M

Mohn   Storm Atlas – Christiania 1870. Norwegian & French   (1

in parallel columns

Since beginning of 1867 has constructed a daily European weather chart
Easy to find among them examples characteristic of storms of North Europe
Published in beginning of 1868 a memoir on the laws of storms – & has
written other memoirs since.   Refers to the interesting storm 24-26 Jan 1868
& the Lofoten one of March 31. both worked up by Buchan, these are very
interesting & well observed, all at tides, storms –   Recounts whence he
gets his observations ' 210 in all – all barom reduced to sea level
some difficulty in getting exact altitudes of places – Does not matter –
the nearest millimetre is really accurate enough – but he took great pains
Prefers this plan to that of Deviations from normal pressure. – Temper.
is only given in the maps of variation   iso thermic lines (synoptic) are
very irregular, & temp. depends so much on local causes, time of day &c.
He has not attempted to reduce them to sea level – the importance of
uniform basis was not realised till he began to construct his maps
He did not ask for psychromet. observ.ns at first & did not like to delay
publication till he got them & therefore gives only one specimen those
of the Lofoten storm (March 31) on the 1st page of it. – Humidity charts are
useless they don't shew that striking continuity which we find in charts
of vapour tension – Wind direction reckoned 0 to 6 → by the number
of feathers to the arrow 0 is a ring. Sky by rings more or less filled up
Rain snow also are given by a . & a *   fog by ☐   thunder storm ⚡
4 maps to each day (1, for the morning, a big one, observation not
strictly simultaneous (they seem to vary 4½ hours viz from 7 am
local time in Germany to 9 am ditto in Scotland.) but there has
never been in consequence any abrupt change of continuity in the maps.
On the opposite page are 3 more maps, (2, for the evening smaller scale
& simpler treatment than in (1).   (3), map of variation of barom: in 24
hours from morning to morning   a black line joins all places where
the height is unchanged. & other lines shew changes of 5 mm .... for fall — for rise
(4) similar map for variation of temp —   It would be much better
if registering apparatuses had been generally used, to give maps. ~~here~~ at closer intervals

As thermo: maps give the variation during 24 hours
$\frac{1}{24}$th of the variation corresponds on the average to 1 hour
& this is found practically very near the truth – ~~also~~ this
is tested by 2 or 3 observ: daily charts but especially by this
they give the mean variation. & 8 pm is the mean hour between
8 a m & 8 a m. The chord through points of equal ~~value~~ bar:
height at 8 am is nearly parallel to the tangent of the curve
through the corresponding points at 8 pm

Round areas of barom: elev:n the isobars are wide apart
but close together, especially at one side, round areas of low elev:n
In the latter they are usually oval. their major axis is more commonly
N & S than in any other one position, but it may be in any. Areas
of elev:n are often long in same geograph: position those of depression
move nearly always towards East. their speed is very variable.
Mean of several obs: Direction E 6° S. speed 43 kiloms per hour.
The [long] easterly component of the movement of storms diminishes
regularly as the storm leaves the atlantic & gets to Russia.
Their mean 49 on sea, 38 Scandinavia & Germany, 35 Russia.
~~movement~~ direction is ~~Scandi Russia~~ [atlantic mean] The [Barom] minimum in
South Sweden have much less regular isobars, their movement
is slow & often irregular & their direction is distinctly towards S.
but Barom: minima become more pronounced in Scandinavia.
In Siberia the barometer oscillates little.
fill up & seem to disappear in Russia. There are many examples of the disappearance
of Barom: minima in great continents Leverrier's great atlas
shews many. These maps shew ~~these~~ cases of the formation
of Barom: minima, notably the Lofoten Storm. – There are
many cases of secondary bar: minima like appendices to the great ones

p.100 He defines a gradient as the horizontal distance at which barom
vary 1 mm. it is therefore the cotan not the tangent of the dip as with us. He
says the closer the isobars are together the larger the gradient.

My formulae are better than Buys Ballot's plan	Let θ be the direction of the minimum bar $\theta+90°$ or $\theta+\phi$ is the direction of the wind [illegible] if $\psi=\theta+\phi$ is the direction of the wind $\psi-90°$ is the bearing of the baro or $\psi-\phi$

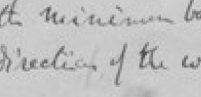


Table
values of gradient mean in his scale not ours (see above) . 20. 30. 40 50 60 70 80 90 100 kilos
force of wind 49 39 31 23 18 20 15 18 14

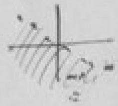
to

~~the gradient × velocity of wind in kilos = 1440~~

(Mohn) gradient × velocity of wind in kilom per hour = 1440

In minimum, the isobars are generally closer together on one side. — and the violence of the wind is where they are closest — In centre of the storm the gradient is "large" & wind small

If 

AB be the direction of the bar minimum motion & C the centre of the minimum the frequency of storm are shown by the figures. hence in the  shaded hemicircle the storms are most common

Vapour tension is given (p 12) in figures. He was unable except in one case to ~~make~~ frame notes of them (see before) The MSS make given these results. Vapour tension is usually greatest to the South of C or SE or to SW branches extend from its max: from SW to NE following the S & SW winds  They are directed somewhat in advance of centre of depression. The locus of greatest vapour tension does not move much but clings to certain localities — to supply reservoirs There may be several reservoirs simultaneously of this kind

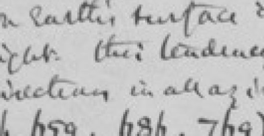
The sky is generally most clouded in advance of centres of depression & more rain & snow there — Often hail in the back side.

Variation of barometer p14–15, not very clear.

Varn of therm. much less regularly disposed than of barom., the zone of rise is in front, of fall, behind the centres of depression.

Varn of wind — It veers on the right side of the centres of depression & backs on the left side

p.17 Effect of rotation of Earth, all bodies moving in any direction on Earth's surface in N. hemisphere have a tendency to turn to the right. this tendency = 15° × sin lat, per hour. It is the same in all directions in all azimuths (see Comptes rendus Tome XLIX 2e semestre pp 459, 484, 749)

p 18  Mohn's results are calculated on the assumption (not expressed) that the winds take just 90° turn in their spirals, not more.

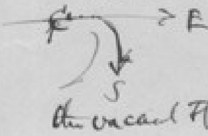
(4)

19 Thinks it better not to ascribe ½ the cyclone to the polar & half to the Equatorial curr: but rather to recognise the fact that each part of it is fed from different quarters & has attributes peculiar to each.

Causes of baromet: depression

1. All moving bodies weigh less. (? does a teetotum weigh less when it spins) a live man full of movements, less than a dead man)
2 warmth of air, 3 damp: because water vapour is lighter than air.
4. ascending movement of air. 5 Condensation of vapour, & evolved heat
6. Rain & snow, taking so much weight out of the air — now these are just what we get on the anterior border of a Cyclone. The wind there, comes from the S bringing vapour, the centripetal component of the air makes it rise & deposit cloud & rain, &c. Comparison of cyclones & ^water^ Equatorial calms.

Reason why the centre moves E is that the air in front is fed from the S.



As the bar: tends to fall in front, so it rises behind because the vacant space is filled up. & by ~~cold~~ air from the N

23. The wind backs. when the north side of a cyclone passes over then it usually backs in ^arctic^ N. America & Europe.
Iceland is in the main route of the centres of depression

24. When there is cold ahead the cyclone ~~turns~~ is checked & turns SE

In true tropical cyclones the rotatory force is small (because sin lat is small & the winds blow along the gradients until near the centre. Their powerful convergence produces a powerful ascensional movement. The quantity of vapour too is enormously greater than with us. The movement of translation is slow because the N & S winds are ^almost^ equally warm & damp. — It may stop altogether or recieve from the area that yields most vapour in that to (which?) which its anterior border points

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f6v f5

Reducing Barom: to sea level

Correction = $\frac{\text{Elev}^{n} \text{ of station in feet}}{\text{Height of Column of air corresponding to } \frac{1}{10} \text{ inch Bar: at temp of observation}}$ × $\frac{\text{reading of Barom}}{\text{normal height at sea level}}$

the last term for 400 ft is at a maximum for values such as $\frac{28}{29.5}$ or $\frac{31}{29.5}$ = 1.05
and may therefore be disregarded as a factor of the correction

28/29.5(1.05
28
150
140

the first term is at a maximum at $\frac{400}{\text{Height at } 15^{\circ}}$ or $\frac{400}{\text{Height at } 95^{\circ}}$ = $\frac{400}{84}$ & $\frac{400}{100}$

84/400(4.76 100/400(4
336
640
588
520
504

= 4.76 and 4.00 in $\frac{1}{10}$th of inch = 0.476 & 0.400 inches

being a difference of 0.76 between the two extremes
or 0.38 between either extreme & the mean.
which may be disregarded. more the omitted term reduces, not increases, the correction.

Generally the extreme error is less than $\frac{1}{100}$th inch for each 100 feet of elevation

take a more moderate limit $\frac{400}{\text{height at } 32}$ · $\frac{400}{\text{height at } 80}$ = $\frac{400}{87.5}$ & $\frac{400}{94.8}$

difference between extremes 0.44
between either extreme & mean 0.22

87.5/4000(4.57
3500
5000
4375
6250

94.8/4000(4.13
3872
1280
948
3120

4.57
4.13
0.44

or extreme error = $\frac{1}{100}$th inch for every 200 feet bar.

5 triangles (or omitting Gl: 4 triangles)

distances in geogr. miles