TABLE 2.—*Percentage frequency of velocities (meters per second) in different velocity groups. Highest percentage underscored*

Velocities in—	January						July						Year					
	0–1	2–7	8–14	15–21	>21	Number of observations	0–1	2–7	8–14	15–21	>21	Number of observations	0–1	2–7	8–14	15–21	>21	Number of observations
SURFACE																		
Fairbanks	93	7				45	41	51	8			49	64	34	2			641
Nome	21	64	15			43	24	73	3			37	21	66	12	1		528
Point Barrow	5	93	2			60	6	81	13			63	3	86	10	1		580
1,000 METERS																		
Fairbanks		64	32	4		44	7	72	21			47	5	66	27	2		623
Nome		59	41			39	13	53	27	7		30	5	62	27	4	2	468
Point Barrow	2	51	33	7	7	57	2	42	39	15	2	54	2	40	43	11	4	473
2,000 METERS																		
Fairbanks	3	55	36	6		33	8	65	22	5		40	7	55	31	6	1	517
Nome	7	38	41	14		29	5	58	26	11		19	2	48	42	8		320
Point Barrow		51	33	16		57	2	51	35	12		43	1	46	36	15	2	391
3,000 METERS																		
Fairbanks	6	50	33	11		18	4	60	36			28	2	51	37	7	3	384
Nome		22	55	17	6	18	8	46	38		8	13	2	49	42	5	2	181
Point Barrow	2	46	35	15	2	46	3	46	42	9		33	2	46	38	13	1	276
5,000 METERS																		
Fairbanks		33	67			3		50	50			6	3	34	42	15	6	153
Nome			100			2		40	60			5	9	45	40	4	2	47
Point Barrow	7	54	31	8		13	13	67	20			15	4	40	42	13	1	108
8,000 METERS																		
Fairbanks						0						0		36	36	5	23	23
Nome						0						0		33	50	17		6
Point Barrow						0		30	60	10		10	7	21	47	25		28

In summary the following facts stand out:

1. The mass movement of air in the region of Northern Alaska is relatively small as compared with that for the northern part of the United States.
2. Below 3,000 meters, on the average, easterly winds are most frequent, while at higher levels westerly winds prevail.
3. Average wind velocities for this region, both surface and aloft, are 30 to 40 percent less than for points in the northern part of the United States.
4. Individual velocities do not deviate greatly from the average.

Since Northern Alaska is an heretofore uncharted region, as far as upper air winds are concerned, it is hoped that this study will contribute something of value to our knowledge of the general circulation of the atmosphere.

TABLES (IN MILLIBARS) OF THE "PRESSURE OF SATURATED AQUEOUS VAPOR OVER WATER" AT TEMPERATURES FROM 0° TO —50° C.

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Tables of the "Pressure of Saturated Aqueous Vapor over Water" at temperatures below 0° C. are frequently required in aerological work, particularly in connection with the interpretation of hair-hygrograph readings. Tables of this nature down to −50° C. have been prepared on the basis of relationships given by Washburn in an article entitled "The Vapor Pressure of Ice and of Water Below the Freezing Point" (MONTHLY WEATHER REVIEW, vol. 52, October 1924, pp. 488–490. See also International Critical Tables, vol. III, p. 210, McGraw-Hill Book Co., 1928).

If e_i=pressure of saturated aqueous vapor over ice at temperature t.

e_w=pressure of saturated aqueous vapor over water at temperature t.

t=temperature in °C.

and T=absolute temperature=$(273.1+t)$°K.,

then Washburn gives for e_i (in mm of mercury) the expression

$$\log_{10}e_i=\frac{-2445.5646}{T}+8.2312\log_{10}T-0.01677006T+1.20514\times10^{-5}.T^2-6.757169 \quad (1)$$

and for the ratio $\left(\frac{e_w}{e_i}\right)$, the expression

$$(2)\quad \log_{10}\left(\frac{e_w}{e_i}\right)=\frac{-1.1489t}{(273.1+t)}-1.330\times10^{-5}t^2+9.084\times10^{-8}t^3-1.08\times10^{-9}t^4$$

We can compute values of e_w for various temperatures by making use of the equation

$$(3)\qquad e_w=e_i\left(\frac{e_w}{e_i}\right),$$

where values of e_i are obtained by means of equation 1 and values of $\left(\frac{e_w}{e_i}\right)$ are obtained by means of equation 2.

Washburn has already given a table of values of e_i for every tenth degree over the range 0° to −30° C. For the present work, values of e_i (in mm of mercury) were computed by means of equation (1) for every whole degree over the range −30° to −50° C.; and values for every intermediate half degree were obtained from these by the use of Newton's interpolation formula. The computations were carried out to five significant figures. Values of e_i for every tenth degree were obtained by linear interpolation between each half degree of temperature over the range in question. All the values over the range 0° to −50° C. were converted to millibar units through multiplication by the factor 1.333224. The final table which was thus obtained is not reproduced here.

Values of $\left(\frac{e_w}{e_i}\right)$ were computed by means of equation (2) for every whole degree over the range 0° to −50° C.; and values for every tenth degree were obtained by linear interpolation. Table 1 contains the results of the former computations.

Table 2 shows the values of e_w obtained by multiplying the values of e_i (in mb), referred to above, by the ratios $\left(\frac{e_w}{e_i}\right)$ for the corresponding temperatures.

These are mostly given to four significant figures; however the fourth figure, and in the lower part of the table the third, cannot be regarded as strictly accurate, owing to uncertainties in the equations and to slight uncertainties arising from the dropping of following significant figures during the course of the numerous arithmetical operations.

Acknowledgment is due to Messrs. C. Russo and A. D. Hustead of the Aerological Division of the Weather Bureau, for carrying out the laborious computations required in the preparation of the tables and for the care they exercised throughout that performance.

TABLE 1.—$\left(\frac{e_w}{e_i}\right)$, *ratio of the pressure of saturated aqueous vapor over water to the pressure of saturated aqueous vapor over ice*

t	0	1	2	3	4	5	6	7	8	9
°C.										
−0	1.0000	1.0097	1.0196	1.0295	1.0396	1.0497	1.0600	1.0704	1.0809	1.0914
−10	1.1021	1.1129	1.1238	1.1349	1.1460	1.1572	1.1686	1.1800	1.1916	1.2032
−20	1.2150	1.2268	1.2388	1.2509	1.2630	1.2753	1.2877	1.3001	1.3127	1.3253
−30	1.3381	1.3509	1.3638	1.3768	1.3899	1.4031	1.4163	1.4296	1.4430	1.4564
−40	1.4699	1.4835	1.4971	1.5108	1.5245	1.5382	1.5520	1.5658	1.5797	1.5935
−50	1.6074	------	------	------	------	------	------	------	------	------

TABLE 2.—*Pressure of saturated aqueous vapor over water (millibars)*

t	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
° C.										
−0	6.105	6.061	6.017	5.974	5.931	5.888	5.845	5.803	5.761	5.719
−1	5.677	5.635	5.594	5.553	5.513	5.473	5.433	5.393	5.353	5.314
−2	5.275	5.236	5.198	5.160	5.122	5.084	5.046	5.009	4.972	4.935
−3	4.898	4.862	4.826	4.790	4.754	4.719	4.684	4.649	4.614	4.580
−4	4.546	4.512	4.478	4.445	4.412	4.379	4.346	4.313	4.281	4.249
−5	4.217	4.185	4.153	4.122	4.091	4.060	4.029	3.999	3.969	3.939
−6	3.909	3.879	3.849	3.820	3.791	3.762	3.733	3.704	3.676	3.648
−7	3.620	3.592	3.564	3.537	3.510	3.483	3.456	3.430	3.404	3.378
−8	3.352	3.326	3.300	3.274	3.249	3.224	3.199	3.174	3.149	3.124
−9	3.100	3.076	3.052	3.028	3.004	2.981	2.958	2.935	2.912	2.889
−10	2.866	2.844	2.821	2.799	2.777	2.755	2.733	2.711	2.690	2.669
−11	2.648	2.627	2.606	2.585	2.564	2.544	2.524	2.504	2.484	2.464
−12	2.444	2.424	2.405	2.386	2.367	2.348	2.329	2.310	2.291	2.273
−13	2.255	2.237	2.219	2.201	2.183	2.165	2.147	2.130	2.113	2.096
−14	2.079	2.062	2.045	2.028	2.011	1.995	1.979	1.963	1.947	1.931
−15	1.915	1.899	1.883	1.868	1.853	1.838	1.823	1.808	1.793	1.778
−16	1.763	1.748	1.734	1.720	1.706	1.692	1.678	1.664	1.650	1.636
−17	1.622	1.608	1.594	1.581	1.568	1.555	1.542	1.529	1.516	1.503
−18	1.490	1.477	1.465	1.453	1.441	1.429	1.417	1.405	1.393	1.381
−19	1.370	1.358	1.346	1.335	1.324	1.312	1.301	1.290	1.279	1.268
−20	1.257	1.246	1.235	1.224	1.214	1.204	1.194	1.184	1.174	1.164
−21	1.153	1.143	1.133	1.123	1.113	1.103	1.093	1.083	1.074	1.065
−22	1.056	1.047	1.038	1.029	1.020	1.011	1.002	.993	.985	.976
−23	.967	.958	.949	.941	.933	.925	.917	.909	.901	.893
−24	.885	.877	.869	.861	.854	.846	.838	.830	.823	.816
−25	.809	.802	.795	.788	.781	.774	.767	.760	.753	.746
−26	.739	.732	.726	.720	.713	.706	.699	.693	.687	.681
−27	.674	.668	.662	.656	.650	.644	.638	.632	.627	.621
−28	.615	.609	.603	.598	.592	.587	.581	.576	.571	.565
−29	.560	.554	.549	.544	.539	.534	.529	.524	.520	.515
−30	.510	.505	.501	.496	.491	.486	.482	.477	.473	.468
−31	.464	.460	.455	.451	.447	.442	.438	.434	.430	.426
−32	.421	.418	.414	.410	.406	.402	.398	.394	.390	.386
−33	.383	.379	.375	.372	.368	.364	.361	.357	.354	.350
−34	.347	.344	.340	.337	.334	.330	.327	.324	.321	.318
−35	.314	.311	.308	.305	.302	.299	.296	.293	.290	.288
−36	.285	.282	.279	.276	.273	.271	.268	.265	.263	.260
−37	.257	.255	.252	.250	.247	.245	.242	.240	.237	.235
−38	.233	.230	.228	.226	.223	.221	.219	.217	.214	.212
−39	.210	.208	.206	.204	.201	.199	.197	.195	.193	.191
−40	.189	.187	.185	.183	.182	.180	.178	.176	.174	.172
−41	.170	.169	.167	.165	.163	.162	.160	.158	.157	.155
−42	.153	.152	.150	.149	.147	.145	.144	.142	.141	.139
−43	.138	.136	.135	.134	.132	.131	.129	.128	.127	.125
−44	.124	.122	.121	.120	.119	.117	.116	.115	.113	.112
−45	.111	.110	.109	.107	.106	.105	.104	.103	.102	.101
−46	.0994	.0984	.0973	.0962	.0951	.0941	.0931	.0920	.0910	.0900
−47	.0890	.0880	.0870	.0861	.0851	.0841	.0832	.0823	.0814	.0805
−48	.0795	.0787	.0778	.0769	.0760	.0752	.0743	.0735	.0727	.0718
−49	.0710	.0702	.0694	.0686	.0679	.0671	.0663	.0656	.0648	.0641
−50	.0633	------	------	------	------	------	------	------	------	------