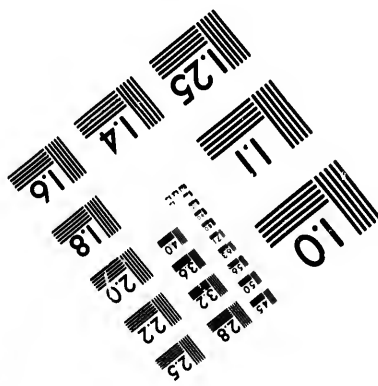
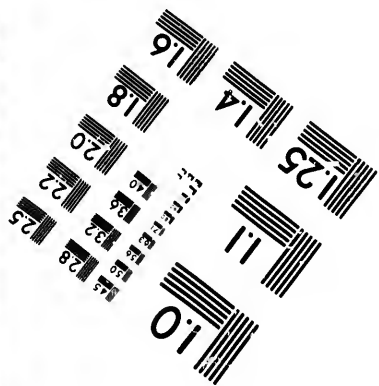
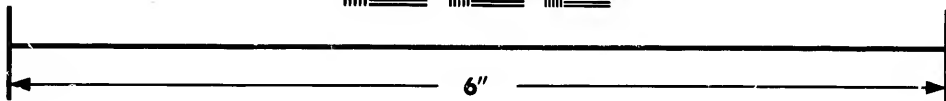
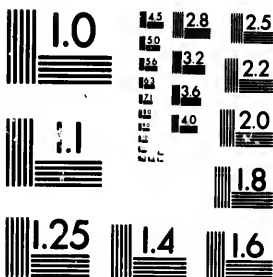


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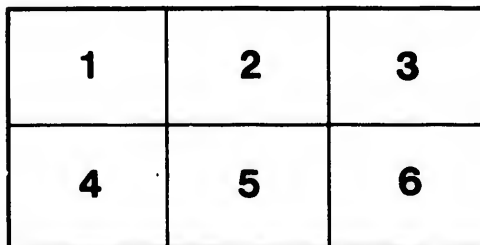
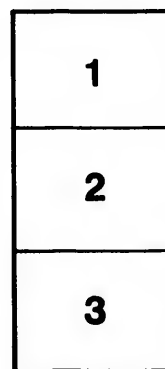
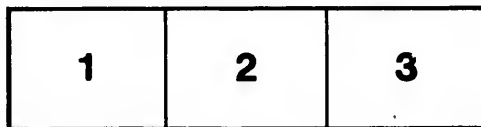
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A

PAPER AND RESOLUTIONS

IN ADVOCACY OF THE ESTABLISHMENT OF A

UNIFORM SYSTEM

OF

METEOROLOGICAL OBSERVATIONS,

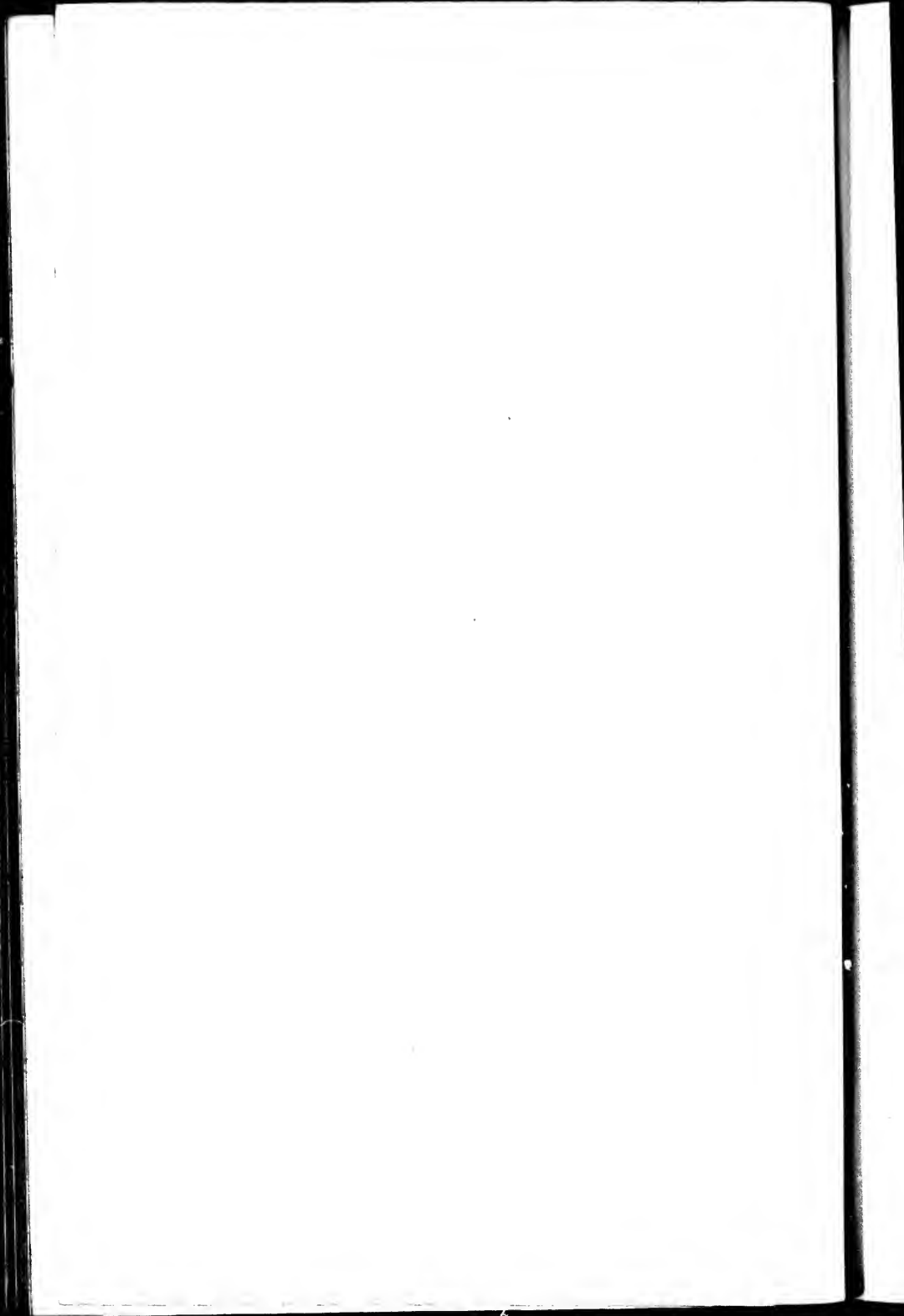
THROUGHOUT THE WHOLE AMERICAN CONTINENT.

READ BEFORE THE METEOROLOGICAL SECTION OF THE AMERICAN ASSOCIATION,
ON THE 30TH OF APRIL, 1858.

BY MAJOR R. LACHLAN,
Of the British Army, now residing at Cincinnati, Ohio.

CINCINNATI, O.:

PRINTED AT THE OFFICE OF THE "CINCINNATUS," COLLEGE HILL;
OSGLEY & SHAIN, STEREOTYPERS AND PRINTERS.
1859.

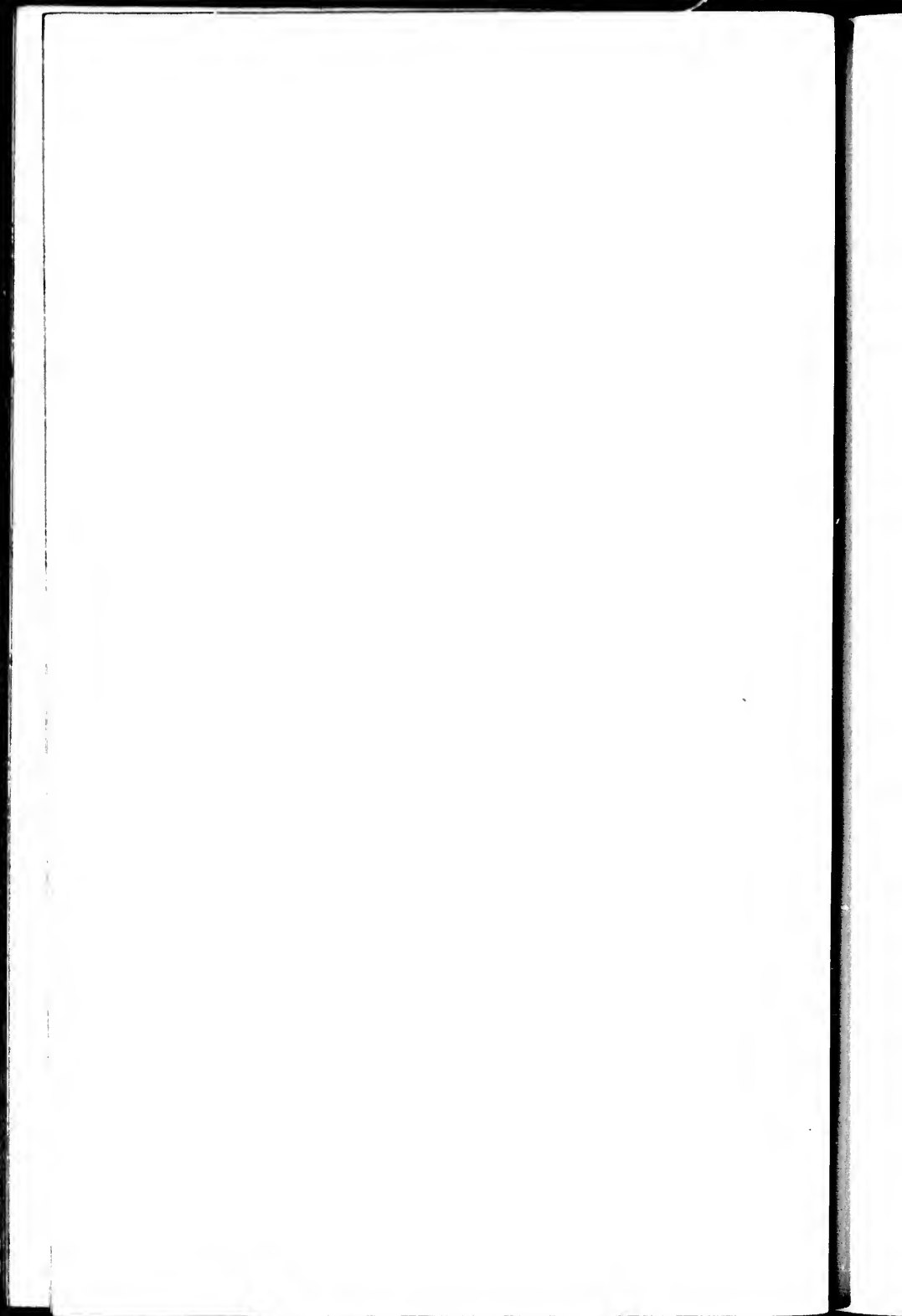


PREFATORY NOTICE.

It having been found, on referring to the recently-published volume of last year's Transactions of the American Association at Baltimore—lately received—that the Standing Committee of that Institution have adhered to their hastily-formed resolution of limiting all notice of a Paper and Resolutions, read by Major LACHLAN, “in advocaey of the extension of Meteorological Observations,” to being only what is termed “printed by Title,” instead of, as hoped by him, being published *in extenso*, with a view to the widest possible circulation, the writer has deemed it due to the universal importance of the object aimed at, as well as to his own zealous though humble exertions in its behalf, to appeal against so mortifying a decision to the impartial tribunal of Public opinion; and in that pardonable, independent spirit, he is herewith led to submit his suggestions in pamphlet form, “*with all their imperfections on their head*,” to the unbiased consideration of men of science at large; not, however, as claiming for his writings any literary or scientific merit, but simply as giving expression to long-formed and well weighed, yet unpretending opinions, on the best means of *agitating* and forwarding one of the most widely-diffused and valuable branches of Physical Investigations that could possibly engage the attention of the leading Philosophical Association on the American Continent.

Resting content with these few introductory words, the writer humbly, yet confidently, commits the following pages to the indulgent perusal of the philosophical reader.

MOUNT AUBURN, CINCINNATI, June, 1859.



ON A
UNIFORM SYSTEM
OF
METEOROLOGICAL OBSERVATIONS.

THE following paper, in advocacy of the American Association, as the leading Philosophical Institution in the Western Hemisphere, taking the very desirable and important step of being the instrument of a strenuous endeavor to set on foot a great systematic chain of simultaneous Meteorological Observations throughout the whole of the American Continent, was read before the Association, at Baltimore, April 30, 1858:

Circumstances having, last year, prevented my laying before the American Association some desultory remarks in behalf of the universal spread of simultaneous Meteorological Observations—as alike of value to the philosopher, the agriculturist, the merchant, and the mariner—I am *now* irresistibly led to lend my humble aid in bringing so important a desideratum to its particular notice, as a natural sequence of what had, on a minor scale, engaged my attention for a number of years, in Canada. I allude to unavailing efforts made by me in favor of the institution of a systematic chain of simultaneous Meteorological Observations throughout British America, to be connected with the meritorious system of similar records in successful operation in the United States. And I am the more encouraged to take this step, from having recently become aware that I shall thereby be only reviving a course of action aimed at by this Association, some seven years ago.* I am, therefore, led to entertain a san-

* By referring to the records of the American Association, it will be found that at the meeting of 1851, "A report was made and a series of resolutions adopted, for extending the system of Meteorological Observations to *other parts of this continent*," among which was one "to memorialize the *Canadian Government* to co-operate in the same enterprise;" but with what result does not appear.

guine hope, of not only inducing the Association to be the instrument of forwarding *that* portion of so very desirable and important a philosophical arrangement, but of extending the sphere of its operations far beyond what was at first contemplated by me.

Although I may perhaps be adopting a *somewhat* inverse course of proceeding, in first, briefly describing what I at first wished to accomplish, and then, explaining the grounds on which I now presume to claim your attention, I am disposed to risk doing so, as the readiest way of at once leaving the whole matter to be decided on, from its own intrinsic merits, and, at the same time, allowing any explanation of my own progressive views to have only such weight as they may justly deserve. I rest satisfied that the incalculable value of the establishment of a great chain of co-operative Meteorological Observations throughout the civilized world, is so self-evident that it would be equally a waste of time to attempt even to enumerate the many beneficial, philosophical, scientific, and economic objects which it would either illustrate or subserve, or to demonstrate that no more appropriate time could be chosen for advancing so desirable an object than the present, when, to the recent rapid, general, extension of physico-geographical knowledge is now—I trust without fail—about to be added, the completion of that marvelous electric chain which—as it were—annihilating both time and distance—is to bind the two hemispheres in instantaneous mental communication with each other. Among other recent inducements, however, I might point to the great general excitement prevalent during the last two years from an unusual combination of atmospheric disturbances, connected with the philosophy of storms; in the former instance, supposed by many to have been more or less influenced by the passing comet, and in the latter, as being characterized by remarkably conflicting accounts of the past winter season in almost every part of the world.

With these few introductory words, I now proceed to observe that having, as already hinted, unfortunately failed in my endeavors to accomplish, through a Canadian medium, the establishment throughout the *British American Provinces* of a system of simultaneous observations, to be connected with that already in successful operation in the American States, in hope of so far aiding in the completion of a uniform universal chain of such records, I am now induced to place so important a philosophical object, in its most extended sense, under the powerful auspices of this leading Trans-Atlantic Association, as, though *American* by name, being, like its great British prototype and its own noble coadjutor, the Smithsonian Institution,

of so thoroughly *cosmopolitan* a character as to embrace within its liberal grasp, "*universal Man and Nature*," or—to borrow still further the language of the enlightened founder of an eastern philosophical association, of which I had the honor to be a member*—"whatever is performed by the one or produced by the other;" and I would, therefore, at once, respectfully suggest that, instead of leaving detached parts of a measure of such vast philosophical and physical importance, at the mercy of uncertain fitful movements by any particular State or scientific body, this undeniably pre-eminent American Association should, without delay, take into mature consideration the most prompt and effective mode of placing itself in direct communication with not only the different British Colonial Governments, and philosophical societies, of Canada, New Brunswick, Nova Scotia, Prince Edward's Island, and New-Foundland, but also with those of the Bermuda and West India Islands, as well as with the various independent governments in Central and South America,—with the view of inviting and soliciting their individual and collective liberal co-operation, *in whatever way each may deem most expedient*, toward the completion of *one* grand harmonious chain of observations throughout the whole of the American continent, as not only a measure of deep philosophical interest, but fraught with direct benefits to every country in the world.

Having thus briefly adverted to the very important object aimed at by me, my wisest course would, perhaps, be to leave the rest to the Association; but considering the warm interest I have so long taken in it elsewhere, I trust I may be permitted to add, that though for many years impressed with the great value of systematic meteorological observations,† I had no good opportunity for drawing particular attention to my views on the subject, till about six years ago, when, happening to occupy the rather influential position of President of the Natural History Society of Montreal, I at last felt myself favorably situated for enlisting in so congenial a cause the valuable co-operation of Colonel Lefroy, then President of the Canadian Institute, as well as able director of the Magnetic Observatory, at Toronto; but before the necessary preliminaries could

* The Asiatic Society of Calcutta.

† Systematic observations were first advocated by me in an Address to the members of an Agricultural Association in the Western District of Upper Canada—of which I was President, so far back as 1837; and again in a discourse before a local Philosophical Society—of which also I was President—in 1841.

be matured for bringing the matter forward under the joint auspices of the two societies, Col. Lefroy was, unfortunately, called to England, and discouraging circumstances led to my withdrawing from the Natural History Society. Having, however, in the meantime, become connected with the Canadian Institute, I resolved to prosecute the object I had so long at heart, through that Association; and I accordingly did so in March, 1851, in a paper strenuously advocating the establishment of simultaneous Meteorological Observations throughout the British American Provinces, combined with a methodical record of the periodical rise and fall of the great lakes. On this latter subject, also, I submitted a rather elaborate essay in the following month; and both of these papers being favorably received, and a committee appointed to report thereon, I naturally looked forward to some decisive action being speedily taken on the subject. But, unfortunately, the only progress made up to the close of that year, consisted of a reference to the Smithsonian Institution "for information regarding the working of a similar system in the United States;" and, the following year threatening to be equally unproductive, I was, toward its close, led to forward a Paper of supplementary remarks, giving additional information and explanations, in the hope of thereby removing any possible obstacle in the way of a timely appeal to the Provincial Legislature for a suitable appropriation for so highly useful and creditable a purpose. Again, unfortunately, no further movement was deemed advisable; the Institute, apparently, not feeling itself at liberty to extend its sphere of action beyond the limits of Upper Canada; whereas my object had all along expressly embraced not only Lower Canada, but the whole of the remaining British North American Provinces. And such, as far as I know, is still the unsettled state of the matter, with the exception of the enlightened Superintendent of Education of Upper Canada, having taken steps for ere long filling up, through its grammar schools, so much of the proposed chain of observations as lay within his jurisdiction.*

* It may be advisable to explain here, in reference to the opinions of friends who think I ought to have given in this paper a sketch of the means and practical rules deemed necessary by me for carrying out what I proposed, that as I had, from first to last, insisted upon whatever was done in Canada, being in strict accordance with the system and forms adopted by the Smithsonian Institution, so I inferred that a similar line of conduct would be adopted by the American Association, and therefore imagined that any such addition would be unnecessary. But, as my paper now comes before the public in a detached form, it may be proper to add here the following quotation from the supplementary remarks above alluded to: "Deeming it unnecessary to enter again

In connection with these unexpected results, I trust I may, as a *Briton*, be here permitted to give vent to a few words of patriotic regret, that, during the eventful years which have in the interim elapsed, Canada has lost the opportunity of having the credit of, next to the United States, taking the lead in the establishment of a uniform national system of Meteorological Observations, as I learn that an arrangement, very similar to that which I contemplated, has been recently introduced in France, in which, as long hoped for by me, the services of the Electric Telegraph, are to be made available in the dissemination of Meteorological intelligence.*

The allusion just made to the valuable services derivable from the

into the details of the view all along taken by me of the great *philosophical* as well as *public* benefits to be derived from the adoption of my proposition, I am content to refer you to my former articles on the subject, and to state here in few words, that I look forward to the Canadian Institute's measures being in concert with the Smithsonian Institution; in fact adopting the same system and embracing the same objects as are now *successfully* carried out in the United States, under the direction of that Association, with the addition of a *systematic registry of the periodical rise and fall of the great lakes*; and that it appears to me that both branches of the undertaking, though resting mainly on a *philosophical* foundation, are in a provincial point of view, so decidedly and especially of a *useful and beneficial public character*, that, if appealed to, our Government would not hesitate to bear a part in its promotion; and the more so, as forming important links in the great chain of valuable researches connected with physical geography now in progress *all over the world*. I consider, however, that the Parliamentary assistance might, in the first instance, be limited to granting an appropriation sufficient to meet the expense of furnishing a set of well-adjusted instruments for each station, and authorizing such public officers as harbor-masters, light-house keepers, and collectors of customs, to give their valuable assistance; but that the Commander of the forces should, at the same time, be solicited to aid the undertaking by requesting all medical officers in charge of hospitals, to furnish to the Institute a copy of the Meteorological Record transmitted by them periodically to the Inspector General in London; and that the valuable co-operation of the Governor of the Hudson Bay Territory, should not be overlooked: and further, that every University, College, and other educational institution, together with every literary and philosophic society, and every mechanics' institute throughout the province, should be invited to lend their aid; and finally that the co-operation of the Governments of Nova Scotia, New Brunswick and Prince Edward's Island, should be invoked in the laudable work." In short, I indulged the hope that the Canadian Institute would be permitted to have the honor of standing in the same relation to the British American provinces, as the Smithsonian Institution did to the great American Union.

* I am happy to be able to add here, that since this paper was written, I have learned that not only has another *national* system of Meteorological Observations been established in Russia, but that a widely-extended scheme of observations has been lately set on foot in Europe, which will include Petersburg, Algiers, Dublin, Lisbon, Greenwich, Bordeaux, and other places, with the Electric Telegraph for an adjunct, and Paris for the center of discussion and observation; and further, that the French Government has recently established not fewer than twelve Meteorological Observatories in Algeria, in Africa—a part of the world in which such observations have been completely neglected, and are therefore likely to prove of great scientific importance.

co-operation of the Telegraph in the prompt transmission of Meteorological intelligence, naturally and opportunely leads me back to a very important part of the object in view, and I therefore trust I may be permitted to dwell a little on that point, because regarded by some as unattainable, except at considerable expense; at least such would appear to have been the feeling of a late Committee of the Canadian Institute, from its allotting in its Report, a special sum for the services of a telegraph operator; whereas I, as one of the many *unpaid*, humble gleaners, who cheerfully follow the steps of a host of more distinguished yet equally *gratuitous* philosophical reapers in the field of Science, am fully persuaded that there is not a telegraph in the whole American Union, or in the British American Provinces, whose directors would not be happy to assist in forwarding so praiseworthy a public object without charge, provided arrangements were made to give as little trouble as possible. Indeed, it will be in the recollection of many now present, that *daily*, but, unfortunately, far from regular, or uniform, Reports of the state of *the weather, at least*, have long been voluntarily furnished by telegraph to the public press, from a great number of places, which, if recorded at fixed hours and in uniform descriptive terms, however brief, would be of infinitely more value, either as mere items of general meteorological intelligence, or connected with the philosophy of storms in particular. Take, for instance, from among several slips, clipped from newspapers, which I now hold in my hand, the Report for the 2d of March last, and it will be seen that out of thirty-three entries, though all give the state of the thermometer, only one mentions that of the barometer, and only fourteen notice the direction of the winds; and yet the conflicting record of that day involves both fine weather and foul, clear and cloudy, winds N. E. and S. W., gentle and stormy, rain and snow, slight and hard, and a range of temperature from 4° . to 33° .! I could have readily referred to other examples of even a less explicit character, in which the range of the thermometer was still greater, and involved stormy phenomena of much importance and deep interest; yet the Report from some places was limited to the indefinite terms "very cold," or "very fine," etc., without any reference whatever to either barometer, thermometer, or winds.

But, to draw toward a conclusion, although it is upward of forty years since, in India, I first began to regard the barometer with a philosophic eye; and it is now more than twenty years since, as a Canadian farmer, I turned my attention to it in connection with the phases of the moon, and felt a desire to court the co-operation of

other similarly-situated observers, in the hope of reaping therefrom considerable direct benefit, as well as interesting philosophical information, all my humble efforts sink into insignificance compared with the invaluable services of that eminent hydrograper and shrewd observer, Captain MAURY, of the United States Navy, to whom the world is mainly indebted for a knowledge of the existence of that singular, uniform plateau at the bottom of the Atlantic Ocean, which led to the achievement of a sub-marine telegraphic communication between the old and new world. I will, therefore, instead of using any language of my own, make free to bring to your recollection two observations in point, made by that highly intelligent officer—the one on the value of meteorological observations connected with agricultural pursuits, in an Address to the *farmers* of the United States, and the other, on the benefits to be derived from a fore-knowledge of the approach of storms, through the agency of the magnetic telegraph, contained in an official letter to the Secretary of the Navy, so late as the month of February last. In the former of these, Capt. Maury justly observes that, “*if furnished with the necessary instruments and guided by proper instructions for their use, as regards systematic conformity of observation, there would be no difficulty in embodying, without cost, a voluntary corps of observers, who would soon furnish all the data requisite for a complete study of both agricultural and sanitary meteorology;*” and he then proceeds to say—to use again his own words—“*could not at least one farmer be found in the average for each county in every state? I do not think there would be much difficulty on that score. But, on an average, ten observers for a state would be sufficient.*” “*Now,*” he pertinently continues, “*if we could get the English Government, and the French Government, and the Russian Government, and the other Christian States, both of the old world and the new, to do the same by their farmers, we shall have the whole surface of our planet covered with meteorological observers, and eliciting from nature, under all varieties of climate and circumstances, answers to the same questions; and that, too, at no other expense than what each Government chose to incur for the discussion and publication of the observations made by its own citizens or subjects.*”

In the other communication alluded to, Captain Maury first justly observes that with a well-conducted system of co-operative meteorological observations, and the use of the magnetic telegraph as an appliance, “*warning of an approaching storm might be given to the shipping in port and the laborer in the field, at least several hours in advance, and quite in time to save annually to the farmer, the*

merchant, and the mariner, much valuable life and property." And he then adds that "he is happy to state that such an extension of the system *has* been made in Holland, and that the results promised justify the opinion he had expressed—M. BALLOT, the Superintendent of the noble Meteorological Institution at Utrecht, having, from five years' observations, at five co-operative stations, made the important discovery of there being a numerical relation between the force of the winds and the changes of barometrical pressure, which, if confirmed, will prove of the highest practical importance to the industrial pursuits of every country, by land as well as by sea."

Much more of an encouraging character might be added, expressive of the favorable opinions of other distinguished American meteorologists; but, as I trust, the whole merits of the subject will be discussed by a competent preliminary tribunal, of which some of those talented individuals will doubtless form a part, I forbear from trespassing longer on the patience of the meeting, and shall, therefore, respectfully proceed to move the following resolutions:

1. That the establishment of a grand co-operative system of Meteorological Observations among the civilized nations of the world, being independent of mere philosophical purposes, certain of proving in many ways beneficial to mankind generally, but especially in connection with the advancement of industrial pursuits, the accumulation of valuable sanitary information, and the timely foreknowledge of the approach of storms; and many of the most distinguished philosophers in Europe having turned their attention to the subject, it behooves the enlightened people of the American Continent to lend their aid in the achievement of so important an object.

2. That such being the case, it naturally becomes the duty of this Association, as the acknowledged leading Philosophical Institution in America, to evince its readiness to co-operate in so laudable a *cosmopolitan* undertaking.

3. That it is therefore respectfully moved that a Special Committee be nominated to take the whole subject into immediate consideration, with the view of devising such plan of preliminary arrangements, *in harmony with the Smithsonian Institution*, as will enable it to enter, without delay, into direct communication with not only the heads of every State in the Union, but with surrounding Foreign States, and more especially with the different Governments of the neighboring British American Provinces, as well as of those of the West India Islands; and also with the various independent States in Central and South America; calling their particular attention to the universally-beneficial objects of the proposal, and inviting their cordial co-operation in so enlightened a combination. And, further, that to insure every possible publicity being given to whatever course of proceeding may be adopted, the Permanent Secretary be authorized to notify the same to all and every literary or philosophical Institution in Europe and elsewhere, with which this Association is in communication, in the hope of thereby giving an additional impetus to the exertions of the friends of Science throughout the world.

POSTSCRIPT.

An extremely meager and incorrect notice of the foregoing paper appearing next morning in the *Baltimore American*, Major LACHLAN felt it his duty to counteract any probably injurious consequences to the object in view, that might result therefrom, by making the following observations at the next general meeting :

As it would appear, from the meager notice in the *American* of Saturday, of my paper and resolutions on the extension of Meteorological Observations, that instead of my reading a written paper occupying at least half an hour, I only urged the Association, in a few introductory words, to *increase its efforts* to procure simultaneous observations, *by means of the magnetic telegraph, for the purpose of giving warning of the approach of storms*, and that Prof. HENRY, though kindly complimentary to me personally, *objected* to the passage of the resolutions, I trust I am not out of order in taking this public opportunity of endeavoring to prevent incorrect impressions going abroad, that, if not noticed, might prove injurious, if not fatal, to a very important object, by now stating that as far as my imperfect hearing enabled me to understand Prof. Henry, he did *not* object to the resolutions, but merely observed that they could not well be passed, as being too laudatory of the Association, and that body having no funds to devote to such a work as that proposed ; and that, as an advocate of caution, he therefore moved the resolutions being referred to the standing committee.*

Not being quite at ease on that head, I would now beg permission to state, that, at any rate, my friend Prof. Henry seems to have been

* The Report in the *Baltimore American*, of May 1st, 1858, was as follows:

"METEOROLOGICAL OBSERVATIONS.—Major Lachlan, of Cincinnati, urged the Association to increase its efforts to procure simultaneous Meteorological Observations throughout the American Continent, by means of the Magnetic Telegraph, expressing his belief that the Directors of every Telegraphic Line would cheerfully, and without charge, lend their aid to this object, provided the system could be arranged so as to give as little trouble as possible. Knowledge of an approaching storm would thus be given to vessels in port, about to sail, and valuable lives and property be saved that otherwise might be sacrificed. He concluded by moving the following resolutions:" [which appear in a preceding page, after which the *American* continues as follows:]

"Professor Henry highly complimented Major L., on his devotion to Meteorological Science, but objected to the passage of the resolutions, both on account of their being too laudatory of the Association, and on account of the Association having no means to undertake such a work. The Smithsonian Institution was doing what it could, and now had three hundred and fifty observers, all of whom at two o'clock made a record of the weather; and these observations cost no less than \$5,000 per annum, independent of the cost of printing, etc., which can not be undertaken without the aid of Government. He concluded by moving that the resolutions be referred to the standing committee, with instructions to take such action as may be deemed advisable, which was adopted."

inadvertantly under a misapprehension in both respects: the supposed over-laudatory expression, at first existing in one of the resolutions, having been easily modified, so as to state only the simple (uncomplimentary) fact, which can not be denied, of its being the *acknowledged* leading Philosophical Association in America. And, as to its having no means to undertake such a work as that proposed, I beg it to be thoroughly understood that what I contemplated involved little extra expense, being, as stated in my paper, simply that the Association should undertake to communicate with every Government in America on the subject, leaving to each to decide how far and in what manner they would co-operate, by—of course—carrying on and reducing whatever observations were registered within their own limits; and therefore the only extra expense likely to fall upon the Association, would be connected with the ultimate incorporation of these Abstracts in one grand Meteorological Register, for the whole Continent of America.

Once more, then, let me earnestly intreat, as in all likelihood my last effort in a great and good cause, that this Association will *not* shrink from undertaking an office of such world-wide interest and importance. Should it happily prove successful, honor and credit to it will be the result. Should its efforts prove in vain, it will, at all events, have the satisfaction of having made the attempt, and feeling that the discredit of failure can not justly be laid at its door.

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