

**MINNESOTA STATE WEATHER SERVICE HISTORY
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Despite a brief (c.1883-c.1889) and troubled history, the Minnesota State Weather Service did much to lay the foundation for what has since become a "thick" statewide network of cooperative weather stations. This service (in some important respects a prototype of today's state climatology office) owed its existence largely to the efforts of Prof. William Wallace Payne of Carleton College [Northfield Mn], who (during the early 1880's), acting in concert with the U.S. Army Signal Corps and various Minnesota commercial and agricultural interests, organized a statewide network of volunteer stations, several of which (e.g. Morris) have continued to the present. Although created primarily in response to the needs of Minnesota's burgeoning 1880's agricultural economy, the state weather service was also, in part, a response to a nationwide initiative, viz: the federal government's renewed interest in the voluntary observer program established earlier in the century under the auspices of the Smithsonian Institution and the U.S. Surgeon General's Office. The older network which, regrettably, had been allowed to languish during the years immediately following establishment of the U.S. Army Signal Corps' national meteorological program was resuscitated and expanded in the 1880's (both in response to a growing interest in weather and climate and the promptings of national economic interests which, like their Minnesota counterparts, had become increasingly dissatisfied with the sparse climatological network maintained by the U.S. Army Signal Service during its formative years in the 1870's).

Minnesota's response to various federal and local initiatives came as early as 1880 when Prof. Payne wrote to Alexander Ramsey, then U.S. Secretary of War, requesting the equipping and establishment of a voluntary Signal Corps station at the then nascent Carleton College at Northfield. The request was favorably received and on 1 December 1880, the college was "so designated and a partial outfit of instruments supplied by Washington" with "the remainder necessary to make a complete station....purchased by the college...". Several months later (26 May 1881), John Pillsbury, then governor of Minnesota (probably at the urging of Prof. Payne and others), wrote to Carleton's president (Dr. J.W. Strong) "calling attention to the benefits that might accrue from a systematic collection of meteorological data by the educational institutions of the state..." .

The college responded by asserting that it "had already undertaken that service in the fullest way possible", a claim which, at that point, seems to have had little, if any, basis in fact . In reality, no substantive action appears to have been taken until 1883 when, in a 12 June letter to Prof. Payne, the Chief Signal Officer asked that Minnesota follow the example set by Ohio, New Jersey, Indiana, Illinois, Michigan, Iowa, Missouri, Kansas, Nebraska and Tennessee, states which, he noted pointedly, had each organized a state weather service ("the benefits already received are great and induce me to ask

your cooperation in affecting a similar organization in Minnesota..."). Significantly, however, the Signal Officer's nagging letter did more than repeat an earlier request: it outlined, in addition, a "general plan" of action which, if implemented, would require that "observers in the several counties of the state furnish to the central observer of the state a monthly report of rainfall, temperature and miscellaneous data of interest and benefit...". It further stipulated that "these reports are to be examined [by the central observer] and a summary forwarded to this office and to each individual observer. Newspapers also gladly publish any data given them by the central office..."

The college's response to this letter was undoubtedly positive, prompting the Chief Signal Officer to send a member of his staff (Lt. H. H. C. Dunwoody) to Minnesota to assist in implementation of the proposed plan. After "due deliberation" the college authorities (no doubt at the urging of Prof. Payne) agreed to "undertake the work" (which was assigned to the college's department of mathematics and astronomy). It was further noted that the Chief Signal Officer "requested the director of the [Carleton] observatory (i.e. Prof. Payne) to act as director of the weather service for the state and very kindly gave aid and much personal attention to the organization which was wholly...voluntary..."

Soon after his appointment, Prof. Payne -- probably with the assistance of some of his students and staff -- set in motion an aggressive plan of action which, during the spring and summer of 1884, included trips to "every important town in Minnesota for the purpose of establishing stations with meteorological instruments and making necessary arrangements for regular observations, records and reports...". These efforts appear to have been highly successful, resulting in establishment of "about" thirty five stations in various parts of the state. So far as can be determined, the funding required for establishment and operation of the new network was obtained locally ("prominent towns and cities were induced to purchase standard meteorological instruments") and/or from grants (amounting to about \$1,500) provided by Carleton from its own resources.

Establishment of the Minnesota weather service was accompanied by formulation of a detailed "plan of service". This plan, although never fully implemented, nevertheless reveals much concerning the motives and aspirations of the officials and agencies who conceived and authorized it. Specifically, it called for a central state office, a state director and at least one voluntary observer in each county of the state. The voluntary observers, in turn, were expected to "keep a record of temperature and rainfall and report the same to the central office of the state, at such times and in such ways as the Chief Signal Officer...shall request...". The plan further noted that "county observers wishing to make continuous records of wind force, humidity and the barometer will be aided in all possible ways, both by the state and the [federal] government, for such observations are locally of equal value to those of temperature and rainfall....The state will supply from the Chief Signal Officer...the instruments necessary for...all observations...at greatly reduced cost from catalog prices. These instruments will be compared with government standards...and a memorandum of errors will be furnished to each local observer so that a uniform system of observations is secured (emphasis

added).....The central state office will also furnish free of charge...the necessary blanks, instructions, reports...and other useful information communicated by the Chief Signal Officer...."

The Minnesota plan, however, included much more than a structural blueprint: it provided, in addition, the following list of the "advantages" of a state weather service (a list which, in modern terminology, would be called a "mission statement"): a) "...bringing the benefits of the Signal Service...into every county of Minnesota."; b) "...securing better predictions of weather changes and storms..."; c) preparing Minnesota for a system of storm signals displayed from railway trains...."; d) "...giving every county of the state government standards for temperature, rainfall, wind velocity, humidity, etc.."; e) "...putting means of accurate observation within reach of local agricultural societies (which, in the course of years, must be valuable to any locality in the study and adaptation of cereals).."; and f) "...bringing the science and methods of the Signal Service within the reach of principal high schools in the state, offering teachers and pupils alike excellent opportunities to study a wide range of the applications of science to foster and protect agriculture...". According to the plan, stations could be equipped with thermometers and a rain gauge at a cost of about \$15 and, at a cost of about \$125, "the equipment for a full signal service station could be provided and put in working order."

Minnesota's "plan of service" was approved by the Chief Signal Officer in August 1884 and on 5 September 1884, Signal Corps observer Pvt. David R. McGinnis was promoted to the then newly established position of assistant state weather service director and, in November 1884, was assigned to the state weather service office in Northfield. Unfortunately, however, McGinnis, contrary to the intentions of those who appointed him, soon became the focus of a controversy serious enough to threaten the continued existence of Prof. Payne's fledgling organization. According to a Signal Office report prepared several years after the event, McGinnis "allowed" himself to become "secretly and discredibly" allied with the University of Minnesota in an attempt to take control of the state weather service and to move its central office from Northfield to the Twin Cities. Specifically, this report (which, because it was written by Prof. Payne, probably provides a somewhat biased account of the matter), states that "the University of Minnesota claimed that the state weather service should belong to that institution and a special committee of the faculty, by means rather questionable in courtesy and propriety, strongly pressed its claims with the Chief Signal Officer in Washington....Pvt. McGinnis was...involved in this under the promise (as he said) of gaining a professorship in the University at a salary of \$1,500...This, however, was later denied by officials of the University....A FRIENDLY (emphasis added) conference between the regents of the University and the trustees of Carleton college, though lasting several months, however, resulted in no change....."

During the years immediately following Prof. Payne's 1884 tours and the attendant creation of a statewide climatological network, the state weather service appears to have flourished, both in terms of its scope and reputation. A system of crop and livestock reports was inaugurated in 1885-1886 and, in September 1885, the "state

system undertook the distribution of cold wave warnings...". According to Prof. Payne, the latter responsibility -- which involved the assistance and direction of the Chief Signal Officer -- was undertaken "with extreme caution by the officers in charge, in view of the known uncertainty of data upon which cold wave predictions must be made for the northwest." However, after being tested at five Minnesota stations (locations not specified), the results of the cold wave warning system were found to be "more favorable than expected...". Such comments indicate, of course, that the state weather service enjoyed the confidence of much of the state's business and agricultural community: more importantly, however, they are comments indicating that Prof. Payne had, within a short period of time, created a competent and loyal (although still skeletal) statewide observer network. This group, as described in the service's 1887 annual report, consisted of "men of different professions and businesses and graduates of some of our best educational institutions who realize and appreciate the value of regular observations which tend so much to assist in the study of these [weather] phenomena which have not as yet been made clear and which will enable us to make predictions of hail, thunder and severe wind storms and thus give ample time for protection of life and property...the thanks of the service and special mention is due to the following voluntary observers who have not missed an observation during the past year [1886] (emphasis added): Prof. O. Whitman, Red Wing; D. T. Wheaton, Morris; Prof. H. P. Cushing, Mankato; Pres. R. B. Abbott, Albert Lea; J. Peacock, Sherburne; B. F. Farmer, Spring Valley and C. N. Ainsley, Rochester. The observers of this service receive no remuneration for the duties they perform but in many cases purchase their own instruments besides giving of their time and attention, hence their services cannot be valued too highly. They do the work from a knowledge of the value of the results and a desire to do something for the future as well as the present good of their state...."

In addition to the efforts of these and other volunteers, the initial success of the state weather service depended to a great extent upon the cooperation and good will of the railroad industry. Payne notes, for example, that, for a period of several years during the mid-1880's, Minnesota's major railway companies (viz: the St. Paul, Minneapolis and Manitoba railway; the Chicago, Milwaukee and St. Paul railway; the Chicago, St. Paul, Minneapolis and Omaha railway [for a short time only]; the Minneapolis and St. Louis railway; the St. Paul and Duluth railway; and the Minnesota and Northwestern railway) absorbed much of the expense involved in telegraphic transmission of data generated by the service's observers. Beginning in June 1886, this service was expanded to include telegraphic transmission of daily "indications" (forecasts) to various "flag stations" located in Minnesota and several adjoining states. By September 1886, forty such stations were in operation, all of which, after receiving daily telegraphic forecasts, displayed "indications" flags at depots, post offices and other public places (displays which, according to Payne, were "usually" in place by 0800 hours each day). State weather service reports also noted that railroad officials were "very liberal in giving free transportation to the director and his assistant for all needful travel in the interest of the service..."

At about the same time, railroad participation in the operations of the state weather

service was complemented (overshadowed?) by the expanding role of the St. Paul Chamber of Commerce. Extant documents indicate that, beginning early in 1886, the Chamber provided office space and furniture to the extent required for operation of the service's central office and, in addition, contributed "nearly" \$600 annually to defray printing, travel and other expenses required for maintenance of the observer network and the service's reporting and statistical activities. Financial support was, however, accompanied by transfer of state weather service headquarters from the Carleton campus to the Chamber of Commerce building in St. Paul. According to Prof. Payne's 1886 annual report, this change, for reasons "that need not be given here" [i.e. in the report], was undertaken because "Carleton college deemed it wise to transfer the central station...to the Chamber of Commerce, especially as that influential corporation was willing to take supervision of the service and meet all its needful expenses..." . Although the Chamber's financial support was no doubt welcome, Payne's report may be seen as suggesting, however subtly, that the transaction was somewhat "questionable," perhaps even indicating that Payne himself may have had qualms relative to his involvement in an affair which, as subsequent discussion suggests, appears to have taken place under a cloud of fiscal impropriety. The report may also reflect Payne's fear that the move to then faraway St. Paul, combined with dependance on the Chamber's largesse would erode his role as director of the state weather service.

Such concerns notwithstanding, extant evidence indicates that Prof. Payne continued to be actively involved in the affairs of the service and that, during the year following the opening of the St. Paul office, he, in concert with Chamber officials, began work on a new project which, it was hoped, would greatly improve the meteorological and climatological services provided to Minnesota's commercial, agricultural and transportation interests. According to the Minnesota weather service's 1887 report, this entailed preparation of a "a lengthy paper setting out the needs of the northwest in the matter of improved signal services....". This paper -- prepared jointly by Payne and the Chamber's meteorological committee and presented to the Chief Signal Officer (Gen. A. W. Greely) in the early autumn of 1887 -- was "kindly and favorably considered", prompting Signal Corps officials to establish a branch "indications" (forecast) office in St. Paul's Chamber of Commerce building, effective 15 October 1887 . As noted below, the record further indicates that this service was discontinued after a "trial" of about six months. This action,taken by Signal Corps headquarters was "regretted" by Prof. Payne even if --as he stated in a 19 March 1888 report -- it was an action taken for "good reason". According to Payne's account -- an account which, in retrspect was notably disingenuous -- creation of the St. Paul office was a "wise and useful step and great good resulted from it in the matter of improved indications for daily use in all the northwest...during the six months of trial of this service we know the people came to appreciate it more than ever before, because they could rely on it more certainly than ever before...the only thing lacking in the judgement of the director [i.e. Payne] to have made that service almost perfect was a few more stations and a better telegraph service..." .

In any event, however, failure of the St. Paul indications office project was but one in a

series of setbacks which, any early successes notwithstanding, combined to erode Minnesota's brief, yet fruitful, attempt to create and maintain a state weather service. One of the first and one of the most serious of these appears to have occurred in 1887 when the railroads, now constrained by provisions of the Interstate Commerce Act, were no longer able to provide free transportation for the director (i.e. Payne) and his Signal Corps assistant. According to Payne's March 1888 report, this caused the state weather service "to labor under a serious disadvantage", rendering it "impossible...to make regular and needful visitations to observing stations for the instruction of observers and the examination of instruments...". The same report also complained that the Signal Corps had refused to assist in creation of additional reporting stations which had been requested earlier and which, in Prof. Payne's view, would have made it possible to continue the St. Paul indications office (and, perhaps more importantly, would have enhanced the effectiveness and reputation of the state weather service). Besides contributing to the failure of the St. Paul indications branch, the Signal Corps' reluctance to consider Payne's request resulted in the loss of financial support which otherwise would have been provided by several area railroads ("...this being the decision of the United States officer...the railroads of course withdrew all support...greatly weakening the efficiency of the state service...."(emphasis added).

Extant evidence also indicates that operations of the Minnesota weather service were further frustrated when, as result of actions taken unilaterally by the Chief Signal Officer, responsibility for meteorological telegraphic service was transferred from the railroads to the Western Union Company in New York. According to Prof. Payne, this changeover took place on 25 September 1887 following an agreement whereby Western Union "offered to perform the service at very low rates...". At that time, Payne and other state officials were told that high quality service would continue to be provided: specifically, that state weather service display stations would, consistent with the service provided by the railroads, continue to receive daily "weather messages" in a timely fashion (i.e. prior to 0800 hours each day except Sunday). Unfortunately, however, Western Union performed poorly (providing, what in Payne's terms was "very unsatisfactory" service). The inevitable result (together with other difficulties involving the railroads and the Signal Corps) was significant disruption (and probable demoralization) of Payne's volunteer network and, eventually, erosion of public confidence in the work of the state weather service. Payne, it should be noted, considered the Western Union Company to be greedy, uncooperative and inefficient, doing whatever he could to discredit the company, even attempting to thwart its influence.

In addition to setbacks attributable to Western Union and hampered by provisions of the Interstate Commerce Act, the demise of the state weather service was hastened by a bitter, yet colorful, conflict involving Dr. Payne and the U.S. Signal Corps. This critical juncture in the history of Payne's creation has been thoroughly documented by David Laskin, author of a book entitled the "Children's Blizzard," [2004] an account of the famous blizzard which swept across parts of the Upper Midwest and the Central Plains on 11-14 January 1888 (and which resulted in numerous deaths, many of them children who froze when they become lost in the blizzard's massive, wind driven

"white out" after being released from school as the storm struck). According to Laskin, this conflict followed the opening of the Signal Corps "experimental" indications [forecast] office in St. Paul, an office created by Greely, the then newly appointed and reform minded chief of the U.S. Signal Corps. "Greely," Laskin pointed out, "authorized the experimental ...office in St. Paul during a flush of reforming zeal, though his choice of St. Paul as the location had less to do with reform than with politics and pressure from local interests. Indeed Greely had been lobbied hard that summer by the five prominent businessmen who constituted the 'meteorological committee' of the St. Paul Chamber of Commerce. On August 13, 1887, [the committee] sent Greely a letter strongly recommending that an indications office be opened in [St. Paul] (and not in Chicago, as Greely himself desired) in order to enhance the timeliness and accuracy of cold wave and heavy snow warnings. About two weeks later, a second and even more urgent request arrived on Greely's desk under the....signature of....Payne.....followed up with a personal visit to [Greely's office] in Washington, D.C.It's unclear what Greely knew about the character, accomplishments and aspirations of Payne....."*

"Payne.....was a formidable figure in Minnesota intellectual circles.....Payne acquired at his own expense a three inch Fauth transit circle by which he could measure the positions and motions of the stars and planets and two state of the art Howard and Company clocks. Thus equipped he could determine the time more precisely than anyone in Minnesota.....Payne himself strung the wire that connected the readings of his Howard clocks to the nation's telegraphic network and thus put his Carleton observatory on the map as an official time service. For years the local railroads set their clocks by the signal sent out by Prof. Payne, and starting in September 1881, Payne also relayed the signal for the daily time ball drop by which residents set their watches.....With an observatory at his disposal, it was easy for Payne to add meteorological observations to his other scientific endeavors, and in November 1881 he started taking official thrice daily readings for the Signal Corps.....Two years later Payne became director of the Minnesota State Weather Service....It was in this capacity that he wrote to Greely....about the need for an indications officer in St. Paul....."

"Greely endorsed Payne's proposal and, for a bureaucrat, acted on it with amazing speed. Within a matter of weeks he had selected [Thomas M.] Woodruff for the post.....ordering the lieutenant to 'proceed to St. Paul...and establish, not later than October 20, 1887, an office for the purpose of making weather indications for northwestern states.....The beginning was rough. Woodruff complained that the Signal Corps office on the top floor of the six story Chamber of Commerce building....was too cramped and lacked 'telegraph facilities'....the two staff members already on duty -- longtime observer Sgt. Patrick Lyons and Pvt. Edwin Brandenburg - - were too busy with other tasks to be of much help, and worst of all, the data from other stations that Woodruff needed for making forecasts arrived chronically late or not at all....."

Soon, however, it became apparent that the difficulties encountered in setting up and

maintaining the St. Paul indications office were dwarfed by the aforementioned controversy (or, more accurately, power struggle) involving Prof. Payne and Lt. Woodruff. According to Laskin's account, "The three pages of orders that Greely dictated detailing Woodruff's new responsibilities included clear and detailed instructions regarding his dealings with Prof. Payne: immediately after his arrival in St. Paul, Woodruff was to set up a meeting so that Payne could brief him on ' the general outline of the meteorological network performed by him' as director of the Minnesota state weather service and 'in cooperation with the Signal Service' (emphasis added). The meeting went well. Payne wrote to Greely on October 22 that he was 'pleased' with Woodruff and promised to help him. But relations between the two soured very quickly. By November, they had all but declared war. The conflict flared around the usual issues: power, authority, money, jealousy, rivalry, control of information. To begin with, Payne, after his initial welcome, made it plain that as director of the Minnesota State Weather Service he considered himself to have control over the St. Paul Signal Office, which meant that Woodruff was his subordinate. (emphasis added) 'Professor Payne had quite an idea that I was to report to him,' Woodruff wrote later, 'and was quite surprised when I read him the part of my instructions showing that there was no relation whatever except as to consulting about the establishment of stations.'

"Even more rancorous was their fight over how weather data [were] to be gathered and communicated, for this directly involved Payne's old bete noire, Western Union. The two men met to discuss the matter at Woodruff's office on November 14 and, as Woodruff reported to Greely, Payne 'was anything but pleasant.' Back in August, Payne had written Greely that Western Union might be ' willing to allow' the railroads to send weather messages free of charge, and on the basis of this possibility he urged the general to authorize the opening of twenty new weather stations to improve observation and distribution of warnings...Payne's idea was to expand the..network along the rail lines and get Western Union to foot the...bill.....Now in November, Payne insisted...that it didn't matter what Western Union charged or who had to pay -- the messages must be sent. Woodruff countered that 'as soon as the railroads sent me telegrams of the weather to be used by me in making the gneral predictions just so soon would the Western Union ...claim the government rates, and that if I received such messages they would be a claim against the United States. Whereupon Payne demanded, 'is it any of your business or concern where or how messages came to be provided if they gave you information that you could use in making indications [forecasts]?' ".....From there the men proceeded to bickering about their relations with the railroads, Payne complaining that Woodruff had gone behind his back in contacting railroad managers.....and Woodruff retorting that he was under no obligation to include Payne in these negotiations.....Woodruff added that the State Weather Service would certainly have received funding from the Minnesota legislature the previous winter 'had Prof. Payne not been connected with it.....'".

"Payne proved to be a formidable enemy. But this was just the beginning. Woodruff soon found himself fending off a flank attack from the chair of the meteorological committee of the St. Paul Chamber of Commerce, one Thomas J. Cochran Jr., a local

businessman notorious for his shady practices and high stakes lawsuits.....It wasn't just Cochran -- the entire meteorological committee was boiling with scandal and fiscal impropriety. Woodruff learned of an old rumor that the Chamber of Commerce paid out \$608 to the state weather service in 1886, though no accounting of this sum could be found. And further, Cochran and his cohorts had been circulating a penny postcard to local businesses soliciting 'a contribution of \$5 to the annual expenses of the Minnesota State Weather Service.' The card bore the signature of Pvt. Brandenburg of the U.S. Signal Corps, though Brandenburg strenuously denied having anything to do with the...scheme. In December, Greely dispatched a bluff Irish lieutenant...named John C. Walshe.....to inspect the St. Paul Signal Office. The general promptly got another earful of dirt. Alluding to the 'begging circulars' sent out by Cochran's committee, Walshe reported that 'in some way the impression has been produced that the public service here, rendered by the United States Signal Service, depends on the result of money raised by the people, and is a mercenary affair. This is to be deplored.....Walshe further noted that Western Union officials complained bitterly that Prof. Payne 'is continually opposing that company,' and that St. Paul's 'very honest, painstaking and conscientious ' observer Sgt. Patrick Lyons, 'has complained to me that some time ago, Prof. Payne interfered very much with the working of his office.'"

".....Not that Woodruff himself was blameless in his battle with Payne and the meteorological committee....A career soldier first and a scientist second, Woodruff made a fetish out of executing his orders punctiliously -- even if it meant impeding or sacrificing the pursuit of knowledge.....not only did Woodruff fail to attempt to make his indications available more swiftly and more widely and to expand the network of data gathering stations, he did everything in his power to block these avenues....he had orders from headquarters and he must follow them". Because of his cautiousness (rigidity?), perhaps coupled with his personal dislike for Payne, Woodruff, as noted, had refused Payne's request for the establishment of twenty new stations, a decision which may have contributed to the indication office's failure to warn Upper Midwest residents of the lethal January 1888 blizzard, a blizzard which, following a mild January morning, struck unexpectedly. Had the twenty stations been in operation at the time, the St. Paul office might have received data which would have helped Woodruff and his staff to better understand the developing meteorological situation, allowing the earlier posting of "flag warnings" throughout the area.

Despite problems caused by in-fighting, distrust, inadequate communications and marginal funding, Prof. Payne's organization (so far as can be determined) continued to function as an independent entity until the closing years of the 1880's. And, although the events of its waning years are obscured by a lack of surviving records, extant documentation is, nevertheless, sufficient to suggest that the state weather service ended, ultimately, because it failed to obtain funding from the state of Minnesota. Specifically, the 1887 state legislature was asked to provide funds for operation of the service, a request which "successfully passed" the state senate but failed because the house of representatives adjourned "before having an opportunity to vote... ". Following this setback, the St. Paul Chamber of Commerce (on 24 March

1887) voted to "allow the state weather service the use of their present quarters until the next meeting of the legislature...". Payne's report for the year ending 30 June 1887 (but submitted on 19 March 1888) indicates further that Chamber funding continued through much of 1888 ("...at a meeting of the meteorological committee of the Chamber...a few days ago to discuss the needs of the state service, it was decided to furnish the means necessary to carry on the service during the remainder of the year and to ask the legislature of this winter [probably 1889] for an annual appropriation to defray its expenses hereafter. The friends of the service are hopeful of success...").

The desired "success", however, was not forthcoming and, by late 1890, the state weather service had ceased to exist as an independent entity, its functions soon to be fully assumed by the then newly created U.S. Weather Bureau. According to an 1891 report written by Willis L. Moore, then director of the "federalized" Minnesota weather service, the central office of the former state service was moved from St. Paul to Minneapolis on 23 December 1890 with "Mr. John Healy assigned in charge". Healy, in turn, was "relieved" on 22 June 1891 and replaced by Moore. An assistant director, H. W. Ford, was appointed, effective 21 December 1890.

According to Moore's report, the Minnesota service was maintained "wholly by the U.S. Weather Bureau, the state furnishing no funds whatever toward its support (emphasis added)...". He also noted that "...a deep public interest is manifested in the work [of the service]. When the weekly crop reports are received on Saturday morning it is...usual to see the reporters of the evening newspapers copying the reports from sub-stations as fast as received, so anxious are they to get the full report...These crop reports are published in all the daily and weekly papers of Minneapolis and St. Paul and by most of the county papers throughout the state...". The 1891 reporting network -- a continuation of the system established by Prof. Payne and his associates -- consisted of forty "crop correspondents", eighteen voluntary observers "taking daily observations and submitting monthly reports" and five "regular" stations "forwarding either weekly or monthly reports of daily observations". Three new stations were reported as having been established and one station was discontinued during the year (1891).

Although he was ultimately unable to obtain the support necessary to maintain an independent state weather service, Prof. Payne's efforts, as indicated in Moore's 1891 report, laid the groundwork for the present day Minnesota cooperative observer network. Important as they were, however, Payne's meteorological endeavors appear to have been secondary to his astronomical and educational projects. According to a 9 August 1925 St. Paul Pioneer Press report (written when Payne was "almost" ninety years of age), he was largely responsible for establishment of Carleton college's celebrated Goodsell observatory. The present observatory, named in honor of Charles M. Goodsell, a benefactor of the college, was dedicated on 11 June 1891, the culmination of a campaign inaugurated by Payne in the late 1870's. Soon after its founding, the observatory attained a nationwide reputation, evidence of which includes the American Astronomical Society's decision to hold its 34th annual meeting at Carleton in September 1925.

Also, as noted previously, the observatory -- and Prof. Payne -- also played an important role in late 19th century time keeping activities. The first electronic time signals in the northwest were sent out from the Goodsell observatory in the early 1880's and, if the August 1925 Pioneer Press account is to be believed, Prof. Payne was prominently involved in the controversy which arose when uniform time zones were adopted in 1883. According to the newspaper account, "some Minnesota railway officials were highly skeptical of the new system..." (apparently because they thought, for whatever reason, that the disadvantages of standard time outweighed the advantages of the old "local solar time" system which prevailed in most areas of the country prior to 1883). Prof. Payne, however, was a staunch supporter of the new system and, after numerous meetings was able to convince Minnesota railroad officials that they should support the proposed changes.

Prof. Payne was born in Somerset, Hillsdale county Michigan on 19 May 1837, the son of Jesse and Rebecca Ann Payne. He attended Hillsdale College, obtaining an undergraduate degree in 1863 and a master's degree in 1864. He obtained an LL.B. degree from Chicago Law School in 1866 and, in 1916, received an honorary doctoral degree from his Michigan alma mater. He moved to Minnesota in the late 1860's, serving for several years as Dodge county superintendent of schools and as the editor of "Minnesota Teacher" magazine. He joined the Carleton college faculty as an instructor in mathematics and astronomy in 1871, serving the college in various capacities from that time until 1908 (a tenure, which according to an obituary appearing in the Northfield News on 3 February 1928, was characterized by "...singular vision and ability..."). In addition to his efforts on behalf of the state weather service, Prof. Payne (as noted previously) did much to promote the science of astronomy, efforts which included establishing and editing the "Sidereal Messenger", a journal of popular astronomy (and the forerunner of "Popular Astronomy", a later publication promoted and guided by Prof. Payne and several of his proteges). After leaving Carleton, Payne founded and directed the private astronomical observatory owned by the Elgin Watch Company. He died in Elgin, the victim of heart attack, on 29 January 1928. Survivors included his widow and a daughter.

** Greely succeeded William B. Hazen who, as chief Signal Officer had allowed the Signal Corps station network to deteriorate, both in the quality of observations made and in the personal conduct of the observers themselves.*