FIRST

REPORT ON METEOROLOGY,

TO THE

SURGEON GENERAL OF THE UNITED STATES ARMY,

BY

JAMES P. ESPY, A. M.,

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WASHINGTON CITY, *October* 9, 1843.

SIR: The object of the "report" which it is my duty to make annually on meteorology, will be understood by the following circular

"TO THE FRIENDS OF SCIENCE."

"Last summer I announced to my correspondents, and the public generally, that a 'form for keeping meteorological journals' would be prepared and sent to all those in the United States, Bermuda, West Indies, Azores, and the Canadas, who should signify a willingness to co-operate with me in my endeavors to find out all the *phases* of storms which occur within the range of the wide-spread simultaneous observations about to be established.

"I have to announce now that the 'form' is completed,* and arrangements are made to strike off a sufficient number to supply all who shall express a wish to aid in this most important undertaking. It is my intention to lay down, on skeleton maps of the United States, by appropriate symbols, all the most important phases of the great storms which come within the range of our simultaneous observations; and thus it is hoped that we shall be able to determine the *shape* and *size* of all storms, whether they are *round* or *oblong;* and if oblong, whether they move *side foremost* or *end foremost*, or *obliquely;* and their *velocity* of motion and the *direction* which they take in all the different seasons of the year; the *course* that the wind blows in and beyond the borders of the storm; the *fluctuation* of the barometer and *change* of temperature which generally accompany storms, and the *extent* to which their influence is felt beyond their borders.

"Now, as many of these particulars can be observed as well without meteorological instruments as with them, it is manifest that all who will send me a faithful account of the winds and weather will essentially contribute to the great end in view. Editors of papers, too, who notice great storms, may be of much service, by mentioning the time of greatest violence, and the direction of the wind and time of change, and sending a paper containing the account to the *Surgeon General's office, Washington city*, with the word 'meteorology' marked on the corner of the envelope. All papers and journals thus directed will come to my hands, as I am now attached to that bureau; and, after being carefully collated with each other, will be deposited in the archives of that office, to aid the future meteorologist in developing laws which the present state of the science may not enable us to detect. Let none think their *mite* too insignificant to be thrown into this common treasury.

"I am authorized by the Secretary of State to request all our ministers, consuls, and other diplomatic and commercial agents of the United States in foreign countries, to whom the 'form' is sent, to transmit to the *Department of State* the journals which they may keep, or procure from others, that they may be immediately placed in my hands.†

"All masters of vessels sailing in the Atlantic, or Gulf of Mexico, are requested to send a copy of their 'logs' to the *Surgeon General's office*, immediately on their landing at any port in the United States.

"If the chain of simultaneous observations could thus be kept unbroken entirely across the Atlantic, the value of the whole system would be much increased.

"Journals, according to the adopted plan, will be kept at all the military stations of the United States; and the Secretary of the Navy has given orders for the same to be done at the naval stations and in ships

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* It is the "form" prepared under the direction of the Surgeon General for the military posts.

† This request is renewed now, February 24, 1845.

of war on our coast. Forms also will be sent to all the light-houses and floating lights, and many of them will at least keep journals of the wind and weather. Governor Reid, of Bermuda, has promised to send me journals from that island, and I have the promise of various journals from Canada, Newfoundland, and Nova Scotia.

"There are many of the colleges of the United States from whom I have not yet had such promise; but I now appeal to them *all*, with confidence, to unite in their efforts to perfect this most interesting science.

"There are one hundred and three colleges in these United States, and very many high schools; and as it is known that barometric fluctuations accompany storms, it is manifest that the direction in which storms move, and their velocity, may be ascertained by observations made on the barometer alone at these various institutions.

"The number of observations cannot be too great.

"JAMES P. ESPY.

"SURGEON GENERAL'S OFFICE,
Washington, December 6, 1842."

The above "circular" was sent last winter to many hundred persons in various parts of the world, and I have now (May 29, 1843) the pleasure of informing the "friends of science" that more than fifty observers who note the barometer, and more than sixty others who have no barometers, have commenced sending in their journals. From the certainty of success, it is *now* hoped that others, who feel disposed to aid in this great undertaking, will commence their observations immediately.

It is my duty to collate all the journals, and report annually "to the Secretary of War." A copy of these reports shall be sent to each of my regular correspondents as soon as they are published by government.

More observers are much wanted, especially along the Allegany mountains, on both sides; in the northern parts of Vermont, New Hampshire, and Maine; in the "far west," northwest, and north, and in the ocean between this and Europe.

I take this opportunity of requesting all my correspondents to visit the path of any tornado within their reach, and let me know the following particulars: The *width* and *direction* of the path; the *direction* in which the trees are thrown down on the *two sides*, and also in the *middle;* whether the trees are thrown inwards *equally* on both sides, or more backwards on one side than on the other. If any are thrown across each other, mention on which side of the path, and the direction in which both the *upper* and *under* trees are lying; whether the *line* to which the trees converge on both sides, if they do converge, is in the *centre* of the path, or *nearer* to one side than the other.

These questions apply only to a tornado where it passes through a forest of equal density on both sides of the path, for elsewhere both borders will not be well defined.

In case any one has a salt marsh or prairie which he wishes to burn, or a large mass of timber from a clearing of land, preserve these combustibles till the time of a drought, if one should occur: then choose a very calm and clear day, and at about eight o'clock in the morning take a tumbler of cold water, in the open air in the shade, and with a thermometer find the *highest* temperature of the water when it is just cold enough to cause the moisture in the air to condense on the tumbler. This highest temperature is called the dew-point. If this should not be more than six or eight degrees (the less the better) below the temperature of the air, everything is then favorable at the surface of the earth for the production of rain. Set fire to your combustibles at many places in the circumference at once. Immediately an up-moving column of air will be produced; and if it is not bent out of a perpendicular motion, by an upper current of air, it will begin to form a cloud when its top reaches as many hundred yards high as the dew-point is below the temperature of the air in degrees of Fahrenheit. *Watch the subsequent phenomena, and describe them to me.*

If it rains, it will not extend much to the west; but it is *probable* that it will widen out from the place of beginning, and become a general rain to the east.*

If it should not rain, it will be prevented by one of two causes: an *upper current* of air, sweeping the up-moving column out of the perpendicular; or an *upper stratum* too warm and light to let the up-moving column swim in it.

Other instructions will be given, if requested, before the middle of July.

JAMES P. ESPY.

To carry out the plan proposed in the circular, skeleton maps of the territory embracing the observations were procured; and on these maps are laid down the observations taken by the various observers at three o'clock, p. m., of each day, unless another hour is specially mentioned.†

The direction of the arrows shows the direction of the wind, and the length shows its force. An arrow half an inch long represents a gentle breeze, and one an inch and a half a very violent wind; and so in proportion. The points of the arrows are near the places of observation. The numbers in red ink represent the quantity of water fallen, whether in rain or snow, in hundredths of an inch. *S* means snow, and *R* means rain. A large *S* means a great snow, and a small *s* means a little snow; and so of rain.

The long black lines represent the various maxima of pressure of the atmosphere, as indicated by the barometer; and the long red lines represent the various minima of pressure. The figures attached to these

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* Since this was written, various experiments have been made, and extensive rains to the east were produced, and none to the west.—*Author.*

† Only 29 of the 92 maps are engraved for this report.

lines represent the amount of change in the barometer since the preceding fluctuation at the place where the figures stand.

The numbers which stand by themselves in black ink, with the sign + or — after them, represent the various fluctuations of the thermometer at its highest and lowest temperatures. When *max.* is subjoined, it means the highest temperature of the month; and when *min.* is subjoined, it means the lowest temperature of the month. These numbers are affixed to several localities in the extreme north, south, east, and west, and middle of our territory, with a view to ascertain whether any general law, regulating the sudden fluctuations of temperature, could be deduced from the observations.

The great irregularities which attend the fluctuations of the thermometer seem to forbid any attempt *at present* to lay down general laws on the subject. The time of observation is too short. During the three months which have been employed in the examination on this point, the highest elevations of the thermometer sometimes take place in the east, at the same time that the lowest take place in the west, and *vice versa.* The same may be said of the north and the south. Nay, even the maximum and minimum of the month sometimes occur on the same day at different places. If there is anything at all approaching regularity on this point, it is that the thermometer has a tendency to rise on the eastern side of storms, and sink on the western side; but this is by no means universal. It would be expected that northerly winds would always reduce the temperature; but even this is not a universal law. Instances are not wanting of a rise of temperature with a northerly wind, and of a fall of temperature with a southerly wind. That these apparent anomalies are effected by the influence of the vicinity of storms, there can be little doubt; and if so, patient investigation will eliminate the cause.

Other phases of storms are less anomalous, and, from a careful examination of the meteorological charts, the following generalizations have been deduced:

1st. The rain and snow storms, and even the moderate rains and snows, travel from the west towards the east, in the United States, during the months of January, February, and March, which are the only months yet investigated.

2d. The storms are accompanied with a depression of the barometer near the central line of the storm.

3d. This central line of minimum pressure is generally of great length from north to south, and moves side foremost towards the east.

4th. This line is sometimes nearly straight, but generally curved, and most frequently with its convex side towards the east.

5th. The velocity of this line is such, that it travels from the Mississippi to the Connecticut river in about twenty-four hours; and from the Connecticut to St. John, Newfoundland, in nearly the same time, or about thirty-six miles an hour.

6th. When the barometer falls suddenly in the western part of New England, it rises at the same time in the valley of the Mississippi, and also at St. John, Newfoundland.

7th. In great storms, the wind, for several hundred miles, on both sides of the line of minimum pressure, blows towards that line, directly or obliquely.

8th. The force of the wind is in proportion to the suddenness and greatness of the barometric depression.

9th. In all great and sudden depressions of the barometer, there is much rain or snow; and in all sudden great rains or snows, there is a great fluctuation of the barometer.

10th. Many storms are of great and unknown length from the north to the south, reaching beyond our observers on the Gulf of Mexico and on the northern lakes, while their east and west diameter is comparatively small. The storms therefore move side foremost.

11th. Most storms commence in the "far west," beyond our most western observers; but some commence in the United States.

12th. When a storm commences in the United States, the line of minimum pressure does not come from the "far west," but commences with the storm, and travels with it towards the east.

13th. There is generally a lull of wind at the line of minimum pressure, and sometimes a calm.

14th. When the wind changes to the west, the barometer generally begins to rise.

15th. There is generally but little wind near the line of maximum pressure, and on each side of that line the winds are irregular, but tend outwards from that line.

16th. The fluctuations of the barometer are generally greater in the northern than in the southern parts of the United States.

17th. The fluctuations of the barometer are generally greater in the eastern than in the western parts of the United States.

18th. In the northern parts of the United States, the wind, in great storms, generally sets in from the north of east, and terminates from the north of west.

19th. In the southern parts of the United States the wind generally sets in from the south of east, and terminates from the south of west.

20th. During the passage of storms, the wind generally changes from the eastward to the westward by the south, especially in the southern parts of the United States.

How far these generalizations will apply to other months of the same year, or even to the same months of different years, remains to be seen by future investigations. Whatever may be the result, the facts which will be collected and imbodied cannot fail to be of the highest interest and utility, especially if they shall be found to unite in one grand theory which explains all the phenomena.*

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* For explanation of these phenomena, see "*Espy's Philosophy of Storms.*"

It would add much, however, to the interest, and probably to the utility of the system of investigation now adopted, if simultaneous observations were obtained over a much wider field.

It is highly desirable to *surround* storms, and keep them constantly in view, from their beginning to their end. Now, as the barometer generally sinks more during the passage of our great winter storms in the northern parts of the United States than in the southern, is it not probable that the northern half of many of these storms is entirely beyond the bounds of our observations? And, as these storms certainly reach Newfoundland in their progress towards the east, is it not probable that they do not break up before they advance far into the ocean? May not some of them even reach the shores of Europe? Under these circumstances, would not the governments of England and France, if they were requested by the proper authorities, order the masters of the numerous steamers which now ply the Atlantic to send copies of their journals to Washington city, to be collated with those received now from so many other quarters?

What high utilities to the mariner, and through the mariner to all mankind, might not reasonably be anticipated from such a system of wide-spread simultaneous observations, continued long enough to compare with each other, not merely the storms of different seasons, but the storms of different years!

All which is respectfully submitted.

JAMES P. ESPY.

THOMAS LAWSON, M. D.,
Surgeon General U. S. A.

JAN. 9th 3 P.M. 1843

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind!

JAN. 10th 3 P.M. 1843

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

JAN. 30th 9 P.M. 1843.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

JAN. 31st 1843 9h A.M.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind.

JAN. 31st 3 P.M. 1843.

95 90 85 80 75 70 65 60 55

45 40 35 30

Lake Sup. Mich. L. MICH. L. ONTARIO L. ERIE

Ft. Brady Ft. Mackinac Presqueisle Ft. Howard Ft. Snelling Ft. Winnebago Ft. Crawford Atkinson Ft. Gratiot Buff. Barracks Detroit Erie Toronto Niagara Milleville Pen Yan Rochester Syracuse Utica Oswego Albany Montpelier Lowville Malden Barracks Hamilton Hanover Dartmouth Keene Portsmouth Gardner Whitehall Ft. Sullivan Halifax Ft. Preble Kent Fairfield Berwick Barracks Quebec Montreal Newfoundland St. Johns

Ft. Gibson Ft. Smith Ft. Washita ARK. Ft. Towson Ft. Jessup Natchi Natchez Ft. Morgan Baton Rouge Ft. Wood Ft. Pike New Orleans Ft. St. Philip Ft. Jackson Cant Mont Mobile Pensacola Ft. Gaudsden Ft. Marion Ft. King Ft. Brooke Key West Ft. Leavenworth Ft. Atkinson Ft. Desmoines Macomb Augusta Ft. Calhoun Ft. Croghan Dearborn Ft. Armstrong Winnamac IND. Sandusky Cleveland Twinsburg OHIO Granville Columbus Zanesville Indianapolis Greencastle Brookville Spiritwood Lancaster Marietta Chillicothe Cincinnati Maysville Paris Lexington Louisville Lebanon K.V. Dunville Nashville Ten. Knoxville Ft. Jeff. Barracks St. Louis Mo. Ill. Miss. Alla. Ga. N.C. S.C. Columbia Athens Augusta Milledgville Ft. Mitchell Ogletharpe Barracks Whitemarsh Ft. Moultrie Charleston Savannah Macon Johnson C. Hatteras Chapel H. Pa. Lamar Sunbury New Salem Harrisburg Carlisle York Gettysburg Hanover Baltimore Washington Fredericksburg Richmond Va. Petersburg Brunswick Ft. Monroe Ft. Delaware Philadelphia Newark New York Hartford New Haven Conn. Vt. N.H. Me. Amherst Mass. Boston New Bedford Adams Stockbridge Portland Augusta Bangor Calais

Ther. rose 30

Ther. fell 28°

3° 14° 34° 51° 27° 35° 51° 46° 51° 50° 51° 52°

At Ft. Trumbull the Wind at 3 P.M. of 31st is given S.W^c. No doubt it ought to be S.E^c. Ft. Trumbull is near New Haven, Connt

Bermuda R south

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

FEB. 1st 9 A.M. 1843.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

Bermuda

Lake Sup · Ft. Brady · Ft. Mackinac · Ft. Snelling · Ft. Howard · Ft. Winnebago · Ft. Crawford · Ft. Crogh an · Ft. Calhoun · Ft. Armstrong · Ft. Desmoines · Macomb · Augusta · Ft. Leavenworth · Ft. Scott · Ft. Gibson · Ft. Smith · Ft. Jessup · Natchi · Natchez · Ft. Wood · Ft. Pike · New Orleans · Ft. St. Philip · Ft. Jackson · Ft. Towson · Ft. Washita · Nashville · Ten. · Knoxville · Chapel H. · Key West · Ft. Brooke · Waccasassa · Ft. King · Pitcolata · Fleming · Ft. Marion · Stansbury · Gamble · Pensacola · Ft. Gadsden · Ft. Morgan · Cant Mont · Mobile · Pickens · Baton Rouge · Natchez · Ft. Pike · La Grange · Columbia · Athens · Augusta · S.C. · Milledgville · Ft. Mitchell · Savannah · Whitemarsh · Qglethorp · Barracks · Charleston · SE Moultrie · Johnson · Marion · C. Hatteras · Brunswick · Ft. Monroe · Richmond · Virg. · Petersburg · Baptona Arsenal · Danville · Lebanon · Paris · Lexington · Louisville · Maysville · Cincinnati · Chillicothe · Zanesville · Columbus · Springfield · Greencastle · Brookville · Indianapolis · Granville · Twinsburg · Wooster · Mansfield · Cleveland · Sandusky · Detroit · Ft. Gratiot · Mich. · L. MICH. · Dearborn · Winamac IND. · Buff. Barracks · Toronto · L. ONTARIO · Rochester · Mulleville · Pen Yan · Utica · Albany · N.Y. · Troy · Hanover · Malone · Plattsburg · Lowville · Montreal · Quebec · Me. · Vt. · N.H. · Concord · Ft. Preble · Whitehead · Ft. Sullivan · Hancock Barracks · Hallifax · Portsmouth · Amherst · Mass. · Boston · Conn. · New Haven · New Bedford · Nantucket · Ft. Adams · New York · Newark · Harrisb. · Sunbury · Lamar · Pa. · Alleghany Arsenal · Carlisle · Gettysburg · York · Lancaster · Philadelphia · N.J. · Ft. Delaware · Del. · Ft. M.c Henry · Talbot · Baltimore · Washington · D.C. · Annapolis · Newfoundland · St. Johns · Bars · Max. · Min.

end 8 P.M. · end 5 P.M. · all day · sprinkle · from 9 till 3 P.M.

4°– · 16°– · 22° · 24°– · 19°– Min. · 30°– Min. · 42°– · 42°– Min. · 41°– · 29°+ · 39°+ · 38°+ · 26°–

FEB. 10th 3. P.M. 1843.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

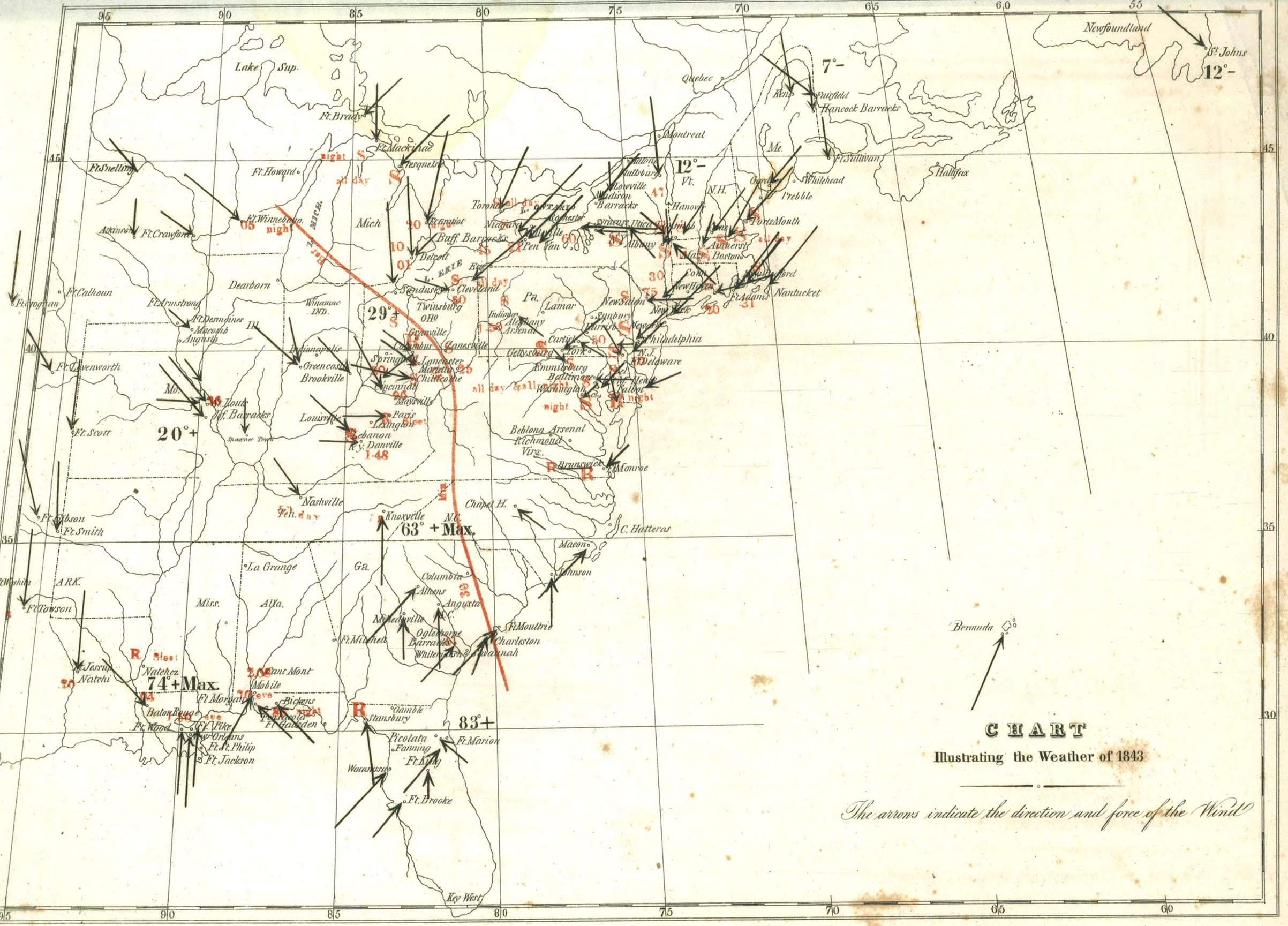
FEB. 11th Sunrise 1843.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

FEB. 14th 3. P.M. 1843



FEB. 15th 3. P.M. 1843.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 9. 3. P.M. 1843.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 10. 3. P.M. 1843

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 11th 3 P.M. 1843

Lake Sup
Ft. Brady
Ft. Mackinac
Presque Isle
Ft. Howard
Ft. Snelling
Ft. Winnebago
Atkinson
Ft. Crawford
Ft. Croghan
Ft. Calhoun
Ft. Armstrong
Ft. Desmoines
Macomb
Chicago
Dearborn
Juliet ville
Winamac IND.
Ill.
Indianapolis
Greencastle
Brookville
Ft. Leavenworth
Mo.
St. Louis
Ft. Barrancas
Ft. Scott
Louisville
Parys
Lexington
Lebanon
K.y.
Danville
Shawnee T.
Ft. Gibson
Ft. Smith
Nashville
Ten.
Knoxville
N.C.
Chapel H.
C. Hatteras
Manteo
Roanoke
La Grange
Ga.
Columbia
Athens
Augusta
S.C.
Millerville
Ogletheorpe Barracks
Whitemarsh
Savannah
Ft. Moultrie
Charleston
Ft. Mitchell
Ft. Hessup
Natchez
Natchi
Ft. Morgan
Batonrouge
Ft. Wood
Ft. Wilkinson
New Orleans
Ft. St. Philip
Ft. Jackson
Pensacola
Ft. Gadsden
Camble
Stansbury
Ft. Marion
Ft. King
Ft. Brooke
Key West
Warasassa
Apalachicola
Fanning
ARK.
Miss.
Ala.
Ten.
Ky.
Ohio
Ind.
Ill.
Mich.
L. Mich.
L. ONTARIO
L. ERIE
Toronto
Niagara
Buff. Barracks
Ft. Gratiot
Detroit
Erie
Cleveland
Sandusky
Twinsburg
Granville
Columbus
Zanesville
Springfield
Lancaster
Manetta
Chillicothe
Cincinnati
Maysville
Pa.
Lamar
Meadville
Allegheny Arsenal
Carlisle
York
Gettysburg
Emmitsburg
Baltimore
Washington D.C.
Bellona Arsenal
Richmond
Virg.
Brunswick
Ft. Monroe
Pittsburg
Rochester
Syracuse
Utica
Albany
Fredonia
Ponderspot
Lowville
Madison Barracks
Plattsburg
Montreal
Quebec
Hanover
N.H.
Vt.
Me.
Hampden
Gardner
Ft. Preble
Portsmouth
Northampton
Amherst
Mass. Boston
Conn.
Newhaven
New Bedford
Ft. Adams
Nantucket
Sudbury
Harrisb.
Newark
New York
N.J.
Ft. Delaware
Ft. M. Henry
Talbot
Ft. Sullivan
Eastport
Whitehead
Reuben
Hancock Barracks
Houlton
Halifax
Newfoundland
St. Johns
Bermuda

20°-
42°+
34°+
32°+
45°+
62°+
50°+
50°+
59°-
+40
+40
Bar.
Max.
Max. +1.17
Min. -.50
.75 Rain
.30 Rain
.40

The direction and length of the Arrows show the direction and force of the Wind. the Points of the arrows are near the places of Observation. The numbers in Red, show the quantity of Water, fallen whether of Rain or Snow in 100ths of an Inch. S. means Snow and R. means Rain the size of the letter in proportion to the quantity when known

The long Black lines represent the various maxima of pressure of the Atmosphere as indicated by the Barometer and the long Red lines the various minima of pressure The figures attached to these lines, show the amount of change in the Barometer since the preceding fluctuation. at the place where the figures stand

The numbers which stand by themselves in black ink With the sign + or – after them represent the various fluctuations at its highest and lowest temperatures. When Max. is subjoined it means the Highest temperature of the Month and when Min is subjoined, the Lowest.

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind.

MARCH 13. 3. P.M. 1843

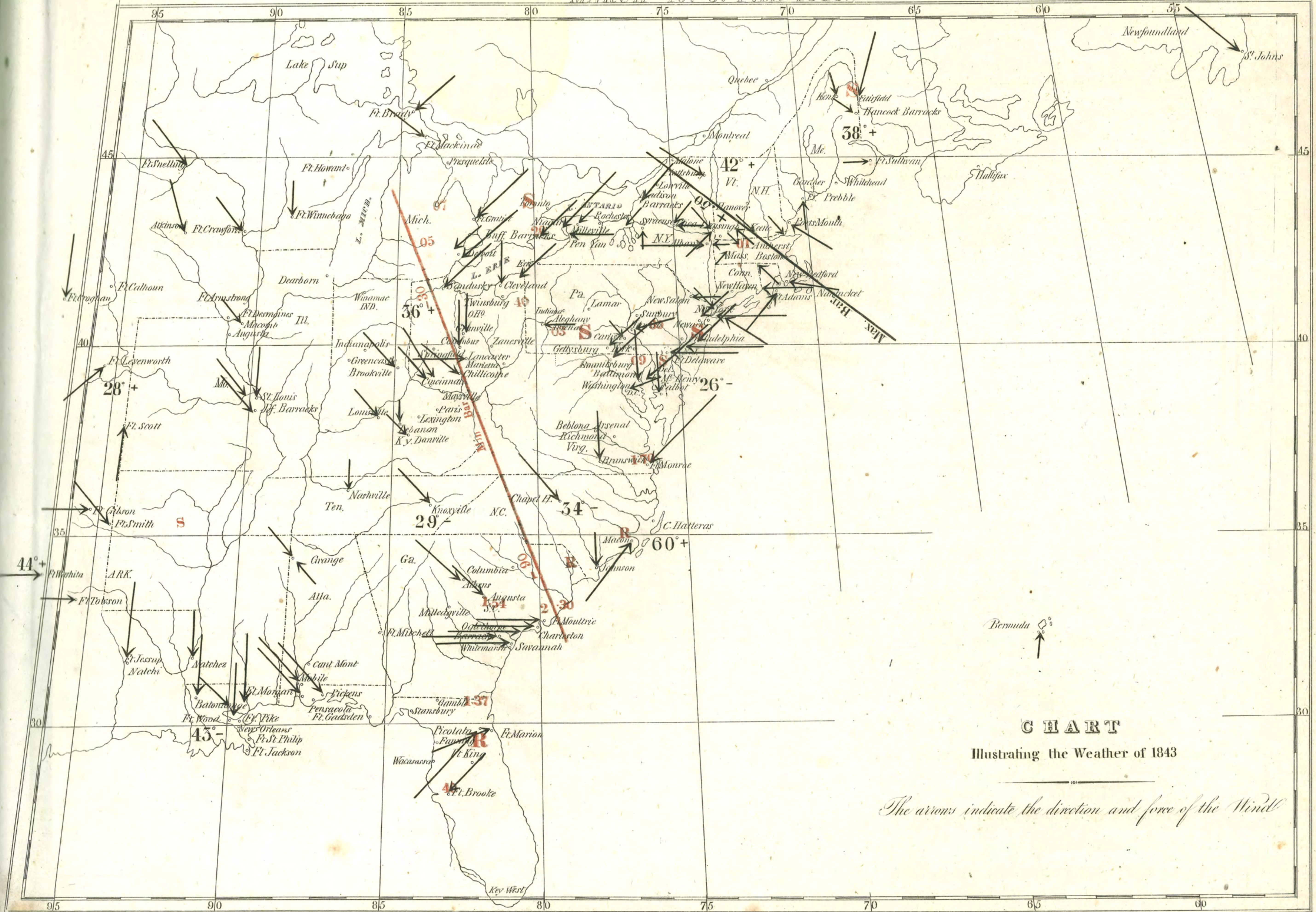
Lake Sup
Ft. Brady
Ft. Mackinac
Presque Isle
Ft. Howard
Ft. Snelling
Ft. Winnebago
L. Mich.
Mich
Atkinson
Ft. Crawford
Chicago
Dearborn
Ft. Calhoun
Ft. Croghan
Ft. Armstrong
Juliet ville
Winamac IND.
Ft. Desmoines
Macomb
Augusta
Ill.
Ft. Leavenworth
Mo.
St. Louis
Jef. Barracks
Ft. Scott
Clawnee Ts
Louisville
Ther. fell 20°
Indianapolis
Dayton
Greencastle
Brookville
Cincinnati
Springfield
Lancaster
Marietta
Chillicothe
Maysville
Paris
Lexington
Lebanon
K.y. Danville
Nashville
Ten.
Knoxville
Ft. Gibson
Ft. Smith
Ft. Wichita
ARK.
Ft. Towson
La Grange
Miss.
Alla.
Ga.
Natchez
Ft. Jessup
Natchi
Cant Mont
Mobile
Ft. Morgan
Bickens
Pensacola
Ft. Gadsden
Baton Rouge
Ft. Wood
Ft. Pike
New Orleans
Ft. St. Philip
Ft. Jackson
Stansbury
Gamble
Picolata
Fanning
Ft. King
Ft. Marion
Wacarassee
Ft. Brooke
Key West
Columbia
Athens
Augusta
S.C.
Milledgville
Ft. Mitchell
Ogletharpe Barracks
Whitemarsh
Ft. Moultrie
Charleston
Savannah
Chapel H.
N.C.
Johnson
C. Hatteras
Manon
Beblona Arsenal
Richmond
Virg.
Petersburg
Ft. Monroe
Washington D.C.
Baltimore
Ft. Mc Henry
Talbot
Annikosta
Gettysburg
York
Carlisle
Harrisb.
Sunbury
Newark
Philadelphia
N.J.
Delaware
Lamar
Pa.
Alleghany Arsenal
Indiana
Twinsburg
O.He.
Granville
Zanesville
Sandusk
Cleveland
Erie
Predonia
Shet.
Condersport rose 15
Delphi
Buff. Barracks
Niagara
Toronto
L. ONTARIO
Rochester
Syracuse
Utica
Lexingt.
Albany
N.Y.
Van
Montreal
Quebec
Plattsburg
Malone
Lowville
Madison Barracks
Vt.
N.H.
Hanover
Keene
Amherst
Barracks
Boston
Concord
Nashua
Portsmouth
Gardner
Prebble
Whitehead
Ft. Sullivan
Eastern
Mr. Hampden
Fairfield
Hancock Barracks
Ft. Adams
Nantucket
Newfoundland
St. Johns
Halifax
Bermuda
Max. + 40 Bar.
Max. + 60 Bar.
Max. + 50 Bar.
- 10
21°-
14°-
29°-
35°+
34°-
55°-
54°+
54°+
43°+
1,23

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 16. 3. P.M. 1843.



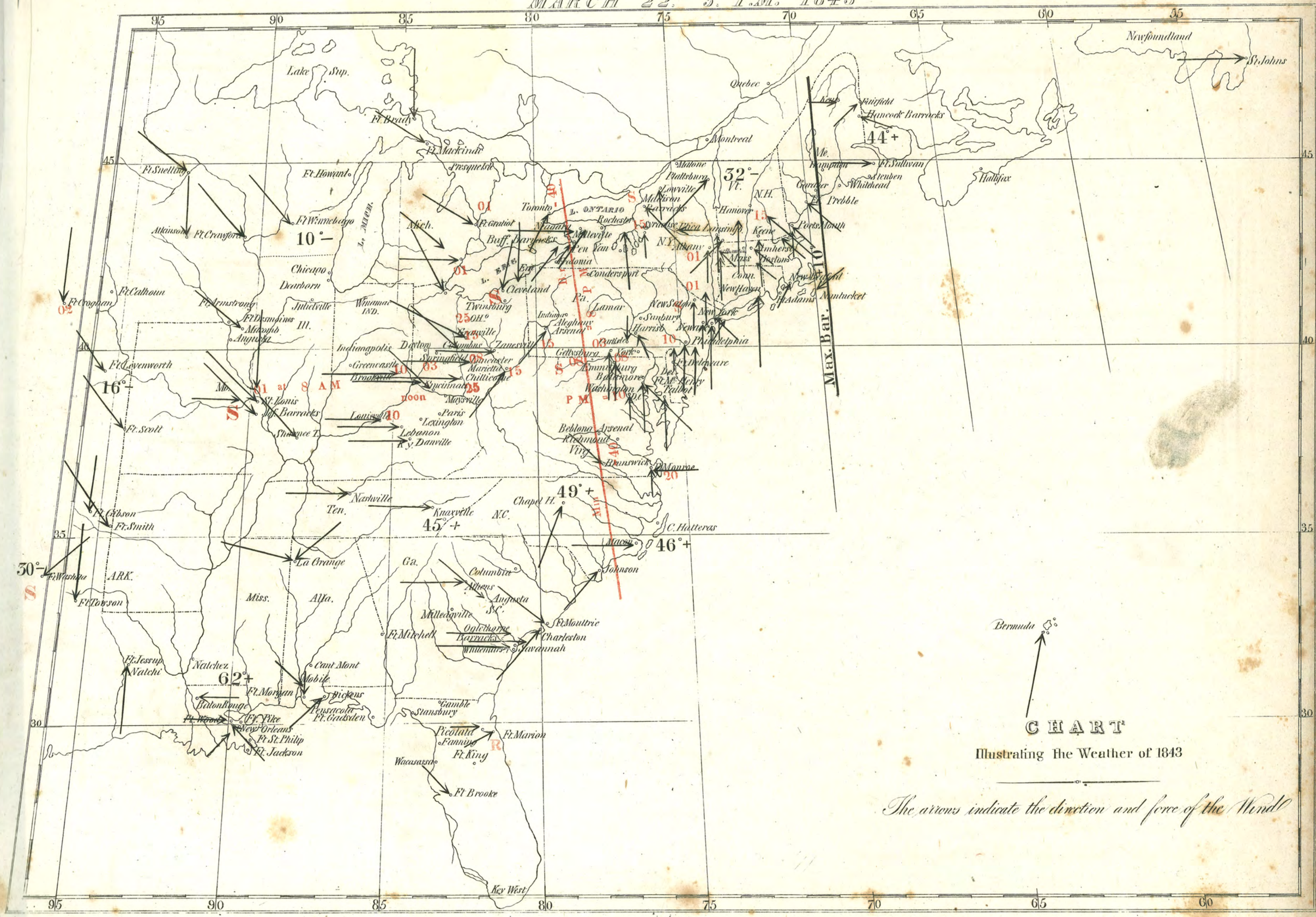
MARCH 17. 3. P.M. 1843

CHART

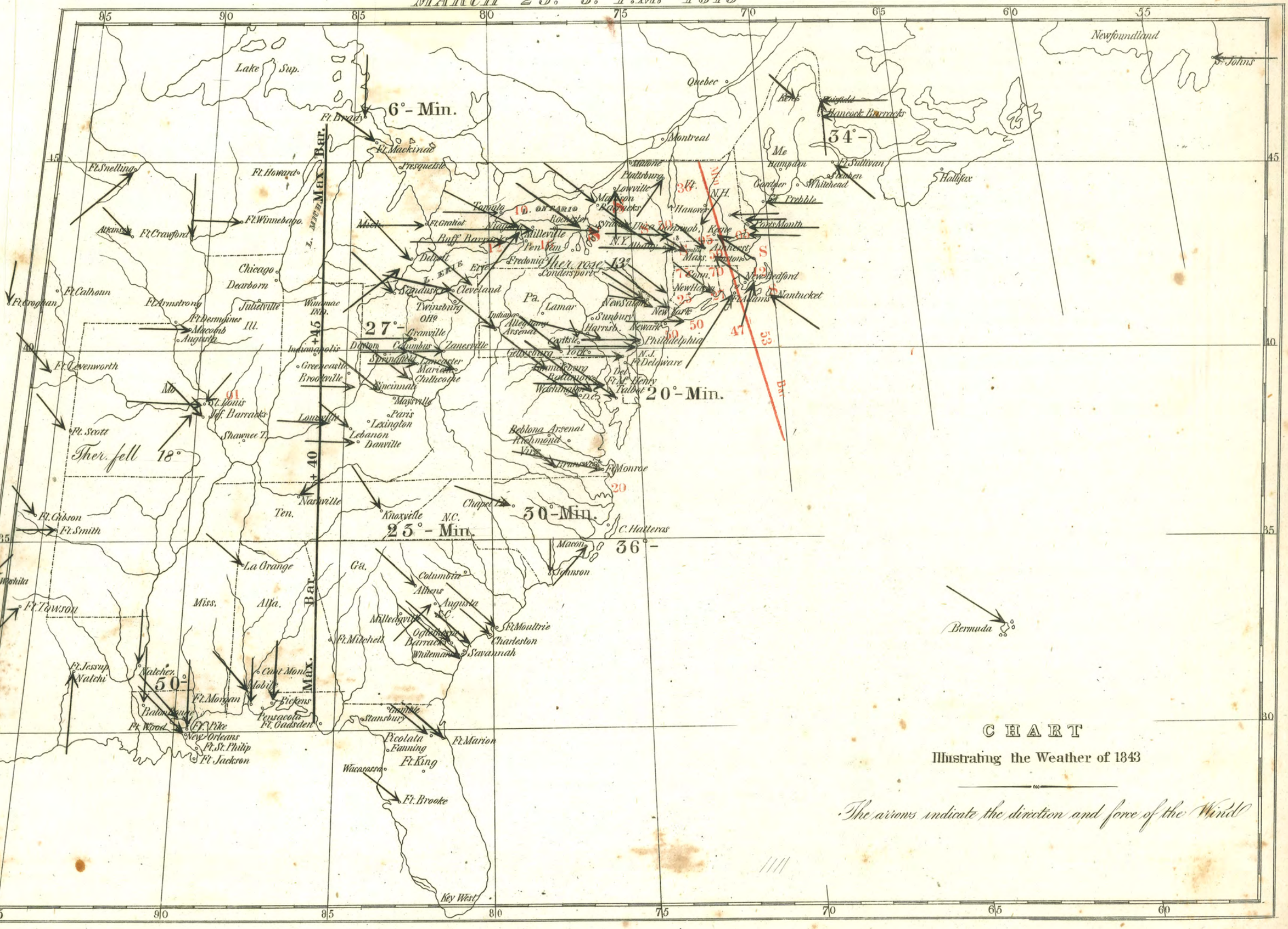
Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 22. 3. P.M. 1843



MARCH 23. 3. P.M. 1843

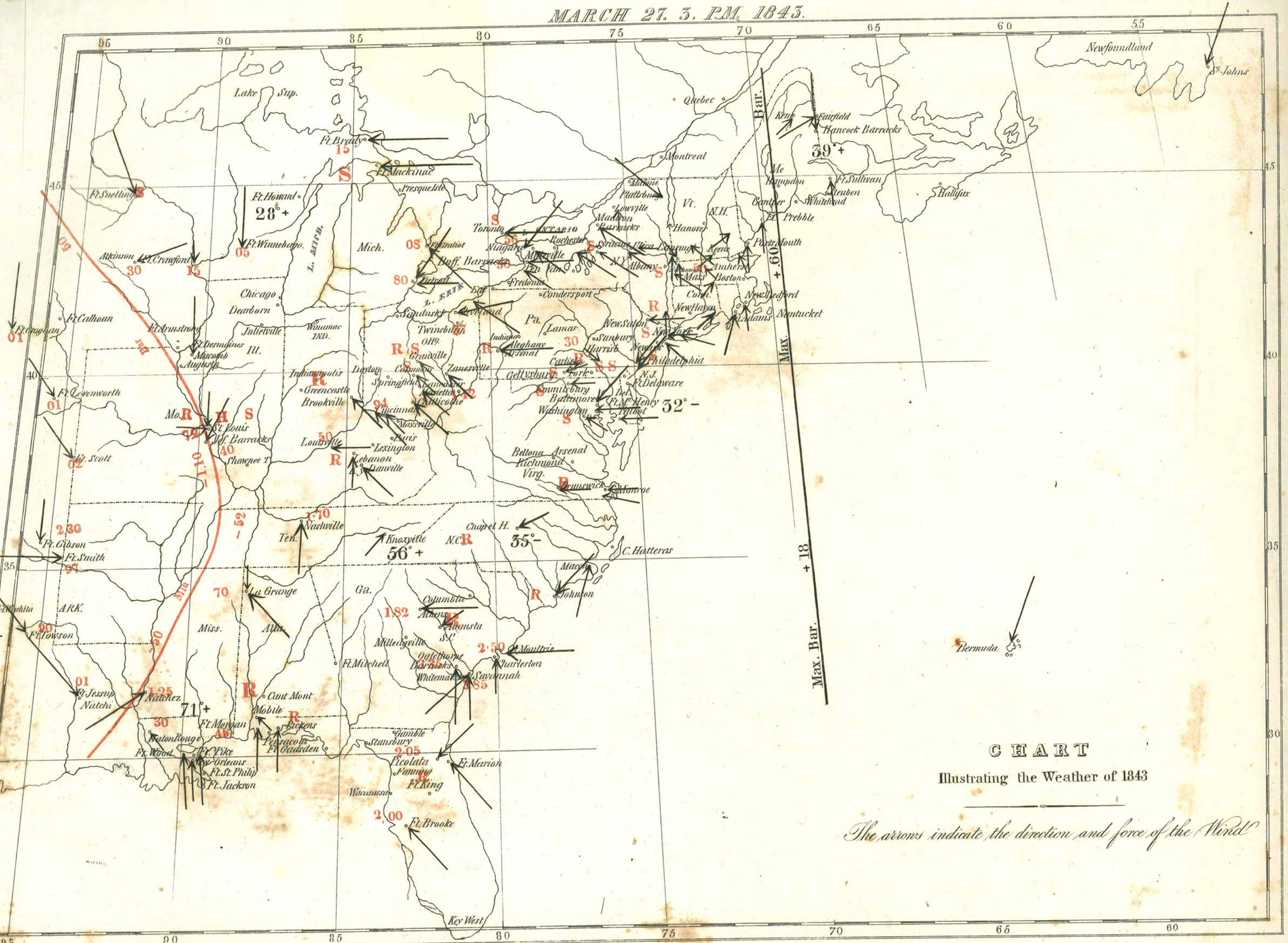


CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 27. 3. P.M. 1843.

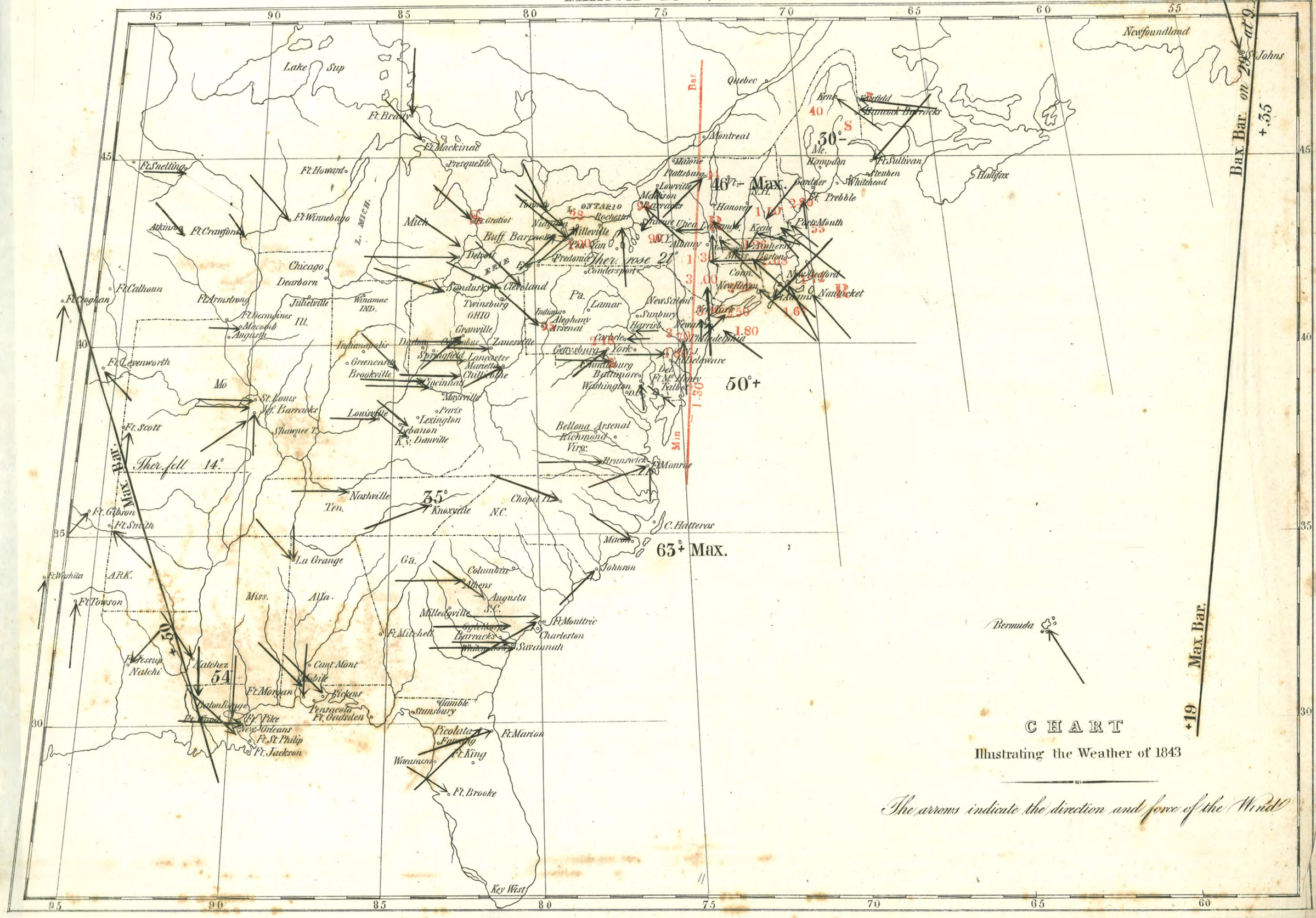


CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 28. 3, P.M. 1843.

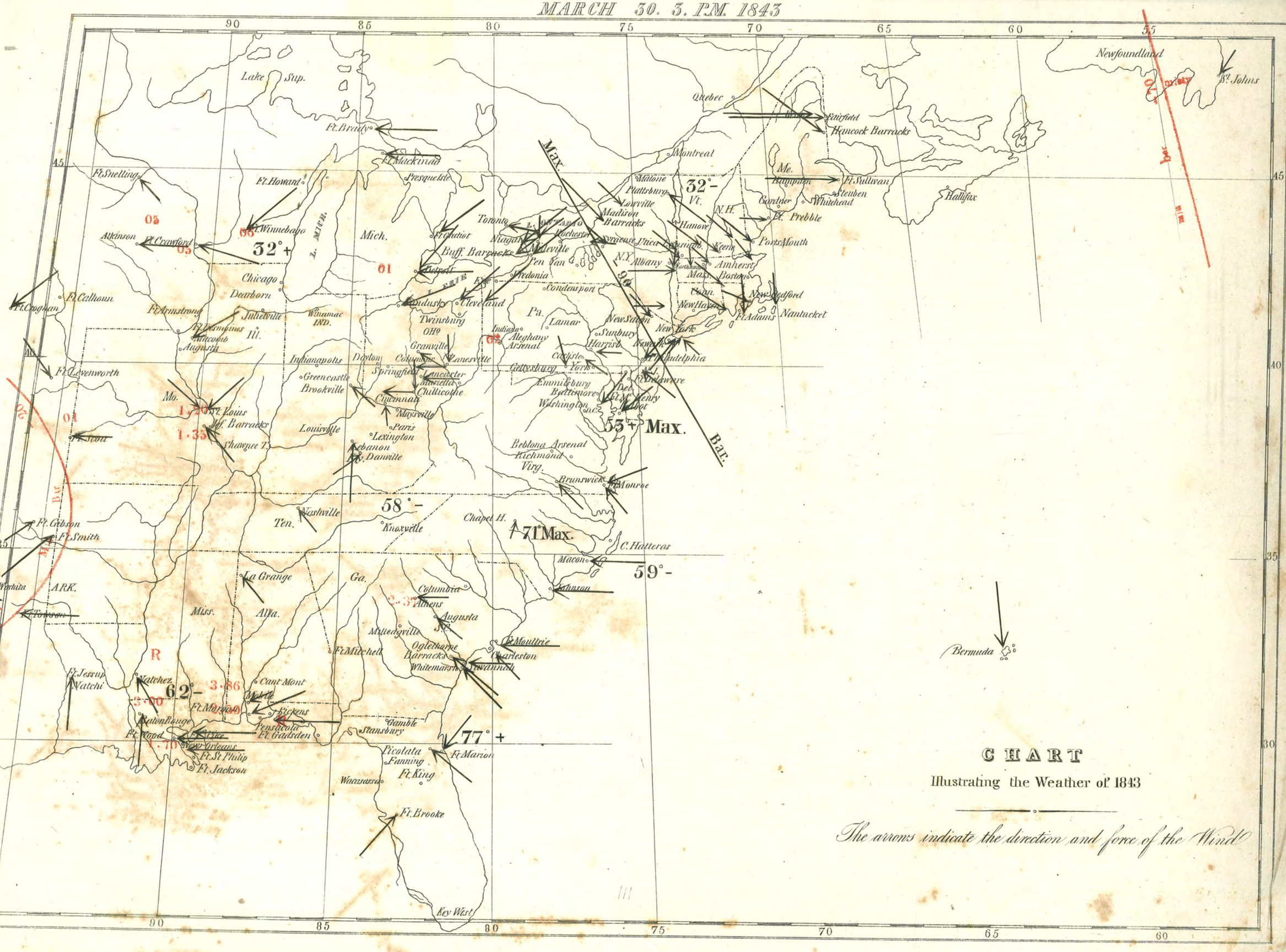


CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 30. 3. P.M. 1843



CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

MARCH 31. 3. P.M. 1843

95 90 85 80 75 70 65 60 55

45 40 35 30

Lake Sup. Ft. Brady Ft. Mackinac Presque Isle Ft. Howard Ft. Snelling Ft. Winnebago Ft. Crawford Atkinson Ft. Calhoun Ft. Armstrong Ft. Desmoines Macomb Augusta Ft. Leavenworth Ft. Scott St. Louis Jef. Barracks Shawnee T. Indianapolis Greencastle Brookville Louisville Lexington Paris Maysville Lebanon Mt. Danville Nashville Ten. Ft. Gibson Ft. Smith La Grange Miss. Ala. Ft. Jesup Natchi Natchez Baton Rouge Ft. Wood Ft. Pike New Orleans Ft. St. Philip Ft. Jackson Chicago Dearborn Juliet ville Winamac IND. Ill. Mich. L. MICH. Buff. Barracks Detroit Sandusky Cleveland Twinsburg OHIO Granville Columbus Zanesville Springfield Lancaster Marietta Chillicothe Cincinnati Dayton L. ERIE Pa. Fredonia Condersport Lamar Aleghany Arsenal Sunbury Harrisb. Newark Carlisle Gettysburg York Emmitsburg Baltimore Washington D.C. Ft. McHenry Talbot N.J. Ft. Delaware Philadelphia New Salem Indiana Toronto Niagara Rochester Oswego Utica Syracuse Albany Troy Schenectady Hudson Barracks Utica Oneida Canal Little Falls Canajoharie Johnstown Schoharie Canal Ft. Plain Otsego Lake Cooperstown Unadilla Oxford Norwich Delhi Delaware R. Catskill Mts. Catskill Hudson Kingston Poughkeepsie Newburgh Peekskill Sing Sing Harlem Bridge Manhattan I. New York Brooklyn Long Island Sandy Hook Quebec Montreal Madison Plattsburg Lowville Ogdensburg Vt. N.H. Hanover Concord Gardiner Ft. Preble Me. Hampden Ft. Sullivan Steuben Whitehead Fairfield Hancock Barracks Halifax Newfoundland St. Johns Keene Ports Mouth Amherst Mass. Boston Conn. New Haven New Bedford Adams Nantucket Ft. Mifflin Ft. Delaware Ft. McHenry Talbot Beblona Arsenal Richmond Virg. Brunswick Ft. Monroe Chapel H. N.C. C. Hatteras Macon Johnson Columbia Athens Augusta S.C. Milledgville Oglethorpe Barracks Whitemarsh I. Ft. Mitchell Ft. Moultrie Charleston Savannah Cant Mont Mobile Ft. Morgan Pensacola Ft. Gadsden Bickens Gamble Stansbury Apalachicola Fanning Ft. King Ft. Marion Wacasassa Ft. Brooke Key West Bermuda

31°+ 32°+ 51°+ Max. 47°+ 59°+ 72°+ 48°– 32°– 36°– 59°– 62°–

Max. Bar. +80 Min. Bar. 1.25

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90

R S

CHART

Illustrating the Weather of 1843

The arrows indicate the direction and force of the Wind

Jan. 1843.

1 2 3 4 5 6 7 8. 9 10 11 12 13 14 15 16 17 18 19 20 2

Natchez

Jan. St. Louis

Snelling

La Grange

Armherst

Nashville

Cincinnati

Knoxville

Athens Geo.

Lebanon Ky.

Granville 29

Milledgeville 24

Columbus

Detroit

Savannah

Hudson

Charleston Sc.

Toronto