partiality in preparing preliminary reports, is the best possible insurance against trouble later on.

Who scouts through wilderness and cold
And finds the stone that turns to gold,
The gems of Nature's wealth untold—
The Engineer.

Who gets five paltry plunks per day
To give the thing he finds away
To some one else who makes it pay,—
The Engineer.

Who's heart is always in the game
When trouble comes it's just the same,
But when it comes,—who gets the blame?
The Engineer.

EBERMAYER'S EXPERIMENTS ON FOREST METEOROLOGY.

TRANSLATED FROM EBERMAYER'S ORIGINAL WORK AND CONVERTED INTO ENGLISH UNITS BY ROBERT E. HORTON, M. M. E. S.,
57 NORTH PINE AVENUE, ALBANY, N. Y.

The secretary asked the writer to revise and extend the paper on "Deforestation Drainage and Tillage" which appeared in the Michigan Engineer in 1906, and which is now practically out of print.

In view of the recent public prominence of the questions of the relation of forests to stream flow and the conservation of water, forests and other natural resources, the writer has felt that the paper in question had better stand as it is until he has time to analyze the newer data and apply it to Michigan conditions. The relation of forests to stream flow is a broad and profound branch of hydrology, which should be discussed scientifically rather than politically, as appears sometimes to have been done by over enthusiastic conservation propagandists. As a contribution to the rather limited

stock of really valuable and pertinent data, the writer presents a translation of Ebermayer's classical experiments on forest meteorology. This data was published as far back as 1873 in Ebermayer's work "Einwirkung des Waldes auf Luft und Boden." The results which were then published in Paris feet and lines, with temperatures on the Reamur scale have not, so far as the writer is aware, hitherto been presented in full in modern units.

The writer regrets that he has not had time to discuss these results in their relation to the great deforested areas of Michigan. The tables are, however, so clear in the original arrangement of data used by Ebermayer, that their import is evident. The only conclusion the writer now suggests is, that there is no simple general rule as to the effect of deforestation which will apply to all climate, forests or drainage basins.

These researches conducted under the direction of Dr. Ernst Ebermayer, in Bavaria, include all the data necessary for a complete comparison of evaporation from water, from natural soils and from saturated soils, both in forests and in open, with the exception of water temperature and of wind velocity. Full soil temperature records are given, and the evaporation gage was so exposed that the temperature of the contained water probably followed the temperature of the air very colsely. As regards the observations in forests, it is probable that the wind velocity was negligible in nearly all cases. The experiments include a considerable variety of conditions of soil and of forest cover. In general, the soils were sandy, and the forest cover pine, fir, beech, or birch.

The several stations and the conditions as to forest, soil and exposure are described below.

The instrumental equipment of the stations was as follows:

For the determination of atmospheric pressure, a mercurial barometer by Greiner of München was used. The readings were reduced to zero Reaumur by means of Dr. Bruhn's tables.

Thermometers for the determination of the temperature of the air were graduated to one-tenth degree Reaumur scale.

Soil temperature was observed at depths of one-half foot, one foot, two feet, three feet and four feet at each station. The soil thermometers were graduated to one-tenth degree Reaumur, and had large elliptical bulbs. The thermometers were lowered into the ground on wooden slides fitting into wooden tubes of square section having holes at one side near the bottom, opposite which the thermometer bulbs were placed. The tubes were withdrawn for the purpose of taking observations.

The temperature of the tree trunks were taken by means of thermometers graduated to one-fifth degree Reaumur, one of these thermometers being inserted in a hole bored in a suitable tree at a height of five feet above ground at each station. The thermometer bulb was placed in the center of the tree trunk, and the scale protruded. The hole was closed air tight with wax. The thermometers were placed on the northerly side of the trees, and the protruding stems were bent at right angles close to the trunks.

The absolute and relative humidity of the air was determined by means of an August psychrometer, placed under an instrument shelter at each station. The humidity was determined from the readings of the dry and wet bulb thermometers by means of Souhl's psychrometric tables. The wet bulb thermometer was provided with a water reservoir, and the tube covered with muslin. The thermometer scales were graduated to tenths degree Reaumur. In the winter a hair hygrometer of Saussure was utilized.

Evaporation from free water surface was observed from March, 1868, to February, 1871, inclusive. During 1868 and 1869 the evaporation was measured by means of a rectangular zinc vessel 3 Paris inches deep and 1 Paris square foot (1.136 English feet) surface area. This vessel was filled 0.694 full by pouirng in 300 Paris cubic inches (363 English inches) of water at the beginning of each period of observation. Observations were taken at intervals of 8 to 14 days in summer and once a month in winter, the water remaining being measured in a glass graduate, the ice being melted before measurement in winter. The evaporator was placed at a height of about 5½ feet above ground, and protected from

the direct rays of the sun and from rainfall by means of a small roof, but was fully exposed to air currents. In the beginning of 1870, the Lamont atmometer was utilized in order to obtain more precise observations during the summer season, the evaporation tank observations being continued in winter. The atmometer consists of a reservoir A, a close-fitting piston B, the position of which relative to the scale C is adjusted by means of a screw. Reservoir A communicates with the evaporation pan D. At the beginning of observations, the index is set at zero on the scale, and water poured into the evaporation pan until the water surface appears at the small opening E. The piston is then moved downward until the water level rises to a height one Paris line (0.089 inch) below the rim of the evaporation pan. The instrument is then allowed to stand two, three or more days, according to the dryness of the air, before the reading is taken. The evaporation depth is then determined by raising the piston B until the water surface flows to the orfice E. The reading on the scale then gives the depth of the evaporation. The size of the reservoir and the pan were so adjusted as to multiply the depth in the pan, and enable the evaporation depth to be observed to 1-100 Paris line (.00089 inch). The instrument was sheltered from the direct rays of the sun.

The evaporation from continuously saturated soil was determined by means of the apparatus shown in Figure 20. The zinc tank A has a surface area of 1 Paris foot (1.136 English square feet), is 8 inches deep, and at a height of 2 inches from the bottom is placed a perforated sieve-like double bottom DD. The tank A is in communication with a cylindrical zinc vessel BB, in which a second cylindrical water reservoir C is placed, in the bottom of which is an air valve E similar to that used in students' lamps. The upper end of the water reservoir has an air tight cover. The reservoir C is filled, then placed in position. The valve is then closed and the reservoir inverted and placed in the container. The needle of the valve bears against the bottom of the tank, permitting air to enter the reservoir. The water flows out into the bottom of the evaporation tank until the space underneath the perforated false bottom is filled and the water level is raised to

the height of the air valve in the reservoir, shutting off the air vent, hence preventing outflow of water from the reservoir. Water is lifted through the mass of earth in the tank A by means of capillarity, and is evaporated from the surface. Whenever the water level underneath A is reduced by evaporation sufficiently to open the air valve, water again flows out of the reservoir and fills the space underneath the evaporation tank. In this way the soil tank is continuously suppplied with water, the conditions resembling those of a natural soil with a constant ground water level. At the beginning of the observations the soil tank was filled to a depth of 6 inches. The reservoir was also filled, and the apparatus allowed to stand until water had risen through the soil, saturating it and rendering the surface moist. A known quantity of water was then placed in the reservoir, and evaporation allowed to go on during fourteen days, after which time the water remaining in the apparatus was drained off from the cup underneath the soil tank, and measured in a graduated glass cylinder. Between the earth and the false bottom in the soil tank was placed a thin mat of straw. The apparatus was so placed that the soil surface stood 5 inches above ground. A small roof was erected over the instrument to cut off rainfall, snow, and the direct rays of the sun. Three soil atmometers were erected at each pair of meteorological stations. They were all filled with earth similar to that at the forest station; the apparatus was carefully leveled.

A slight error is introduced by the fact that when the reservoir is only partially filled, the air pressure, and consequently the outflow may vary, as the result of temperature changes.

This instrument offers a means of determining the relative evaporation from various classes of soils, both with and without a covering of litter. Also the effect of various forms of forest litter, as dead leaves, pine needles and ground moss, and to compare this with evaporation from a free surface.

The precipitation was measured by means of the improved rain gages made by Manard in Bromberg. The surface of the funnel of the rain gage was 1 Paris square foot (1.136 English feet). The funnel of the rain gage was placed

about seven feet from the earth, and carefully leveled. In the interior of the forest, the instrument was placed on a post underneath a close-standing group of trees whose branches touched one another. The record obtained in this way from a rain gage so placed, when subtracted from that of a gage in the open, indicates about what water is intercepted by the leaves, twigs, branches and trunks of the trees. That portion of intercepted rainfall which flows down twigs and branches, and in that way reaches the ground, may be approximately measured by means of a zinc intercepting ring placed around the tree trunk, from which the water flows into a measuring cylinder. If the horizontal projection of the tree has been measured, the amount of water received on the forest soil in inches per unit surface can be estimated. Such observations were made at the station at Johannes-Kreuz.

For snow measurement, a rectangular vessel of zinc 1.5 Paris feet (1.6 English feet) high, of 1 Paris square foot (1.136 English square feet) cross section was used. This gage was placed on the ground, and the catch was measured in a graduated glass cylinder. The snow gage was placed under a group of close-standing trees in the forest.

For the determination of the percolation, either while in the forest or in the open, lysimeters consisting of rectangular zinc vessels, one Paris square foot (1.136 English square feet) cross section, were used. The lysimeters were filled with earth of the type found at the station, and allowed to stand exposed to the influences of temperature and rainfall until the contained earth had attained the natural condition of the surrounding soil. The lysimeters were sunk in the ground to such a depth that the uppper rim projected just above the surrounding soil surface, and cut off the surface run off. The precipitation which fell on the surface of the lysimeter was either evaporated, or passed through the soil as infiltration. A perforated false bottom was placed in each lysimeter. The funnel shaped bottom communicated with a measuring glass placed in an adjourning pit. The percolating water collected in the bottom of the lysimeter, and was drawn off from time to time by means of a stop cock in the outlet pipe. Seven lysimeters were erected at each pair of stations, three in the

open having a depth of 1, 2 and 4 Paris feet, (1.07, 2.13 and 4.26 English feet) respectively, with and without vegetation. Two lysimeters, 1 Paris foot depth, were placed at each forest station, one with bare soil, and the other covered with forest litter. Additional forest lysimeters, covered with litter and having a depth of 2 and 4 Paris feet (2.13 and 4.26 English feet) were also used. The hours of observation were 8:00 A. M. and 5:00 P. M. daily, March to October ,1868, and 9:00 A. M. and 4:00 P. M., November, 1868, to February, 1896, inclusive.

Ebermayer states that the instruments were graduated in degrees Reaumur and in inches of the French "Systemme Ancien" for the reason that these were in almost universal use in Germany and Austria at that time. In the following tables the general results which have a bearing on evaporation and percolation have been presented, it is believed, for the first time in English units. A large amount of additional data relative to maximum and minimum temperatures, ozone, temperature of air in tree tops, etc., may be found in Ebermayer's original report, from which the tables here given have been translated.

DUSCHLBERG.

In the Bavarian forest at the foot of the Dreisesselberges, Latitude 48 degrees 47 minutes 54 seconds North, Longitude 31 degrees 23 minutes 54 seconds East. Altitude 2959 feet above tide.

The soil is a fertile clay loam formed from disintegration of granite, grains of which are intermingled with the soil.

The station in clearing is situated in a meadow slightly inclined to the west and freely exposed to sun and wind.

The forest station is in a forest of forty-year old pine, with occasional firs and beeches, a short quarter-hour walk from the open station, and, on a westerly slope of slight inclination.

The tree trunk thermometer is in a 50-year old fir tree, 12 inches diameter at breast height.

(a) Dr. Ernst Ebermeyer, Die phyiskalischen Einwirkungen des Waldes auf Luft und Boden.

SEESHAUPT.

In the Bavarian high plains at the south end of the Sternberg sea, Latitude 47 degrees 49 minutes 30 seconds North, Longitude 28 degrees 27 minutes 42 seconds East. Altitude 1951 feet above tide.

Soil, calcareous detritus mixed with clay.

The station in clearing is on a level plain, and is fully exposed to sun, rain and wind from all sides.

The forest station is in a close stand of 40-year old fir trees, somewhat inclined to the east, and about one-half hour's walk from the open station.

The tree trunk thermometer is in a 36-year old pine of 8 inches diameter at breast height.

ROHRBRUNN.

In Spessart, Latitude 49 degrees 53 minutes 48 seconds North, Longitude 27 degrees 3 minutes 6 seconds East. Altitude, 1564 feet.

Soil, sandy loam from disintegration in situ of colored sandstone and containing unweathered sandstone fragments.

Station in open is located on a level meadow, fully exposed on all sides.

The forest station is situated in close stand of 60-year old beech trees with occasional 200-year old oaks. The country side has a moderate northeasterly inclination and the station is a five-minute walk from the open station.

JOHANNES-KREUZ.

In the Haardt Mountains in the Rhine Valley, Latitude 49 degrees 20 minutes 12 seconds North, Longitude 25 degrees 29 minutes 12 seconds East. Altitude 1564 feet.

Soil, fine grained sand.

Station in open is on level meadow exposed on all sides.

Forest station, in 60-year old, close-standing beech wood, a quarter-hour walk from the open station.

A tree trunk thermometer is in a 60-year old beech, 12 inches in diameter breast high.

EBRACH.

In Steigerwald, Latitude 40 degrees 50 minutes 54 seconds North, Longitude 28 degrees 9 minutes 30 seconds East. Altitude, 1249 feet.

Soil for two feet at surface is sandy loam. In the forest the subsoil is a red poecelite formation.

The station in open is on a freely exposed meadow, about one-half hour's walk from, and 178 feet above the forester's dwelling where the barometer is located.

The forest station is in 50-year old pine forest, containing isolated oaks, birches, and aspens, and is about ten minutes' walk from the open station.

The tree trunk thermometer is in a 50-year old beech, diameter 12 inches breast high.

ALTENFURTH.

In the imperial forest of Nuremburg, Latitude 49 degrees 24 minutes 36 seconds North, Longitude 28 degrees 49 minutes 48 seconds East. Altitude, 1066 feet.

Soil, poecilite formation mixed with some humus to 1.5 feet depth. Soil in forest is almost pure sand, but is moist and has a good moss cover. Ground water is found at five feet depth.

The open station is in a meadow freely exposed to atmospheric influences.

The forest station is in a close stand of thrifty, medium sized wild pine, about fifteen minutes' walk from the station in the open.

The tree trunk thermometer is in a 36-year old wild pine, 12 inches in diameter at 5 feet height.

ASCHAFFENBURG.

Latitude 49 degrees 58 minutes 36 seconds North, Longitude 26 degrees 48 minutes 36 seconds East. Altitude 426 feet. Station is in the garden of Professor Ebermayer, near the city, and freely exposed on all sides.

No forest station was established.

PROMENHOF.

At Kutten plains in Bohemia, Latitude 49 degrees 52 minutes 42 seconds North, Longitude 30 degrees 17 minutes 54 seconds East. Altitude, 1748 feet.

Soil, sandy loam of disintegrated gneiss.

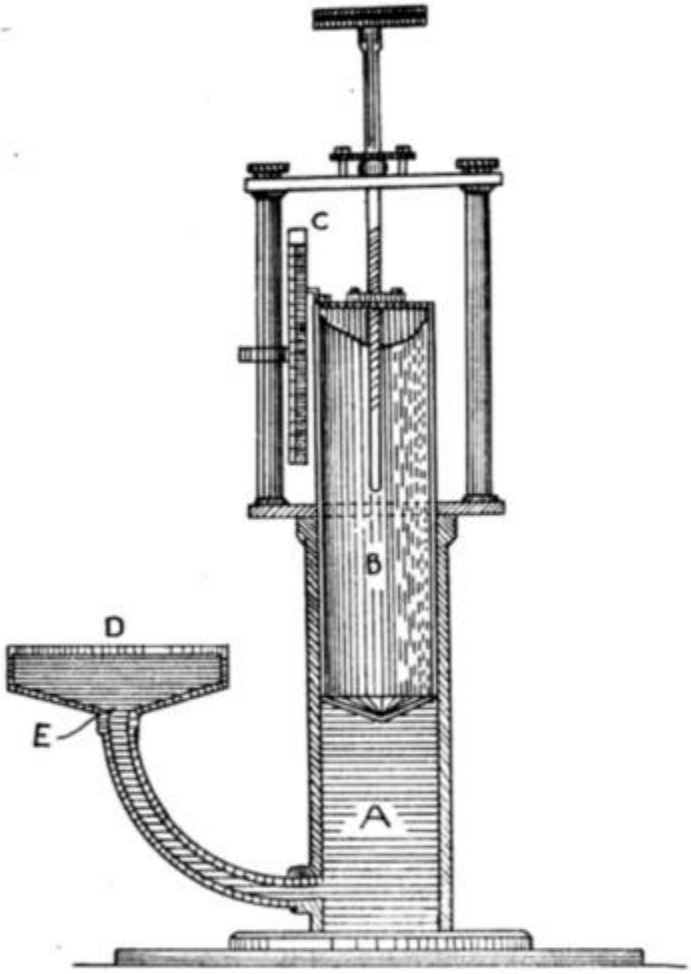

Fig. 19. LAMONT ATMOMETER.

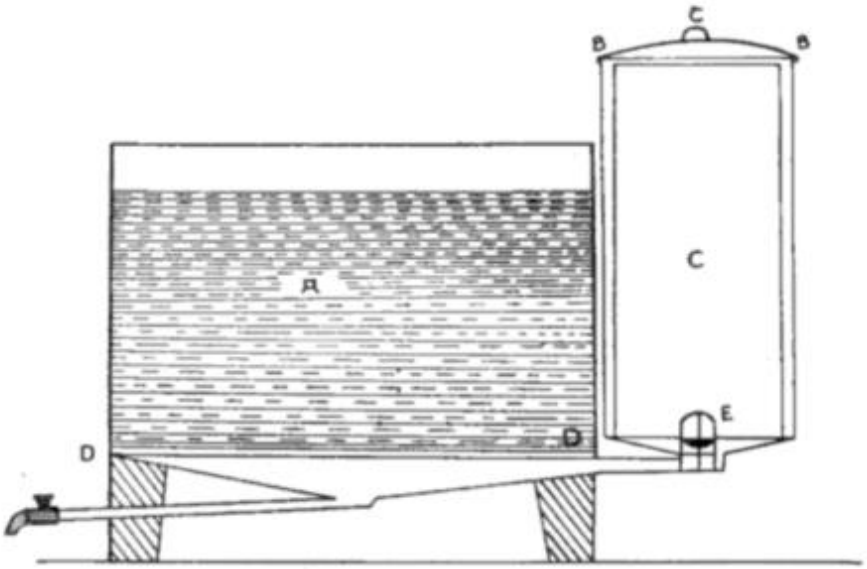

Fig. 20. LYSIMETER WITH AUTOMATIC SUPPLY AND CONSTANT WATER LEVEL.

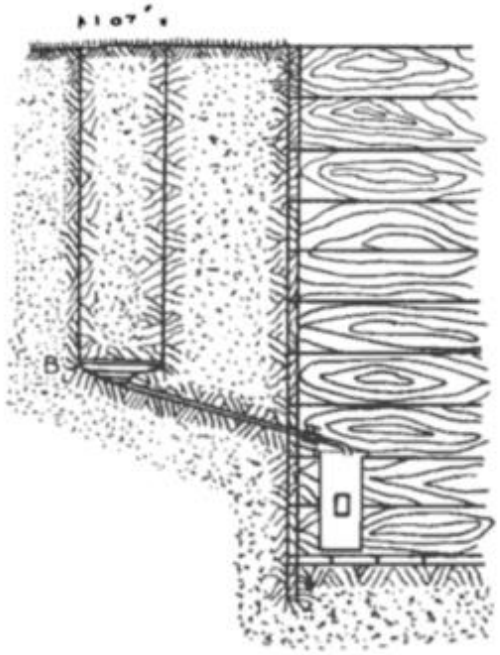

Fig. 21. LYSIMETER USED BY EBERMEYER IN BAVARIA.

SUMMARY OF EBERMAYER'S EXPERIMENTS, MARCH, 1868. TO FEBRUARY, 1869, INCLUSIVE.

Station	Soil	Forest
Seeshaupt	Calcareous clay	40-year old fir
Ebrach	Sandy loam	Chiefly 50-year old pine
Rohrbrunn	Sandy loam	Close 60-year old beech
Johanneskreuz	Fine sand	Close 60-year old beech
Altenfurth	Sand and moss	Close thrifty wild pine
Aschaffenberg	Garden	(No forest station)

Station	Precipitation, Inches				Evaporation, Inches		
	Open	Forest	Difference	Per Cent	Open	Forest	Per Cent
Seeshaupt	34.96	25.51	9.45	0.270	19.55	4.03	0.206
Ebrach	26.82	22.45	4.37	0.162	27.28	10.97	0.402
Rohrbrunn	43.02	35.90	7.12	0.166	26.40	7.42	0.283
Johanneskreuz	29.90	30.16	9.74	0.244	23.45	10.87	0.464
Altenfurth	25.07	18.13	6.94	0.277	20.97	9.29	0.443
Aschaffenberg	22.30	.....	.....	.....	19.00	.....	.....
Average	32.01	2 .43	7.52	0.224	22.77	8.52	0.360

PERCOLATION, INCHES

Station	Without Litter			With Litter			
	In Open			In Forest			
	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft	4 Ft.
Seeshaupt	18.94	15.49	10.28	22.26	26.68	16.90	13.49
Ebrach	.....	.....	.....	17.55	19.53	22.21	12.05
Rohrbrunn	28.88	29.12	28.12	27.62	31.45	30.51	25.93
Johanneskreuz	20.73	13.10	25.14	12.92	11.73	26.48	.....
Altenfurth	11.43	14.54	14.03	11.34	12.59	11.89	9.25
Aschaffenberg	12.27	12.26	.....	.....	.....	.....	.....
Average	18.45	16.90	19.39	18.31	20.40	21.60	15.18

EVAPORATION FROM SOIL, INCHES

Station	Without Litter			With Litter			
	In Open			In Forest			
	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft.	4 Ft.
Seeshaupt	16.02	19.47	21.68	3.25	—1.17	8.61	12.02
Ebrach	.....	.....	.....	4.90	2.92	0.24	10.40
Rohrbrunn	14.14	13.90	14.90	8.28	4.45	5.39	9.97
Johanneskreuz	19.17	26.80	14.76	17.24	18.43	3.68	.....
Altenfurth	13.64	10.53	11.04	6.79	5.54	6.24	8.88
Aschaffenberg	10.03	10.04	.....	.....	.....	.....	.....
Average	14.80	16.17	16.35	8.09	6.50	4.83	10.32

COMPARATIVE EVAPORATION, DEPTH IN INCHES, FROM SATURATED SOIL.

	Altenfurth					Aschaffenburg					
	Water Surface Evaporation		Saturated Soil				Water Surface Evaporation		Saturated Garden Soil		
			In Open Humus, Bare	In Forest					In Open, Bare	In Forest	
1868	Open	Forest		Sand Bare	With Litter	1868	Open	Forest		Bare	With Litter
Mar.	.962	0.348	.....	.....	.....	Mar.	0.777	.....	.....	.....	.....
Apr.	1.613	0.607	.....	.....	.....	Apr.	1.169	.....	.....	.....	.....
May	3.552	1.783	.....	.....	.....	May	3.063	.....	.....	.....	.....
June	3.219	1.606	.....	.....	.....	June	1.990	.....	.....	.....	.....
July	2.671	1.221	.....	.....	.....	July	3.270	.....	.....	.....	.....
Aug.	2.849	1.332	.....	.....	.....	Aug.	2.752	.....	.....	.....	.....
Sept.	2.324	1.096	.....	.....	.....	Sept.	2.360	.....	.....	.....	.....
Oct.	0.888	0.384	.....	.....	.....	Oct.	0.608	.....	.....	.....	.....
Nov.	0.473	0.170	.....	.....	.....	Nov.	0.543	.....	.....	.....	.....
Dec.	0.836	0.213	.....	.....	.....	Dec.	0.977	.....	.....	.....	.....
1869						1869					
Jan.	0.503	0.155	.....	.....	.....	Jan.	0.596	.....	.....	.....	.....
Feb.	1.080	0.376	.....	.....	.....	Feb.	0.895	.....	.....	.....	.....
Mar.	1.029	0.428	.....	.....	.....	Mar.	1.124	.....	.....	.....	.....
Apr.	2.087	0.962	.....	.....	.....	Apr.	2.530	.....	.....	.....	.....
May	2.116	1.036	2.294	1.258	0.570	May	1.894	.....	.....	.....	.....
June	2.050	0.932	1.953	0.918	0.362	June	1.339	.....	2.050	.....	.....
July	3.004	1.547	1.761	1.443	0.588	July	1.901	.....	1.613	.....	.....
Aug.	1.820	0.829	1.058	0.777	0.303	Aug.	1.436	.....	1.628	.....	.....
Sept.	2.131	0.873	1.124	0.777	0.324	Sept.	1.665	.....	0.621	.....	.....
Oct.	0.762	0.251	.....	.....	.....	Oct.	0.548	.....	.....	.....	.....
Nov.	0.549	0.147	.....	.....	.....	Nov.	0.362	.....	.....	.....	.....
Dec.	0.398	0.107	.....	.....	.....	Dec.	0.481	.....	.....	.....	.....
1870						1870					
Jan.	0.334	0.111	.....	.....	.....	Jan.	0.503	.....	.....	.....	.....
Feb.	.....	.....	.....	.....	.....	Feb.	0.407	.....	.....	.....	.....
Mar.	0.551	0.237	.....	.....	.....	Mar.	0.654	.....	.....	.....	.....
Apr.	1.864	0.799	1.295	0.682	0.396	Apr.	1.887	.....	1.931	.....	.....
May	2.775	1.228	2.945	1.458	0.666	May	3.049	.....	2.346	.....	.....
June	2.546	1.161	2.679	1.243	0.555	June	1.864	.....	1.976	.....	.....
July	2.990	1.324	2.790	1.295	0.599	July	1.917	.....	1.561	.....	.....
Aug.	1.302	0.407	1.361	0.503	0.266	Aug.	0.851	.....	0.688	.....	.....
Sept.	1.613	0.616	1.539	0.621	0.281	Sept.	1.006	.....	0.777	.....	.....
Oct.	1.154	0.408	.....	.....	.....	Oct.	0.643	.....	.....	.....	.....
Nov.	0.429	0.096	.....	.....	.....	Nov.	0.481	.....	.....	.....	.....
Dec.	0.222	0.074	.....	.....	.....	Dec.	0.259	.....	.....	.....	.....
1871						1871					
Jan.	0.207	0.140	.....	.....	.....	Jan.	0.237	.....	.....	.....	.....
Feb.	.....	.....	.....	.....	.....	Feb.	.....	.....	.....	.....	.....

COMPARATIVE EVAPORATION, DEPTH IN INCHES, FROM SATURATED SOIL.

Johanneskreuz						Ebnach					
	Water Surface Evaporation		Saturated Fine Sand Soil				Water Surface Evaporation		Saturated Sandy Loam Soil		
			In Open, Bare	In Forest					In Open, Bare	In Forest	
1868	Open	Forest		Bare	With Litter	1868	Open	Forest		Bare	With Litter
Mar.	1.228	0.731	.....	.....	.....	Mar.	0.895	0 461	.....	.....	.....
Apr.	2.124	1.280	.....	.....	.....	Apr.	1.968	1.161	.....	.....	.....
May	4.307	1.949	.....	.....	.....	May	4.181	1.917	.....	.....	.....
June	3.108	1.265	.....	.....	.....	June	3.441	1.288	.....	.....	.....
July	2.990	1.169	.....	.....	.....	July	4.684	1.835	.....	.....	.....
Aug.	2.782	1.066	.....	.....	.....	Aug.	4.114	1.642	.....	.....	.....
Sept.	2.752	1.376	.....	.....	.....	Sept.	3.944	1.110	.....	.....	.....
Oct.	0.710	0.287	.....	.....	.....	Oct.	1.140	0.310	.....	.....	.....
Nov.	0.679	0.314	.....	.....	.....	Nov,	0.643	0.251	.....	.....	.....
Dec.	0.947	0.477	.....	.....	.....	Dec.	0.703	0.307	.....	.....	.....
1869						1869					
Jan.	0.658	0.299	.....	.....	.....	Jan.	0.570	0.229	.....	.....	.....
Feb.	1.161	0.666	.....	.....	.....	Feb.	0.999	0.466	.....	.....	.....
Mar.	0.659	0.444	.....	.....	.....	Mar.	1.272	0.570	.....	.....	.....
Apr.	2.782	1.894	.....	.....	.....	Apr.	2.812	1.658	2.930	1.272	0.555
May	2.316	0.954	2.938	1.013	0.286	May	3.078	1.029	.....	0.902	0.251
June	2.242	0.807	2.730	0.918	0.179	June	2.375	0.918	2.323	0.843	0.429
July	3.448	1.339	3.063	1.376	0.397	July	4.225	1.990	4.403	1.458	0.532
Aug.	2.523	1.058	2.819	1.102	0.252	Aug.	2.775	1.021	2.827	0 858	0.307
Sept.	2.775	1.177	2.708	1.243	0.255	Sept.	2.923	1.265	3.145	1.132	0.303
Oct.	1.080	0.458	.....	.....	.....	Oct.	0.984	0.414	1.406	0.373	0.178
Nov.	0.251	0.185	.....	.....	.....	Nov.	0.488	0.173	.....	.....	.....
Dec.	0.377	0.159	.....	.....	.....	Dec.	0.396	0.207	.....	.....	.....
1870						1870					
Jan.	0.525	0.321	.....	.....	.....	Jan.	0.392	0.203	.....	.....	.....
Feb.	0.762	0.410	.....	.....	.....	Feb.	0.836	0.284	.....	.....	.....
Mar.	0.918	0.643	.....	.....	.....	Mar.	0.814	0.492	.....	.....	.....
Apr.	2.782	1.842	2.679	1.731	0.351	Apr.	2.420	1.399	2.568	1.998	1.258
May	3.115	1.769	3.160	1.658	0.348	May	3.707	2.471	3.722	1.702	0.754
June	3.122	1.628	3.197	1.539	0.340	June	3.411	1.591	3 152	1.161	0.610
July	.....	.....	.....	.....	.....	July	3.700	1.665	3.108	1.310	0.370
Aug.	.....	.....	.....	.....	.....	Aug.	2.005	0.895	1.864	0.540	.....
Sept.	.....	.....	.....	.....	.....	Sept.	2.072	0.725	2.760	0.570	0.222
Oct.	.....	.....	.....	.....	.....	Oct.	.....	0.710	.....	.....	.....
Nov.	.....	.....	.....	.....	.....	Nov.	0.814	0.318	.....	.....	.....
Dec.	.....	.....	.....	.....	.....	Dec.	.....	.....	.....	.....	.....
1871						1871					
Jan.	.....	.....	.....	.....	.....	Jan.	.....	.....	.....	.....	.....
Feb.	.....	.....	.....	.....	.....	Feb.	.....	.....	.....	.....	.....

COMPARATIVE EVAPORATION, DEPTH IN INCHES, FROM SATURATED SOIL.

Rohrbrunn						Rohrbrunn					
	Water Surface Evaporation		Saturated Sandy Loam Soil				Water Surface Evaporation		Saturated Sandy Loam Soil		
			In Open, Bare	In Forest					In Open, Bare	In Forest	
1868	Open	Forest		Bare	With Litter	1869	Open	Forest		Bare	With Litter
Mar.	1.080	0.481	.....	.....	.....	Oct.	1.450	0.274	1.813	0.370	0.192
Apr.	2.346	1.029	.....	.....	.....	Nov.	0.555	0.370	.....	.....	.....
May	4.055	1.465	.....	.....	.....	Dec.	0.296	0.237	.....	.....	.....
June	3.500	0.888	.....	.....	.....	1870					
July	4.499	1.029	.....	.....	.....	Jan.	0.296	0.207	.....	.....	.....
Aug.	2.990	0.866	.....	.....	.....	Feb.	0.606	0.370	.....	.....	.....
Sept.	3.737	0.836	.....	.....	.....	Mar.	0.740	0.481	.....	.....	.....
Oct.	1.021	0.207	.....	.....	.....	Apr.	3.508	1.443	4.491	2.271	1.021
Nov.	0.636	0.170	.....	.....	.....	May	4.137	1.458	4.921	1.480	0.496
Dec.	0.940	0.281	.....	.....	.....	June	3.367	1.006	4.314	0.984	0.384
1869						July	4.662	0.954	4.259	0.858	0.370
Jan.	0.703	0.185	.....	.....	.....	Aug.	2.012	0.355	2.190	0.370	0.247
Feb.	0.888	0.429	.....	.....	.....	Sept.	2.407	0.444	2.997	0.429	0.200
Mar.	1.124	0.481	.....	.....	.....	Oct.	1.517	0.438	.....	.....	.....
Apr.	3.419	1.569	2.974	1.694	0.599	Nov.	0.603	0.181	.....	.....	.....
May	2.553	0.710	3.855	0.888	0.437	Dec.	0.178	0.074	.....	.....	.....
June	2.479	0.644	3.034	0.747	0.222	1871					
July	3.818	1.110	4.632	1.110	0.296	Jan.	0.089	0.037	.....	.....	.....
Aug.	3.182	0.770	3.751	0.725	0.244	Feb	.....	.....	.....	.....	.....
Sept.	2.582	0.584	3.011	0.525	0.140						

COMPARATIVE EVAPORATION, DEPTH IN INCHES, FROM SATURATED SOIL.

Duschelberg						Seeshaupt					
	Water Surface Evaporation		Saturated Clay Loam Soil				Water Surface Evaporation		Saturated Calcareous Clay Soil		
			In Open, Bare	In Forest					In Open, Bare	In Forest	
1868	Open	Forest		Bare	With Litter	1868	Open	Forest		Bare	With Litter
Mar.	.....	.....	.....	.....	.....	Mar	0.954	0.592	.....	.....	.....
Apr.	.....	.....	.....	.....	.....	Apr.	1.628	0.170	.....	.....	.....
May	3.182	1.576	.....	.....	.....	May	2.679	0.481	.....	.....	.....
June	2.531	0.843	.....	.....	.....	June	2.346	0.377	.....	.....	.....
July	2.405	0.814	.....	.....	.....	July	1.976	0.259	.....	.....	.....
Aug.	2.057	1.140	.....	.....	.....	Aug.	2.146	0.370	.....	.....	.....
Sept.	2.745	0.947	.....	.....	.....	Sept.	2.553	0.666	.....	.....	.....
Oct	0.584	0.290	.....	.....	.....	Oct.	1.236	0.214	.....	.....	.....
Nov.	0.296	0.207	.....	.....	.....	Nov.	0.747	0.178	.....	.....	.....
Dec.	0.052	0.022	.....	.....	.....	Dec.	0.925	0.148	.....	.....	.....
1869						1869					
Jan.	0.666	0.170	.....	.....	.....	Jan.	0 636	0 200	.....	.....	.....
Feb.	0.518	0.359	.....	.....	.....	Feb.	1.724	0.377	.....	.....	.....
Mar.	0.592	0.178	.....	.....	.....	Mar.	1.369	0 185	.....	.....	.....
Apr.	1.909	0.555	.....	.....	.....	Apr.	1.887	0.444	.....	.....	.....
May	2.091	1.361	.....	.....	.....	May	2.553	0.656	3.878	2.035	1.132
June	1.746	0.577	1.880	0.381	0.293	June	2.494	0.592	2.279	0 673	0.178
July	2.050	0.680	1.642	0.607	0.488	July	2.923	0.725	2.553	0.703	0.138
Aug.	1.399	0.333	1.906	.....	.....	Aug.	2.295	0.666	1.872	0.532	0.962
Sept.	1.924	0.577	2.101	1.036	0.614	Sept.	3.700	1.214	2 212	0.584	0.074
Oct.	0.918	0.784	1.073	0.367	.....	Oct.	1.110	0.592	.....	.....	.....
Nov.	0.222	0.044	.....	.....	.....	Nov.	1.347	0.592	.....	.....	.....
Dec.	.....	.....	.....	.....	.....	Dec	0.592	0.103	.....	.....	.....
1870						1870					
Jan.	0.089	0.030	.....	.....	.....	Jan.	0.659	0.140	.....	.....	.....
Feb.	0.103	.....	.....	.....	.....	Feb.	.....	0.400	.....	.....	.....
Mar.	.....	.....	.....	.....	.....	Mar.	.....	0.240	.....	.....	.....
Apr.	.....	0.444	.....	.....	.....	Apr.	1.776	0.348	.....	.....	.....
May	2.287	0.703	1.480	0.592	.....	May	2.879	1.339	.....	.....	.....
June	1.628	0.607	1.850	0.969	0.392	June	2.923	0.866	.....	.....	.....
July	2.146	0.777	1.413	0 999	0.296	July	3.522	0.940	.....	.....	.....
Aug.	0.592	0.459	0.747	0.370	0.148	Aug	2.287	0.296	.....	.....	.....
Sept.	1.088	0.384	.....	.....	.....	Sept	1.332	0.384	.....	.....	.....
Oct.	0.696	0.242	.....	.....	.....	Oct.	1.628	0.518	.....	.....	.....
Nov.	.....	.....	.....	.....	.....	Nov.	.....	0.443	.....	.....	.....
Dec.	.....	.....	.....	.....	.....	Dec.	0.777	0.562	.....	.....	.....
1871						1871					
Jan.	.....	.....	.....	.....	.....	Jan.	.....	.....	.....	.....	.....
Feb.	.....	.....	.....	.....	.....	Feb	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT DUSCHELBERG.

Altitude, 2959. Forest, 40 years pine, etc. Latitude, 48° 48' N. Longitude, 31° 24' E. Soil, granitic clay loam.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in Inches		Relative Humidity Per Cent	
	Tree Trunk (Fir) 5 Ft. Hght.	Air in Open, 5 Ft. Hght.	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest					
				Surface	4 Ft. Depth	Surface	4 Ft. Depth	Open	Forest	Open	Forest
1868											
Mar.	30.11	33.42	30.54	31.89	36.16	31 89	34 74	0.159	0 152	85.51	89.57
Apr.	32.97	38.25	35.62	31.01	36.47	30.68	35.42	0.201	0.188	85.76	90.56
May	52.07	60.80	55.40	57.42	43 99	46 13	36.07	0.358	0.361	67.93	81.41
June	54.95	61.70	59.00	59.00	52.04	53.21	44 56	0.369	0.387	70.06	78.22
July	55.40	62.15	58.32	59.90	53.94	54.14	47.30	0.410	0.424	74.46	87.39
Aug.	56.52	62.38	59.22	60.80	56.30	55 18	50.14	0.392	0.422	72.01	83.07
Sept.	53.58	59.68	56.30	60.80	54.00	51.68	48.99	0.332	0.382	67.64	84.74
Oct.	43.54	44.15	43 92	46 28	51.01	43.79	47.25	0.258	0.280	88.47	94.35
Nov.	27.66	28.36	27.50	33.12	44.02	31.64	41.16	0.139	0.141	89.61	93.77
Dec.	30.83	33.26	31.82	33.76	40.32	32.42	37.69	0.176	0.168	90.21	94.55
1869											
Jan.	20.03	22.84	22.64	25.54	37.62	26.65	36.25	0.118	0.114	88.42	90.77
Feb.	33.32	37.69	35.62	36.54	36.68	34.56	34.88	0.160	0.182	72.25	89.42
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precipitation in Inches		Evaporation from Water Inches		Percolation Through Soil, Inches						
					Without Litter			With Litter			
					In Open			In Forest			
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft.	4 Ft.
1868											
Mar.	12.51	7.40	.....	.....	.....	.....	.....	.....	.....	.....	.....
Apr.	6.67	5.07	.....	.....	.....	.....	.....	.....	.....	.....	.....
May	1.10	0.85	3.182	1.576	.....	.....	.....	.....	.....	.....	.....
June	2.60	1.65	2.531	0.843	0.081	0.762	0.222	.....	0.969	1.332	1.361
July	4 53	3.06	2.405	0.814	0.925	0.636	1.088	0.836	1.524	2.220	1.620
Aug.	2.21	1.81	2.057	1.140	0.089	0.103	0.273	1.383	1.620	1.058	0.888
Sept.	0.69	0.26	2.745	0.947	0	0	0	0	0	0.384	0
Oct.	5.26	4.25	0.584	0.290	2.028	1.931	1.739	1.887	2.064	2.323	1.946
Nov.	2.30	1.62	0.296	0.207	1.036	1.043	1.006	0.475	1.013	0.629	0.548
Dec.	9.42	6.87	0.052	0.022	3.456	3.115	3.071	4.048	3.966	4.359	3.833
1869											
Jan.	1.05	0.74	0.666	0.170	.....	.....	.....	.....	.....	.....	.....
Feb.	8.78	8.29	0.518	0.359	.....	.....	.....	.....	.....	.....	.....
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT ASCHAFFENBURG.

Altitude, 426. Forest, none. Latitude, 49° 59′ N. Longitude, 26° 48′ E.
Soil, garden.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in inches		Relative Humidity Per Cent	
	Tree Trunk (Pine) 5 Ft. Hght.	Air in Open, 5 Ft. Hght.	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest					
				Surface	4 Ft. Depth	Surface	4 Ft. Depth	Open	Forest	Open	Forest
1868											
Mar.	.....	43.65	.....	42.91	42.71	.....	.....	0.226	.....	79.52	.....
Apr.	.....	50.94	.....	48.29	45.32	.....	.....	0.298	.....	80.09	.....
May	.....	71.38	.....	68.48	53.10	.....	.....	0.458	.....	59.85	.....
June	.....	70.70	.....	70 29	60.35	.....	.....	0.467	.....	64.51	.....
July	.....	72.72	.....	73.62	62.36	.....	.....	0.511	.....	65.62	.....
Aug.	.....	70.92	.....	71.37	64.40	.....	.....	0.480	.....	63.24	.....
Sept.	.....	64.40	.....	63.95	61.47	.....	.....	0.412	.....	69.49	.....
Oct.	.....	50.16	.....	50 60	56.75	.....	.....	0.312	.....	85.63	.....
Nov.	.....	37.62	.....	38.00	49.23	.....	.....	0.193	.....	85.08	.....
Dec.	.....	43.47	.....	42.08	45.92	.....	.....	0.238	.....	83.38	.....
1869											
Jan.	.....	33.30	.....	33.64	43.52	.....	.....	0.171	.....	85.16	.....
Feb.	.....	45.41	.....	42.58	41.94	.....	.....	0.248	.....	77.89	.....
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precipitation In Inches		Evaporation From Water, Inches		Percolation Through Soil, Inches						
					Without Litter			With Litter			
					In Open			In Forest			
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft.	4 Ft.
1868											
Mar.	2.41	.....	0.777	.....	1.968	1.694	.....	.....	.....	.....	.....
Apr.	2.44	.....	1.169	.....	1.383	1.465	.....	.....	.....	.....	.....
May	0.62	..	3.063	.....	0.042	0.053	.....	.....	.....	.....	.....
June	1.86	.....	1.990	.....	0.017	0.040	.....	.....	.....	.....	.....
July	1.66	.....	3.270	.....	0.017	0.037	.....	.....	.....	.....	.....
Aug.	2.13	.....	2.752	.....	1.095	0.030	.....	.....	.....	.....	.....
Sept.	0.76	.....	2.360	.....	0.037	0.227	.....	.....	.....	.....	.....
Oct.	2.30	.....	0.608	.....	1.258	1.917	.....	.....	.....	.....	.....
Nov.	1.97	.....	0.543	.....	1.746	1.399	.....	.....	.....	.....	.....
Dec.	2.90	.....	0.977	.....	2.841	2.849	.....	.....	.....	.....	.....
1869											
Jan.	1.12	.....	0.596	.....	0.747	0.643	.....	.....	.....	.....	.....
Feb.	2.13	.....	0.895	.....	1.117	1.806	.....	.....	.....	.....	.....
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT SEESHAUPT.

Altitude, 1951. Forest, close 40-year fir. Latitude, 47° 49′ N. Longitude, 27° 28′ E. Soil, calcareous clay.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in Inches		Relative Humidity Per Cent	
	Tree Trunk (Pine) 5 Ft. Hght.	Air in Open 5 Ft. Hght	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest					
				Surface	4 Ft. Depth	Surface	4 Ft. Depth	Open	Forest	Open	Forest
1868											
Mar.	34.65	38.16	35.58	37.28	36.95	32 58	34.76	0.194	0.210	85.50	90.20
Apr.	40.46	45.81	41.94	45.34	40.12	38.61	36.45	0.242	0.240	75.24	81.77
May	57.88	64.85	60.12	65.75	50.09	56.30	43 14	0.443	0.464	68.48	82.23
June	58.32	65.30	59.90	65.75	57.20	56.98	49.12	0 461	0.458	69.83	82 22
July	59.45	66.20	60.58	65.08	59.68	58.32	51.35	0 496	0 490	73.50	84.75
Aug.	60.35	66.20	61.25	65.30	61.92	58.55	54.05	0.502	0.484	74.29	82.95
Sept.	57.42	63.50	57.88	60.80	59.68	55.18	53.08	0.438	0 419	72.88	81.78
Oct.	47.30	48.74	47.03	38.36	56.08	47.10	51.01	0.302	0.312	83.83	90.03
Nov.	33.44	31.80	34.30	34.07	45.86	34.09	44.08	0.154	9.189	81.26	93.90
Dec.	37.35	38.59	38.09	36.79	40.52	37 60	40.32	0.199	0.244	80.87	93.20
1869											
Jan.	27.23	25.79	29.17	30.02	38.36	28.67	38.91	0 138	0.154	86.11	88.62
Feb.	37.67	42.24	39.72	37.69	35.64	36.05	36.41	0.221	0.214	79.06	81.37
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precipitation in Inches		Evaporation from Water, Inches		Percolation Through Soil, Inches					
					Without Litter			With Litter		
					In Open			In Forest		
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft	4 Ft.
1868											
Mar.	2.99	0.98	0.954	0.592	1.983	1.302	0.670	2.493	2.434	1.289	1.458
Apr.	4.87	3.60	1.628	0.170	2.893	1.946	2.287	3.648	3.789	3.656	2.101
May	2.23	2.68	2.679	0.481	0.675	0.732	0.279	1.946	2.035	2.368	2.331
June	3.96	3.28	2.346	0.377	2.160	0 807	0.456	2.568	2.902	1.854	0.614
July	5.28	3.88	1.976	0.259	2 420	0 925	0 052	3.041	3.892	1.618	1.154
Aug.	3.09	1.24	2.146	0.370	1.383	0.376	0 659	1 413	1.961	0.880	0.895
Sept.	2.49	2.11	2.583	0.666	1.258	0.836	0.168	1.250	1.939	1.013	1.110
Oct	2 61	1.82	1.236	0.214	1.724	1.539	1.154	1.406	2.064	1.228	0.991
Nov.	1.84	1.26	0.747	0.178	0.051	0.740	0 451	0.148	0.162	0.451	0.414
Dec.	3.46	3 21	0.925	0.148	3.374	3.685	3.352	3.063	3.700	2.146	1.480
1869											
Jan.	0.72	0 50	0.636	0.200	0.438	0.643	0.543	0.326	0.388	0.229	0.067
Feb.	1.42	0.95	1.724	0.377	0.577	0.962	0 607	0.962	1 369	0.481	0.873
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT JOHANNESKREUZ.

Altitude, 1564. Forest, close 60-year old beech. Latitude, 49° 20' N. Longitude, 25° 29' E. Soil, fine sand.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in Inches		Relative Humidity Per Cent	
	Tree Trunk (Beech) 5 Ft. Hght.	Air in Open, 5 Ft. Hght.	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest		Open	Forest	Open	Forest
				Surface	4 Ft. Depth	Surface	4 Ft. Depth				
1868											
Mar.	37.42	39.52	38.43	38.25	39.83	37.56	39.49	0.181	0.184	76.69	81.49
Apr.	45.32	46.54	45.32	45.07	42.26	43.74	40.91	0.220	0.231	72.60	79.24
May	59.45	67.32	63.05	65.75	50.09	57.42	46.33	0.397	0.429	60.58	74.63
June	57.20	66.42	60 58	68.90	58.32	56.75	49.75	0.426	0.452	66.63	85.40
July	59.45	68.00	63.50	68.45	60.35	59.22	51.28	0 457	0.472	68.14	80.51
Aug.	59.00	65.98	62.82	64.62	61.92	58.78	53.12	0.438	0.450	70.33	80.01
Sept.	58.10	62.60	60.35	59 00	59.22	57.20	52 36	0.376	0.382	69.53	74.48
Oct.	45.48	46.96	46.56	47.86	54.41	47.00	50.45	0.288	0.288	88.51	90.67
Nov.	34.61	35.10	36.07	35.66	46.46	37.78	44.73	0.180	0.186	88.78	88.30
Dec.	40.60	41.72	42.35	40.52	44.24	41.24	42.96	0.234	0.241	88.72	88.65
1869											
Jan.	29.51	31.48	32.36	31.80	41.42	33.86	40.98	0.158	0.170	87.12	90.35
Feb.	40.80	41.74	41.61	40 10	40.34	39.11	39.58	0.224	0.230	84.70	86.96
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precipitation in Inches		Evaporation from Water, Inches		Percolation Through Soil, Inches						
					Without Litter			With Litter			
					In Open			In Forest			
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft	2 Ft.	4 Ft.
1868											
Mar.	3.15	2.22	1.228	0.731	1.169	1.428	4 3.6	0.030	0.379	0.396	.....
Apr.	3.54	2.75	2.124	1.280	1.717	2.346	2.190	0.880	1.302	1.658	.....
May	1.71	1.62	4.307	1.939	0.356	0.6.3	0.799	0.228	0.843	1.184	.....
June	4 50	4.18	3.108	1.267	0.947	0.597	0.895	0.829	1.872	4.891	.....
July	4.15	2.82	2.992	1.169	0	0.084	0.096	1.117	1.510	3.308	.....
Aug.	1.86	1.46	2.782	1.066	0	0	0	0.252	0.740	1.295	.....
Sept.	1.83	1.38	2.752	1.376	0	0	0	0.535	0.528	1.124	.....
Oct.	4.92	3.52	0 710	0.287	3.826	1.864	3.419	2.079	1.140	3.885	.....
Nov.	2.18	1.78	0.679	0.314	1.776	0.829	2.509	1.317	0.747	1.781	.....
Dec.	7.26	4.88	0.947	0.477	7 481	3.182	5.728	4.188	1.236	3.870	.....
1869											
Jan.	2.20	1.66	0.658	0.299	1.436	0.977	2.501	0.534	0.747	1.554	.....
Feb.	2.60	1.89	1.161	0.666	2.020	1.169	2.671	0.932	0.688	1 583	.....
Year.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT EBRACH.

Altitude, 1249. Forest, 50-year pine, etc. Latitude, 40° 51′ N. Longitude, 28° 10′ E. Soil, sandy loam 2 feet, red clay loam subsoil.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in Inches		Relative Humidity Per Cent	
	Tree Trunk (Beech) 5 Ft. Hght.	Air in Open, 5 Ft. Hght.	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest					
				Surface	4 Ft. Depth	Surface	4 Ft. Depth	Open	Forest	Open	Forest
1868											
Mar.	37.01	38.14	37.31	38.77	38.52	36.43	37.82	0.186	0.186	80.18	84.75
Apr.	45.77	46.15	45.18	44.48	41.00	43.67	39.94	0.234	0.234	75.25	77.91
May	61.25	65.52	62.38	61.25	49.41	57.20	46.18	0.443	0.428	70.16	75.64
June	60.12	66.42	61.70	63.72	57.42	59.00	51.37	0.508	0.448	76.84	81.37
July	63.05	68.45	64.18	67.10	59.22	61.70	52.97	0.488	0.469	69.40	79.10
Aug.	62.60	67.10	63.95	66.20	61.70	61.25	55.40	0.444	0.443	69 00	76.50
Sept.	58.55	61.92	59.90	63.28	59.90	57.65	56.75	0.395	0.387	72.25	76.05
Oct.	45.14	46.46	45.56	48.65	55.62	46.92	51.91	0.289	0.287	91.89	94.48
Nov.	35.69	34.38	33.39	36.25	47.12	35.87	45.95	0.182	0.176	91.95	92.18
Dec.	36.97	38.64	37.92	38.59	41.68	37.72	41.52	0.211	0.214	87.33	92.62
1869											
Jan.	26.20	27.86	26.87	31.82	39.90	29.15	40.12	0.119	0.131	74.75	77.80
Feb.	39.31	40.73	40.28	40.30	37.69	38.72	37.72	0.222	0.226	84.91	89.53
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precipitation in Inches		Evaporation from Water, Inches		Percolation Through Soil, Inches						
					Without Litter			With Litter			
					In Open			In Forest			
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft.	4 Ft.
1868											
Mar.	2.81	2.49	0.895	0.464	.....	.....	.....	0	0	0	0
Apr.	3.13	3.00	1.968	1.161	.....	.....	.....	2.930	2.893	3.411	2.279
May	1.02	0.70	4.181	1.917	.....	.....	.....	0.670	0.603	0.843	0.648
June	2.24	1.43	3.441	1.288	.....	.....	.....	1.658	1.813	1.746	1.102
July	1.14	0.75	4.684	1.835	.....	.....	.....	0.067	0.222	0.310	0.040
Aug.	1.31	1.18	4.114	1.642	.....	.....	.....	0.229	1.050	0.962	0.570
Sept.	1.33	0.85	3.944	1.110	0.137	0.074	0.062	0.455	0.940	0.918	0.303
Oct.	2.61	1.80	1.140	0.310	1.206	0.407	0.281	1.694	2.198	1.924	1.073
Nov.	3.78	3.64	0.643	0.251	3.049	1.917	1.472	3.249	2.042	2.827	0.843
Dec.	4.20	3.57	0.703	0.307	4.159	3.603	3.404	3.907	5.032	5.839	3.027
1869											
Jan.	1.27	0.98	0.570	0.221	0.807	0.444	0.100	0.807	0.588	1.199	0.588
Feb.	1.98	1.86	0.999	0.466	2.234	0.532	0.037	1.880	2.146	2.227	1.576
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT ROHRBRUNN.
Altitude, 1564. Forest, close 60-year old beech, some oak. Latitude, 49° 54′ N. Longitude, 27°03′ E. Soil, sandy loam.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in Inches		Relative Humidity Per Cent	
	Tree Trunk (Beech) 5 Ft. Hght.	Air in Open 5 Ft. Hght.	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest					
				Surface	4 Ft. Depth	Surface	4 Ft. Dpth.	Open	Forest	Open	Forest
1868											
Mar.	36.63	39.47	40.06	39.18	38.86	37.06	37.67	0.188	0.190	80.00	78.25
Apr.	44.53	46.00	46.64	46.46	41.50	43.25	39.29	0.227	0.238	75.25	75.77
May	59.45	65.08	63.95	64.40	50.15	57.88	45.41	0.425	0.446	66.09	73.70
June	57.88	63.72	62.38	65.75	56.75	58.10	50.11	0.436	0.452	69.46	80.10
July	60.35	65.75	63.95	67.10	59.00	59.68	51.60	0.456	0.492	68.80	81.98
Aug.	59.68	65.30	63.05	65.52	60.80	60.80	53.76	0.468	0.489	72.35	84.88
Sept.	56.75	61.70	59.90	60.35	57.65	55.85	52.63	0.387	0.422	69.77	84.51
Oct.	45.30	45.97	46.40	47.86	53.94	46.06	50.00	0.276	0.286	88.67	90.92
Nov.	33.82	33.01	35.46	35.58	45.61	35.56	44.20	0.171	0.173	89.46	87.85
Dec.	38.08	38.98	39.70	38.23	41.83	38.48	40.80	0.207	0.222	85.31	89.83
1869											
Jan.	28.31	28.09	29.03	31.08	40.00	31.76	39.74	0.143	0.153	85.34	87.72
Feb.	39.11	41.56	41.72	38.91	38.54	38.25	37.82	0.219	0.226	82.25	84.21
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precipitation in Inches		Evaporation from Water, Inches		Percolation Through Soil, Inches						
					Without Litter			With Litter			
					In Open			In Forest			
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft.	4 Ft.
1868											
Mar.	4.77	3.83	1.080	0.481	4.380	4.380	2.827	3.367	3.352	3.589	4.418
Apr.	4.79	3.50	2.346	1.029	3.367	3.145	3.515	3.056	3.470	3.093	3.182
May	2.95	2.43	4.055	1.465	1.095	1.420	1.901	1.501	2.079	2.790	1.642
June	3.55	3.09	3.500	0.888	0.814	1.021	1.066	1.961	3.011	3.256	2.050
July	2.53	2.14	4.499	1.029	0	0.019	0.185	1.369	1.746	2.064	1.339
Aug.	3.97	4.34	2.990	0.866	1.243	1.436	1.058	2.123	3.093	1.589	1.968
Sept.	1.52	1.30	3.737	0.386	0.207	0.268	0.337	0.991	1.073	1.243	2.005
Oct.	4.25	3.22	1.021	0.207	3.286	3.145	2.679	2.597	2.930	2.982	1.628
Nov.	2.70	2.46	0.636	0.170	2.841	2.863	3.182	2.420	1.872	1.798	2.671
Dec.	5.63	4.24	0.940	0.281	5.809	5.247	5.150	4.225	4.188	3.730	2.250
1869											
Jan.	2.08	1.58	0.703	0.185	1.302	1.487	1.901	0.991	1.066	1.295	0.762
Feb.	4.28	3.77	0.888	0.429	4.536	4.691	4.321	2.930	3.867	3.130	2.012
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT ALTENFURTH.

Altitude, 1066. Forest, wild pine. Latitude, 49° 24′ N. Longitude, 28° 50′ E.
Soil, no forest, in open, humus sand with moss cover.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in Inches		Relative Humidity Per Cent	
	Tree Trunk (Wild-pine) 5 Ft. Hght	Air in Open, 5 Ft. Hght.	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest					
				Surface	4 Ft. Depth	Surface	4 Ft. Depth	Open	Forest	Open	Forest
1868											
Mar.	35.35	40.51	38.80	40.73	39.76	37.00	40.46	0.198	0.198	79.40	83.20
Apr.	42.50	47.93	45.32	48.54	42.55	42.50	41.02	0.254	0.256	77.58	82.16
May	59.90	69.12	65.52	69.80	50.54	59.00	45.66	0.474	0.454	67.05	69.50
June	60.24	69.35	65.75	72.72	55.85	61.25	50.02	0.503	0.463	71.80	73.30
July	61.02	68.67	64.85	70.02	57.65	61.25	51.80	0.542	0.504	78.20	79.20
Aug.	61.25	69.12	66.87	68.45	59.45	61.70	53.75	0.526	0.503	79.40	80.60
Sept.	55.62	62.82	59.90	61.70	57.65	55.62	52.83	0.413	0.399	74.87	78.37
Oct.	45.97	47.50	47.21	48.54	54.50	47.30	51.26	0.301	0.303	90.78	92.48
Nov.	32.88	33.08	34.14	34.45	46.78	35.06	46.60	0.170	0.184	88.90	94.10
Dec.	35.84	39.06	39.06	37.78	42.21	37.51	43.02	0.213	0.219	88.30	91.79
1869											
Jan.	26.40	27.72	30.92	29.89	40.08	30.47	41.70	0.143	0.160	80.40	90.01
Feb.	38.12	42.64	41.38	39.85	38.48	38.32	39.42	0.213	0.223	77.67	85.33
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precolation in Inches		Evaporation from Water, Inches		Percolation Through Soil, Inches						
					Without Litter			With Litter			
					In Open			In Forest			
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft.	4 Ft.
1868											
Mar.	2.40	1.33	0.902	0.348	1.694	1.806	2.042	1.064	1.147	1.161	0.100
Apr.	3.00	1.94	1.613	0.607	1.524	2.094	2.064	1.517	1.642	1.561	1.228
May	0.94	0.43	3.552	1.783	0.011	0.135	0.525	0.092	0.281	0.196	0.573
June	2.64	1.84	3.219	1.606	0.030	0.148	0.251	1.021	1.302	0.940	0.440
July	2.21	1.49	2.671	1.221	0.007	0.022	0.070	0.540	0.679	0.103	0.329
Aug.	1.47	0.98	2.849	1.332	0	0.017	0.001	0.266	0.297	0.214	0.207
Sept.	1.65	1.33	2.324	1.095	0.130	0.001	0	0.496	0.630	0.512	0.155
Oct.	2.10	1.47	0.888	0.384	1.376	1.339	0.488	1.140	1.280	0.932	0.384
Nov.	3.70	4.14	0.473	0.170	1.132	2.841	1.939	1.406	0.947	1.199	1.088
Dec.	2.76	1.80	0.836	0.213	3.530	4.003	4.092	2.390	2.745	3.182	2.745
1869											
Jan.	1.13	0.77	0.503	0.155	1.177	1.095	1.510	0.770	0.829	0.947	1.206
Feb.	1.07	0.61	1.080	0.376	0.821	1.036	1.050	0.641	0.807	0.947	0.791
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

EBERMAYER'S EXPERIMENTS AT PROMENHOF.

Altitude, 1748. Forest, 60-year old pine. Latitude, 49° 54′ N. Longitude, 30° 18′ E. Soil, gneissic sandy loam.

Month	Temperature, Degrees Fahrenheit							Absolute Humidity in inches		Relative Humidity Per Cent	
	Tree Trunk (Pine) 5 Ft. Hght.	Air in Open, 5 Ft. Hght.	Air in Forest 5 Ft. Hght.	Soil in Open		Soil in Forest					
				Surface	4 Ft. Depth	Surface	4 Ft. Depth	Open	Forest	Open	Forest
1868											
Mar.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Apr.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
May	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
June	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
July	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aug.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sept.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oct.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nov.	.....	29.82	.....	32.45	45.82	.....	43.72	.....	.....	.....	.....
Dec.	32.29	36.23	34.20	34.63	41.14	33.31	39.44	0.180	0.193	88.67	94.56
1869											
Jan.	28 32	27.71	22.87	27.30	39.11	29 17	37.94	0.121	0.127	84.23	95.44
Feb.	34.79	38.75	37.56	37.11	3[illegible].26	33.58	35.82	0.195	0.216	81.46	95.44
Year.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Month	Precipitation in Inches		Evaporation from Water, Inches		Percolation Through Soil, Inches					
					Without Litter			With Litter		
					In Open			In Forest		
	Open	Forest	Open	Forest	1 Ft.	2 Ft.	4 Ft.	1 Ft.	1 Ft.	2 Ft.	4 Ft.
1868											
Mar	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
Apr.	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
May	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
June	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
July	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
Aug.	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
Sept.	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
Oct.	.....	.....	.....	.....	0	0	0	.....	.....	.....	.....
Nov.	.....	.....	0.577	0.214	0	0	0	.....	.....	.....	.....
Dec.	4.33	2.95	0.703	0.085	5.231	4.137	2.072	3.411	5.564	3.3[illegible]9	3.293
1869											
Jan.	0.82	0.57	0.362	0.048	0.725	0.659	1.420	0.289	0.321	0.499	1.058
Feb.	3.61	2.85	0.654	0.233	3.352	2.782	2.730	1.827	0.999	1.901	2.693
Year	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....