressed a key and recorded them in his own fashion. The difference would then be apparent. The smallness of the personal equation is of no consideration, but its constancy is all important.

By the following November 21 I was able so send my longitude results to Washington. The reader need not be told that I put into them all the refinements of computation, even using what is called the method of least squares. But it was only on June 4, 1888 that I received the Washington results. Our observations gave a longitude thirty-eight hundredths of a second of time greater than that determined by the United States Coast and Geodetic Survey. This amounted to saying that our Observatory was 435 feet west of where it actually is, and putting it on the eastern end of the running track around the football gridiron. This determination is highly gratifying, if one considers that my brother and myself were then only amateurs and had to use an injured clock.

On January 24, 1888 a total eclipse of the moon, in<sup>255</sup> which the total phase lasted more than an hour and a half, was well observed by Father Joseph, who wrote a long article on it for the daily press under the title “The Moon in Mourning.” It may be remarked once for all in passing that newspaper editors always claim the privilege to write the titles to the communications they receive. Sometimes these headlines betray their own ignorance, and sometimes they even contradict the statements of the writer. The same is the case with interviews, which sometimes have never occurred. I know from experience whereof I speak.

In like manner a partial eclipse of the sun, which was total in California, was well observed on New Year’s Day 1889.

#### VACATION WORK 1889<sup>256</sup>

In 1889 I was back again at the Observatory from June 26 to September 4. I came from Woodstock in company with Mr. Donoher. I was glad to have his company, although I strongly suspect that his motive was not the lure of astronomy so much, in which he never did anything before or after, as the desire to revisit Omaha where he had been stationed from December 1886 to June 1888. My brother was away the whole two months.

While Mr. Donoher was using the transit, I for the first and only time gave myself up to the poetry of astronomy. I directed the equatorial to all the interesting objects in the sky, and thereby not only learned exactly what a five-inch<sup>257</sup> telescope can do, but also gathered information that proved to be very serviceable in the instruction of students and in the entertainment of visitors.

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<sup>253</sup> “those of two or more persons” handwritten above “they”, which is crossed out by hand.

<sup>254</sup> Comma added by hand.

<sup>255</sup> “in” handwritten above, with handwritten insertion mark.

<sup>256</sup> In original manuscript, the typed underline does not extend to the beginning “V” or the ending “9”.

<sup>257</sup> Hyphen added by hand.

Several practical details were also attended to. On June 28 we put in the new works of the sidereal clock which had arrived six months before, and on July 3 and 4 we renewed the reticule of the transit for a reason I do not remember. On August 14 we made a triangulation connection between our Observatory and the station of the United States Coast and Geodetic Survey in the high school grounds. On August 29 we found out by means of our chronograph that it took 48 and 67 hundredths of a second respectively for two professional players to pitch a baseball from their stand to the home plate.

On the evening of September 3 an unusual astronomical event occurred, an occultation (or eclipse) of the planet Jupiter with its four moons by our own moon which was then about one day past its First Quarter. This had been duly written up and published in the Omaha Bee, my first communication to this paper, on the preceding Sunday, September 1, in a long and illustrated article "Jupiter Will Hide His Face." The night of the 3rd was clear and we had many visitors. John Creighton was there and with his pencil drew a sketch of what he saw on the stone pier. We also gave him a peep through the transit at a tiny star, Omega Camelopardalis. "What's that you say" he enquired. We gave him the name again. He wondered why such a small star should have such a big name. "I must memorize that" he said "and tell my wife about it."

Fr. Ricard of Santa Clara, California, who has since attained international fame by his predictions of the weather from the positions of spots on the sun, was with us from August 12 to September 4, and was indoctrinated into the use of the transit. I had the honor therefore to be his teacher, and he has always gratefully acknowledged it.

Sometime after our departure on September 4, I do not know exactly when, my brother transferred both clocks to the vault which had been built the preceding May in the angle between the equatorial and transit rooms and the short passage that connects them. This vault had triple walls and a triple roof in order to insulate it against rapid changes in temperature. It could also be heated electrically.

In the beginning there was great trouble with moisture, but as the walls gradually dried out, this trouble has entirely disappeared. There is a round window with two panes of glass a foot apart or more, through which the solar clock face can be seen, and in like manner there are two doors with glass in their upper parts through which the sidereal clock face can be seen by the observer as he is getting ready to observe southern stars in the transit. Of course, there was a switchboard through which any desirable combination could be effected between the chronograph, the two clocks and the two instruments, as well as for sending and receiving signals. This switchboard existed already in 1887.

#### 1890 -- 1894

During the year 1890 there was nothing to record except that Professor G. D. Swezey, then at Doane College, Crete, Nebraska, found his longitude by telephonic connexion with our Observatory with Fr. Joseph's assistance.

On August 24th of that year I was ordained to the priesthood in Woodstock by Cardinal Gibbons.

Upon the completion of my theological course in 1891 I was at the Georgetown College Observatory from May 11 to June 30, and learned from Fr. Hagen, now<sup>258</sup> director of the Vatican Observatory, how to observe variable stars. This information I proceeded to impart to my brother in Omaha from July 12 to August 20.

Several years now passed without<sup>259</sup> incidents worth recording in the history of the Observatory. There was one event, however, which was a trifle at the time and the recreation of an amateur, but which later on proved to be of prime importance, and this was that on Tuesday, May 2, 1893 at 3:06 P.M. a photograph was taken of the Observatory. This picture eleven years later, as will be narrated in due course, all by itself and mainly by a shadow in it, was made to disclose all its secrets and that in a better and more accurate way than the photographer himself could have done it.

#### FR. JOSEPH RIGGE LEAVES OMAHA 1894<sup>260</sup>

On August 22, 1894 Fr. Joseph Rigge bid good-bye to Omaha. He had been here nine years, during all of which he had taught chemistry and had been in charge of the Observatory, but he taught physics only for four years. He built the Observatory as it is today, that is, the round house or equatorial room, the transit room and the clock vault, and procured for it the Fauth transit,<sup>261</sup> the solar and sidereal clocks and the chronograph with some minor apparatus. Although he was well informed on astronomical matters and could impart his knowledge well and entertainingly, he was not a born astronomer, and the practical handling of measuring instruments with their computations did not come natural to him, as chemistry did, just as I would say the reverse about myself, although I actually taught chemistry for five years. Then too, as is mentioned with more detail in the Chapter on the Chemical Department, his love for the natural sciences began to slacken and finally to die out. I feel pretty certain that he left the Observatory with little regret. So much so in fact, that when he revisited Omaha three years later he could with difficulty be induced to help me observe the solar eclipse of July 29, 1897, and ten years after that, in 1907, he would not come over to the Observatory at all.

#### 1894 – 1896<sup>262</sup>

During the next two years the Observatory passed into the hands of two men, one each year, who did no more than use the big telescope for sight seeing, wind the clocks and keep the house in repair. I do not say this because I find fault with their conduct. Not at all, I am merely stating a fact. They did no harm to the transit. While my brother had experimented with several covers for it to protect it against the dust, one of these directors enclosed it in a house of stiff oilcloth with a chimney for the telescope tube. This fitted so closely that it required two men to remove it. As he did not know how to use it, he probably considered this its best protection. I should say that neither knew how to use it, because of one I am certain and of the other I know that, to observe a transit of Mercury on November 10, 1894, he carried the chronometer to the Western Union office in order to find the correction to its time, and had the imprudence to say so in his official report to the Naval Observatory, which

<sup>258</sup> “o” handwritten above “e”, which is crossed out by hand, to change “new” to “now”.

<sup>259</sup> Typo in original; should be “without”.

<sup>260</sup> In original manuscript, the typed underline does not extend to the beginning “F” or the ending “4”.

<sup>261</sup> “the Fauth transit,” added by hand.

<sup>262</sup> In original manuscript, the typed underline does not extend to the beginning “1” or the ending “6”.

I read in print. If something was out of order with the use of his own transit, and I can imagine a dozen things, he should have said so. When I wrote to him for an explanation, he would not answer, thereby confirming me in my surmise.

#### FR. WILLIAM RIGGE COMES TO OMAHA - 1896<sup>263</sup>

In August 1895 I went to the Georgetown College Observatory to enter upon what Fr. Hagen, its director, Fr. Hedrick, my fellow student in Woodstock, to whom I owed my astronomical education and who was now my fellow astronomer, and myself also, considered the work of my life. This was first, the photographic observation of the variation of latitude, which might take two or three years, and then secondly, the photographic determination of the right ascensions of stars, which would be entirely free from personal equation, and bring immortal glory to Georgetown and to the Jesuit Order. But Providence willed otherwise. One of the best oculists in St. Louis, simply because I was then less than forty years old, insisted on my using my distance glasses for close work also. My obedience to his directions was, I believe even now, correct in principle, but he made an enormous mistake. My eyes could not stand the strain, and after three months I broke down so completely that I had to give up all observatory work, and even ordinary reading. I remained in Georgetown until the close of the school year, and did nothing besides teaching higher algebra one hour a day. I was then sent to Omaha, where I arrived on August 28, 1896. It was fully three years before I could begin to use my pen again.

Upon the whole, and I know I have all the readers with me, I have been able to do more with my pen in Omaha than I could have done at Georgetown. So that miss-direction of the oculist, which seemed to ruin completely my scientific career, was actually a blessing in disguise. It really did not ruin my scientific career, it merely guided it into a more congenial and effective channel.

The first thing to be done in the Observatory was to make the transit accessible, by removing its tight-fitting stiff cover and replacing it by a curtain which hung from a frame work without touching the instrument, and could be rolled aside by one person. A table was also built about the pier very closely but not in contact with it. Then the transit was critically examined and put into first-class working condition. Electric light, AC 110 volts, was turned on in the Observatory for the first time on March 27, 1897. The current came from the physics department of the College, into<sup>264</sup> which an<sup>265</sup> account of the very low condition of the exchequer, it had been introduced exclusively on the preceding December 18th. The wires were underground, seven of them, in an iron pipe laid by Father Joseph. In subsequent grading a plow had broken this pipe in several places, but the insulation on the wires held out well. On June 14 the driving clock on the equatorial was made to do its duty.

On July 29, 1897 a solar eclipse was observed scientifically for the first time, and gave occasion for the first appearance of the Creighton College Observatory in the *Astronomical Journal* of August 24 and in *Popular Astronomy* in September. By this time, September 3, a small converter had been built to supply the current for the one-candle-power lamps used on the transit and elsewhere.

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<sup>263</sup> In original manuscript, the typed underline does not extend to the beginning "F" or the ending "6".

<sup>264</sup> Handwritten editing marks and a comma added by hand change "from the College into the physics department of" to "from the physics department of the College, into".

<sup>265</sup> "an" likely should be "on".

## TELEPHONIC LONGITUDE OF LINCOLN - 1900<sup>266</sup>

In April 1900 Professor G. D. Swezey, of the University of Nebraska at Lincoln,<sup>267</sup> exchanged clock signals with our Observatory in order to obtain his longitude. This time the telephone was used, and every facility was given us by the Nebraska Bell Telephone Company. This telephonic exchange differed from the telegraphic one of August 1887 in that the clock signals were not automatic,<sup>268</sup> but each observer had himself to press the key by hand as he heard the beats of the distant clock in the telephone. As this telephone could, of course, be used for speech also, the conveniences of the method far outweighed its theoretical inferiority.

April 23rd was a trial night in spite of the rain. The official exchange of signals took place on April 25 and 30, and on May 3. The following night Professor Swezey came here to observe for personal equation. The method used was that one observer noted the transits of a star over the first three threads, and then the other over the last three, first and last being properly exchanged in another star. After reducing these transits to the middle wire, the personal equation could at once be seen. Professor Swezey was so delighted with our transit, that he volunteered to do all the necessary computation.

I thereupon gave him my chronograph sheets. When he came home late that night he did not have them. "Now, where could I have lost them?" he began to muse. After some hard thinking, he finally concluded that a restaurant in Lincoln was very probably the place. He hurried back as fast as possible. The servant had just swept the room. But as he had gathered together all kinds of leavings, he could not remember anything that looked like the treasure Professor Swezey was in search of. So the latter asked to see the sweepings. When he was shown them, he at once dumped the barrel on the floor. And there, amid banana peelings, tobacco juice and what-not, "What do you think I found?" he wrote me. "Why, those chronograph sheets."

## THE TOTAL ECLIPSE OF THE SUN

MAY 28, 1900<sup>269</sup>

On May 28th, 1900, there was a total eclipse of the sun visible in the United States on a line drawn from New Orleans to Cape Hatteras. As the preceding total eclipse visible in this country had occurred eleven years before and the next following one would not occur for eighteen years to come, extraordinary interest was taken in this eclipse by the astronomical world. Expeditions were fitted out by the principal<sup>270</sup> observatories on an elaborate scale, and a large number of college professors joined these expeditions. Creighton University determined to contribute its share toward the scientific observation of the eclipse, and accordingly sent its astronomer to Washington, Georgia. As time and means were limited, and as the Creighton Observatory instruments were not designed to be portable, their dismounting, packing, shipping and remounting, with the subsequent repetition of all this

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<sup>266</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "0".

<sup>267</sup> Comma added by hand.

<sup>268</sup> Comma added by hand.

<sup>269</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "N" in the first line of the title, nor does it extend to the beginning "M" and the ending "0" in the second line.

<sup>270</sup> "a" handwritten above and an "e" is crossed out by hand to change "principle" to "principal".

labor, were out of the question. Accordingly, Father Rigge had to content himself with the Heinrich chronometer belonging to the observatory and a three-inch telescope kindly loaned him by a friend. With this comparatively meager instrumental outfit, he selected a line of work which he judged to be the best and most useful that his equipment admitted of, the observation of the four contacts, that is, of the moments when the moon first began to obscure the solar disk, when the total eclipse began and ended, and when the moon finally withdrew from the sun's face. The correction and rate of his chronometer he obtained from the telegraphic noon signals sent all along the line of totality by the Naval Observatory at Washington, D.C., and the latitude and longitude of his position he determined by connecting it with the eclipse station of the Massachusetts Institute of Technology in the same town of Washington, Georgia. This Institute had detailed four of its observers for this purpose with a complete instrumental outfit, and they determined their position by star observations extending over several weeks. As soon as they had published their official report, "The Eclipse Expedition of the Massachusetts Institute of Technology to Washington, Georgia"<sup>271</sup>, in their own organ, the *Technology Quarterly*, in September, 1900, Father Rigge set to work to reduce his own observations and compare them with theirs. He embodied his results in an article entitled "The Eclipse Expedition of the Creighton University to Washington, Georgia," which appeared in the same *Technology Quarterly* in March, 1901. In this technical article, Father Rigge explains his method of observing the eclipse and of determining his latitude and longitude and then compares his results with those obtained by the astronomers from the Institute of Technology. The article is very mathematical throughout and illustrated by diagrams. "Popular Astronomy" No. 86, page 310, calls it "a worthy paper by an interested astronomer."

Of course, the eclipse was written up plentifully in the local papers. There was first a preliminary article in the *Bee* on May 20, a week before the eclipse. Then a long one in the same paper on June 3, giving an account of what observations had been made by the various parties all along the line of totality. The title, which, as said before, it is the privilege of the editor to write, was "Viewing the Shadowed Sun." How the sun can be shadowed the editor will find it hard to explain. The expression however is quite a common one in newspapers. And then there was a third article, this time in the *World Herald* on January 13, 1901, "Study of the Last Eclipse," based upon the reports of the observing parties.

#### MINOR ITEMS 1901 – 1904<sup>272</sup>

On account of the great building boom in 1901 when the southwest and north wings, the library, the auditorium and heating plants were erected, a part of the underground pipe leading to the Observatory had to be removed, and two wires for light only were strung on two poles. They came first through what is now the office of the college dean, room 242, but upon the completion of the north wing they were removed to a north window of the present physics lecture room 368. At this time also, April 1901, a Howard clock, which was called a regulator,<sup>273</sup> was removed to the college. This clock had been set up in the southeast corner of the transit room in place of the sidereal clock when this was placed in the vault in 1889. This regulator was in fact a master clock, in that it closed a circuit one second every minute and operated an electric dial, which has ever since faced the main entrance in the college.

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<sup>271</sup> Typo; should be "Georgia".

<sup>272</sup> In original manuscript, the typed underline does not extend to the beginning "M" or the ending "4".

<sup>273</sup> Comma added by hand.

The clock mentioned was hung up in the physics lecture room and is there yet. It does no active, exterior work anymore, although it is perfectly able to do it, since the new master clock in the dental building after 1921 now operates all the secondary clocks in the dental, law and college buildings.

In 1903 the running gear of the dome was renewed and improved. The old system was certainly wretched. The dome was supported by twelve two-inch pulleys sunk into the wood so that only about a quarter of an inch of the pulley projected. The wooden ring of the dome rested on these. Grooves had been worn into the wood, chips of wood had splintered off, and dirt had clogged most of these pulleys so tightly that they could not turn, and it required very great muscular power to move the dome at all. The side thrust was taken up by one-inch pulleys. These also had cut a groove into the wood. One in the northwest had broken off so that the dome could be turned past it only in one direction.

On October 29th the new gear was finished. The two-inch pulleys were replaced by three and three-fourths inch ones, now running on a<sup>274</sup> iron track. The side thrust is also taken by three and three-fourths inch pulleys against an iron band. When this system was first installed and the pulleys were well oiled, one's little finger could actually turn the dome around.

In September 1904 I had the privilege of<sup>275</sup> spending a<sup>276</sup> week at the World's Fair in St. Louis, and of attending the Scientific Congresses. On the 20th, under Fr. Hagen's aegis, I took dinner in the "Tyrolese Alps" with the chief astronomers of the country and a few foreign ones.

On September 24, 1904 the article "When was the Photograph Taken?" appeared in the Scientific American. It showed how the year,<sup>277</sup> day, hour,<sup>278</sup> and even minute of the exposure of a certain photograph of the Observatory had been found from the position of a shadow in the picture. This was 1893 Tuesday May 2, 3:06 P.M. On June 10, 1905 another article in the same journal gave the exact position of the camera.

#### THE OBSERVATORY CONDEMNED TO THE ROOF<sup>279</sup>

In November 1905 the Observatory was suddenly exposed to an unexpected danger, its very existence was seriously menaced, and that by so great a man as Father Dowling himself. With the prospect of the early cutting through of 24th street, he intended to shave down the north end of the front lawn as he had done to its south end. The college campus was then bounded on the north by an alley, which is now the roadway next to and south of the present gymnasium. This would have meant a fall of 40 feet in the 300 that separated the nearest corner of the north wing from the northeast corner of the college grounds, so that as the Observatory was midway between these two points, there would have to be a cut here of twenty feet.

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<sup>274</sup> Typo in original; should be "an".

<sup>275</sup> "of" added by hand.

<sup>276</sup> "a" typed above the line, with typed insertion mark.

<sup>277</sup> Comma added by hand.

<sup>278</sup> Comma added by hand.

<sup>279</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "F".

The Observatory was therefore an obstruction in the scheme. As there was absolutely no other available site for it, it was to be put on the roof of the college building. Now such a position would have ruined it altogether. In the big telescope every tremor in the building, and much more so, every rumbling of a heavy truck on the streets, which even now makes itself felt by one sitting in a chair on the second floor, and frequently sets pendant objects swinging visibly, would have made even sight-seeing rather painful than agreeable. And as for the clocks and the transit, their position on the roof of a tall building would have been simply suicidal. For how could a level be used, when the dancing of a star image would displace it capriciously by more than a thousand times the amount that the level was made to measure? And how can a clock keep good time when the vibrations of its pendulum are continually interfered with?

No, what an Observatory needs vitally is a support on terra firma. Give its instruments, and by all means its measuring instruments, a firm foundation. Put them low down to secure this stability. Rather see half the sky well, than all of it poorly. In this decision every professional astronomer will agree. And if the judgment and experience of a professional in his own branch is not to be taken, whose is? Do we not do that in every other case? And if we as educators make it our profession to teach<sup>280</sup>, should we not employ at least essential principles?

Well, thank Heaven, the Observatory was not touched. The building and the instruments are still where they were placed. And even the hand of time has not changed the position of the fine Fauth transit by a measurable amount. And how did it come to pass that the Observatory was spared? The reason is probably this, that although detailed plans had been drawn, Fr. Dowling with his usual business acumen judged it imprudent to lower the college ground below that of the street before its cutting through and its definitive grade could be securely relied upon. There was no immediate hurry therefore to remove the Observatory. It might remain until he could issue his final order. This time never came. He was removed from office on February 22, 1908, and it was nearly a year later, January 5, 1909, that the City Council finally made up the mind to open and grade the street. The actual grading however did not begin until the following August 2.

#### THE EQUATORIAL RELACQUERED<sup>281</sup>

In January 1906 the equatorial was taken apart and carried to the Omaha Plating Company to be cleaned and relacquered. The mistake had been made at the start of enclosing the long tube and other parts in oiled silk. This had gummed itself tightly on the brass and made it look dirty. The lacquering was not a success. But as the cleaning had been well done, and as not even one of the hundred or more pieces had been lost, the outlay of twenty-five dollars was very moderate. The whole telescope was now provided with a large folding curtain, which can be easily removed and replaced, and which has several times done good duty as an additional protection in a driving rain storm with a leaking roof.

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<sup>280</sup> Underline does not extend under "t".

<sup>281</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "D".

### STUDENTS FIND THE LONGITUDE<sup>282</sup>

At the suggestion of Professor Swezey, the Lincoln and Omaha students of astronomy exchanged telephonic clock signals on May 21, 1907 in order to obtain their difference of longitude. Having found the correction to our chronometer by the transits of a few stars, we carried it to room 156 in the college where there was a telephone. In sending the signals a student tapped a bell every second in front of the transmitter, and in receiving them he listened to the distant bell and noted the seconds on the chronometer. As the sky at Lincoln was cloudy, the exchange was merely good practice. The results however were pretty fair. The carriage of the chronometer to the college building was necessitated by the fact that there were only two wires running to the Observatory, and these were used for light. They were outside and too visible. In August 1902 when the great building boom was over, Fr. Dowling had indeed proposed to put the wires underground. But knowing his propensity for grading,<sup>283</sup> and fearing that the wires would have to be dug up again soon, I declined the offer. I regretted it for seven years, until 1909, when a new grading would have torn them out and necessitated their relaying.

### THE STEWARD ALTAZIMUTH IMPROVED<sup>284</sup>

During the month of January 1908 and the preceding Christmas vacation, the old Steward theodolite, which in spite of two falls had done such good work in August 1886, was entirely rehabilitated in the college shop 369. Steel rings had been shrunk on the axis by the Bausch and Lomb Optical Company of Rochester, N.Y., and trued up with an accuracy becoming an astronomical instrument. For this they had charged the moderate price of eleven dollars. A two-inch objective now replaced the old one and one-fourth one. A new striding level, with one division equal to three seconds, was bought for it. The double-screw micrometer, intended by Steward for the equatorial, was put in as the eyepiece, and provided with whole-turn counters, which, absurd as this may seem, it did not have before. An alidade level was attached, as also a level reading to two seconds,<sup>285</sup> and a shelf for supporting the field-illumination lamp in the reversed position of the axis. The lamp was made electric, so that no naughty winds could blow it out again. Wires were not however put in the focus, because this was to be student work during vacation. The whole altazimuth, from being practically worthless, or least to those who are afraid of great inconveniences, is now an excellent instrument, fully worth 600 dollars. It may be used as a transit in the meridian and in the prime vertical, and as a zenith telescope. It will be an inexpressible delight to a young astronomer made of the right metal.

On June 17, 1909 a solar eclipse was well observed. The annual college commencement was going on at the time in the auditorium. Both the eclipse and the commencement were made memorable by a break in the electric light wires somewhere in the city. Judge Faucett in his address to the graduates facetiously blamed the eclipse for darkening the hall.

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<sup>282</sup> In original manuscript, the typed underline does not extend to the beginning "S" or the ending "E".

<sup>283</sup> Comma added by hand.

<sup>284</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "D".

<sup>285</sup> Comma added by hand.

### THE OBSERVATORY AGAIN IN DANGER

As the proposition of opening and grading 24th street between Cass and Burt, and with it the grading of our front lawn, was increasing in certainty every month, the status of the Observatory had to be definitely settled. As the ground about it was to be cut down at least ten feet, the questions were: Shall the Observatory be lowered also, or if not, shall a retaining wall be built about it, or shall the ground be terraced? And in either case, how will the heavy traffic on the street affect it? Or shall the Observatory be removed to another site on the campus or in the outskirts of the city, or relegated to the roof of the college building, or shall it cease to exist?

These were all very vital questions and called for mature consideration. They were prominent in my mind for many years, and were each and all dispassionately weighed and discussed. I will put down briefly the reasons that controlled the final settlement.

And first as to removing the Observatory to another site. At this time, 1909, the campus extended as far as 26th street to the west, but the property between the alley and Burt street where the gymnasium is now, had not yet been secured. As the ground to the west was the athletic field, and there was, and is yet, a steep rise from it to the north lawn, it is evident that there was then, and is now, absolutely no other site<sup>286</sup> for the Observatory than the old one.

Placing the Observatory seventy feet high on the college building, as said before, would have been absurd and suicidal. Transferring it to the outskirts of the city, as some people suggested, would, on account of its distance from the college, dampen the ardor of its director, render its safeguarding impossible, and on account of the growth of the city, only renew the present difficulties.

On the other hand the old site has every advantage but one. Its extent of visible sky is not equaled by any other Observatory situated like it in the middle of a large city. Its view of the heavens extends to almost the very horizon in all directions except the southwest. And it is only here that a building on the north lawn can curtail it. The only disadvantage of the old site is the probable shaking of the ground by the cars and trucks on 24th street, 75 feet away. The loose texture of the soil, however, it is hoped, will minimize this considerably. At their worst these vibrations cannot begin to compare with those of a high building, as Marquette and Valkenburg prove.

Having decided upon retaining the Observatory at the old site, the next question was concerning the height. Lowering the building with the many separate foundations of its instruments would be simply impossible. Rebuilding the Observatory would be easier, but this would be deterrent. For first, the instruments would have to be taken to pieces, stored, and afterwards reset and readjusted. Then the parts of the building that could be used again, such as the dome, the piers, the doors and windows with their frames, would be subjected to such rough handling that they would become practically worthless.

And then, to omit other minor reasons, the delay in the erection of the new Observatory, during which time there would be no Observatory at all, would reopen the whole controversy and put a large question mark upon everything, upon its site, its height, and upon its very existence.

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<sup>286</sup> “t” handwritten above “d”, which is crossed out by hand, to change “side” to “site”.

Keeping the Observatory and its instruments intact and building a retaining wall about it, or even only terracing the ground, would do away completely with all difficulties and objections. The expense would surely not be greater, nor would there be the old trouble of the drying-out of the clock vault. And best of all - and this was my own personal secret - the future of the Observatory would be permanently secured. Nor would a subsequent enlargement of the Observatory be prevented. Additions could be put outside of the retaining wall on the lower level. And even the round house could be expanded for a larger telescope. At present this has an inside diameter of 14½ feet for a five-inch equatorial, while the Georgetown twelve inch has a dome of only eighteen feet. The 3½ additional feet could easily be found, should they be called for. But I never flattered myself with the prospect of a larger telescope. A five-inch is large enough for the purpose of instructing students and entertaining visitors, 99 per cent of whom have never looked through any telescope at all. And city smoke and electric lights are not congenial to a large telescope. When, therefore, I was told "When I get rich, I'll buy you a larger telescope," I always thought, although courtesy would prevent my giving expression to it, that these words were really only a smart way of saying "Please, excuse me from doing anything now."

The net result of all these considerations was that the Observatory and its instruments were to remain where they were, and a retaining wall built about it. J. Davey, the architect, accordingly began to draw the plans.

On August 2, 1909 the long-expected grading of 24th street began, and on the 5th the college also started to pare down its front line so as to keep pace with the street workers. The front lawn north of the College, and entire north lawn also, were cut down. On August 27th the campus grading was finished. The Observatory was then left standing on a vertical bank ten feet high, so that it could be reached only with a ladder.

During the grading an incomplete skeleton was unearthed on August 11, about ten feet north of the transit room, three feet west of its meridian, and two feet deep. As I happened to write to Father Michael A. Shine, of Plattsmouth, who is well known as a great historian of Nebraska, Iowa,<sup>287</sup> and adjacent territory, I told him about this find. To my great surprise he identified the remains as those of M. C. Gaylord, a carpenter, who died in July 1854. He then quoted the following account from Johnson's History of Nebraska, 1880, published by Henry Gibson, Herald Printing Office, Omaha. "His was the first death among the settlers. He was buried on the ridge a short distance from the house (<sup>288</sup>near the present site of Creighton College,)<sup>289</sup> and in June 1877, while excavating for the Creighton College, his remains were taken up and reburied."

#### THE OBSERVATORY RETAINING WALL<sup>290</sup>

On September 27-30 a trench was dug to the Observatory from the end of the corridor in the north wing, and 150 feet of two 1½-inch conduit pipes laid in it for the electric wires. On October 13 the foundations were dug for the Observatory retaining wall. This wall was to be ten feet high above ground and five feet below it. At the top it was to be a foot thick, and have a flaring base of eight feet. This flaring base caused much trouble and anxiety. As the

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<sup>287</sup> Comma added by hand.

<sup>288</sup> Parenthesis added by hand.

<sup>289</sup> Parenthesis added by hand.

<sup>290</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "L".

ground was undercut two feet, it had no support, and quite generally fell down in large chunks, in spite of the reiterated assurances of the architect. As the undercut extended almost to the foundation line of the Observatory, I passed many an anxious hour in fear that the whole building would tumble. The southeast end of the transit room did actually sink somewhat, as may be seen even today in the fact that the south window is wider on the top than on the bottom.

On October 27, the pouring of the concrete began. It was the general opinion that the reinforcing was needlessly strong, as it consisted of two grids, each having vertical rods a foot apart and horizontal ones eight inches apart. But all the better.

On Sunday morning November 7 there was an enormous tumble of about ten cubic yards to the north-northwest of the round house. The men came at once and worked all day shoring-up and removing the fallen dirt. And the architect kept on protesting that the ground could not fall.

On November 10 the last section of the foundation was laid. That brought the undercut danger to an end. Two days later the entire foundation was carried up to the ground level.

On November 29 concreting the upper wall began at the northeast corner. About ten feet along the east and also along the north were all that could be finished before December 3,<sup>291</sup> when the work stopped for the winter. It was a mistake to begin it so late in the season. The contractors, Samuel Friedman and James Anderson, were not to blame. They had to put up with vexatious delays in getting their material and their workmen.

During the winter while the ground was frozen hard the Observatory was safe enough. But as spring began about March 1 and was accompanied by heavy rains, the foundations of the building were beginning to be exposed.

On March 14, 1910 work was resumed in such earnest that twenty feet were on that day concreted in the forms that had been set up the preceding November. Two days later the forms of this section were removed, and ground filled in between the wall and the building.<sup>292</sup> On April 4 the southwest and last section of the wall was concreted. Two days after this the ground was filled in. The mistake was then made against my protest of simply turning the hose on this filled-in ground without tamping it. This is a lazy and cheap way. The consequence was what I had foreseen, that when the upper walk was concreted, this after some time began to settle unevenly so that the rain water would collect in places and not flow off. This came to be so bad that later on nearly half of the walk had to be relaid, and there are even now three faulty places.

By April 22 the steps had also been concreted, so that with them the work came to a close. The concrete work on the Observatory had cost 3500 dollars. This was certainly less than the tearing down of the building and its re-erection would have come to, not to mention the skilled labor required in removing and resetting the instruments.

On May 19 the cables were drawn into the underground conduit pipes. There were seven wires in one pipe, only two being used at the time for electric light, and a lead-covered cable

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<sup>291</sup> Comma added by hand.

<sup>292</sup> Period added by hand.

of fifty wires in the other, only about twenty being used by the private telephone line and the chronograph circuit, so that there was plentiful provision for the future. On that same day the overhead wires which had been there for nine years were removed. The batteries were in the college building.

### IMPROVING THE TELESCOPE<sup>293</sup>

As it was evident that the building of its retaining wall would make all use of the Observatory impossible for many months, the opportunity was seized of putting some much-needed improvements, - they should rather be called essentials - on the equatorial. The large telescope was therefore taken on November 25 to the college shop 369.

As an observatory instrument the Steward equatorial was decidedly an awkward one. It must be said however in justification of the maker and the buyer that neither had intended it for such a purpose. It had been made and bought as a physical instrument, to be rolled out on the lawn for occasional sight seeing. Its driving clock and divided circles served no practical purpose, they were to show what such attachments were supposed to do on a permanently mounted equatorial.

The actual awkwardness of the telescope did not therefore become apparent until it was set up in the Observatory. The first and most obvious absurdity - and that is not too strong a word - was that the declination clamp and slow motion screws, which are used oftenest, were entirely beyond the reach of the observer when he had his eye at the telescope. My brother remedied this at once by attaching short rods.

The second was that the declination circle turned with the telescope while its vernier remained stationary, so that one could never know where to look for it. This was corrected later on by exchanging the two disks, so that the vernier is now, as it is with every instrument of the kind,<sup>294</sup> always in the plane of the telescope and visible in all its positions from the eye end.

The third item was that the driving clock was evidently an afterthought of the maker, a possible addition, which served excellently as an advertisement. There was no place to put it. The situation given it on the pier interfered considerably with the telescope when this was in certain positions. The clock should have been put below the mounting, where it is always put, and where it is entirely out of the way.

In the fourth item the maker manifested his good intention but betrayed his unfamiliarity. This was in regard to the clamp and slow motion in hour angle. The clamp was beyond the reach of the observer when he was looking through the telescope. The slow motion was controlled by an endless cord which passed through two eyelets and then around<sup>295</sup> a grooved wheel which was in connexion with what is called a planetary gearing. The first trouble was that in most positions of the telescope the cord was at too great an angle with the eyelets to work at all. The second was that, as the instrument was of typical English make, strong, massive, and with long bearings, the friction in the polar axis soon became so great that the clock could not drive at all. The only way to force it to do so was to insert a small wooden

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<sup>293</sup> In original manuscript, the typed underline does not extend to the beginning "I" or the ending "E".

<sup>294</sup> Comma added by hand.

<sup>295</sup> Typo in original; should be "around".

wedge and so lock the planetary gearing, and then discard the endless cord. To see his star therefore and keep it in the field of view, the observer had to clamp the telescope ahead of the star, to wait until this came where he wanted it, and then to turn a thumb screw on the south side of the clock box and release a detent in the wheelwork. While the star could be adjusted up and down very readily by the declination slow motion, there was absolutely no adjustment whatever towards the right and left. Am I exaggerating when I say that such awkwardness soon became intolerable?

The first three defects were not difficult to remedy. But the fourth, bringing the clamp and slow motion screws in hour angle down to the eyepiece, was a problem that called for long and continuous consideration and for mechanical skill that I dared not credit myself with. I therefore wrote to Warner and Swasey, of Cleveland, who had the greatest reputation as makers of telescopes, from the 40-inch<sup>296</sup> Yerkes<sup>297</sup> down to the smallest. They of course wanted measurements and photographs, and indicated 150 dollars as a rough preliminary estimate. As I was sure that the whole telescope would have to be shipped to them, and feared that the assigned cost might easily be doubled in reality, I determined to attack the problem myself. Very much time and labor were spent upon it, and many a brilliant idea was wrecked in encountering the existing construction. However, the work was done, and although it bears the thumbmarks of having been homemade, it proved to be a decided success. For the details the reader is referred to the article "The Driving Clock and the Clamp and Slow Motion Screws of an Equatorial" in *Popular Astronomy* xx, 551-561, November 1912.

My actual expenses totalled only about twenty dollars, seven of which went to an expert machinist for cutting gears. I had constructed wood patterns and then had brass castings made, which I turned to shape on the lathe.

While the five-inch lens of the Steward equatorial in<sup>298</sup> fairly good, not the equal, however, of the three-inch in the Fauth transit, there is one contrivance for which the maker deserves great praise. This is that at the lower end of the polar axis the circle is provided with a double graduation and turns with the axis. A milled head sets this circle so that its lower vernier, which is permanently secured to the axis, reads the star's right ascension. When the telescope, after having been adjusted in declination, is now swung round until the stationary upper vernier indicated the sidereal time, the star is in the field of view. While this contrivance it now put on every equatorial, it was somewhat unusual at the time that ours was bought. Students learn to use the circles quite readily, and take great delight in setting them and then seeing their star in the middle of the field of view.

#### HALLEY'S COMET<sup>299</sup>

The improvements on the large telescope was finished on March 10, 1910, but it could not be returned to the Observatory until April 7. Even before this time Halley's comet was beginning to claim attention. The first view of it through the telescope was had as early as March 2, on the third floor of the college. I knew the hot air rushing out of the window

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<sup>296</sup> Hyphen added by hand.

<sup>297</sup> "Y" handwritten above "T", which is crossed out by hand, to change "Terkes" to "Yerkes".

<sup>298</sup> Typo in original; likely should be "is".

<sup>299</sup> In original manuscript, the typed underline does not extend to the beginning "H" or the ending "T".

would set the image “boiling” in a most unsatisfactory way, but I thought it prudent to yield to the demands of the “mob” and let them see for themselves.

On April 20 from 4:10 to 4:40 A.M. another eager “mob” drove me to the Observatory to find the comet for them, and likewise on the 23rd at the same early hour. But on both occasions we could not see it, while up at the City High School it was seen. This I attributed to the fact that the comet was low down in the sky and in a fog, while the High School hill was above the fog. The same thing happened to observers its St. Louis. On April 28th I had my first view of Halley’s comet, the head alone being visible. On May 4th from 3:45 to 4:00 A.M. there was another eager crowd to see the comet. On the 12th and 13th the comet<sup>300</sup> presented a fine sight, with a tail thirty degrees long. On the 18th the tail had grown to 110 degrees. The night following the 18th the earth was expected to pass through the tail of the comet. There was great excitement all over the world. To quiet the city I had two days before given 17 reasons for not fearing the comet.<sup>301</sup> Some people, and Fr. John Kelly among them, passed the whole night near the Observatory waiting for things that did not happen. The net result of their wake was a clogging of the drain pipes with their matches and cigar stumps. The faculty, and the students in the “Beanery,” went about it more reasonably. They portioned the hours among them. All had orders to wake me if anything unusual happened. And as for myself I slept soundly all night, because I was convinced that nothing would happen, and nothing did.

On the following night, the 19th, there were great crowds at the Observatory. But the sky was cloudy and there was nothing to see.

On Monday May 23 the sky was at its best. The comet was seen as early as 8:25 P.M. The crowd was enormous. People stood in line for two hours and a half. They could be admitted only through the one south door, and had to make their exit through the north window. To add to the interest,<sup>302</sup> the moon was totally eclipsed from 11:09 to midnight. Its color was then a beautiful red, the best I had ever seen. The comet’s tail was sixty degrees long. The head set at 10:58.

It would have been a bootless task to try and convince these people that the naked-eye view of the comet in its entirety was better than the telescopic one of its head only. I was forced to yield to the popular demand. I remember a lady who took only one glimpse through the telescope and wished to come down at once from the observing chair. When I urged her to take her chance of a lifetime and look longer, she declined. She had seen the comet through the Creighton College telescope, and that was satisfaction enough for the rest of her days.

And what profit did I reap from the labor? Well, I hope my Guardian Angel was standing beside me all the time with his notebook and his pencil in his hands. Of course, the College and myself gained a great deal in popular favor, but this is a fickel<sup>303</sup> recompense. Otherwise the visible net gain was two cigars.

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<sup>300</sup> “the comet” handwritten above and replaces “this”, which is crossed out by hand.

<sup>301</sup> Two sentences are handwritten additions: “There was great excitement all over the world. To quiet the city I had two days before given 17 reasons for not fearing the comet.”

<sup>302</sup> Comma added by hand.

<sup>303</sup> Typo in original; should be “fickle”.

On the two following nights, the 24th and 25th, the crowd diminished, and the moon interfered considerably. About June 11 the comet disappeared to the naked eye.

#### THE VALUE OF A COBWEB.<sup>304</sup>

On August 2, 1910 an accident happened in the Observatory which at first sight it would seem ridiculously silly even to mention. But it emphasized the statement often made that enormous consequences may result from the loss of trifles. This accident was that the Fauth transit lost some of its cobwebs!

In the description of this instrument it was said that threads or wires, which are often only cobwebs, were put into its focus so that transits of stars across them could be recorded on the chronograph. These wires make a telescope a measuring instrument. They show that a star moves - apparently at least,<sup>305</sup> because it is the earth that really moves - and that even fractions of a second can thus be measured and the time be found accurately. Without such wires the telescope can only see, it cannot measure. These wires are therefore essential, even should they be only cobwebs.

Well, Fr. Tenk was spending July and August at the Observatory. He had had already the experience of two vacations, 1905 and 1906, so that I could rely on him. He put into the transit an eyepiece that I never used. It went in too far and tore some of the threads. I cannot in the least blame him for the accident because the same might have happened to me. But I do blame the maker who should have made such an accident impossible. The result was a general tie-up of the Observatory,<sup>306</sup> except sight-seeing with the equatorial. The transit was dead, the chronograph idle, and the clocks could not be trusted.

The whole reticule had to be renewed. But it took us a whole week to find the right kind of a cobweb. Why? because one kind is made up of loose strands like a torn rope, a second is beaded, a third too fine for the eyes to see, and so on. If Fr. Tenk was at fault, he made noble amends for it. He not only put in the reticule which has remained to this day, but also put a similar one into the Fauth altazimuth which has been waiting for two years and a half for just such an able and willing student. This instrument could now be used for the first time since its improvement in 1908. It was tested on August 11 as a zenith telescope on Pi and Iota Herculis.

The accident narrated gave occasion to write the article "The Value of a Cobweb" which appeared first in St. Michael's Almanac of 1912, published in Techny, Illinois, in July 1911, and then in the Omaha Bee on August 6, 1911 and in the Scientific American Supplement<sup>307</sup> of October 17, 1911. Of course, a repetition of this accident was guarded against by putting a wire ring on the guilty<sup>308</sup> eyepiece so that it could not be pushed in too far in again. Some years afterwards it was feared that this wire ring might slip off or be taken off by one not aware of the danger he would incur. The wire was then soldered on. Anybody that now removes the wire and the solder does so at his own peril.

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<sup>304</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "B".

<sup>305</sup> Comma added by hand.

<sup>306</sup> Comma added by hand.

<sup>307</sup> Corrected typo in original, with "t" handwritten above a "y", which is crossed out by hand, to change "Supplemeny" to "Supplement".

<sup>308</sup> Corrected typo in original, with a "c" changed by hand to a "g" and an extra "i" crossed out by hand to change "cuility" to "guilty".

### THE FRONT RETAINING WALL<sup>309</sup>

The front retaining wall, which extends 526 feet along 24th street from California to the alley between Webster and Burt, and has a height above grounds of from four feet at the southern end to twenty-one at the northern, was begun on June 7, 1910 and finished some time in September. The Webster street steps, twenty-nine feet high in three flights, were completed on October 1. The concrete was reinforced, and the wall was given several good anchorages so as to stand firmly against the pressure of the high ground of the front lawn especially in prolonged wet weather. The work cost 17,500 dollars. It was well done, and has never developed any defects.

While at first some members of the faculty condemned the high blank wall as an eyesore to the property owners across the street, sixteen and more years of experience, during which the property across the street has not received the slightest improvement except a little grading in one place, have continuously approved of the wall as giving the resident faculty all the necessary and desirable privacy. To see what this means, one need but stand now at the main entrance or on the circular driveway around the fountain, and see for himself how these places are exposed to the full gaze of everybody on California street for a distance of 150 feet.

Then let him walk a short distance, say only thirty feet, north, and see how private his entire horizon is, even towards California street. The whole of 24th street with its endless succession of cars and trucks and vehicles and pedestrians, is hidden from view, not only by the slope but also by a hedge. In addition, the entire north part of the lawn front is as level as the north lawn, and admirably adapted for walking and strolling. And all these advantages, or rather necessities, would have been made forever impossible by Fr. Dowling's plan.

The walk that parallels the front of the College buildings had since the beginning in 1878 served as a short cut from Webster, or even Burt,<sup>310</sup> street to 25th and California. The height of the Webster street steps diminished this undesirable imposition very considerably, although it did not entirely prevent it. As it was noticed that dubious characters used these steps at night, an iron gate was put on them, which was first locked only at night and then permanently. This secured our privacy all the more. It was also a benefit to the Observatory, as it put it in a corner entirely out of the approaches to the buildings.

### THE OBSERVATORY SECURE<sup>311</sup>

It was said before that retaining the Observatory upon its old site had every advantage but one, and this was the probable shaking of the ground by the heavy traffic on the street. Most fortunately this one disadvantage turned out to be negligibly<sup>312</sup> small. It is only during the few seconds that a street car is passing its nearest point that I can detect a slight quiver in a star image. Nobody else has ever noticed it, not even Professor Swezey, even when his attention was directed to it.

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<sup>309</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "L".

<sup>310</sup> Comma added by hand.

<sup>311</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "E".

<sup>312</sup> Handwritten "ea" above "i", which is crossed out by hand, to change "negligibly" (which is correct) to "negligeably" (incorrect).

This fact does not contradict the statement made before concerning the vibrations on the college roof. There the shaking would be magnified by the height, by the rumbling of the water pipes, by people moving about, by glee club, orchestra and band practice, by the elevator, and by high walls which in all of Fr. Dowling's buildings had their minimum thickness and bracing.

In the Observatory the instruments are all firmly mounted on terra firma, low down, and on their own separate foundations. The vibrations from the street must therefore first attack the massive retaining wall, and then the building, before their exhausted efforts can reach the instruments.

### INTERIOR IMPROVEMENTS<sup>313</sup>

As the finances of the University, since the distribution of the Creighton estate on March 27, 1908, were in their most flourishing condition, and especially as its president, Fr. Magevney, was a person who liked to see everything spik<sup>314</sup> and span, the season was judged to be opportune for the improvement of the interior of the Observatory. The brick work had never been painted, and although the brick was pressed, it was not plastered, and gave the interior a somewhat somber and depressing appearance. The gas pipes, and later on the electric wire mouldings, were too visible and were anything but artistic. The Observatory was now to be renovated in such a way as to deserve the appellation I have always delighted to use, "The Gem of the Institution."

The beginning was made by securing the services of Paul Kosak, a carpenter, after a considerable delay. He was an excellent workman and took great interest in what he did. He had one failing, and he knew it. He liked to talk and gossip, but to his credit be it said, whenever he realized that he had wasted some time, he made up for it by working after hours. He put the doors and windows and all the woodwork in prime condition and made ready for the steel platers who were to follow him. The clumsy exterior and too visible contrivance for opening the transit roof shutters was changed to a simpler interior one. The dome shutter was also much improved. The two pairs of iron pipes which had supported the clocks before the vault was built, were removed entirely.

On August 31 the platers began their work. I had selected what I judged to be the most elegant design that the Carter Cornice Company had to offer, with the assistance, of course, of its own experts. By September 21 the plating was finished.

The third step consisted in Mr. Kleyla's sending me his best painter, Felix Bouwens, who was a real artist. His work extended from September 26 to October 17. How well he did it, has been the universal praise of every visitor that has an eye at all for beauty.

Other interior improvements consisted in a marble switchboard, new curtains on the equatorial and the transit, curtains in<sup>315</sup> the round house so that all city lights can be excluded, brackets for electric lamps in convenient places, connexions at both instruments and on the outside north and south piers for the chronograph and for small and large electric

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<sup>313</sup> In original manuscript, the typed underline does not extend to the beginning "I" or the ending "S".

<sup>314</sup> Typo in original; should be "spic".

<sup>315</sup> "i" handwritten above "o", which is crossed out by hand, to change "on" to "in".

lamps, and so forth. Only one who has for many years done without these conveniences or necessities can form an adequate idea of them.

The final improvement was the painting of the outside of the Observatory, walls and roof and dome and even iron railing, all with the same uniform gray stone color, which at once added immensely<sup>316</sup> to its appearance. Let me add here as a matter of history that from June 1, 1898 to August 29, 1899 the dome had been painted in the colors of the American flag, the sections being alternately red and white and the shutter blue with white stars. This was intended by the College authorities as a sop to the A.P.A's. Whether they accepted it as such, I do not know.<sup>317</sup> The walls also would have been similarly painted if I had not protested against this further caricaturing<sup>318</sup> of a scientific building. I am happy to state that during all this time no photograph was taken of the Observatory.

### THE PHOTOGRAPHIC SHADOW<sup>319</sup>

On Sunday afternoon, May 22, 1910, an event occurred which was destined to make the Creighton Observatory known all over the world, in popular as well as in scientific publications. On that day at 2:50 P.M. a suitcase containing a pistol and a large number of sticks of dynamite was discovered by the police on the porch of Tom Dennison's house at 1507 Yates street. A string attached to the trigger of the pistol came out of the closed suitcase, and was fastened to a screw eye in the porch. A person, not noticing this string, in attempting to lift the suitcase, would pull the trigger and thereby fire the pistol, explode the dynamite, kill himself and wreck the building. That same day Frank Erdman was arrested and charged with the crime.

Tom Dennison was the well-known leader of a political party, although he himself never ran for office. As is natural, he did things that were not right in the eyes of another party. This party then engaged Erdman to secure some evidence against Dennison. This was known quite generally, so that the two men were mortal enemies, and, as witnesses attested later, Erdman swore he would dynamite Dennison some day. Now Erdman was a desperate character, who had already spent several years of his life in penitentiaries and had just escaped from the one in Colorado and was therefore perfectly capable of carrying out his threat.

It was the belief of many people, and was so publicly expressed by the attorney for the defence in the subsequent trial, that Dennison really feared that Erdman would carry out his threat, and therefore placed the suitcase with bogus dynamite on his porch and then called the police. To increase the deception, he hired a man that resembled Erdman to wear clothes similar to those the latter was accustomed to wear, and to walk about the neighborhood with a similar suitcase.

The trial was to begin on December 6. The judge was Lee S. Estelle, and the prosecuting attorney James P. English, both belonging to the<sup>320</sup> faculty of the Creighton School of Law.

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<sup>316</sup> Corrected typo, with an "m" handwritten above, to change "imensely" to "immensely".

<sup>317</sup> Originally this was the end of the paragraph, but handwritten editing marks indicate the following paragraph should be connected.

<sup>318</sup> Typo in original; should be "caricaturing".

<sup>319</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "W".

The attorney for the defense was John O. Yeiser, who although not rated very high for his ability in his profession, in this trial really made a stroke of genius that any lawyer could be proud of. He found out very soon that the only real evidence against his client was the testimony of two girls, Helen and Julia Hageleit, about eleven and fourteen years old respectively, who said they had seen Erdman in the neighborhood of Dennison's house at about the given time carrying the fateful suitcase, and although they did not see his face, they could identify him by his limping walk and the clothes he wore. If this testimony could be made worthless, Yeiser felt sure he could win his case. There seemed to be only one way of invalidating it, and that was in regard to the time the girls saw Erdman. Upon inquiry he found that they had just come from St. Paul's Lutheran Church, at 28th and Parker streets, about a mile from the Dennison home, and had attended a confirmation ceremony there which had begun at about 2 O'clock and ended about three. Further questioning of the girls and of the minister and his wife elicited<sup>321</sup> the fact that the girls had lingered about the church for a while, and that two 4 x 5 inch photographs of the group of seven girls and two boys had been taken, for which the minister's wife made the exposure. In securing copies of these photographs, Yeiser seemed to feel instinctively that he had in his hand the evidence he needed, if he could only make the pictures talk. After a prolonged scrutiny he noticed a rather pronounced shadow in the right upper corner of one of<sup>322</sup> the photographs. He then remembered vaguely that he had read somewhere - it was my article "When was the Photograph Taken?" in the Scientific American of September 24, 1904 - that a shadow in a photograph marked the time of its taking. Quick as a flash then came the hope that the time his picture was taken would be after 2:50 P.M. when the police discovered the dynamite suitcase. Yes, but who would find the time for him? His friends directed him to see me about the matter. This was on December 2. I entered into his ideas with enthusiasm, because I foresaw what scientific glory that would bring to the Creighton Observatory. I went at once with him to the place of the shadow and made some preliminary measurements. Coming back to the college I consulted a shadow diagram I had drawn about six years before and published in The True Voice of November 18, 1904. I said the time was about 3:20, but to be sure I would like to remeasure my lengths more accurately. Yeiser's eyes brightened at once, and he offered to get a surveyor to help me. Although I could have done the work myself, I was glad to have the experience of a professional, who could then also, if necessary,<sup>323</sup> testify to the genuineness of the measurements.

The next day the three of us went to 28th and Parker streets. The surveyor had brought along his transit, level, staff, and steel tape. As it was easy to identify the object that had cast the shadow, we measured the distances the shadow had fallen<sup>324</sup> down, eastward and northward.

On the following day I computed the time. I had four ways of doing this, because in the astronomical triangle made by the zenith, the pole and the sun, I knew one side from the latitude, and a second from the day of the year, and the third side and one angle by measurement. I therefore knew four out of the six parts of the triangle. And as only three are required to be known, I could treat each one of the four in turn as an unknown. This therefore gave me four ways of finding the time. The results were 3h-21m-12s, 3-21-31, 3-21-29, 3-21-33. As the extremes were only 21 seconds apart, I could safely say that the

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<sup>320</sup> "and the prosecuting attorney James P. English, both belonging to the" added by hand.

<sup>321</sup> Likely should be "elicited".

<sup>322</sup> "one of" added by hand.

<sup>323</sup> Comma added by hand.

<sup>324</sup> Likely should be "fallen".

average of the four, 21 minutes, 26 seconds,<sup>325</sup> or 21½ minutes after 3 o'clock, was surely within one minute of the truth.

The problem was scientifically speaking, really only an elementary one, so that any practical astronomer could have solved it. But everyone of them, and myself included, would have hesitated to testify to the results of his computations in the solemnity of a court of law, for fear, not of the mathematical calculations, but of the accuracy of the measurements of the position of a shadow, which, as everybody knows, has a very indistinct border, and this the more, the farther the object and its shadow are apart. What finally induced me to take up the case were two facts, first, I had solved a similar problem before in regard to the time a photograph of our Observatory had been taken (May 2, 1893), and secondly, in this case I had four methods of solving it and these differed less than half a minute from each other. So that, when Yeiser asked me the momentous question, "Will you swear to this in court?" "Yes," I replied, "if I can get President Magevney's<sup>326</sup> approval." This was easily obtained after I had explained matters to him.

On Friday morning December 9, 1910 I made my first appearance in a criminal court. Yeiser had advised me to remain within hearing distance of the telephone bell in the college. He would then call me half an hour before I would be needed and thus not waste many hours in an uncongenial environment. This was in the old court house. I took the oath with due solemnity, and the clock before which I took it, has hung now for many years on the west wall of what was long called the Assembly Room on the first floor of the main building of the college, but is now the reading room annex to the library. I gave my testimony which invalidated that of the Hageleit girls. These girls were probably very sincere, but had very likely seen the dummy whom Dennison was said to have engaged, and who was walking in the neighborhood and not knowing that the police had already a half an hour ago or more found the dynamite suitcase.

The attorney for the prosecution asked me among other things whether I did not know that photographs were very deceptive, that a picture of a man could be inserted into a group so skillfully that experts would testify that the man was really there, while those that were actually in the group would swear he was not there. I granted all that, I said, but "you cannot put the shadows in the right place, because every one of them must give the same time."

It was owing to my testimony especially that the jury, in handing in its verdict, was split six to six. A second trial was therefore necessary. But before it could begin, I had published two articles on the shadow. The first appeared in the World Herald on December 11, 1910, even while the trial was going on, under the title "Tells Exact Time by Shadow in a Photo," and the second in the Scientific American on February 4, 1911, "A Shadow in Court."

The second trial began Monday March 6, 1911. The officers were the same as at the first, except of course the jury. The same witnesses gave the same testimony, and I also was called upon to testify as before. The attorney for the prosecution, James P. English, was at the time the most expert criminal lawyer in the state. He realized at once that his only hope of success lay in demolishing my scientific testimony. As he was on the staff of the Creighton College of Law, and had his son in my class, he had a difficult task before him. I am happy to say

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<sup>325</sup> Comma added by hand.

<sup>326</sup> "e" handwritten above an "a", which is crossed out by hand, to change "Magavney's" to "Magevney's".

that he performed it in a masterly manner without the least offence. He did what was probably the only thing he could do, he belittled, and then made fun of all scientific accuracy, especially in regard to weather predictions and to Halley's comet, which had just then caused such a stir. He was full of sarcasm for his opponent Yeiser, and with his witticisms kept the jury in a continuous roar of laughter during the two hours his speech lasted. I did not hear this speech, but some of my students did and reported it to me. The result was a tribute to his skill in handling a jury, which brought in a unanimous verdict of "Guilty."

It will be of interest here to insert the fact that Tom Dennison and the chief of detectives, Stephen Maloney, come to see me several times at the college with the intention no doubt of shaking my testimony. Once Maloney remarked with emphasis, "Now, we know Erdman did it." "I do not know whether you do or not" I replied, "and I do not care whether Erdman is guilty or not. All I am interested in is the scientific advertisement that my testimony is to Creighton University." And why not? Why should I go to a criminal court and interest myself in such a dubious character as Erdman?

At another time Maloney gave me a copy of what he said was another photograph of the group before the church. It also had a shadow in it, and he wanted to know when the picture was taken. It did not take me long, after he had gone,<sup>327</sup> to realize that this photograph was a trap to ensnare<sup>328</sup> me into a contradiction or into incompetency. It was the first picture of the group taken about twenty minutes before the decisive one at 3:21½. The shadow in it had been partially but clumsily erased, and another drawn upon it. Then the people in the group had the identical positions and postures in every particular that they had in the first picture, which was manifestly a physical impossibility. Further analysis, the details of which I have forgotten,<sup>329</sup> disclosed<sup>330</sup> to me seven reasons why this picture was a fraud. When Maloney heard this, he had enough, and did not care to know the reasons.

The verdict of the jury entailed a sentence of fifteen years in the penitentiary. The defence then appealed to the Supreme Court of the State. As this is not influenced by sarcasm not<sup>331</sup> by rhetoric but by arguments, and generally proceeds very slowly in its investigations, it was nearly a year,<sup>332</sup> February 23, 1912,<sup>333</sup> before it gave its decision. This was to the effect that the prisoner had been sentenced on insufficient evidence. Dennison and Maloney then came to me again and said that my measurements and calculations needed verification. "I have no objection whatever to that" I replied. "But whom shall we get?" they questioned. "Get anybody you like," I rejoined, "but he must be a practical astronomer. Give him a copy of the photograph, and let him measure and compute for himself." "Mention somebody" they pleaded. "Well, go to any observatory. Swezey in Lincoln is the nearest. Perhaps he will do it."

And they went to Lincoln and got Swezey." But as his computed time differed only twenty-nine seconds from mine, they gave up and nulled<sup>334</sup> the case. Erdman was then set free. But his freedom did not last long, because the sheriff from Colorado at once laid hands on him

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<sup>327</sup> Comma added by hand.

<sup>328</sup> Typo in original; should be "ensnare".

<sup>329</sup> Comma added by hand.

<sup>330</sup> "i" handwritten above "e", to change "desclosed" to "disclosed".

<sup>331</sup> Likely should be "nor".

<sup>332</sup> Comma added by hand.

<sup>333</sup> Comma added by hand.

<sup>334</sup> May have intended this to be "nulled".

and brought him back to the penitentiary to serve our his unfinished term of two years. When these were over he was liberated. He passed through Omaha, but did not come to see me. Whatever my motives were towards him, and of these he had no direct evidence, as an actual fact I saved him from fifteen years in the penitentiary. And that was at least worth a personal word of thanks.

During the time that the Supreme Court was investigating the details of the Erdman trial, the first anniversary of the taking of the photograph, May 22, 1911, was approaching. I went to the place at 28th and Parker streets a few days before and noted the positions of the shadow at 3:21½<sup>335</sup>. On the anniversary itself, May 22, I could not go there because our great fire had occurred only two weeks before and the Assistant City Electrician, Percy McGough, wanted to inspect the wiring in the college on that afternoon. On the following day I saw the shadow at the given time, and then had the supreme satisfaction to know that on the anniversary itself its position must have been so close to that it had on the photograph that my computed time could have been hardly more than fifteen seconds in error. I now had another argument in my possession, one that would convince any jury and outweigh in their minds all the mathematics in the world. And as the shadow would be in the identical spot at 3:21½ on every May 22, I could safely defy the world and challenge everybody to come and see for himself.

I did not know until more than ten years afterwards that Maloney saw the shadow on the day of the anniversary itself and found it to be as accurately at the assigned place as anybody could desire.

On the 23rd or 24th I telephoned the good news to our three city dailies. One of them printed it at once on the 25th. English saw this and promptly called me up and said I was trying to influence public opinion in favor of my side before the Court had decided the case. Of course, I apologized for whatever indiscretion I had been guilty of<sup>336</sup>, and at once begged the other two papers not to publish the item. And they courteously did not.

I felt all along that many well-intentioned and otherwise learned people, to whom astronomical and mathematical methods were unintelligible, had some doubts lingering in their minds about the possibility of my finding the time a photograph was taken from the position of a shadow in it. While they felt convinced that I would not knowingly testify to a falsehood or to an impossibility or even to a probability, still, they thought I might be mistaken. "It cannot be done." Even the five judges of the Supreme Court, whose decisions I read later on in print,<sup>337</sup> did not understand my scientific testimony. Four of them made no reference whatever to it, and the fifth mentioned it only lightly and put it among the other and ordinary testimonies.

A public appeal to a fact which anybody who wished to could verify for himself, was the only practical and decisive answer to such doubts. Accordingly, when the second anniversary, May 22, 1912, was approaching, I published in the World Herald on the preceding<sup>338</sup> Sunday May 19th a short article which the editor entitled "Shadow Will Be There, Says Father Rigge." It reproduced the original photograph with its shadow, and concluded with

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<sup>335</sup> Colon handwritten over hyphen to change "3-21½" to "3:21½".

<sup>336</sup> Likely should be "of".

<sup>337</sup> Comma added by hand.

<sup>338</sup> Typo in original; should be "preceding".

these words: "Next Wednesday, May 22, will be the second anniversary of the taking of the photograph. Within one minute of 21½ minutes after 3 o'clock the shadow will be in exactly the same position it occupied at the time the photograph was taken. It was there last year at that time, and it will be there each anniversary as long as the church stands. Anyone interested in the matter may go to 28th and Parker streets and verify the fact for himself."

When I came to the place shortly before the appointed time, I was delighted to find that a class of students had preceded me, and especially that the Omaha Daily News had sent a reporter and a photographer to the scene. No other people were present, although I had advertised the fact with sufficient prominence and had even sent a copy of the paper to Estelle, English, Yeiser, Dennison and Maloney. At my suggestion the photographer made three exposures, the first at 3:20½, a minute before the computed time, the second at 3:21½ exactly on time, and the third, at 3:22½ a minute after. How accurately the middle picture gives the original position of the shadow that it has on the photograph taken two years before, and how the other two show its progress during the minute before and after, can now be verified at any time by any person.

This triumph of science and this glory of Creighton University deserved and received the universal admiration and praise that has ever been poured upon it. Passing over the accounts given of it in the Daily News the day after and in the other local papers soon thereafter, and in the newspapers and popular periodicals all over the country and in many parts of the world, I will mention only the more prominent and semi-technical journals that have given space to it.

According to the sound principle which experience teaches one very soon, "If you want a printed account about yourself or your work to be correct, write it yourself," I published in the Scientific American on July 20, 1912 the article, "<sup>339</sup>"A Shadow in Court" - The Sequel" with the four pictures, the first taken in 1910 and the other three in 1912. This article, like those in the same journal on February 4, 1911 and September 24, 1904 were translated into French and reprinted verbatim with their illustrations in Photo-Revue and Photo-Magazine of Paris, France, under dates of March 5, 1905, March 26, 1911, and November 17, 1912.

Father Hagen, director of the Vatican Observatory, wrote an able article about the occurrence in the Stimmen<sup>340</sup> aus Maria-Laach, in 1913 Part 1, under the title "Ein Gerichtsurteil im Widerspruch mit der Astronomie," (A Court Decision in Opposition to Astronomy.) In the last paragraph he makes an apt allusion to C. G. Abbot, who in his book on "The Sun" 1911, gives the usual false account of Galileo and his condemnation, and remarks on page 1 "How fortunate we are to live in the present age." Fr. Hagen says: "I wonder if Erdman realized this good fortune, when in spite of four mathematical proofs of his innocence he was condemned to fifteen years in the penitentiary. Galileo had no proofs whatever for his opinion, least of all mathematical proofs: and in this particular the wrong decision of his judges is more intelligible than that of the twelve jurymen in Omaha."

From December 26, 1912 to January 5 following, the American Association for the Advancement of Science, as also the Astronomical and Astrophysical Society of America (which later on abridged its name to the American Astronomical Society), and many other scientific societies held meetings in Cleveland, Ohio.

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<sup>339</sup> First quotation mark added by hand.

<sup>340</sup> In original manuscript, the underline does not extend below the first letter, "S".

In the Astronomical Society I read my first paper, which was of course on the photographic<sup>341</sup> shadow, under the title “Astronomy in the Civil Courts.” E. C. Pickering, the director of the Harvard College Observatory and president of the society, introduced me and my subject with the remark that astronomy was quite commonly regarded by the public as a theoretical and impractical science, but in this instance had once more proved itself to be of great practical utility even in such an unexpected place as a criminal court. I then proceeded to explain briefly how I had been able by four different methods, to compute the time the original photograph had been taken, and then projected the four pictures on the screen. The paper was so well received that C. A. Chant, secretary of the Royal Astronomical Society of Canada, engaged me to write up the subject for the journal of his society. It appeared therein in the March-April number of 1913, under the title “Saved by a Shadow.” In this article I gave all the data and descended into more scientific details. Amongst others I answered the difficulty that a few astronomers had mentioned, that as the year, which is measured by the sun’s motion north and south, and the day, which is<sup>342</sup> measured by its westward motion, are incommensurable (that is, as there is no whole number of days and no definite fractions of a day in a year), the sun can never again simultaneously have the very same annual and daily positions, so that as a consequence it can never again occupy the same point in the sky and cast shadows in the identical spots. While I granted that in theory the objection was well taken, I proved that in practice it was of no consequence. With the probable error of one minute that I had set, with the fact that a shadow is always bordered by a penumbra which makes it difficult to locate with precision, and lastly with the fact that the original photograph is on a scale less than one-fiftieth of the reality, I was sure that not even an expert astronomer would hesitate to pronounce the two photographs of the shadow of 1910 and 1912 as perfectly identical as would be necessary to convince any jury, and that the same identity would be shown on any anniversary whatever.

Professor Pickering in particular was so enthusiastic about this shadow problem, that when he went to Europe in 1913 and attended astronomical meetings in Bonn from July 30 to August 5, in Hamburg from August 6 to 9, and in Birmingham on September 10, as is usual under these conditions, he and his listeners got some of the details wrong. The Observatory, an English astronomical journal, mentioned the matter at least four times.

Arthur B. Reeve in his story about “The Campaign Grafter” incorporated the shadow bodily. He did the most prudent thing that one not conversant with such computations could do, he used the identical data and did not even dare to change my feet into yards or inches. Whole expressions were copied verbatim.

The photographic<sup>343</sup> shadow has always been a most alluring subject to the members of the press. Periodically when they run out of matter and something or other happens to bring me again into public notice, they must rewrite the story of the shadow. When the Royal Photographic<sup>344</sup> Society of Great Britain held its sixtieth annual exhibition of photographs in London, lasting from August 23 to October 2, 1915, invitations to send in remarkable photographs were published in all scientific journals. In response I forwarded photographs of the<sup>345</sup> shadow and of the Panoramic Pictures taken from the Observatory on August 22, 1913

<sup>341</sup> “photographic” handwritten above “Erdman,” which is crossed out by hand.

<sup>342</sup> “measured by the sun's motion north and south, and the day, which is” added by hand.

<sup>343</sup> “photographic” handwritten above “Erdman,” which is crossed out by hand.

<sup>344</sup> “ic” added by hand, to change “Photograph” to “Photographic”.

<sup>345</sup> “Erdman”, which appeared in the original typed version, is crossed out by hand, to change “the Erdman shadow” to “the shadow”.

together with explanations. Harold J. Shepstone, author and journalist, was so much interested in the shadow pictures that he wrote to me for further details and asked leave to publish the article "The Saving Shadow" which appeared in The Wide World London, in March 1916. In usual English fashion he prided himself on this as the first publication of the matter in a popular journal.

The last write-up with pictures to my knowledge that has appeared was in the University magazine "Shadows" in May 1923. I must commend the author Lawrence H. Brown, for doing what is never done by writers who "know it all," and that is submitting his manuscript to me before publishing it. The result is of course that I can guarantee its accuracy. The same good testimony I give freely to Gerard C. Griswold, of the World Herald, who wrote-up my Golden Jubilee on July 14, 1925.

To conclude this rather long account of the<sup>346</sup> shadow, it will be of interest, or perhaps rather a disappointment, to add that verifications of the position of the shadow at subsequent anniversaries were rendered impossible by the tornado of Easter Sunday, March 23, 1913, which demolished the entire building. The original negative however is safe in the Observatory.

#### WIRELESS<sup>347</sup>

As the first wireless signals were telegraphic, inasmuch as they consisted of dots and dashes.<sup>348</sup> I took no interest in them because I was too old to hope ever to become proficient in them. A second reason was that I did not want to waste my time on what I considered a useless fad. But when the subject assumed an astronomical phase, I at once changed my attitude.

It came about in this way. On August 25, 1913 a circular letter was received from the Naval Observatory at Washington, D.C., stating that from October 1 to April 15 of the next year a long series of wireless time signals were to be exchanged between the Arlington station near Washington and the Eiffel tower in Paris, and that all astronomers within receiving distance of either of these stations would thus have an exceptional opportunity of determining their longitude with the greatest precision.

The first thing I did accordingly was to consult Dr. F. H. Millener, who was then generally acknowledged to be the greatest expert in wireless in the city. He suggested to me to string six parallel stranded wires, two feet apart and two hundred feet long, and to raise them on steel masts thirty or forty feet above the college roofs, together with burying five feet deep in the earth an elaborate copper ground connection. While he guaranteed this outfit to be most satisfactory, he was frank enough to admit that the flimsy wiring of a youthful amateur might work equally well in the reception, at least, of signals, which was in this case really the only requirement. As this elaborate construction would cost over six-hundred dollars and would moreover be very conspicuous, I was not in a mood to act precipitously.

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<sup>346</sup> "Erdman", which appeared in the original typed version, is crossed out by hand, to change "the Erdman shadow" to "the shadow".

<sup>347</sup> In original manuscript, the typed underline does not extend to the beginning "T" or the ending "W".

<sup>348</sup> Likely should be a comma.

As has happened to me so frequently in my life, Providence came to my help in an efficient manner and at an opportune time. George G. Gerhard, 1710 Dorcas street, of his own accord presented me with a complete wireless receiving outfit, and William Reinhardt, another youthful amateur, kindly adjusted it for me after I had strung first one, then two, and finally four, almost invisible wires from the top of the college tower to various distant parts of the roofs. With this simple installation, whose most vital part was a galena detector, and which practically did not cost me a cent although it entailed several hours of labor, we heard the principal stations all over the country from the Atlantic to the Pacific and from Canada to the Gulf and even to Panama. Its most elegant scientific feature was that no power of any kind was required, such as a converter attached to the electric current, or even a single dry cell. For many years the Arlington time signals were heard with it distinctly almost every day (except Sundays and holidays) at 9 P.M. and sometimes also at 11 A.M.

On December 8th I made my first wireless determination of the longitude. The method was briefly this. At Arlington there was a clock, or at least a kind of a clock, that sent one hundred and one signals in one hundred seconds, so that each beat would gain one one-hundredth of a second on the home clock. Once therefore in one hundred seconds the two clocks would be coincident. If a mistake of one second was committed in noting this coincidence exactly, the error in the time would really be only one one-hundredth of a second.

My wireless station was in the northwest corner of the physical cabinet, to which I had run the wires from both clocks at the Observatory. In setting a stopwatch to the beats of the solar clock, I had practically its own face before me, so that I could see the seconds and was not under the constraint of counting them and thus incurring the risk of error and worry. Another great advantage was that the clock signals came early in the evening, so that when storms or the inconsiderate interferences of local amateurs prevented their reception, I did not need to go to the Observatory to observe the transits of stars.

The American and French astronomers had divided themselves each into two parties. While one American and one French party was in Washington, the other American and French party was in Paris. All used perfectly similar apparatus and instruments, fitted out of course with the latest refinements and accuracy. After observing thus for three months the parties exchanged places, the Washington men going to Paris and vice versa, and then continued their work for another three months.

The results of this campaign were published in 1916 in the Appendix to Publications of the United States Naval Observatory, Second Series, Volume IX. The probable error is less than one three-hundredth of a second of time, so that the relative position of certain fixed points in the Observatories of Washington and Paris is uncertain by about the length of a yard.

In this Report there is also a list of the American Observatories that actually participated in the work and that communicated their results to the Naval Observatory for publication. This list is rather small, containing, as it does, only seven observatories, but that of the Creighton University is among them. They are: (1) Case, Cleveland, Ohio; (2) Columbia University, New York; (3) Creighton University, Omaha, Nebraska; (4) Drake University, Des Moines, Iowa; (5) Elgin, Elgin, Illinois; (6) Illinois Watch Company, Springfield, Illinois; (7) Flower, University of Pennsylvania, Philadelphia, Pennsylvania. Along with the name of the Observatory are given the names of the astronomical observer, the radio observer, and the computer, as well as the number of nights on which observations were made, and lastly the

resulting longitude. The largest number of nights is twelve, the next are nine and eight, then two with four (one of which is the Creighton University) and two with three.

The first wireless determination of our longitude in this series was, as said before, made on December 8th, 1913, and the others on January 23, February 2 and 3, 1914. Having on each night found the corrections to our clock by star observations, it was only on October 19, 1914 that I received those of the Washington clock and could thus know the longitude. Although my own observations were satisfactory enough, there seems to have been some systematic error somewhere which made this wireless determination inferior to that of the telegraphic ones of August 5, 6, 7, 1887. Someday I or one of my successors may discover this error, just as happened to me on February 12, 1923 when I found a mistake I had made at the very beginning of a long computation on August 22, 1886, thirty-six and a half years before.

However, any student that is interested in the wireless determination of his longitude now has this opportunity on almost every clear night. Wireless time signals are now so plentiful and so conveniently received, and that even automatically on a chronograph, that it is not at all likely that any astronomer would now use any other method.

If the reader would like to have a few more details in regard to the wireless installation at the College, he may find it in the Creighton Chronicle for November and December 1913, February 1914 and October 1916, as also in Popular<sup>349</sup> Astronomy in December 1913 and January 1914.

My interest in wireless was confined to the daily time signals. Towards the end of my regency in the physics department, speech and music began to replace the telegraphic dots and dashes, and broadcasting stations suppressed the interfering and clattering amateurs. I doubt if I would now devote much time to wireless. Speeches and music and singing and the like are too monotonous for my taste. Trying new "hook-ups" does not appeal to me as it did to my successor Mr. Perk, who liked nothing better than to completely dismantle his apparatus and pull out every wire, and then wire it all over again on a new plan.

#### MASS AT THE OBSERVATORY<sup>350</sup>

On Sunday October 6, 1918 the Observatory was supremely and exceptionally honored by the Holy Sacrifice of the Mass which was said on the upper level west of the round house. It was celebrated at 8 o'clock by the pastor Fr. McNeive, and was the only one ever said there. The reason for this unusual honor was that, on account of the rapid spread of the Spanish influenza at the time, all in-door gatherings had been forbidden by the city health authorities. Although the people had been notified only after 7 o'clock the night before, there was a large congregation present which packed half the available space on the north lawn.<sup>351</sup> The altar was a long table tastefully ornamented with palms, and the vesting place was the transit room. The weather was ideal.

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<sup>349</sup> In original manuscript, the typed underline does not extend to the beginning "P".

<sup>350</sup> In original manuscript, the typed underline does not extend to the beginning "M" or the ending "Y".

<sup>351</sup> As originally typed, the paragraph ended here, but handwritten editing marks indicate that the following two-sentence paragraph should be combined.

On the following two Sundays mass was celebrated just outside the main entrance of the college. On October 27 even this outdoor gathering was prohibited, but by the end of that week the ban was entirely removed. For further particulars see the chapter on “During the War.”

### VISITORS<sup>352</sup>

The visitors to the Observatory may be divided into two classes, distinguished and ordinary ones, understanding by the first professional astronomers or persons otherwise high in social standing.

### DISTINGUISHED VISITORS<sup>353</sup>

It may be taken for granted, of course, that our great benefactor Mr. John A. Creighton, came to the Observatory frequently, either alone or in company with friends he had brought along.

As no record was kept, to my knowledge, of what transpired at the Observatory except what I myself jotted down in my private notes and only in 1909 transferred and continued in a special notebook, I can speak only what came under my own personal observation. With this limitation, the first professional to come to our Observatory was Professor G. D. Swezey, of Lincoln, on May 4, 1900. His object was to determine his personal equation with me after a telephonic exchange of signals for longitude a few nights before. The circumstances of this event have been given already.

On November 29, 1912 Professor Swezey came again, this time to try out our transit to see what an instrument of that size could do as he was contemplating the purchase of a similar one for his own observatory. He handled our transit in professional style.

The second great man to visit the Observatory was Fr. José<sup>354</sup> Algué<sup>355</sup>, director of the famous Manila Weather Observatory. While his specialty was rather meteorology than astronomy, he had distinguished himself in the latter while at the Georgetown College Observatory in the design and use of a novel zenith telescope, which permitted the simultaneous observation of two stars, one north and the other south, but at equal zenith distances, one directly, and the other by reflection from a basin of mercury. For this purpose he had mounted two equal telescopes so that they faced in opposite directions in the same tube, while their common focus was in the middle. A small photographic plate was placed in contact with an equal and fixed one of ordinary glass on which the instrumental meridian was drawn, so that the light of one star passed through this glass to reach the photographic film, and the light, of the other passed through the glass of the photographic plate itself. This ingenious instrument was tested at Georgetown and then taken to Manila, where however the weather service was so absorbing that it<sup>356</sup> has never yet been put to actual use, like the great nineteen inch equatorial, the largest possessed by the Jesuit Order, for which no astronomer could ever be spared.

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<sup>352</sup> In original manuscript, the typed underline does not extend to the beginning “V” or the ending “S”.

<sup>353</sup> In original manuscript, the typed underline does not extend to the beginning “D” or the ending “S”.

<sup>354</sup> Accent mark added by hand.

<sup>355</sup> Accent mark added by hand.

<sup>356</sup> Likely should be “it”.

In meteorology Fr. Algue has done even greater work. Barely to mention his weather predictions, without which no ship captain dares to leave port, he has invented an instrument called the barocyclonometer, which enables a sailor to find the direction and distance of a storm center, and which is said to have already saved a million lives.

At the time of his visit to our Observatory on June 20 and 21, 1904 he was enroute<sup>357</sup> from the World's Fair in St. Louis, where he had installed a big display of the Manila Observatory, with a large hundred-foot relief map of the Philippine Islands, to Manila, whither he was conducting FF. Vilallonga and McGeary, the latter of whom was to be his assistant.

The mention of the World's Fair in St. Louis brings to my memory the week called the week of Scientific Congresses that I spent there from September 18th to the 24th. I must say I was not a little surprised at Fr. Dowling's generosity, but I gladly give him the credit that is due him. And I am sure I made the best use of my opportunity. The chief event to interest me was my being able to attend the sessions of the American Astronomical Society (of which however I did not become a member until December 28, 1911), and best of all, to be taken under Fr. Hagen's aegis and allowed to dine in the "Tyrolese Alps" with all the big astronomers of the United States and several foreign ones, to each of whom I was personally introduced.

The third professional astronomer to visit the Creighton Observatory was Fr. Richard Cirera, director of the Ebro Observatory, near Tortosa, in Spain. This observatory was designed on a comprehensive plan, since it has astronomical, meteorological, magnetic, and seismological departments. It publishes every month the numerical results of its observations, together with a diagram which gives all these in graphic form, so that if one has a theory that certain weather conditions, earthquakes, or other phenomena have an intimate connexion with certain others, it is easy to compare their curves and see if their maxima coincide, or the like. Fr. Cirera came on August 22, 1910, and departed the next day for the International Solar Conference which was to be held at the Mount Wilson Observatory, near Pasadena, in California.

On September 15 following, Fr. A. Cortie, of the Stonyhurst College Observatory, in England, passed through Omaha on his return from Mt. Wilson. Fr. Cortie was in his day (he died in June 1925) the greatest living authority on the connection between sun spots and terrestrial magnetism. He did great work also on the spectra of stars, and wrote many papers in astronomical journals. He was a prominent member of the Royal Astronomical Society, and of many others. Both Fr. Cortie and Fr. Cirera happened to come at a time when the interior improvements of the Observatory were going on, so that they could not see our instruments to advantage.

Another great man to honor our Observatory with his presence was George W. Ritchey, of Mount Wilson, who arrived on March 2, 1911, and gave a lecture in our auditorium on how the Mount Wilson Observatory was built and on the work it had already done. Professor Ritchey was originally a structural engineer, and as such had designed and built the mounting for the sixty-inch mirror, then the largest in the world, which he had also personally ground to perfect shape. He then, of course, tested his telescope on the hitherto inaccessible small objects in the heavens, and by his skill obtained the most superb photographs, many of which he exhibited on the screen in our hall. Professor Ritchey acquired even greater fame later on

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<sup>357</sup> Typo in original; should be "en route".

when he constructed the Hooker telescope on Mount Wilson with its hundred-inch mirror. He is now (1926) engaged in figuring a still greater mirror for an observatory in France.

On June 6, 1915 Professor Joel Stebbins visited our Observatory. He had been a student under Professor Swezey in Lincoln, and when I first met him in that capacity, it took me only a few minutes to see that he was made of the right metal. He became director of the Illinois State Observatory, and is now director of the Washburn Observatory, in Madison, Wisconsin. His title to renown rests on the minute light variations he has measured in variable stars with instrumental means. For this purpose he first used selenium, but now employs an exclusively<sup>358</sup> electric method. He has been for many years secretary of the American Astronomical Society.

Another great man that came to see us was Prof. J.A. Parkhurst of the Yerkes Observatory. He was then, May 19, 1918, on his way to Green River, Wyoming, to observe the total eclipse of the sun on June 8. On June 17 he paid us another visit on his return trip. Prof. Parkhurst has distinguished himself by his observations of variable stars.

### ORDINARY VISITORS

Quite a large number of persons of all ages and conditions have enjoyed the pleasure of looking through the Creighton College telescope. Some were old men and women whose first act after having been hoisted in the observing chair to a convenient height, was generally to grab the telescope with both hands and to jerk it out of adjustment. There were children also who either went up singly with an older person or ascended by twos or threes together. A few of the visitors were pretty well informed and had some idea of what they expected to see, while others did not have even the first elementary<sup>359</sup> notions and seemed so dazed at what they beheld that they had not even a question to ask. Some ought to be called downright illiterate, although they went to school, inasmuch as that at looking at Jupiter and Saturn in succession, they could not begin to tell the difference between them until I put the ideas into their heads by asking them about the size, ring, moon, belts, and the like. Some ragamuffins, as we would call them, used to come when they saw the dome open, and I always gave them a peep after the other visitors had been attended to. Besides trying thus to drop an astronomical seed into what might turn out to be very profitable soil, my motive was partly political in trying to court their good will and saving the Observatory with its mysterious<sup>360</sup> contents from their depredations, since a few times, not more than three as my memory goes, a window pane had been broken maliciously<sup>361</sup>, a contingency which is now rendered practically impossible by proper screens.

For all classes of these visitors "eternal vigilance" had to be my watch word, for fear they would inadvertently do great harm by touching parts of the instruments that only an expert would know how to handle. This continued attention embraced especially the observing chair, in which one hundred and fifty pounds of lead (practically only about one hundred

<sup>358</sup> In the original manuscript, this is the end of "Page -63-" of the section. The following page, page 64, is missing. A note card has been inserted in its place that reads "p64 missing noted Nov 28, 1977. For our version here, we have reverted to an earlier manuscript which has been microfilmed and is kept in the Rare Book Room of Reinert Alumni Library at Creighton University.

<sup>359</sup> "first elementary" handwritten above "slightest", which is crossed out by hand.

<sup>360</sup> End of missing page 64.

<sup>361</sup> Typo in original; should be "maliciously".

were effective on account of friction) counterbalanced the weight of the observer. Two pawls on<sup>362</sup> racks facing in opposite directions securely locked the chair in position, until the right one was released for the upward motion by pressing a pedal, and the left one similarly for the downward trip.

The “scientific” method of operating the observing chair, which students understood immediately, was to stand up on the base board of the chair, catch hold of a peg high up on each side, put the right foot on the right pedal, throw the weight of the body on the hands and bend the knees gradually. The chair would then rise as fast as one desired, and when the work was skillfully done, stop at the proper height. Both feet should then be off the pedals. In descending, the left foot was put on the left pedal. When one’s weight was about 150 pounds, the chair would go down smoothly, if it was greater, both hands should grasp the side rails and control the speed of descent by the proper amount of friction. Very light persons would rise without any effort, but had to be pulled down or do it themselves. But especial care had to be taken not to touch the right pedal at the moment of alighting, for then, as there was no weight in the chair, the 150-pound counterpoise might pull up the empty chair so violently as to break the pawl and then, in its uncontrolled uprush, crash into the telescope and wreck it beyond repair.

While the “scientific” method of ascent<sup>363</sup> was not grasped by everybody, the next best one was to sit in the chair, with the right foot on the right pedal, and to pull oneself up with the hands. The effort required to do this, increased of course, with the weight of the person in the chair. Some people, especially the older and heavier ones, seemed absolutely incapable of lifting themselves, even with the hundred pound counterpoise to help them, and these had then to be raised and lowered bodily as so much “dead weight.” When men were available, I used always to commandeer their services, but when the party consisted of women only -- well, let the reader figure it out.

One night Fr. Magevney, the president of the University, came to the Observatory. We instructed him how to operate the chair and showed him by experiment. But as he was rather heavy, and had evidently never practised<sup>364</sup> much hanging on his hands, he could make no headway, and even several of us could not help him. He then got the idea that we were playing a trick on him, left the Observatory in bad humor and, as far as I can recall, never visited it again. But how he, as president of the University, could imagine that some of his own professors would do such an unmannerly and impolitic thing, or as a religious Superior impute such an unworthy motive to any of his own subjects, is more than I can understand.

The greatest vigilance however had to be employed in the descent of heavy people. There was first the continued dread that the occupant of the chair would, in forgetfulness of the order to notify me, intentionally press the left pedal, or do so accidentally, and then fall suddenly with the chair to the bottom, thus running risk of either breaking it or injuring himself or herself internally, and then -- such is the perverseness of human nature -- suing the University for not having the proper safety appliances. There was almost an equal danger when persons of light weight contrary to instructions kept their foot on the right pedal when getting off the chair, for then the chair would ascend and threaten to lift the foot above their

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<sup>362</sup> Could be “or”. In original manuscript, the typist attempted to correct an error by typing an “n” and an “r” in the same spot, but it is not clear which is intended to be the correct letter.

<sup>363</sup> “s” handwritten above a “c”, which is crossed out by hand, to change “accent” to “ascent”.

<sup>364</sup> Typo in original; should be “practiced”.

head. This happened one time when I had a large party consisting of women only. I had left a girl securely seated in the observing chair while I went to the transit room to show what was there to half the party. I heard the chair move, and at once rushed over to it to find the girl already in a horizontal position with a foot on the pedal and going up. The helpless women hardly knew what to do, but they looked “daggers” at me for having such an inhuman contrivance in the Observatory. And all this and in similar cases, against reiterated and reiterated orders and directions! But I learned two lessons there and then, first never to have a party of women only, except Sisters in the summer school who had accustomed themselves to obey orders, and secondly, never to divide any party except when I had a reliable and trained student to manage the big telescope. But even he, and much more so the chair operators required occasional supervision, the latter, as a class, being very unreliable. Showing visitors the moon required therefore about ten times as much mechanical vigilance as knowledge of astronomy.

The reader may ask why I never made that observing chair safe and fool-proof. Well, even after giving the matter much thought, I could never find a practical solution, which did not involve other and worse inconveniences. Nor has any ever been proposed to me.

For the same reason that I performed all the experiments I could in my lectures in physics, I invited the Sisters of the first summer school, 1913, to come in sections and look at the moon. I did that the next year also and for some following ones. But then I realized that I was overtaxing my physical endurance. One hour of lecture with experiments and two hours of laboratory, with from forty to sixty papers to read every day, during the hot season of the year, was enough for one man. So that towards the end of my career I declined to open the Observatory at all, even to one class, because with the way that women keep secrets, that one class would have made it impossible for me to refuse all.

In the beginning I used to admit visitors quite freely. But I soon found out that by far the greater number knew practically nothing at all about astronomy and had not even done any reading in it. I then began to look upon their desire to visit the Observatory as a polite expression of good will towards me and the College. To test their sincerity, I used to tell them that, as the moon at about the time of its First Quarter was the best object to look at through the telescope, they should consult any almanac or calendar, and then telephone to me a few days before that, when I would assign them a given day and hour. This invariably ended the matter for nine tenths of them. The few that did remind me, I then admitted.

Of course, all these applicants imagined that I was in the<sup>365</sup> Observatory every night and all night, and even all day, that I had a telephone within arm's length, and would be highly pleased to admit visitors at any time that they should choose to come, even unannounced. Some did actually foist themselves upon me in this way. Had I no voice in the matter? Was I under any obligations to admit them at all? I was to entertain them for a couple of hours. And what were they to do? Enjoy themselves, and be profuse in thanks! Was my time not worth anything to me and to Creighton University? I could not in decency charge a fee. Other persons not so situated could, and did. Ome<sup>366</sup> man in this city had a five-inch telescope and another a four-inch. I was glad to be able to direct many of my applicants to them. And they made good money in the summer of 1924, when Mars was nearest the earth.

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<sup>365</sup> “the” added by hand.

<sup>366</sup> Typo in original; should be “One”.

But honestly, did I never get any cash for my services? Yes, once, not counting the offers of single cigars which I could not use because I never smoked. The incident was this. Some time before the opening of the Trans-Mississippi and International Exposition in Omaha in 1908, or that of the Greater America in the following year, Mr. Grosjean conceived the idea of buying a telescope, setting it up in the grounds, charging ten cents a peep, and realizing a handsome profit. He came to me to become acquainted with the most interesting objects in the heavens to look at. I showed them to him for three hours. He then insisted on my accepting three dollars from him, because, he said, as this was a business venture with him, it was only fair that he should pay me for my services.<sup>367</sup> Before ordering a telescope, however, he re-examined his case, and found that he would have to secure ten thousand peeps through it just to come out even. As he had no hopes for such a large number, he gave up the idea. His three dollars in cash were thus the only monetary recompense I ever received for my work in the Observatory.

Once I received a fee of another sort. We had two brothers named McWhorter in the college. With their parents they came several times to the Observatory. In return the mother sent up one of the boys at times with the family auto, in the days when autos were still very rare, and invited the members of the faculty to a drive. One night, while in the Observatory, one of the party noticed a little brown jug in which I kept lubricating oil and used also as the material for a joke. He wanted to know what was in it. "Well," said I, "you know it gets very cold in here when the temperature is near zero and the dome is open. And then the poor astronomer needs some refoscilation." "Oh, you have'nt<sup>368</sup> got that in there" he asked somewhat doubtfully. I offered to give him a drink if he would promise to take it. He was, of course, not daredevil enough to do that. "Now, that gives me an idea" said Mrs. McWhorter, and the next day she sent me a bottle of benedictine!

As the Observatory is so prominently situated on the college grounds, it could not but attract the attention of at least some of the students, who then expressed their desire to see its interior and to look through the telescope. When it was at all possible for me, I always showed the instruments to those who came to me during the day time. Inviting them at night had many practical inconveniences and impossibilities. First, a good night had to be selected when there was something in the heavens to be seen. Secondly, except the students who lived in the dormitory nearby, the rest had to come great distances and to make a special effort to do so which they would then forget. Thirdly, the capriciousness of the weather often caused disagreeable disappointments. Fourthly, why should I give so many precious hours to individuals or small groups whose minds, like those of most visitors, were complete astronomical blanks? The net result in practice was therefore that, except for the students in the class of astronomy, very few others ever looked through the telescope. Will the reader suggest a solution? Astronomy is not like the other sciences in that one may do observational or experimental work in it at any time that one pleases and in all weathers.

A few years ago I received a circular letter from Mr.<sup>369</sup> (or shall I call him Prof.?) Earle G. Linsley, of the Chabot Observatory, Oakland Public Schools, Oakland, California, asking me what I did to popularize astronomy, especially to school children. I replied that with my hands full of teaching all day, with extras thrown in, there was little inducement for me to

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<sup>367</sup> In original manuscript, the paragraph ended here, but handwritten editing marks combine it with the next paragraph.

<sup>368</sup> Typo in original; should be "haven't".

<sup>369</sup> Originally read "Mr. C", but the "C" is crossed out by hand.

spend my nights in the Observatory in the self-imposed occupation instructing and entertaining people who, as a class, had never given astronomy a thought before, most of all, children who did not have the first ideas of astronomical things. It was; first, above any man's physical endurance, and secondly such sparse information as I could impart to individuals would be only wasting the energies that I could and was bound to employ in more profitable and necessary things. Then, how could I alone and single-handed attempt to enlighten the tens of thousands of school children in this city?

Now, the man that sent me this questionnaire<sup>370</sup>, is salaried by the Oakland School Board. He has nothing else to do but to entertain visitors at the Chabot Observatory where he has, if you please, a twenty-inch telescope while ours is but a five-inch! Sending the school children to the observatory is most likely the order of the school board, and not his own idea, and we may take it for granted that the children that come<sup>371</sup> have first been instructed by their teachers.

His twenty-inch telescope, which I saw at the Panama-Pacific Exposition in San Francisco in 1915, is by far too big for the purpose. A three-inch will give better ideas to a beginner in showing him the mountains on the moon, the moons of Jupiter, the ring of Saturn, the cluster of the Pleiades and the Milky Way, than a much larger instrument, as I know by experience, because it is only after one is well acquainted with a heavenly body in its entirety, that one can appreciate or even understand the details that a larger telescope reveals.

It would have been immeasurably more practical and productive of greater results, if the money spent on that twenty-inch telescope with its observatory and salaried official, had been used first in purchasing a three-inch telescope for each school, then in educating one or two teachers in each place for the purpose, and in giving them some remuneration for the time and labor they would devote to the children. In this way at any given moment one child in each school could be looking through a telescope, instead of only the one in the whole city at the large instrument. But even after this, how many nights in a year can or will a child come, and what is the net profit its young mind will acquire? Take any institution which possesses a small telescope: how many times in a year is it actually used by the same person? - One of the many modern fads!

After my health had given way in 1922 I had to decline all visitors. The only exception I made was for a few nights at the time of the nearest approach of Mars on August 22, 1924.

### STUDENTS<sup>372</sup>

The students that made use of the Observatory may also, like the visitors, be divided into two classes, ordinary and advanced. By ordinary ones I mean those who were members of the class of astronomy. This was taught five hours a week during the second half of the year in the graduating class, the class of Philosophy, as it was called. It was purely descriptive, of course. And the students soon found out that it was not all poetry, because I explained and required them to give proofs that the earth really turned on its axis, that it went round the sun, and the like. I admitted them to the Observatory as often as I could or they cared to come. I tried to impress upon them, and upon all student visitors, the fact that the Observatory was

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<sup>370</sup> Misspelled in original; should be "questionnaire".

<sup>371</sup> "come" added by hand.

<sup>372</sup> In original manuscript, the typed underline does not extend to the beginning "S" or the ending "S".

primarily built for their education. The time however was too short and their education not sufficiently advanced to enable them to use the instruments, especially the transit, to full advantage. This was done to some extent by the advanced students, practically all of them Jesuits, who came during the vacation months. And some even came several times. Fr. Villiger, a Benedictine from Conception, Missouri, was here the whole school year 1902-03, studying chemistry under Dr. Crowley and mathematics, physics and astronomy under me. The series of advanced students began in 1889 with Fr. Jerome Ricard, of Santa Clara, California, who has since won a world-wide celebrity by his predictions of the weather from the spots on the sun. From that year 1889 until 1926 I have had altogether nineteen different students, from one to five at a time.

While a few of these, as might be expected, had no idea whatever of what they expected to learn, and, of course, departed not much the wiser, and, fortunately only a very few made vacation their first object, many were most excellent, intelligent and industrious. It would not do for me here to mention names.

But alas! not one of them persevered. And while Superiors and myself have been looking about for years to find some one on whom my mantle could fall, my successor has not yet loomed above the horizon.

### SCIENTIFIC SOCIETIES<sup>373</sup>

Membership in learned or technical societies is not of itself a testimony of ability and proficiency. It is at times merely an indication of the length of one's purse, because in practice almost any person may join such an organization and remain in it, if he is faithful in paying his dues. Still, such membership does give one a standing, and is practically required of those who come<sup>374</sup> before the public as writers or speakers. It brings with it also many advantages, such as the ready acceptance of one's articles by all magazines, and especially the personal acquaintance with the great man. For this last purpose of course it is necessary that one should attend the meetings of the society as often as possible.

The great and, one might say, the fundamental scientific society of the United States is the American Association for the Advancement of Science, the A.A.A.S., which is divided off into branches for the individual sciences, and to which practically every American man of science belongs. It generally holds its meetings once a year, and that during Christmas week. Every fourth year an especially large gathering takes place in succession in New York, Washington, and Chicago, and during the other years in various other large cities. While the general assemblies are held mostly in the evening, the sectional ones meet in the morning and afternoon. As there are many sections, and as a large number of affiliated societies meet also during these days, one is forced to restrict himself to only one or a very few of them, if he wishes to reap any advantage from his attendance.

As travelling costs money, there was no prospect of my<sup>375</sup> joining this Association until after the finances of Creighton University had been placed on a secure footing, and the Creighton estate had been distributed in March 1908. Fr. Magevney then proposed the membership to me. Of course, I accepted thankfully and gladly. I was made a member on December 27,

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<sup>373</sup> In original manuscript, the typed underline does not extend to the beginning "S" or the ending "S".

<sup>374</sup> "o" handwritten above "a", which is crossed out by hand, to change "came" to "come".

<sup>375</sup> "m" handwritten above "an", which is crossed out by hand, to change "any" to "my".

1910 at the Minneapolis meeting. I did not attend this as I might have done, principally because I had never been in that city and knew nobody there. This reason however melted away as I gained experience.

The following Christmas week, 1911, the Association met in Washington, D.C. To my great delight I was allowed to go there. I took up my quarters at the Georgetown University, which I had not seen for fifteen years. As Fr. Hagen had been called to the Vatican Observatory by Pius X in 1906, Fr. Hedrick was now director in Georgetown where I had myself been an assistant astronomer for a year, 1895-96, and where I had expected to remain for a long period.

To omit other interesting but irrelevant matters, I found out in a few minutes that the astronomical section of the A.A.A.S. was composed almost exclusively of members of the Astronomical and Astrophysical Society of America, (which later on abbreviated its name to the American Astronomical Society.). I joined this therefore at once, on December 28, 1911. This society however of late holds its annual meeting in August or September, and visits all the large observatories of the country in rotation, but joins in with the A.A.A.S. generally only every fourth year at its large convocations.

The next Christmas week, 1912, I was at the meeting in Cleveland, where I read my first paper. It was entitled "Astronomy in the Civil Courts" and treated of the Photographic<sup>376</sup> shadow, as is mentioned elsewhere in these pages. Two weeks later, January 10, 1913, I was advanced from membership to fellowship in the A.A.A.S.

In December 1913 I was in Atlanta, Georgia, where I had two papers, the first on the Arlington Wireless Time Signals, and the second on Astronomical Panoramic Views from a City Observatory.

In August 1915 I was in California. I read a paper on the Solar Eclipse of 1916 December 24-25, which was to be remarkable in several ways. Of course, I visited the Panama Pacific Exposition the Lick and Mount Wilson Observatories, not to forget my old friend Fr. Jerome Ricard in Santa Clara, and spent two days at the Grand Canyon.

Christmas week 1916 found me in New York, where I showed nine drawings of the solar eclipse whose central line was to pass through the "pin point" of the South Pole on December 13, 1917<sup>377</sup>

In September 1919 the Astronomical Society met in Ann Arbor, Michigan.

During Christmas week 1920 the A.A.A.S. held one of its quadriennial<sup>378</sup> large convocations in Chicago. This was the last meeting I was able to attend.

I joined the Nebraska Academy of Science on April 23, 1911. This meets generally in May every other year in Lincoln, and the intervening ones elsewhere. In 1924 the meeting took place in Creighton University. I attended quite regularly all those that were held in Lincoln and in this city, but not the others.

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<sup>376</sup> "Photographic" handwritten above "Erdman", which is crossed out by hand.

<sup>377</sup> Period omitted in original manuscript.

<sup>378</sup> Typo in original; should be "quadrennial".

While personal acquaintance with those who are working in the same field is the greatest advantage to be gained from membership in scientific societies, the next, and in many cases, the only one is that to be obtained from the periodicals they publish. Most of the organizations realize that, and use their publications as inducements to membership. For this reason I joined the Royal Astronomical Society of England as early as June 11, 1909. Its annual dues are rather high-priced, two guineas, and its Monthly Notices high-levelled, but F.R.A.S.<sup>379</sup> after my name has given me a great deal of prestige.

In 1916 I became a member of the Société<sup>380</sup> Astronomique de France, principally on account of the excellent monthly L'Astronomie. The annual dues were ten francs, two dollars. After the war in 1920 the dues were doubled to twenty francs, but in American money this was only \$1.45. In 1926 I paid only seventy-five cents.

I had been for a little while a member of the German Astronomische<sup>381</sup> Gesellschaft at Fr. Hagen's suggestion. But I left it and would not join again in spite of his pleading, simply because it has no publication that I can use.

In 1920 I joined the incipient American Meteorological Society. Its monthly is still small, but gives promise of good growth.

As the articles in the Astrophysical Journal, which we had been taking for many years, were all of them entirely too technical for our professors, I thought I could invest the subscription price of six dollars to better advantage by becoming a member of the Astronomical Society of the Pacific, whose periodical was within my understanding, and whose annual dues were only five dollars. I joined it accordingly on February 9, 1922. The Astrophysical Journal however made three attempts to keep me on its list, but it had to be content with my excuse.

I was or am still an active member of several societies of lesser importance or magnitude, and an honorary member of some others. I read papers quite frequently at the meetings of all the societies, and lectured to many clubs in and about Omaha, until August 1922. After that I was no longer able to attend a meeting even in the city.

I am sure that my membership in these societies, and especially my attending the meetings and reading papers there, have been of very great advantage to myself and to Creighton University. And I would earnestly advise every one similarly situated to do so likewise.

### WRITING<sup>382</sup>

I am convinced that 99 per cent of the reputation that I am said to have acquired for Creighton University and myself, has been due exclusively to my using my pen. We live in what may pre-eminently<sup>383</sup> be called the age of the press, in which everybody can put his ideas in print. Why should one not then use this powerful weapon for good, to scatter the

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<sup>379</sup> All four periods added by hand.

<sup>380</sup> Accent marks added by hand.

<sup>381</sup> Likely should be "Astronomische".

<sup>382</sup> In original manuscript, the typed underline does not extend to the beginning "W" or the ending "G".

<sup>383</sup> "re-emi" handwritten above "erma", which is crossed out by hand, to change "permanently" to "pre-eminently".

seeds of true knowledge and correct morality beyond the limits of one's class room, to an ever widening circle of readers?

Fired with enthusiasm for the noble work, I began to use my pen early in life, my first article appearing on September 4, 1886. And I am sure that if college publications had existed in my day as they do now, I would have begun more than twelve years sooner. And by word and example I have urged others to enter this glorious field.

The first objection that I had to hear from everybody is that he does not know anything. This I always demolish by saying that, as a teacher, he knows more than his students, and these know more than the general public. Therefore the objection is false. And even if some of the readers should know more, they constitute a negligible<sup>384</sup> minority for whom the article is not written.

The same objection is often made to give a lecture or even a "talk." I well remember the first time I met Dr. Millener, the "wireless wizard" of the Union Pacific. I was introduced to him by Michelsen, the city electrician, just as he was about to give a talk on some electrical subject at the Y.M.C.A. I realized after a few moments of conversation that he had an exaggerated dread of my superior ability, and that my presence would weigh like an incubus upon him. I therefore drew him aside at once and told him that, whatever my knowledge was, he was not to lecture to me but to these ignorant boys, and I promised to support him in everything he said. He then gave a very good talk.

I could never make up my mind firmly as to how I should rate Dr. Millener. To judge from the big mass of literature and the many instruments he had in the room on the roof of the Union Pacific headquarters, and from the way he spoke, he seemed to be well informed on the two subjects he had set his mind to study and to make a practical success. These two were the wireless control of the movements of a distant car, and the wireless telephone with which he intended to put the president of the road in his office into communication with every locomotive engineer on the tracks. He did not attain the expected results in either venture, so that the general public, for which nothing succeeds like success, as well as practically all the technical men in town, used to look upon him as a fraud. However, as Dr. Millener explained to me, the causes for his failures were such as could naturally happen to anybody, and he had also to put up with vexatious delays and refusals, and with many other difficulties and obstacles. To complete this short sketch of him, I must add that he made many promises even of fine instruments, not one of which he ever fulfilled. But he really did help me very much with his directions in regard to wireless telegraphy.

The objection of not having anything to say or to write about is always taken in the sense that the matter presented must be original. This is however no more necessary to a writer than it is to a teacher. The general public, as a rule, is intensely ignorant on the simplest and most fundamental things in every science. Articles on these are appearing continually in our periodicals and newspapers. The timid writer might begin this way, and to his own great astonishment will soon acquire a name for himself. He will be consulted by letter and by telephone and by callers in the parlor, and be asked to explain even more simple things than those he wrote about. This must give him confidence and encouragement.

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<sup>384</sup> Should be "negligible".

Writing on these elementary things which he thought everybody knew, but found out that very few did, will then gradually open the writer's eyes to another fact which his timidity and humility had all along completely concealed from his view. This fact is that, as no two men are exactly alike, he has really a certain and truly original way of presenting an old subject, and indeed is the only one who knows a certain thing because he has never seen it mentioned before, and that in reality he has made a discovery and exceeded his own fondest ambition.

Prudence will now suggest consultation with his friends and with specialists, and confirm the originality of the discovery. He ought then write an article on it for a technical journal and, if possible, have one well known to the editor send it in to him. If it is rejected, the writer may console himself with the thought that the editor must be presumed to be a gentleman and will not mention the rejection to anybody. At the worst, as the paper will be returned to the writer, the editor will no longer have any documentary evidence. Should the editor return the article with suggestions of correcting and even of recasting it, the writer should humbly submit and follow the instructions for the reason that the editor is the best judge of what his readers want.

In practice he will need do this only once, or at least very rarely, because he will then become familiar with the style of the periodical. When the editor then sees that his directions have been followed, he cannot reject the article. Subsequent articles will then generally be received with thanks, and with often only a very few or no verbal corrections whatever. The writer will then be looked up to as an authority on his subject, so that even foreign periodicals may notice him. And he may be sure that whatever he writes henceforth will be read.

What I have just said about the development of a writer is practically a universal experience. Its extreme is also very generally true, that there are some men who are veritable gods in their own specialty, but know next to nothing about most other things. I have come to know several men of this description, so that I have long ago lost my dread of "great men" of the "magni nominis umbra." Their ignorance of elementary things shows itself particularly in matters of religion. The great Edison and Burbank are recent examples of this. If they have a religious bias, it is simply inconceivable according to all the fundamental rules of logic, how an organization as iniquitous as they paint the Catholic Church could exist for even a day.

The second objection made towards writing is want of time. This, of course, is a very valid excuse in many cases. But not in all. We can find time or make it to go to a game or a movie. But these are relaxations. So is writing in its own way. It is as much of a pleasure, at times, as abstract mathematics is, but only to those who are its devotees. Both of these may be irksome now amid then, just as a poorly-played game is. But where there is a will, there is a way. And let me add that never in all my life was special time allowed me for writing, nor on the other hand was I ever accused of having neglected any of my duties on account of it.

A third objection made by some is that they cannot write well enough. This may be true to some extent, but the remedy would be to submit the manuscript to a friend for criticism. In the beginning the whole article may be condemned or the corrections may be plentiful enough to discourage anybody, and I have known some to drop right here. But the object in view is worth the price demanded of it. Try again. History abounds in examples of men who tried again and again to overcome their natural handicaps, and who finally succeeded gloriously.

On the other hand some people are their own worst critics. Nothing that they write or that others write is ever in their eyes fit to be published. My old friend Fr. Hedrick was a typical example. While I was at Georgetown with him in 1895-96 I wrote a series of six articles. When I had submitted the first one to him, he criticized it so severely that scarcely a sentence escaped correction. I followed his directions, however, but when he had slashed the article a second time in the same merciless way, I said to him under my breath. "Hold on, this will never end. You will never get a second chance on any of my writings again." And this same severity he exercised towards himself also. The consequence was that except for a few reports he was obliged to write about the Observatory, he never published anything. An enormous mistake. Nothing that is in print is so perfect that it cannot be improved. And in my own case as soon as I had read most of my own articles in print, I sincerely wished I could have brought in this or that correction.

The hardest blow I received from Fr. Hedrick was when I had rewritten my Georgetown articles in book form in 1917 with the view of publishing them. His criticism was as severe as ever. So much so that I was completely discouraged for six years. Then when my bodily ailments gave me more than abundant leisure, I re-read his criticism. In spite of its severity, I had to admit to myself that it was not unjust, and that every correction was really an improvement. So I girded my loins for the work, followed the criticism as faithfully as I could, but of course did not submit the manuscript to him again. A second critic, whose approval was necessary for publication, was of course enormously more lenient. As I had obeyed the injunctions of both, there was no delay in obtaining the permission to print. I sent the good news at once to Fr. Hedrick. But my letter arrived too late. He had been buried just a few days before. The book in question was the one on "The Graphic Construction of Eclipses and Occultations," which appeared in November 1924.

Fr. Hedrick is not the only one of my friends who would never come out in print unless forced to do so. The result is that their influence for good has not exceeded the limits of their classrooms. And some of these were very gifted men. What a pity!

Monetary remuneration<sup>385</sup> was never my purpose in writing. Fr. Dowling had told me long ago that the reputation brought to Creighton University was worth more than money. Accordingly, although before the end of 1926 I had sent fifty contributions to the World Herald and one hundred and forty-nine to the Bee, the only pecuniary reward I received was one freely offered me by the Bee, my transportation from St. Louis to Atlanta and return to observe the total eclipse of the sun on May 28, 1900. The Bee was always very liberal to me with free copies, but I had often to pay for copies of the other paper.

A few periodicals like the Scientific American and Benziger's Magazine, and even the struggling St. Michael's Almanac, used to pay pretty well in cash. Popular Astronomy, to which I have contributed ninety articles in thirty-one years, put me on the free list of its recipients. At first it used to give me the reprints free also, but now for many years already I have been obliged to pay for reprints in all magazines, the cost for those of one article only often amounting to more than the yearly subscription. The lure of coin therefore was a vain spectre. Still it did help me at times in the hard days, notably in March 1903, when I had received two checks totalling fifty dollars. It was then an easy matter to obtain an

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<sup>385</sup> "u" handwritten above an "i", which is crossed out by hand, to change "remineration" to "remuneration".

appropriation of twenty dollars more and purchase that “king of tools,” the fine lathe, that has done such good work in the college shop ever since.

I always made it a point, whenever I attended a scientific meeting out of town, not only to read a paper there, but especially to give an account of what I did and saw and heard. Thus I wrote four articles on my trip to California in 1915. These writings then reacted on my Superiors, who saw that I was willing to pay for my privileges in the coin that I had. The result was that, if I only had the health, I could have travelled frequently all over the country, and I am sure, gone also to Rome in May 1923 to the International Astronomical Congress, which was attended by astronomers, and even by Jesuit astronomers, from all over the world.

In all my writings I have ever avoided controversy, especially in religious questions. I am convinced that no good ever comes of it because, as the saying is “if you convince a man against his will, he’ll hold the same opinion still.” No matter how clearly one may state his case, an opponent will misinterpret it, not answer a question, and jump to other matter. Unsatisfactory as this is to the contestants, it soon becomes uninteresting and tiresome to the readers, and the editor may print only a part of what is sent him, and stop the controversy at any point. For these reasons I used to ignore attacks on the church in scientific journals, condoning the writer because he had most probably been brought up in these prejudices and took it for granted that everybody agreed with him.

Once a rather vicious series of articles was begun in a scientific journal. I intentionally omit all names and dates, because I do not want to advertise the matter. I kept quiet. A friend wrote to me and urged me to protest. Said I, “why don’t you do it?” Then Fr. Hagen, whose advice I value highly, told me to protest to the editor, but not to the writer. I accordingly wrote a vigorous letter to the editor, who was highly astonished, as he said, that any fault could be found with the statements of the writer. I then wrote him several times and gave him the references. The result was that the writer modified his tone considerably towards the end.

A few, and I am glad to say that there are only a very few, of the great astronomers are intensely bigotted on the Galileo question and say so in print. The worst of these at present is George F.<sup>386</sup> Hale, director of the Mount Wilson Observatory, with its 60-inch and 100-inch telescopes. As an astronomer he ranks very high, but as a reasoner in other matters his mind is that of a child. When I called his attention to some glaring falsehoods he had printed in the Galileo case and asked him for proofs, he said that “Galileo gave ample evidence of the correctness of the Copernican theory, but the sufficiency of this evidence is not the question.” Yes, but what is that “ample evidence?” and if its sufficiency is not the question then how can he be held up to our admiration as having given that “ample evidence?” Does not “ample” mean even more than “sufficient,” and does not “evidence” mean “proof?”

For another false account he referred me to a certain book. It took me several months to get that book. It did contain the incident as he had repeated it, but gave no references whatever. Now, some readers may say they read it in Hale, and he is a great man.

I had asked him point-blank whether he considered Galileo to be a hero when he foreswore his belief in a matter in which he is always said to have been convinced. Why did Galileo not die for his convictions, as the much-praised Bruno is reported to have done? Hale answered:

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<sup>386</sup> “E” changed by hand to “F”.

“In my judgement Galileo was one of the greatest pioneers of science.” Is that answering my question?

From this private correspondence it is evident once more that controversy does not settle a question. It does this good however that Hale will be more cautious in his utterances against the Catholic Church. So will his publisher, to whom I also wrote in the matter.

Finally, the reader will want to know, of course, how many articles I have written. My official list, which includes only those writings which have appeared in print, counts 499 by the end of 1926. They range from the minimum of 100 words to a book of 80,000. Probably half of these are illustrated by drawings or photographs. In many of them the drawing or the map of the eclipse or occultation called for nine tenths of the labor.

I have written two books, one on *The Graphic Construction of Eclipses and Occultations*, and the other on *Harmonic Curves*. If my bodily infirmities had not taken me out of the class room and overwhelmed with enforced leisure, I could probably never have been able to write these books.