**Chapter 11 & Conclusion Questions for FYS 178 Fall 2020**

How do air masses form?

Give two examples of air mass “source” regions.

What can happen when an air mass moves over an area warmer than its source?

The Bergen school tried to establish an air-mass concept and a method of air-mass analysis in connection with their attempt to rationalize so-called \_\_\_\_\_\_\_\_ meteorology. Fill in the blank.

What was one of the weather forecasting difficulties encountered during the initial summer forecasting on behalf of Norwegian farmers?

What two factors made improving forecasts of local showers a high priority for the Bergen meteorologists?

How does rain harm harvested hay and how would improved weather forecasts of local showers help hay farmers?

What did Sigurd Enebo point out that were the majority of the erroneous forecasts during the summer 1918 experiment? Was this type of erroneous forecast more or less serious for the hay farmer than the opposite type of erroneous forecast?

During the summer 1919, did Solberg find that the presence of moist sea air in Norwary was a *necessary* or a *sufficient* condition in the formation of local showers?

What, in addition to the moisture content of the air, is an important factor in the formation of local showers?

In *unstable* air, the rising heated air will be \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ than the air surrounding it at each level of its ascent; hence buoyancy forces support continued vertical displacement \_\_\_\_\_\_\_\_. Fill in the blanks.

What air properties in addition to temperature exhibit a “jump” as one crosses a line of discontinuity (a front)?

What two weather aspects were used by the Bergen meteorologists to infer the stability and origins of air masses?

Of the polar or tropical origin air mass, which was most likely to have the occurrence of cumulus-type clouds, according to Jacob Bjerknes and Solberg?

The head of the army’s air force in Norway claimed that “a modern air force cannot manage without a well-arranged \_\_\_\_\_\_\_\_.” Fill in the blank.

What four weather phenomena not related to fronts and cyclonic activity had proved troublesome during Norwegian flights in 1920?

To obtain vertical distributions of several meteorological elements, Calwagen turned to what aerological instrument?

List the four air mass classifications used by Calwagen.

What is a radiosonde?

What two Norwegian industries were the primary beneficiaries of improved forecasts of the formation of local showers?

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Vilhelm learned early that curiosity, vision, and innovative work were not sufficient to secure success in professional science. On what other two principles would success also depend?

What developing industry did Vilhelm “bank on” that would depend on and contribute to the scientific conquest of the weather and thereby justify his calculated risk of changing his focus from mechanical physics to the atmosphere?

Why was pre-war Germany the right place for Vilhelm to produce a new generation of aerologists with which to establish his new discipline?

To reduce government expenditure the Ministry of Church and Education in Norway recommended in 1924 the consolidation of the two weather centers for southern Norway. Which weather center was closed and which center became the new Norwegian Central Meteorological Institute?

What industry in Norway first increasingly abandoned their folklore and turned to the Bergen forecasts for their weather information?

By the 1930s, what two factors quashed the opportunity for combining practical service roles with academically satisfying work to the benefit of culture, state, and society?

How did the needs of aviation act toward *hindering* progress in meteorological research by the 1930s?

The division between what two aspects of science grew as university degree programs and departments of meteorology began to flourish in Europe, Japan, and North America?

In what year did Vilhelm return to the university in Oslo to pursue “pure” research?

Vilhelm might well have preferred an academic environment that left him free of the need to justify his endeavors to politicians and interest groups. What two factors made this choice impossible?

The emergence of the Bergen meteorology illustrates new knowledge arising through \_\_\_\_\_\_\_\_: discovery as a process. Fill in the blank.

Why did the forecasts of the 21 October 1921 cyclone differ considerably between the Bergen-trained and the Danish meteorologists, even though their forecasts were based largely on the same observations?

For an ambitious scientist working on the geographic periphery with relatively few resources, devising a significant analytic or instrumental technique may provide a means not only to create a school but also to do what?

Many of the theoretical schemes that competed with the polar front meteorology regard lower-level atmospheric changes as \_\_\_\_\_\_\_\_ of events in the upper strata. Fill in the blank.

Vilhelm’s transformation of meteorology in Bergen was conditioned by what two fundamental events?