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A DISSERTATION

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BY

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Norman, Oklahoma

1966

SOME PHYSIOLOGICAL RESPONSES OF DOGS TO HEAT AND HUMIDITY

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The research for this dissertation was conducted at the Civil Aeromedical Research Institute, Federal Aviation Agency, Oklahoma City, Oklahoma.

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CHAPTER I

INTRODUCTION

In order for a homeotherm to maintain a constant body temperature physiological responses must adjust to the environment in such a manner that heat loss is equal to heat gain. Heat exchanges between an animal and its environment can take place through radiation, conduction, convection, or evaporation, operating singly, or more often in combination. The combination of these avenues operating at a particular time is determined primarily by the environment, but also by the thermal state of the organism and by the limits of physiological function.

Metabolism is the source of body heat production. Under conditions where environmental temperature is greater than that of the outer surface (skin) of the animal, radiation, conduction, and convection serve only as avenues of heat input to the animal.

In man sweating is an extremely important mechanism for evaporative cooling (1,2,3). For example, a man may produce 60 to 70 milliliters of sweat per minute for short periods of time (30 minutes) and 500 to 1500 milliliters per hour for longer periods of time (4). This avenue is not available to the dog.

When placed in a hot environment non-sweating or poorly sweating animals, such as the dog, typically increase their respiratory activity,

losing more heat by evaporation from the respiratory tract than under cool or thermally neutral (20-25°C) conditions (5). Although variable, heat loss in humans through evaporation from respiratory passages accounts for only a fraction of the total heat loss, about 10% under average conditions (4).

Thermal panting has long been recognized as a temperature regulating mechanism in dogs (6,7), but few studies relating to its attendant physiological responses are available. In fact, it has been generally believed that panting is a movement of air across the respiratory tract that involves only the dead air space and has little effect on respiratory gaseous exchanges (8,9,10).

There are studies available concerning the effects of high temperature on regulation of body fluids and electrolytes (11,12,13). There are also a number of reports available concerning responses of humans to hot, humid environments (14,15,16). However, studies in which humidity is controlled and measured during heat exposure of the dog are very limited (17,18). Since evaporation is the only avenue of heat loss during high heat stress, humidity is an important factor. Humidity alters the ability of the body to cool by evaporation because of varying vapor-pressure gradients.

With the above in mind, this study was designed to test, under conditions of controlled temperature and humidity, the hypothesis: "Thermal panting is a mechanism which increases evaporative cooling and, as such, alters only those physiological parameters concerned with temperature regulation."

CHAPTER II

MATERIALS AND METHODS

For these experiments conditions of temperature and humidity were established which would induce thermal panting. Three different ambient temperatures [100°F (37.8°C), 110°F (43.3°C), and 120°F (48.9°C)] were chosen to vary the imposed heat load. Three different relative humidities (30%, 60%, and 90%) were selected at each of the temperatures to vary the vapor-pressure gradients which should alter the animals' efficiency for evaporative cooling. Five animals were exposed to each of the nine different experimental conditions. A different animal was used for each of the 45 experiments to eliminate possible effects due to training or conditioning. These were all healthy, young, adult, mongrel dogs, 9 to 17 kilograms in weight.

To test efficiency of cooling, core and skin temperatures were measured. To ascertain the effects of the various heat loads to induce thermal panting, respiratory rate was measured. To determine whether or not parameters other than those associated with temperature regulation were involved, certain blood characteristics were also measured, such as pH, total CO_2 and O_2 content, and the concentrations of some of the common inorganic ions.

Each experiment was conducted in two parts, the first being a thirty

Mean weighted skin temperature was computed using weighting factors of: 0.16 - head, 0.26 - chest, 0.24 - flank, 0.14 - hip, 0.11 - paw, and 0.09 - elbow. The readings from each thermocouple was weighted by a factor proportional to the surface area represented (19). Mean body temperature was computed using factors of 0.7 for internal body temperature and 0.3 for mean weighted skin temperature. (See appendix A for sample calculations).

The thermistor probe and the thermocouples were calibrated periodically throughout the study with a National Bureau of Standards thermometer and a variable temperature calibrating water bath.

Respiratory rate was measured by a pneumograph placed around the chest, with pressure changes reflected through a Statham pressure transducer. These measurements also were recorded every five minutes on the Grass Polygraph.

Ten-milliliter blood samples were drawn in heparin-coated syringes from a brachial or saphena leg vein at the conclusion of the 30 minute control period and every 30 minutes during exposure. Samples were also taken at the end of exposure when dogs were removed prior to the 150 minute maximum exposure time.

Several analyses were performed on each of the blood samples. Immediately after the samples were drawn, the pH was measured with the anaerobic electrode of the Beckman pH meter ("Zeromatic," expanded scale) and hematocrit was determined by a microhematocrit method (20). The samples were then stored under paraffin oil and refrigerated. Later the same day CO_2 and O_2 content were determined by the Van Slyke-Neill manometric method (21). The samples were then centrifruged, the plasma

was drawn off, frozen, and stored. Subsequently the frozen plasma samples were thawed and used for electrolyte determinations. Chloride concentration was determined by electrometric titration against silver ion with the Buchner-Cotlove Chloridometer (22). Magnesium and calcium concentrations were measured by the fluorimetric methods of Hill (23,24) with the Technicon autoanalyzer system. Sodium and potassium ion concentrations were estimated by simultaneous flame spectrophotometry with the standard Technicon autoanalyzer.

CHAPTER III

RESULTS

Mean values for rectal temperature, weighted skin temperature, body temperature, and respiratory rate under the various experimental conditions are found in Tables I through IX. The mean values are for five animals except where otherwise designated. Changes in internal body temperature are shown graphically in figures 1 and 2. Each point on the graphs represents the average of five experiments unless otherwise indicated.

During exposure to 100°F at 30% relative humidity, rectal temperature showed little change, with terminal readings being very similar to control values. During exposure to 100°F, 60% relative humidity, rectal temperature reached a maximum after 35 minutes of exposure then dropped to a level approximately 0.3°C higher than control values. During exposure to 100°F, 90% relative humidity, rectal temperature continued to rise throughout the exposure period but appeared to be approaching stabilized responses toward the end of exposure.

After 75 minutes of exposure to 110°F, 30% relative humidity, rectal temperature reached a maximum value, then dropped to a new stabilized level, which was 0.6 to 0.7°C above the control period readings. During all of the other experimental conditions rectal temperature continued to

rise during exposure and the animals were removed when rectal temperature reached 42.0°C. Changes in mean weighted skin temperature are shown in figures 3 and 4. In figure 3 comparisons are made for each ambient temperature for the exposures. Although the trend appears to be established for the two lower temperatures, a significant difference ($P \leq 0.05$) between responses at the different relative humidities is found only at the 120°F exposure. In figure 4 the comparisons are made for each relative humidity. Significant changes of rate of elevation were evident for each 10°F increase in ambient temperature in each of the graphs of this figure.

Figures 5 and 6 present changes in mean body temperature. In figure 5 comparisons are made for each ambient temperature for the various exposures. Here, the rate of elevation was significantly greater for each higher humidity. In figure 6, where comparisons are made for each relative humidity, the rate of change was also significantly greater for each higher ambient temperature tested.

Figures 7 and 8 are graphic representations of respiratory rates. Figure 7C shows that at 100°F exposure the animals did not reach as high a respiratory rate at the 30% relative humidity level as they did at the 60% and 90% levels, the latter two levels being very similar. During the more severe exposures respiratory rate dropped off prior to the end of exposure. Significant drops between peak respiratory rate and final rate occured only during the 120°F exposures.

Change in hematocrit is shown in figure 9. There was a generalized increase in hematocrit with exposure under all conditions with no

specific pattern established.

Actual mean values for hematocrit, pH, volumes percent CO_2, volumes percent O_2 of whole blood and plasma values for calcium, magnesium, sodium, potassium and chloride may be found in Tables X through XVIII.

Figure 10 demonstrates the changes in pH with the rate of change being greater for increases in heat load due to either an increase in temperature or relative humidity.

Carbon dioxide levels in the blood showed consistently greater rates of decrease with increases in heat loading under all conditions studied. These results are graphed in figure 11.

Figure 12 is a graph of volumes percent of carbon dioxide plotted against pH values with the appropriate linear regression line imposed, demonstrating a very high negative correlation coefficient (-0.95).

The blood levels of oxygen showed fairly consistent rates of increase for increasing heat loading, although not as consistent as the pH and rectal temperature changes.

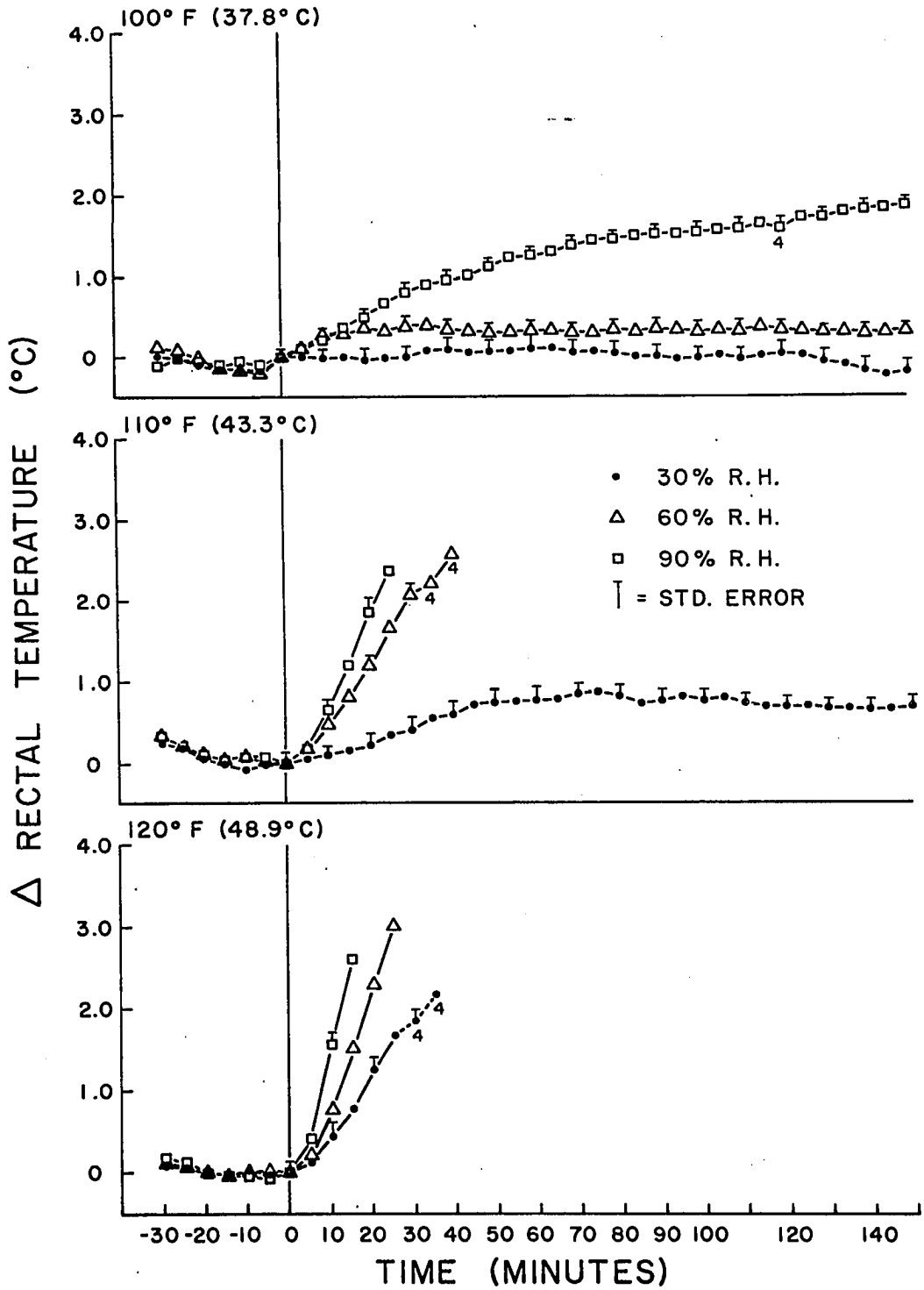
Figures 14 through 18 show respectively changes in calcium, magnesium, sodium, potassium and chloride in the plasma. Calcium and magnesium both showed irregular patterns during all 100°F exposures and during the 110°F, 30% relative humidity exposure. During all exposures in which the maximum exposure time of 150 minutes was not reached (all 120°F exposures and 110°F, 60% and 90% relative humidity) both calcium and magnesium showed a general trend toward increasing concentrations.

Both sodium and chloride indicated, with a few exceptions, a general trend toward increasing concentrations with time under all

conditions.

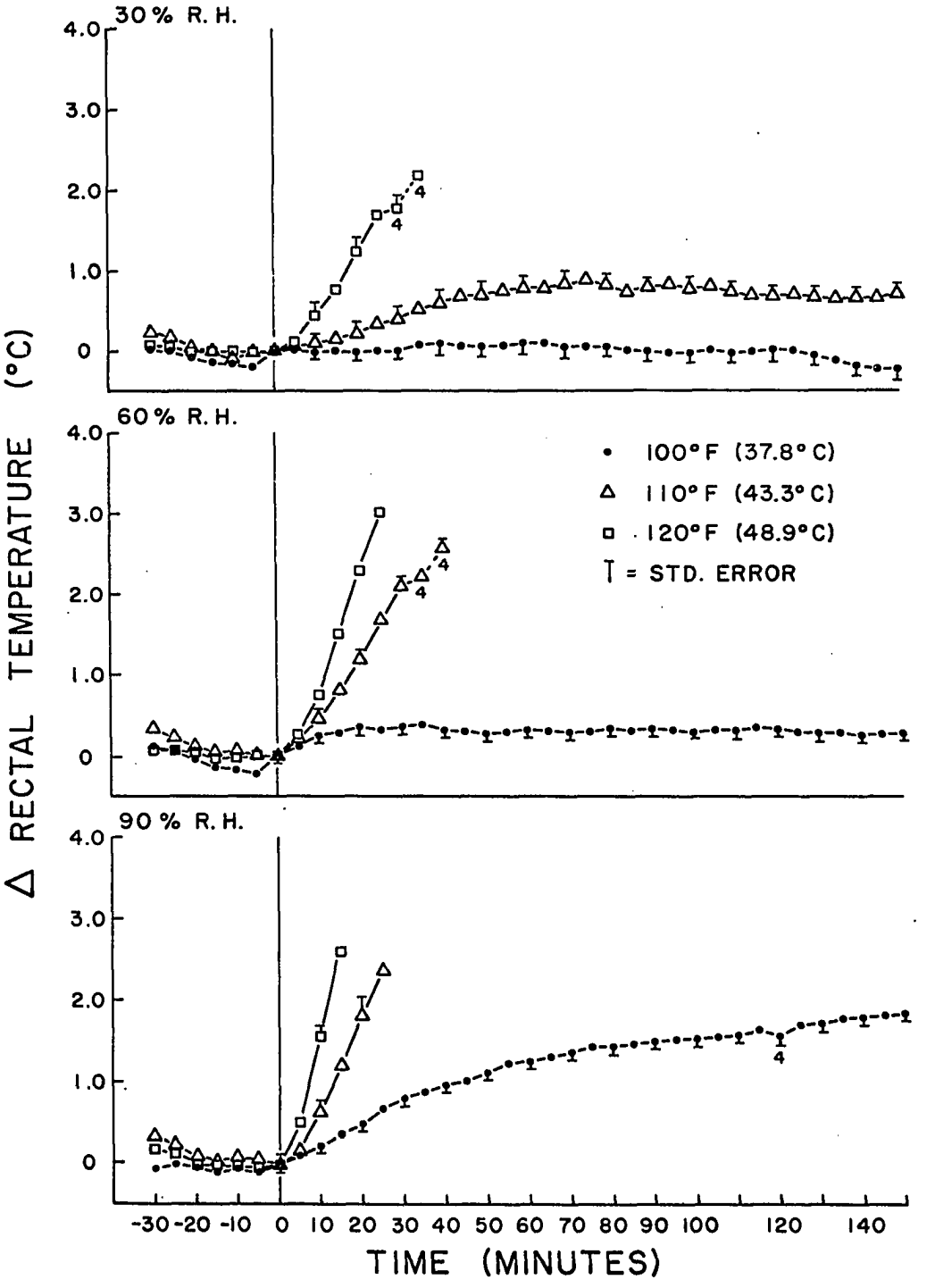
Potassium showed a decrease at end exposure time over control values for all conditions which continued for the full two and one-half hours, but showed a rise at end exposure time for all conditions in which the conditions were severe enough to cause early termination of the experiment. It was also noted that the rate of increase was greater the more severe the condition due to either increasing temperature or increasing humidity.

Figure 1



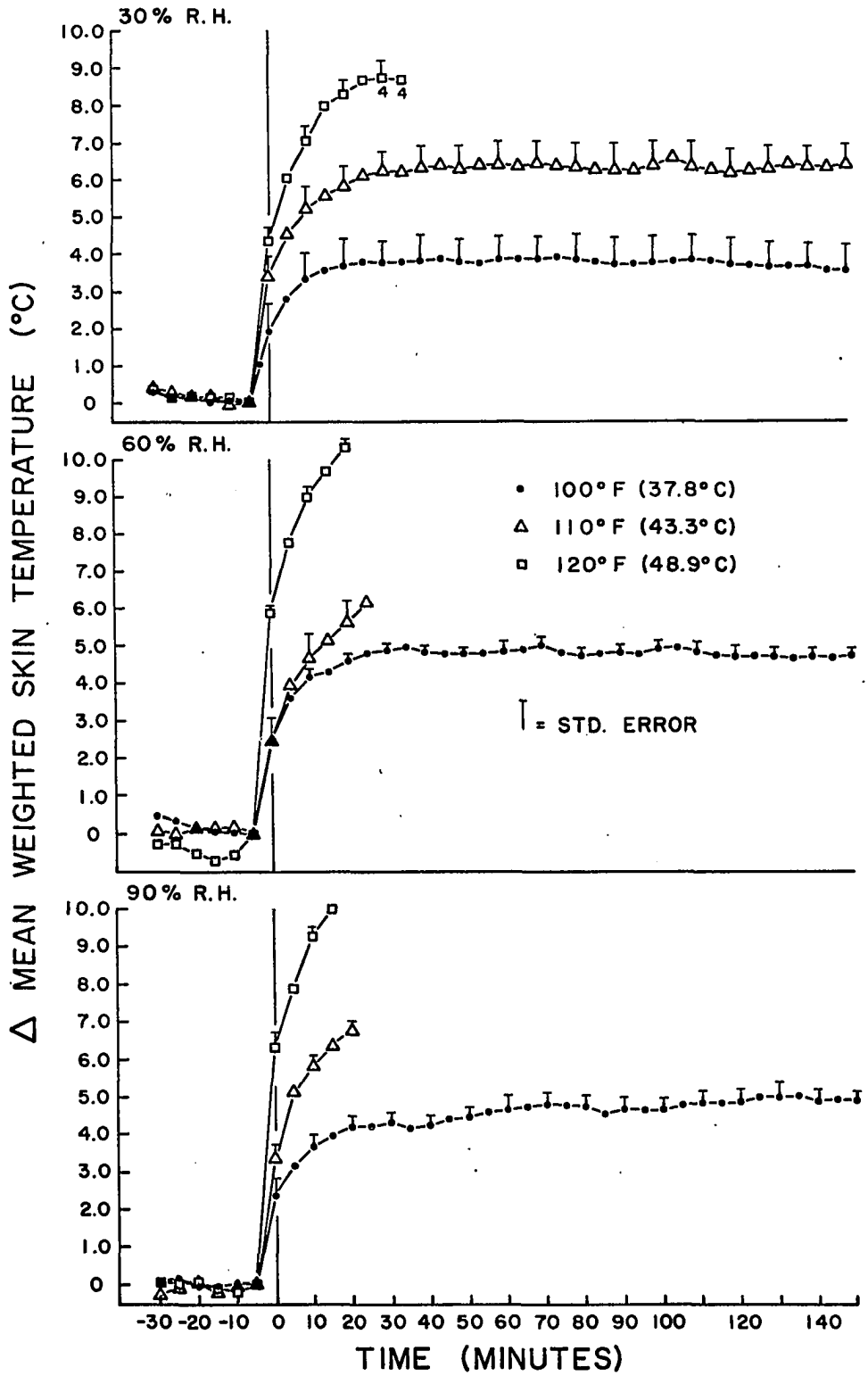
Change in Rectal Temperature As Influenced by Exposure to Different Ambient Temperatures

Figure 2



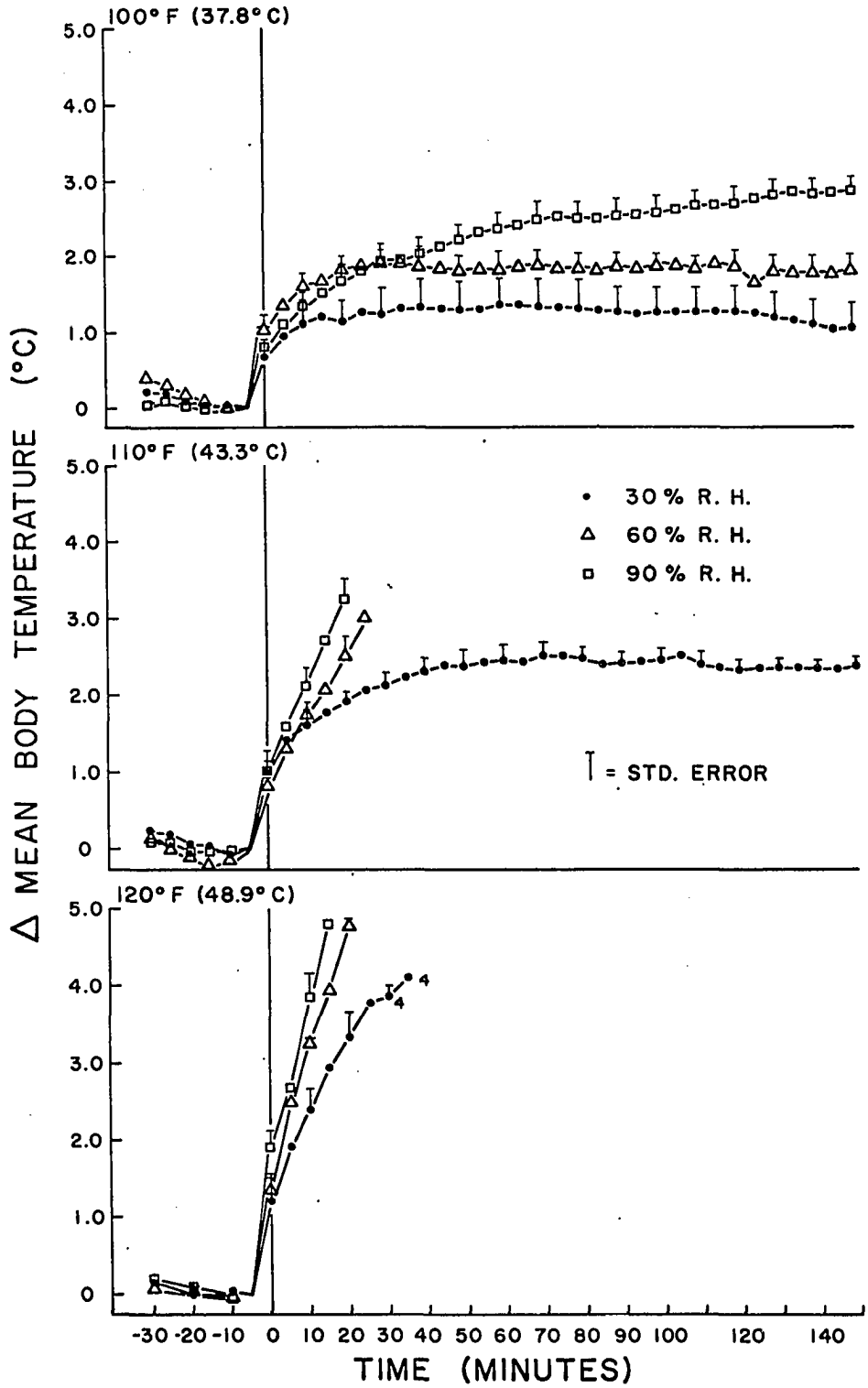
Change in Rectal Temperature As Influenced by Exposure to Different Relative Humidities

Figure 4



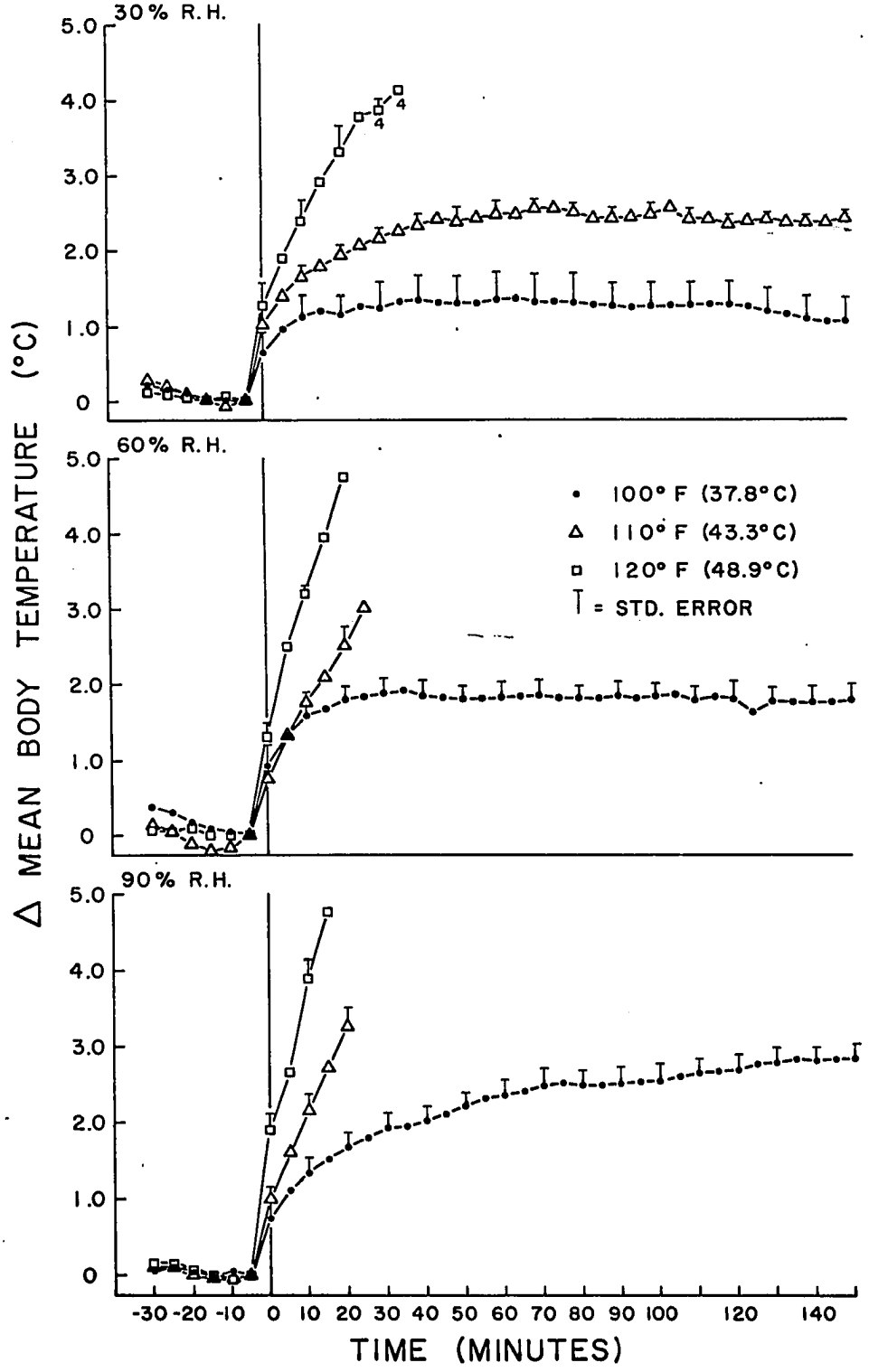
Change in Mean Weighted Skin Temperature As Influenced by Exposure to Different Relative Humidities

Figure 5



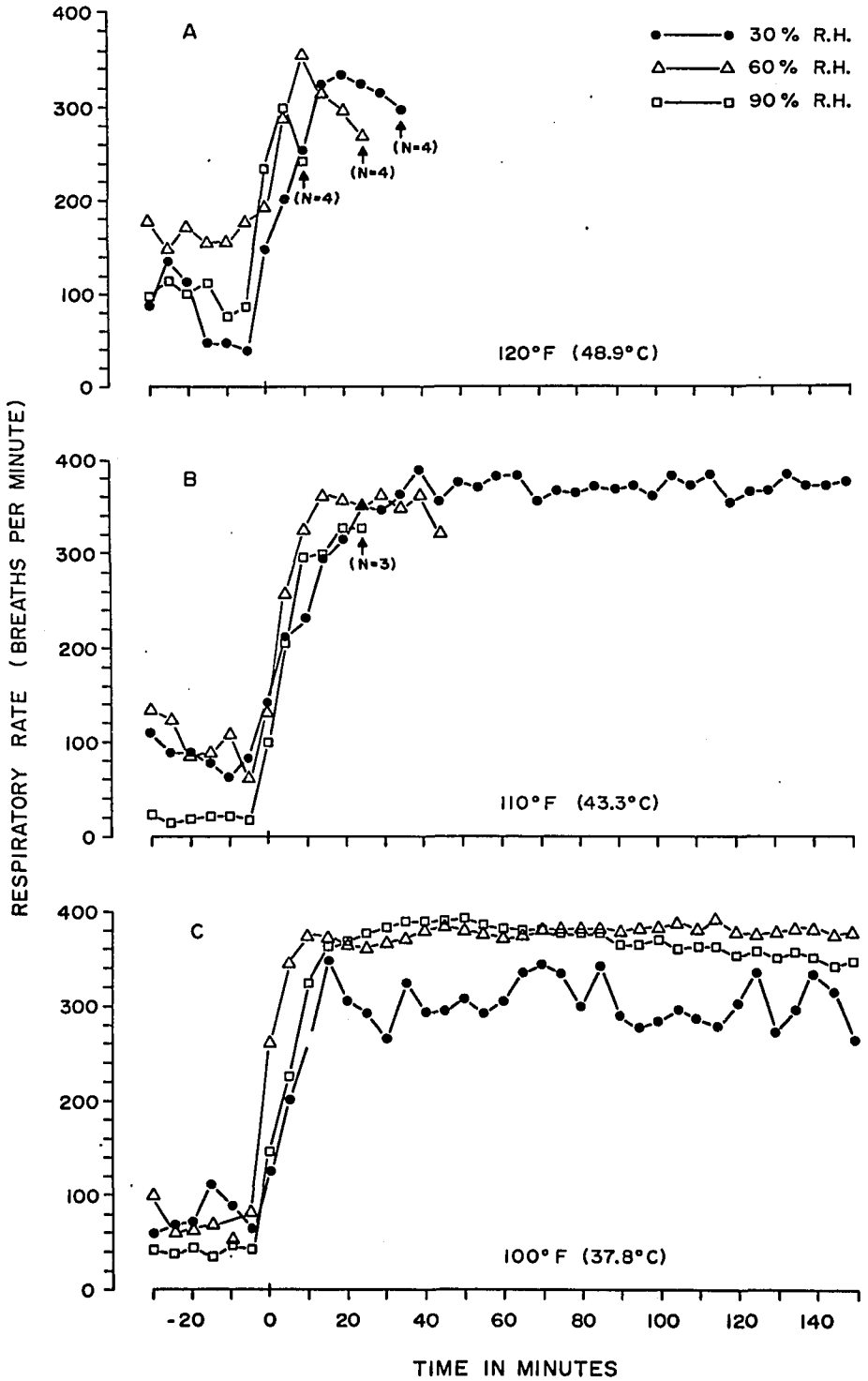
Change in Mean Body Temperature As Influenced by Exposure to Different Ambient Temperatures

Figure 6



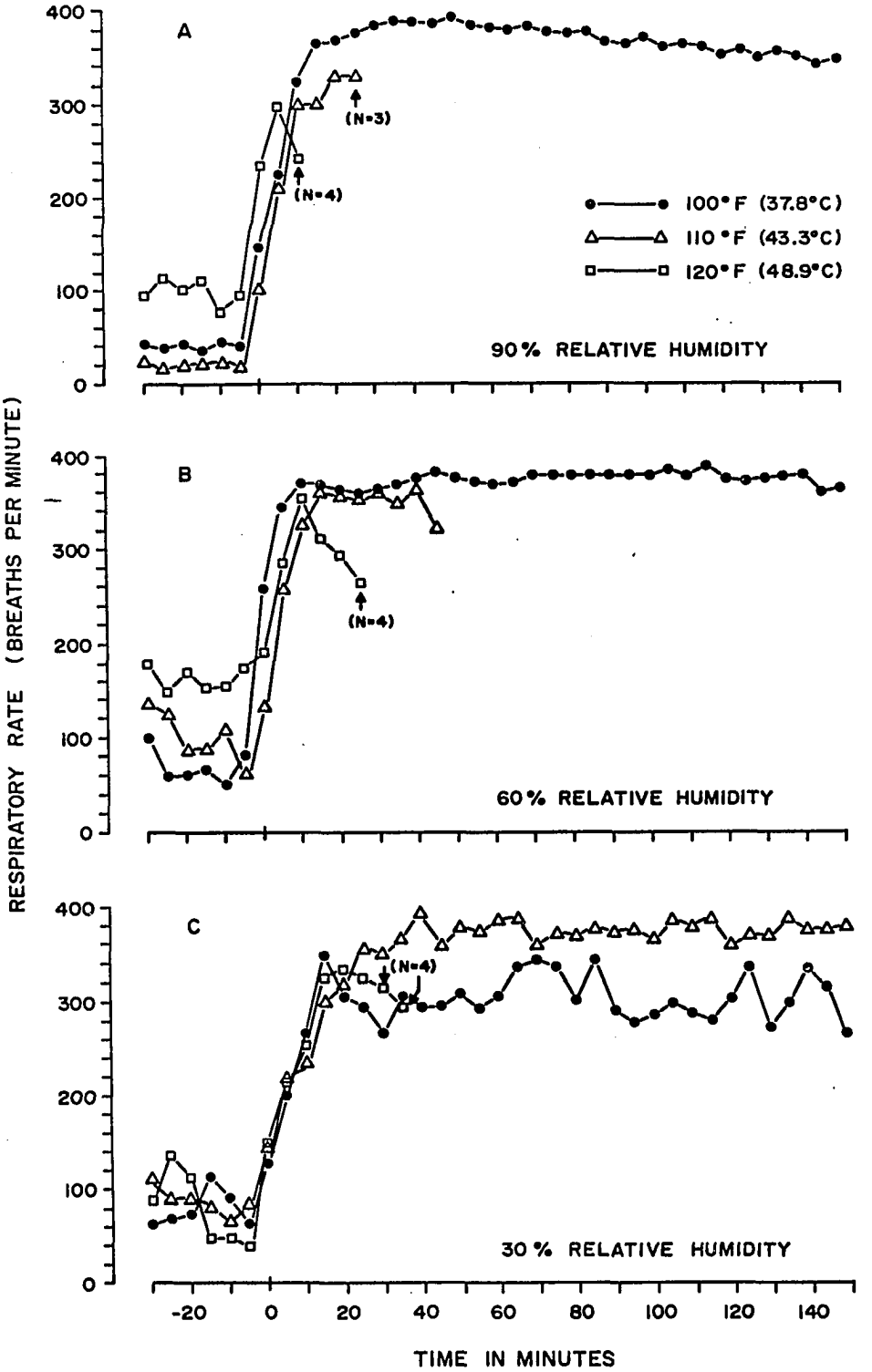
Change in Mean Body Temperature As Influenced by Exposure to Different Relative Humidities

Figure 7



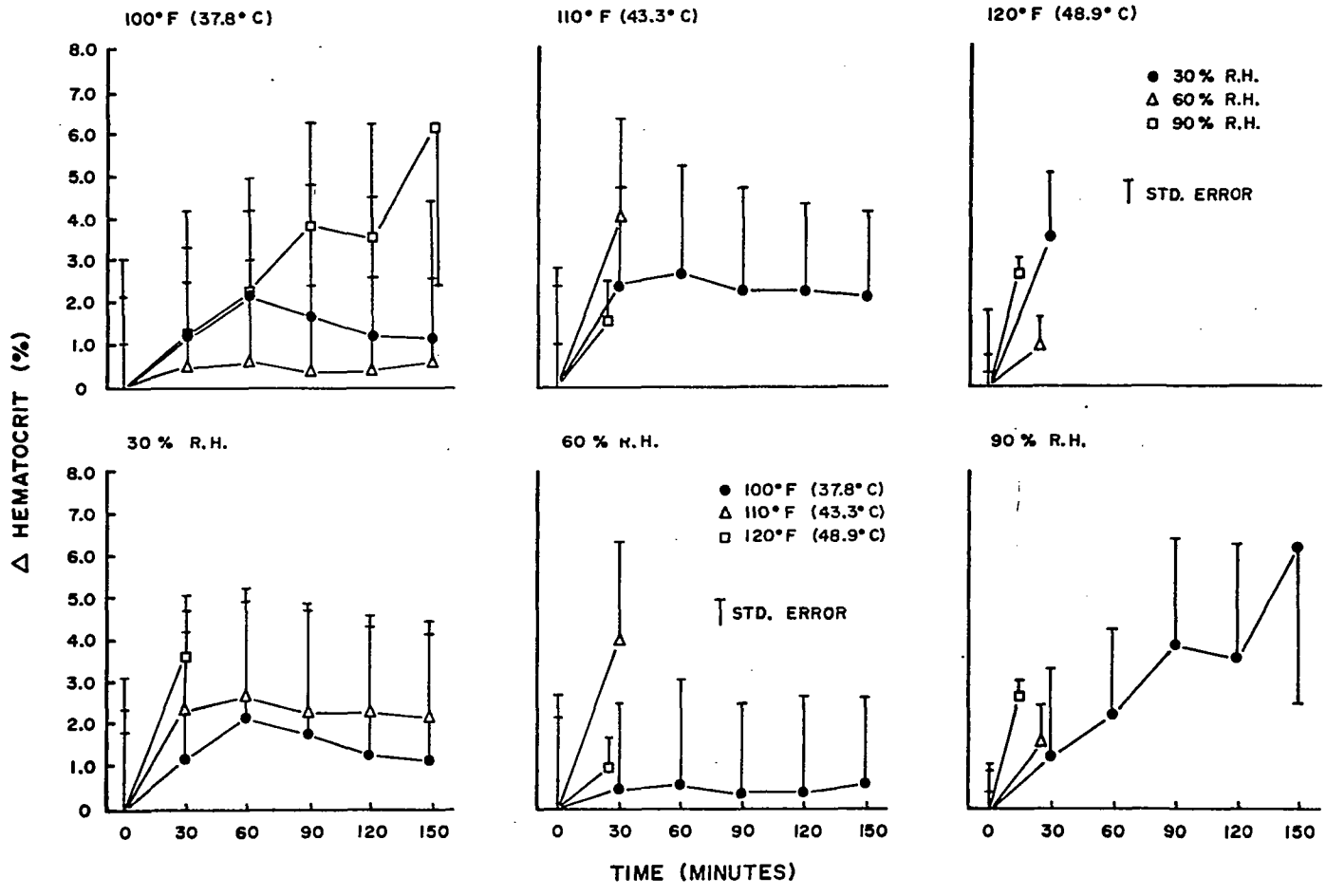
Respiratory Rate As Influenced by Exposure
to Different Ambient Temperatures

Figure 8



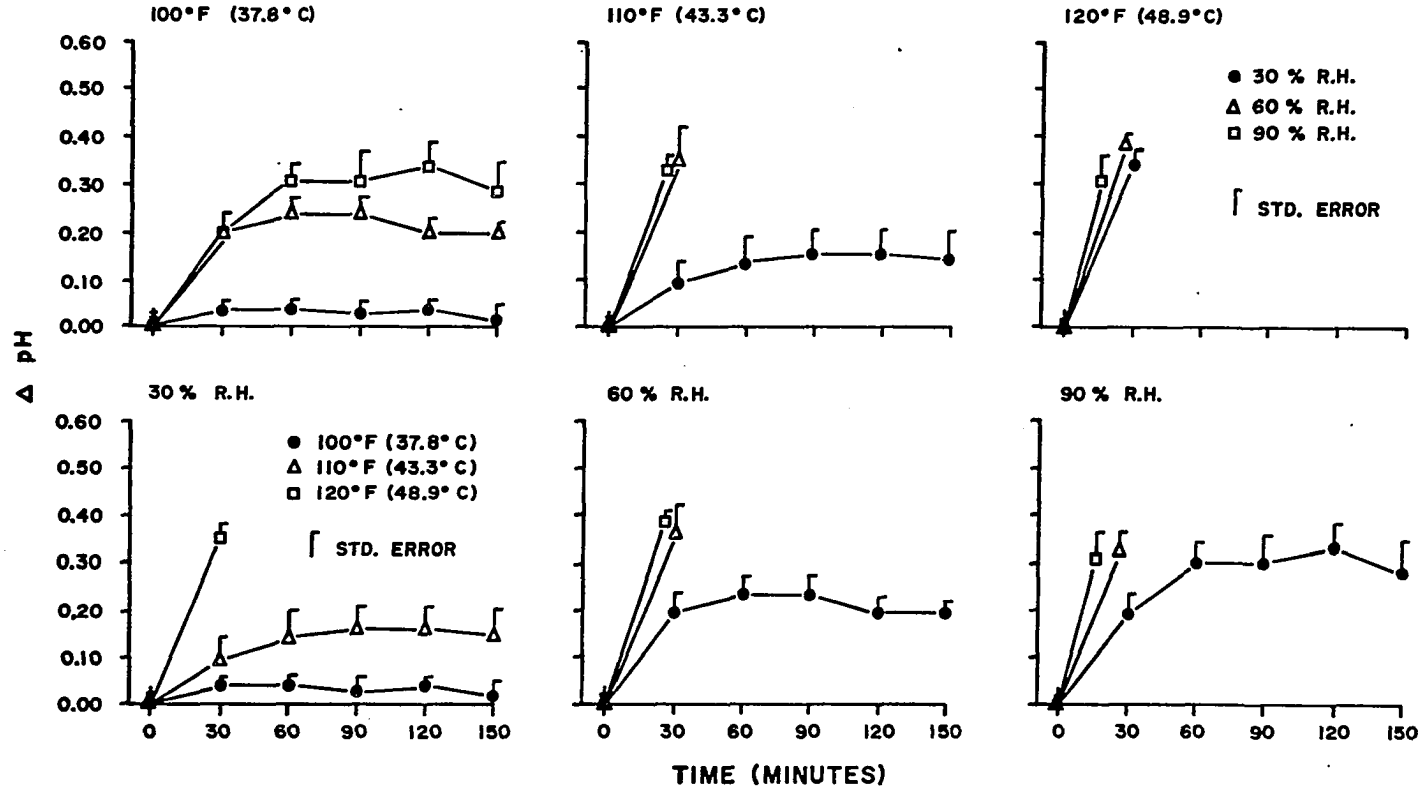
Respiratory Rate As Influenced by Exposure to Different Relative Humidities

Figure 9



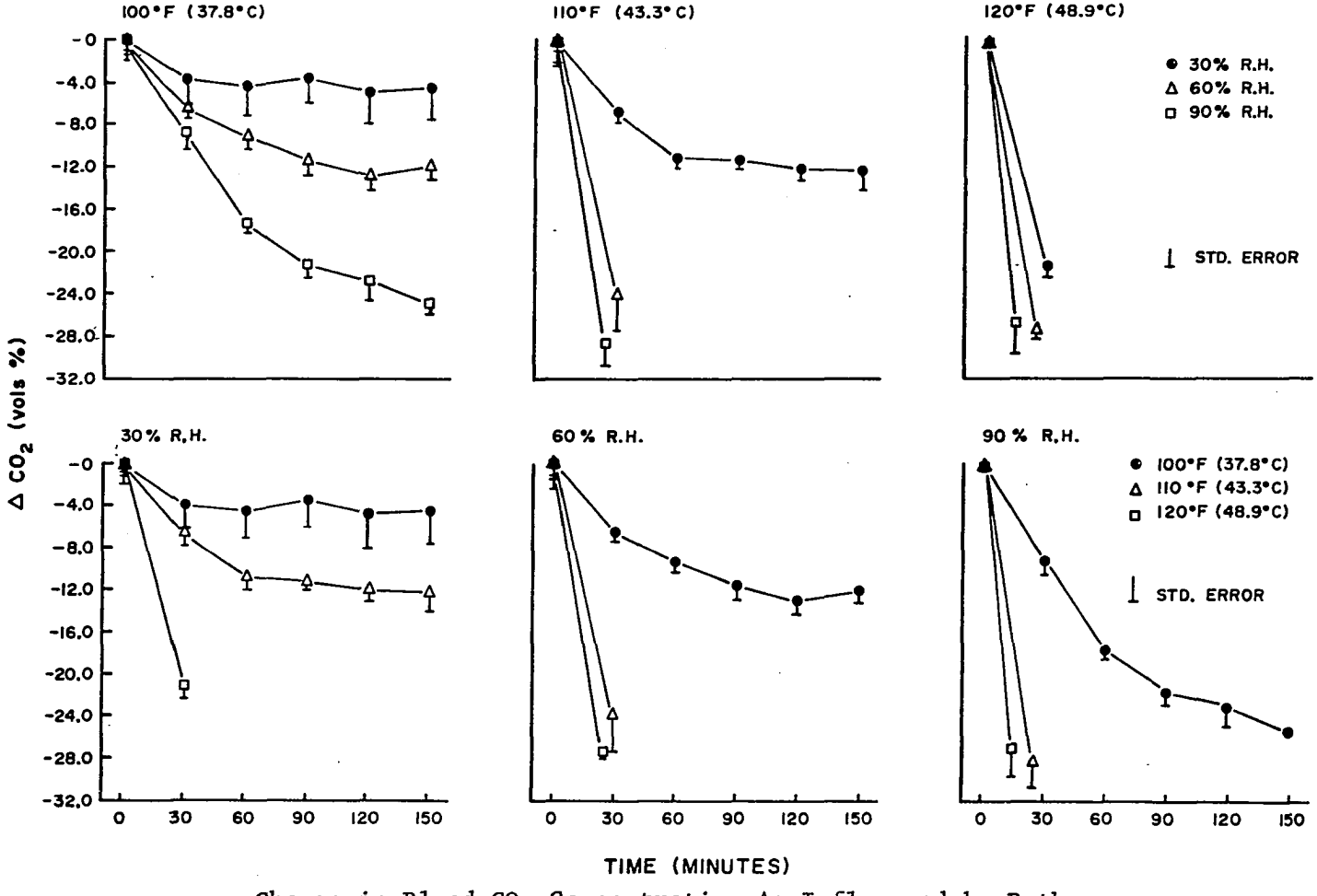
Change in Hematocrit As Influenced by Both Ambient Temperatures (Top) and Relative Humidities (Bottom)

Figure 10



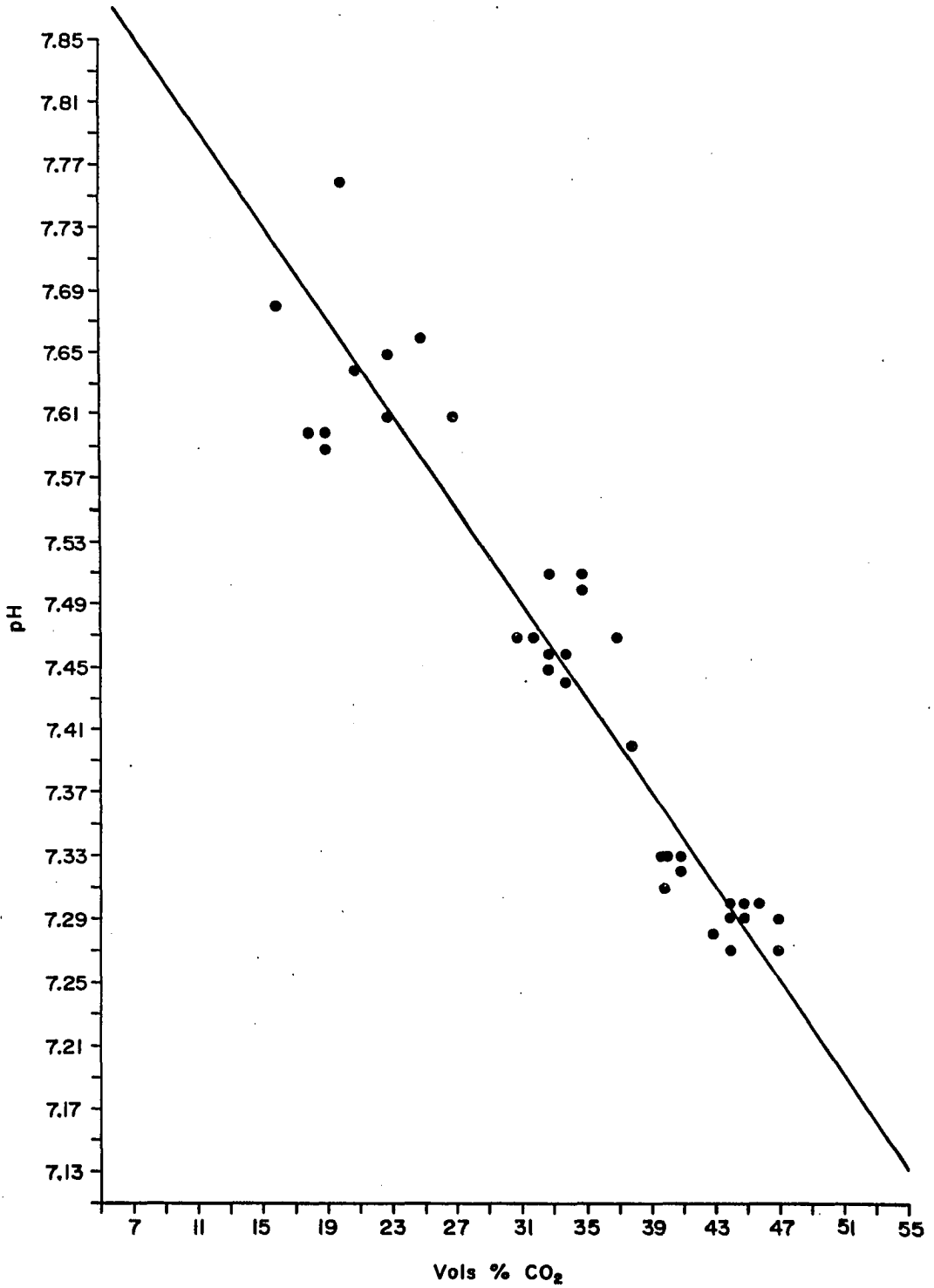
Change in pH As Influenced by Both Ambient Temperatures (Top)
and Relative Humidities (Bottom)

Figure 11



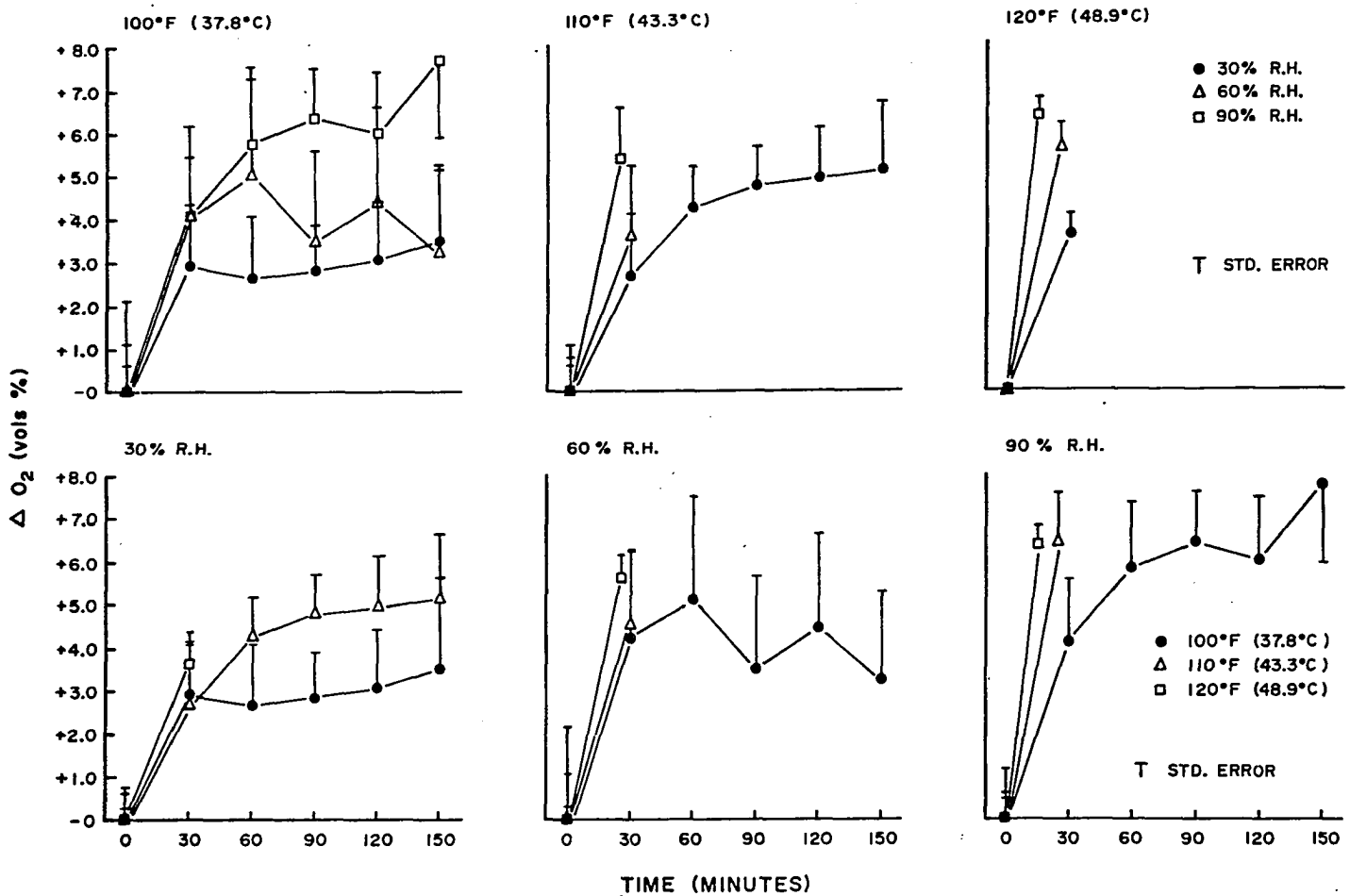
Change in Blood CO_2 Concentration As Influenced by Both Ambient Temperatures[2] (Top) and Relative Humidities (Bottom)

Figure 12



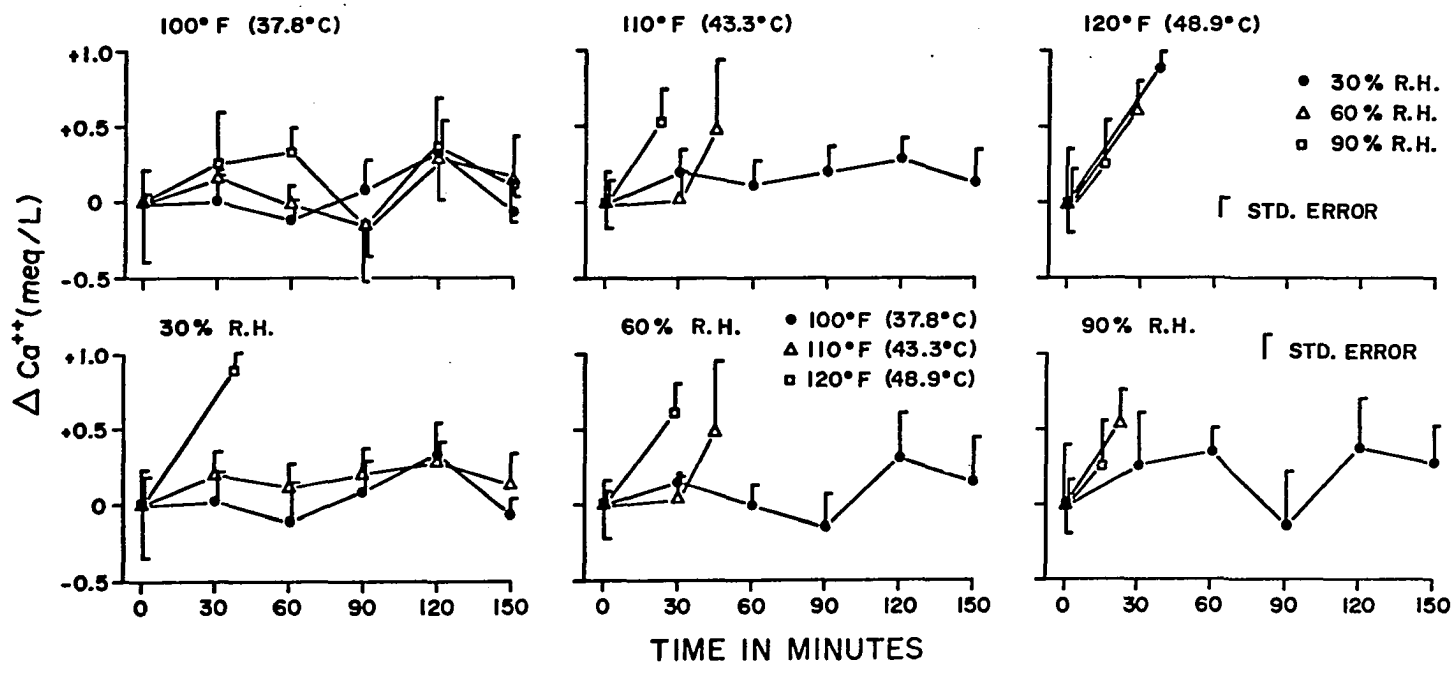
pH Shown As a Function of Blood CO_2 Concentration

Figure 13



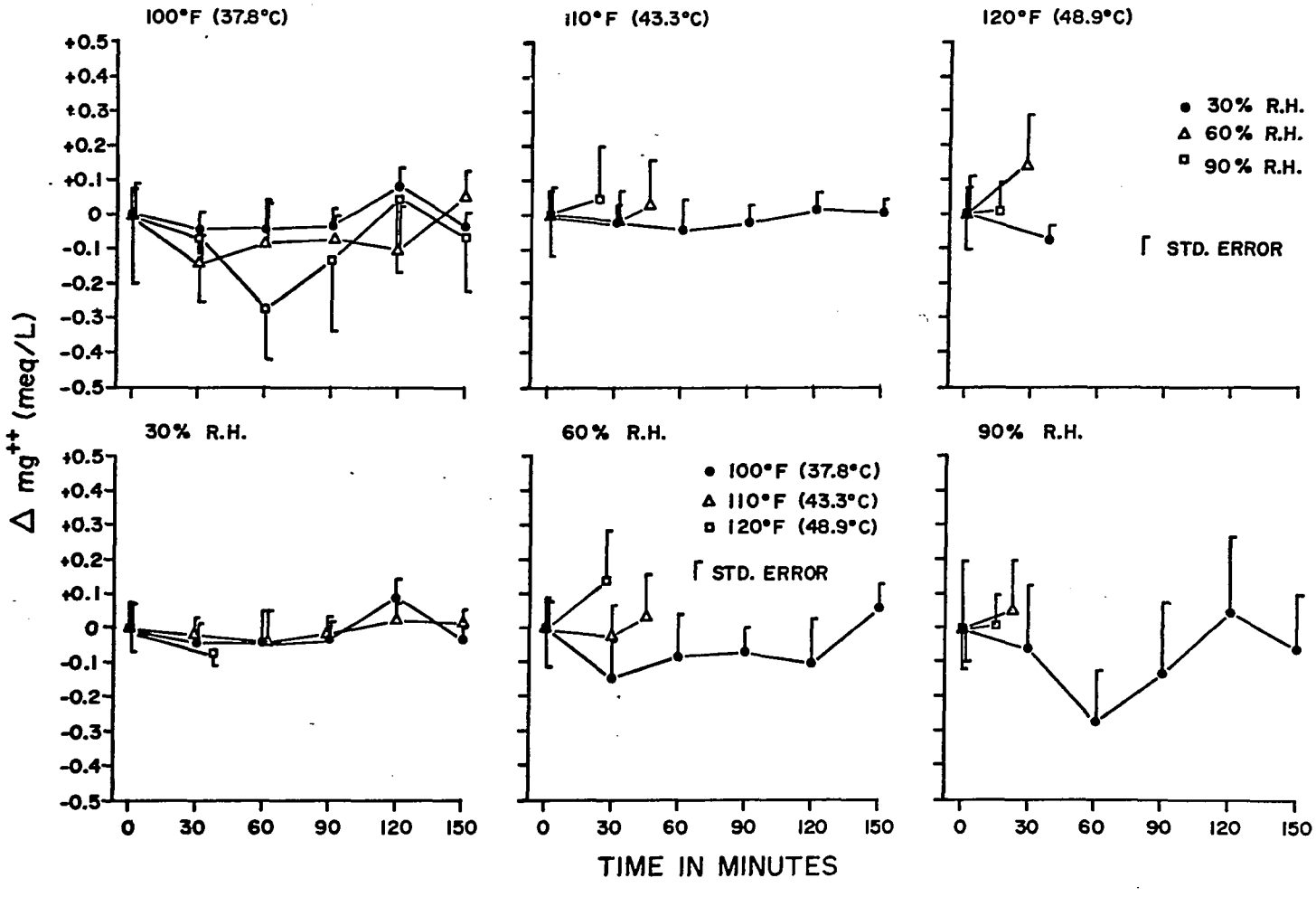
Change in Blood O_2 Concentration As Influenced by Both Ambient Temperatures (Top) and Relative Humidities (Bottom)

Figure 14



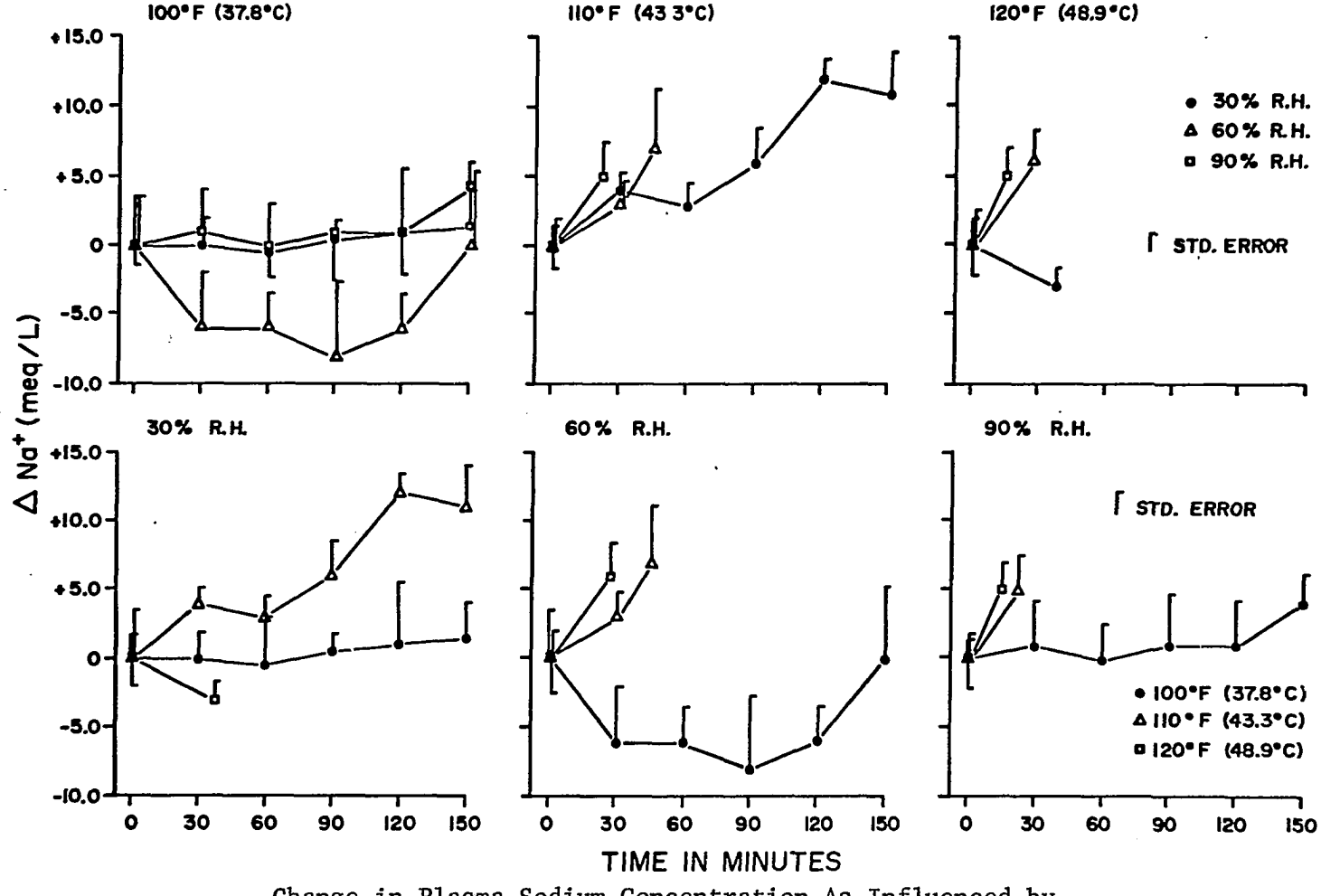
Change in Plasma Calcium Concentration As Influenced by
Both Ambient Temperatures (Top) and Relative Humidities (Bottom)

Figure 15



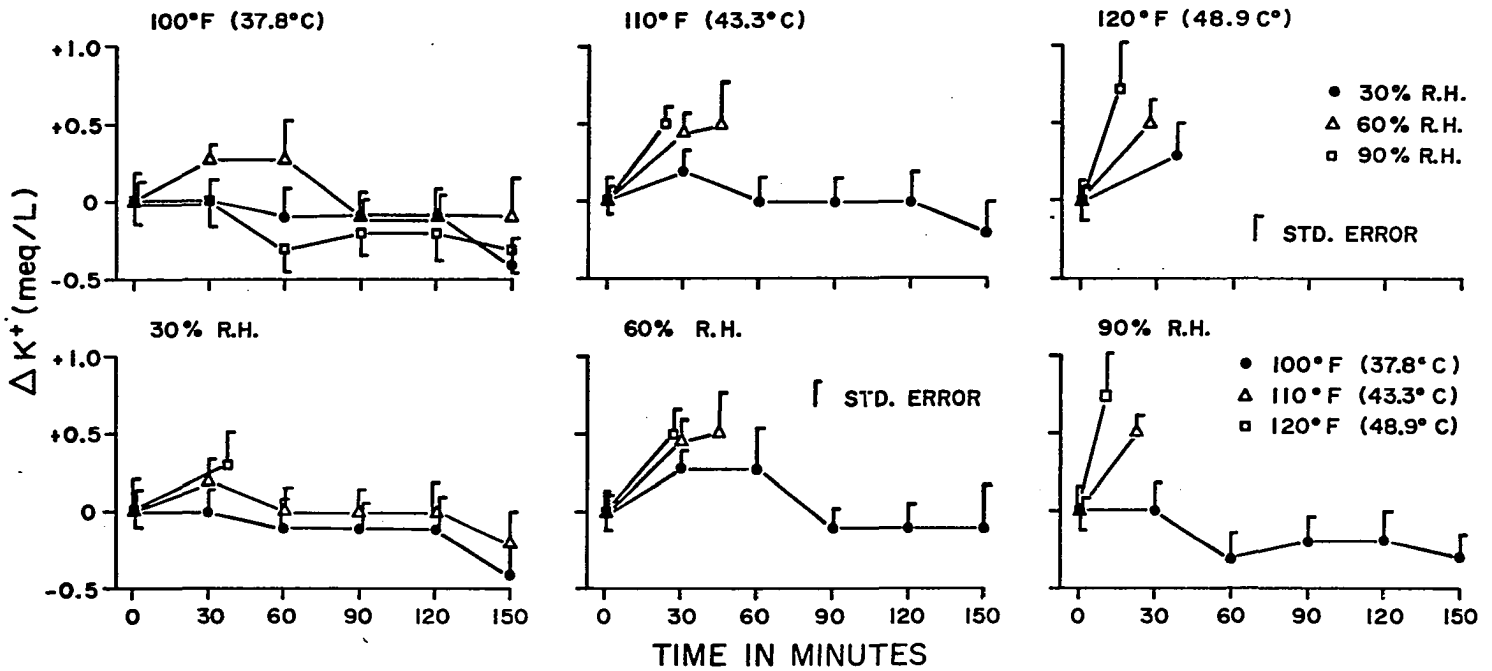
Change in Plasma Magnesium Concentration As Influenced by
Both Ambient Temperatures (Top) and Relative Humidities (Bottom)

Figure 16



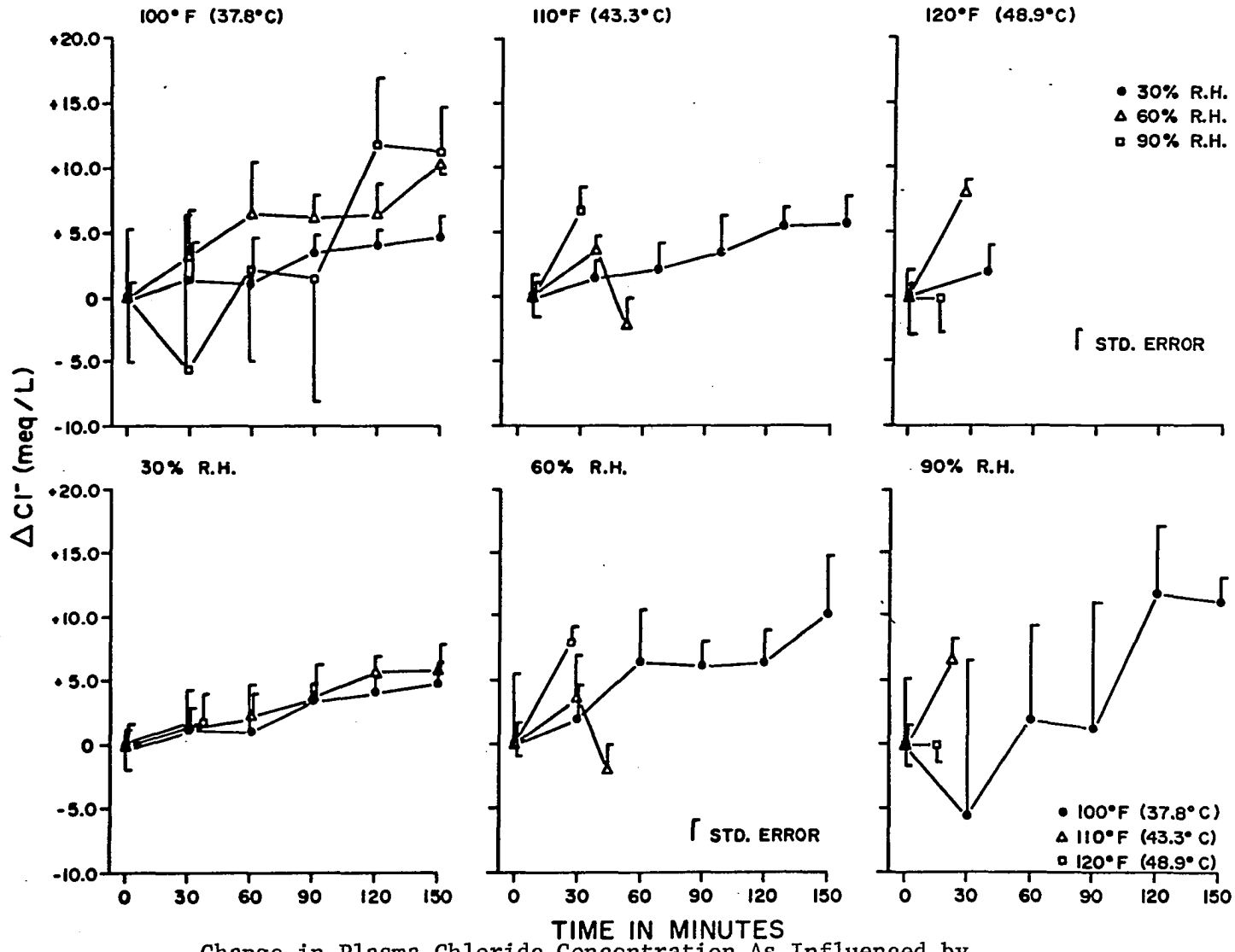
Change in Plasma Sodium Concentration As Influenced by
Both Ambient Temperatures (Top) and Relative Humidities (Bottom)

Figure 17



Change in Plasma Potassium Concentration As Influenced by
Both Ambient Temperatures (Top) and Relative Humidities (Bottom)

Figure 18



Change in Plasma Chloride Concentration As Influenced by
Both Ambient Temperatures (Top) and Relative Humidities (Bottom)

Tables I through IX give average values and standard deviations for an N of five, except where otherwise designated. Time is reposted in minutes. The other columns are values for the measurements listed below:

RR = Respiratory rate (breaths per minute);

Tr = Rectal temperature (degrees centigrade);

Tsmw = Mean weighted skin temperature (degrees centigrade);

Tmb = Mean body temperature (degrees centigrade).

TABLE I

100°F, 30% Relative Humidity

Time	RR	Tr	Tsmw	Tmb
-30	59± 53	39.24±.41	34.92±2.43	37.94±.94
-25	66±54	39.21±.38	34.79±2.23	37.88±.87
-20	70± 53	39.14±.37	34.80±1.72	37.84±.69
-15	110±115	39.08±.31	34.63±2.08	37.75±.71
-10	87±102	39.06±.30	34.70±2.01	37.75±.66
- 5	62± 57	39.03±.27	34.62±2.03	37.71±.62
0	110± 98	39.22±.21	36.41±1.93	38.37±.58
5	192± 92	39.23±.35	37.36±1.68	38.67±.56
10	232± 58	39.21±.47	37.91±1.55	38.82±.63
15	313±107	39.22±.66	38.13±1.61	38.90±.63
20	272± 77	39.20±.46	38.27±1.50	38.85±.58
25	258±112	39.21±.51	38.39±1.50	38.96±.63
30	230± 92	39.22±.58	38.33±1.40	38.94±.70
35	292± 80	39.30±.60	38.36±1.41	39.02±.69
40	259± 97	39.31±.63	38.41±1.54	39.04±.75
45	265±113	39.28±.64	38.42±1.51	39.02±.74
50	275± 81	39.28±.69	38.35±1.47	39.00±.77
55	260± 97	39.29±.70	38.37±1.49	39.01±.77
60	271± 92	39.32±.67	38.44±1.48	39.06±.75
65	300± 83	39.32±.67	38.46±1.53	39.06±.77
70	310± 96	39.27±.66	38.44±1.46	39.02±.74
75	302±101	39.27±.65	38.49±1.54	39.03±.76
80	264± 80	39.26±.62	38.44±1.57	39.01±.74
85	305± 94	39.23±.60	38.39±1.48	38.98±.69
90	268±107	39.23±.61	38.35±1.62	38.97±.71
95	254±104	39.20±.61	38.34±1.68	38.94±.71
100	275± 96	39.20±.58	38.38±1.56	38.96±.68
105	265± 83	39.24±.59	38.38±1.53	38.98±.68
110	260±115	39.20±.54	38.42±1.53	38.97±.64
115	245±110	39.22±.58	38.42±1.46	38.98±.64
120	272± 99	39.26±.65	38.35±1.51	38.98±.70
125	301± 91	39.24±.60	38.32±1.51	38.96±.71
130	258±130	39.16±.58	38.26±1.50	38.89±.66
135	272±120	39.11±.65	38.27±1.52	38.86±.67
140	301± 99	39.05±.66	38.24±1.48	38.80±.68
145	280±130	39.00±.67	38.17±1.42	38.75±.65
150	234±122	39.01±.70	38.16±1.47	38.75±.69

TABLE II

100°F, 60% Relative Humidity

Time	RR	Tr	Tsmw	Tmb
-30	100± 30	39.07±.47	34.71±.43	37.76±.43
-25	60± 32	39.02±.43	34.58±.46	37.69±.38
-20	62± 30	38.93±.39	34.40±.56	37.57±.40
-15	68± 68	38.82±.41	34.29±.52	37.46±.41
-10	52± 22	38.78±.38	34.27±.49	37.43±.40
- 5	82± 56	38.74±.37	34.20±.61	37.38±.42
0	260±114	38.95±.47	36.98±.60	38.36±.50
5	344± 42	39.07±.39	37.85±.57	38.70±.38
10	372± 36	39.21±.42	38.38±.47	38.96±.38
15	370± 34	39.24±.43	38.56±.46	39.04±.40
20	364± 44	39.31±.47	38.84±.35	39.17±.40
25	360± 26	39.28±.47	39.06±.36	39.22±.41
30	364± 34	39.32±.50	39.11±.35	39.26±.43
35	370± 34	39.34±.51	39.19±.44	39.30±.44
40	378± 34	39.28±.45	39.07±.34	39.22±.41
45	384± 34	39.27±.44	39.02±.40	39.21±.43
50	378± 40	39.24±.46	39.02±.33	39.17±.42
55	374± 34	39.25±.46	39.04±.45	39.19±.45
60	370± 42	39.27±.46	39.07±.55	39.21±.46
65	374± 46	39.26±.44	39.11±.37	39.22±.41
70	380± 38	39.25±.45	39.21±.45	39.24±.43
75	380± 34	39.26±.40	39.05±.27	39.20±.35
80	380± 34	39.29±.38	38.98±.35	39.20±.36
85	380± 40	39.27±.37	39.02±.49	39.10±.41
90	378± 36	39.29±.39	39.04±.41	39.22±.40
95	380± 36	39.28±.39	39.01±.35	39.20±.38
100	380± 38	39.26±.35	39.14±.39	39.22±.35
105	386± 34	39.28±.39	39.17±.42	39.25±.40
110	380± 40	39.28±.39	39.09±.43	39.16±.32
115	390± 30	39.31±.39	39.00±.37	39.22±.38
120	376± 54	39.29±.41	38.96±.50	39.19±.44
125	374± 44	39.27±.42	38.96±.52	39.18±.35
130	376± 40	39.25±.42	38.93±.41	39.16±.41
135	378± 38	39.25±.41	38.89±.36	39.14±.39
140	380± 38	39.23±.43	38.92±.47	39.14±.43
145	372± 44	39.24±.43	38.89±.31	39.14±.39
150	376± 42	39.25±.42	38.96±.34	39.17±.40

TABLE III

100°F, 90% Relative Humidity

Time	RR	Tr	Tsmw	Tmb
-30	42±14	39.10±.36	34.74± .91	37.79±.12
-25	38±18	39.15±.33	34.82± .85	37.85±.11
-20	44±18	39.13±.35	34.62± .92	37.78±.13
-15	36± 4	39.07±.34	34.65±1.04	37.74±.15
-10	46±18	39.11±.32	34.67±1.07	37.78±.27
- 5	42±16	39.07±.29	34.66±1.11	37.74±.27
0	146±96	39.17±.40	37.01±1.11	38.52±.48
5	224±98	39.28±.43	37.83± .80	38.85±.49
10	232±42	39.39±.45	38.32± .80	39.07±.51
15	364±14	39.53±.48	38.62± .65	39.26±.50
20	368±18	39.65±.45	38.85± .69	39.41±.50
25	376±19	39.84±.47	38.87± .72	39.55±.51
30	382±16	39.97±.47	38.97± .63	39.67±.47
35	388±22	40.06±.45	38.81± .65	39.69±.49
40	388±22	40.13±.43	38.88± .61	39.76±.47
45	386±27	40.18±.42	39.06± .66	39.85±.47
50	392±27	40.29±.40	39.11± .58	39.94±.43
55	386±34	40.41±.40	39.25± .61	40.06±.44
60	382±37	40.42±.40	39.32± .82	40.09±.48
65	380±39	40.47±.42	39.39± .78	40.15±.50
70	382±40	40.54±.45	39.45± .76	40.22±.51
75	376±42	40.16±.44	39.44± .71	40.26±.49
80	376±38	40.61±.37	39.39± .67	40.24±.43
85	376±37	40.66±.41	39.24± .67	40.23±.44
90	364±51	40.68±.43	39.31± .72	40.27±.47
95	364±53	40.69±.46	39.32± .65	40.28±.47
100	370±40	40.71±.48	39.34± .67	40.30±.51
105	360±47	40.74±.47	39.44± .68	40.35±.47
110	368±41	40.75±.45	39.52± .70	40.39±.46
115	360±40	40.81±.46	39.52± .76	40.42±.49
120	352±62	40.75±.50	39.56± .74	40.44±.47
125	358±42	40.88±.47	39.68± .77	40.52±.47
130	350±38	40.89±.46	39.69± .82	40.53±.47
135	356±39	40.95±.48	39.72± .83	40.58±.49
140	350±53	40.98±.44	39.58± .68	40.56±.45
145	342±52	41.00±.44	39.58± .67	40.58±.46
150	346±42	41.02±.42	39.57± .58	40.59±.42

TABLE IV

110°F, 30% Relative Humidity

Time	RR	Tr	Tsmw	Tmb
-30	111±116	39.38±.51	34.57±1.51	37.94±.62
-25	89±109	39.32±.49	34.46±1.49	37.86±.64
-20	89±137	39.20±.39	34.38±1.70	37.75±.65
-15	79± 97	39.13±.36	34.37±1.58	37.70±.59
-10	65±67	39.07±.30	34.23±1.51	37.62±.54
- 5	83± 82	39.12±.27	34.22±1.61	37.65±.55
0	143±120	39.14±.29	37.50±1.53	38.65±.53
5	213±132	39.20±.36	38.65±1.46	39.04±.48
10	231±139	39.25±.43	39.36±1.39	39.28±.38
15	298± 77	39.30±.51	39.72±1.38	39.43±.30
20	317± 88	39.37±.59	39.98±1.31	39.56±.30
25	353± 49	39.48±.61	40.26±1.31	39.72±.30
30	348± 46	39.54±.70	40.38±1.25	39.79±.30
35	364± 50	39.67±.72	40.37±1.40	39.88±.38
40	391± 41	39.73±.72	40.48±1.35	39.96±.40
45	356± 41	39.81±.68	40.55±1.41	40.03±.38
50	376± 43	39.83±.73	40.47±1.43	40.02±.43
55	372± 51	39.89±.71	40.57±1.40	40.09±.39
60	384± 50	39.91±.70	40.58±1.47	40.11±.43
65	384± 35	39.92±.70	40.53±1.39	40.10±.37
70	356± 26	39.98±.66	40.60±1.38	40.17±.33
75	368± 42	40.01±.59	40.57±1.44	40.18±.28
80	366± 39	39.96±.56	40.52±1.47	40.13±.25
85	373± 40	39.87±.59	40.49±1.53	40.06±.30
90	370± 55	39.91±.59	40.46±1.56	40.07±.31
95	372± 54	39.95±.62	40.44±1.46	40.10±.33
100	362± 57	39.91±.58	40.58±1.51	40.11±.30
105	383± 58	39.93±.53	40.76±1.50	40.18±.26
110	374± 45	39.88±.51	40.51±1.44	40.07±.32
115	385± 27	39.83±.54	40.48±1.48	40.03±.30
120	356± 58	39.82±.52	40.38±1.44	39.99±.26
125	367± 46	39.83±.55	40.45±1.35	40.01±.25
130	367± 53	39.81±.55	40.50±1.32	40.02±.25
135	385± 51	39.79±.57	40.59±1.40	40.03±.29
140	372± 56	39.79±.57	40.54±1.28	40.01±.24
145	373± 54	39.79±.56	40.54±1.35	40.01±.24
150	376± 66	39.83±.60	40.55±1.41	40.04±.30

TABLE VII

120°F, 30% Relative Humidity

Time	RR	Tr	Tsmw	Tmb
-30	88±133	38.87±.54	33.89± .71	37.37±.34
-25	135±158	38.85±.64	33.80± .67	37.33±.31
-20	112±104	38.78±.62	33.77± .63	37.28±.37
-15	147± 38	38.77±.60	33.79± .57	37.27±.48
-10	48± 40	38.79±.62	33.83± .53	37.30±.46
- 5	39± 35	38.76±.59	33.65± .53	37.23±.46
0	147±143	38.78±.58	37.80±1.11	38.49±.70
5	200±143	38.91±.64	39.64± .80	39.13±.64
10	254±137	39.23±.71	40.60± .98	39.64±.67
15	323± 52	39.56±.73	41.57± .88	40.16±.60
20	332± 26	40.00±.83	41.86± .90	40.56±.70
25	323± 28	40.46±.98	42.26± .93	41.00±.78
30	313± 36*	40.56±.58*	42.32± .91*	41.09±.28*
35	295± 24*	40.95±.80*	42.26±1.11*	41.34±.37*

* N=4

TABLE VIII

120°F, 60% Relative Humidity

Time	RR	Tr	Tsmw	Tmb
-30	178±51	38.77±.07	33.62±.65	37.22±.20
-25	148±45	38.76±.06	33.52±.57	37.19±.15
-20	171±46	38.71±.07	33.75±.50	37.22±.13
-15	154±48	38.66±.07	33.66±.52	37.16±.15
-10	155±53	38.67±.08	33.69±.50	37.17±.14
- 5	176±53	38.69±.10	33.50±.98	37.13±.14
0	192±51	38.36±.09	39.42±.32	38.48±.33
5	286±49	38.90±.06	41.27±.34	39.61±.08
10	355±18	39.42±.04	42.54±.38	40.35±.09
15	313±24	40.16±.04	43.20±.37	41.07±.10
20	295±32	40.94±.04	43.84±.43	41.81±.12
25	267±17*	41.68±.09	44.05±.61#	42.36±.17#

* N=4
# N=3

Tables X through XVIII give average values and standard deviations for an N of five, except where otherwise designated. Time is reported in minutes. The other columns are values for the measurements listed below:

pH = pH of the blood;

hct = hematocrit;

$[CO_2]$ = volumes percent of blood CO_2;

$[O_2]$ = volumes percent of blood O_2;

$[Ca^{++}]$ = milliequivalents per liter of plasma calcium;

$[Mg^{++}]$ = milliequivalents per liter of plasma magnesium;

$[Na^{+}]$ = milliequivalents per liter of plasma sodium;

$[K^{+}]$ = milliequivalents per liter of plasma potassium;

$[Cl^{-}]$ = milliequivalents per liter of plasma chloride.

TABLE X

100°F, 30% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.29±.04	41.4±7.0	44.68±4.48	12.69±1.43	5.21±.44	1.41±.16	149± 7.8	4.7±.42	117.6±2.3
30	7.33±.03	42.6±6.8	40.80±5.62	15.68±3.13	5.24±.55	1.37±.12	149± 4.4	4.7±.33	119.0±6.8
60	7.33±.04	43.6±6.2	40.33±6.48	15.40±3.15	5.11±.54	1.37±.08	148± 6.8	4.6±.41	118.7±8.1
90	7.32±.05	43.2±6.9	41.10±5.75	15.56±2.29	5.30±.49	1.38±.14	150± 5.0	4.6±.33	121.1±5.9
120	7.33±.04	42.7±7.3	39.93±7.25	15.80±3.08	5.55±.40	1.50±.20	151±10.3	4.6±.41	121.8±4.7
150	7.31±.06	42.6±7.3	40.17±7.39	16.23±3.54	5.16±.21	1.38±.20	142± 5.5	4.3±.38	122.4±3.6

TABLE XI

100°F, 60% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.27±.06	41.6±4.8	43.98±2.33	13.53±4.53	5.56±.17	1.71±.21	156± 7.9	4.7±.27	113.7±12.1
30	7.47±.07	42.1±4.4	37.46±1.53*	17.83±2.25*	5.70±.04	1.57±.25	150± 8.9	4.7±.21	116.9± 8.3
60	7.51±.07	42.2±5.4	34.92±2.70*	18.65±2.94*	5.55±.31	1.63±.27	150± 5.7	4.7±.53	120.2± 9.0
90	7.51±.07	42.0±4.7	32.65±3.36	17.06±3.82	5.42±.46	1.64±.15	148±11.8	4.3±.24	119.9± 3.6
120	7.47±.06	42.0±5.0	31.06±3.36	17.96±5.02	5.87±.67	1.61±.28	150± 5.8	4.3±.31	120.1± 5.1
150	7.47±.04	42.2±4.5	32.04±2.81	16.81±3.90	5.72±.64	1.77±.16	156±11.8	4.3±.59	123.9±10.3

* N=4

TABLE XII

100°F, 90% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.30±.03	40.6±2.4	43.82±3.11	13.58±2.52	4.95±.89	1.85±.44	154±3.4	4.7±.35	113.8±11.5
30	7.50±.09	41.9±4.5	35.14±3.91	17.71±3.13	5.21±.77	1.79±.42	155±7.0	4.7±.38	108.2±26.9
60	7.61±.08	42.9±4.3	26.50±2.34	19.44±3.16	5.29±.37	1.58±.34	154±5.4	4.4±.33	116.0±16.1
90	7.61±.13	44.5±5.6	22.51±3.63	20.02±2.64	4.80±.82	1.72±.47	155±8.3	4.5±.33	115.3±21.4
120	7.64±.10	44.2±6.0	21.02±4.54	19.61±3.20	5.33±.72	1.90±.50	155±7.1	4.5±.40	125.7±11.6
150	7.59±.12*	46.8±7.4*	18.71±1.33*	21.38±3.47*	5.09±.59	1.79±.36	158±4.6	4.4±.30	125.1± 4.0

* N=4

TABLE XIII

110°F, 30% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.30±.03	38.3±5.3	44.99±1.91	12.63±1.73	4.86±.48	1.28±.15	141±3.3	4.3±.31	115.9±2.9
30	7.40±.09	40.7±5.2	38.49±2.29	15.35±3.16	5.07±.34	1.26±.11	145±2.8	4.5±.28	117.5±3.0
60	7.44±.12	41.0±5.7	34.24±3.07	16.95±2.10	4.98±.33	1.24±.21	144±3.3	4.3±.36	118.1±4.4
90	7.46±.10	40.6±5.4	33.93±2.30	17.47±1.95	5.07±.39	1.26±.11	147±5.8	4.3±.33	119.4±6.4
120	7.46±.11	40.6±4.6	33.03±2.53	17.63±2.64	5.15±.32	1.30±.12	153±3.2	4.3±.43	121.5±3.0
150	7.45±.12	40.5±4.4	32.82±4.42	17.83±3.43	5.00±.47	1.29±.10	152±6.8	4.1±.43	121.6±4.8

TABLE XIV

110°F, 60% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{-}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.29±.03	40.7±6.2	47.06±5.13	14.84±2.44	5.40±.35	1.48±.17	145±4.4	4.3±.21	117.7±3.9
30	7.65±.14	44.7±5.2	23.16±7.83	19.49±3.73	5.43±.40	1.46±.21	148±3.8	4.7±.26	121.3±2.3
45	7.76±.09*	44.2±2.8*	19.67±5.96*	19.39±2.32*	5.88±.82*	1.51±.23*	152±7.5*	4.8±.47*	115.5±3.7*

* N=3

TABLE XV

110°F, 90% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[1^{-}]$
0	7.28±.04	39.9±2.2	46.87±4.18	13.20±1.32	4.44±.35	1.35±.26	148±3.7	4.6±.18	116.1±3.2
25	7.60±.07	41.5±2.0	18.61±5.31	19.65±2.62	4.98±.50	1.40±.33	153±5.6	5.1±.24	122.7±4.2

TABLE XVI

120°F, 30% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.30±.02	42.2±4.2	46.39±1.05	14.06±.42	4.50±.78	1.50±.16	153±4.7	4.6±.20	120.3±4.5
38	7.66±.06	45.8±3.4	25.30±2.97	17.69±1.01	5.39±.26	1.43±.10	150±3.0	4.9±.46	122.2±4.8

TABLE XVII

120°F, 60% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.28±.01	44.6±1.3	42.94±1.77	15.30±.69	4.66±.52	1.48±.25	149±5.7	4.4±.30	118.1±2.6
28	7.68±.04	45.6±1.3	15.72±.48	20.96±1.16	5.27±.44	1.62±.33	155±5.2	4.9±.32	126.1±2.2

TABLE XVIII

120°F, 90% Relative Humidity

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Ca^{++}]$	$[Mg^{++}]$	$[Na^{+}]$	$[K^{+}]$	$[Cl^{-}]$
0	7.29±.02	41.4±0.7	43.76±1.37	15.30±1.01	4.16±.44	1.48±.22	151±5.0	4.0±.30	121.8±6.5
15	7.60±.13	44.1±0.9	18.38±6.72	20.97±6.72	4.42±.70	1.49±.17	156±4.8	4.7±.66	121.9±6.3

CHAPTER IV

DISCUSSION

Rectal temperature is an indicator of the success with which an animal is able to adjust to the imposed heat stress of the environment. At 100°F, 30% relative humidity dogs appeared to be able to adjust to the heat load. At both 100°F, 60% relative humidity and at 110°F, 30% relative humidity rectal temperature stabilized, although at levels above control temperature, indicating the ability to maintain internal body temperature, although at a level higher than that of non-stressful conditions. During exposure to 100°F with 90% relative humidity, the animals showed a continual rise in rectal temperature throughout the experiment. Without extending the time of exposure it cannot be stated whether the dogs could have successfully adjusted to this heat load. Under all of the other experimental conditions rectal temperature reached 42.0°C prior to the 150 minute maximum exposure time, which indicated the difficulty, if not the inability, of adjusting to these higher heat loads.

From a comparison of figures 1 and 2, it is evident that an increase in either ambient temperature or relative humidity increased the rate of elevation of rectal temperature. Using the time required for rectal temperature to reach 42.0°C, weighting factors can be assigned for the

stress values for dry bulb (ambient) temperature and for wet bulb temperature (determined from the relative humidity). From the data obtained in this study with dogs the weighting values are 0.55 for dry bulb and 0.45 for wet bulb readings (see appendix B). Lind et al. (25) found in experiments on humans that the appropriate weightings were 0.85 for wet bulb and 0.15 for dry bulb. Comparing the weighting values for man and dog indicate that relative humidity is a more important factor in the heat loading of man than of dogs.

From figures 3 and 4 it can be observed that during exposure to 100°F mean weighted skin temperature rose above the ambient, indicating the influence of internal body temperature (circulating blood temperature) on the skin as a result of heat-induced vasodilation, thus providing avenues of cooling other than respiratory-tract evaporation. The values on which the graphs are based can be found in Tables I through III. At all of the 110°F and 120°F exposures skin temperature did not reach ambient so that throughout these experiments the only cooling available to the animals was by evaporation.

The hematocrit showed a great variability (figure 9), although in all instances there was at least a slight increase with time. The large variability may be accounted for by the fact that hematocrit is influenced by many factors, such as shifts in body fluids. Further, it has been found that heating causes increased secretion of catecholamines (26). Increased catecholamines are known to cause splenic contractions with the release of stored red cells (27). There could also be significant differences in levels of dehydration experienced by the animals; although no direct measurements were made, some animals were observed

to salivate more copiously than others exposed to identical conditions.

The pH showed a more rapid increase with either higher humidities or higher temperatures (figure 10). A corresponding decrease in blood CO_2 was also evident (figure 11). The very high negative correlation (-0.95) is demonstrated in figure 12 with a scattergram and regression line. The decrease in CO_2 indicates a loss through respiratory activity and shows that panting involves more than a movement of air within the dead air space.

Accompanying the decreased CO_2 was an increase in blood O_2 (figure 13). A decrease in O_2 utilization by the tissues is not a likely explanation for the increased O_2 concentration since it is assumed that the demand for O_2 by the tissues during heat stress would be at least as great as, if not greater than, during non-stressed circumstances. The blood samples drawn were venous samples and the increase in O_2 content may be accounted for by at least two factors. First, during heat-exposure cardiac output is increased, peripheral blood vessels dilate and peripheral blood flow is greatly increased (28); therefore there is a decreased O_2 extraction by the tissues per unit volume of blood. Second, increasing pH shifts the O_2 dissociation curve to the left so that greater O_2 uptake by blood is possible at the same partial pressure of O_2 (29). However, this change is very minor since arterial blood should be near saturation at the partial pressure of O_2 found at this altitude.

Respiratory rate was elevated upon exposure to all of the experimental conditions (figures 7 and 8). During the more severe exposures there was a decrease in rate toward the end of the exposure. At 100°F, 60% relative humidity, respiratory rate was maintained above 370 breaths

per minute from 35 minutes throughout the remainder of the 150 minute exposure (Table II). At 100°F, 90% relative humidity, respiratory rate dropped from 392 breaths per minute at 50 minutes to 342 at 145 minutes (Table III). On the other hand, CO_2 dropped consistently from 43.82 volumes percent to 18.71 volumes percent with each reading being lower than the previous thirty minute reading, during the 90% exposure (Table XII); but it dropped only from 43.98 volumes percent to 32.65 volumes percent at 90 minutes with little additional change during the 60% relative humidity exposure (Table XI). The 60% exposure, therefore, appears to permit a stabilized respiratory rate with a stabilized blood CO_2 concentration following. There was no measurement of total ventilation made, but since at the 90% exposure there was no concommitant decrease in pH or increase in blood CO_2 accompanying the decreased respiratory rate it appears possible that there was an increase in alveolar ventilation, with a greater total volume of air passed over the respiratory tract than with the previously recorded higher respiratory rates.

The decreases in respiratory rate were much more marked at all relative humidities during exposure to 120°F. However, since the experiments at this temperature were of short duration, only one blood sample could be drawn after the control sample. Therefore, no judgements can be made concerning the CO_2 levels during the highest and subsequently lowered respiratory rates.

Kappey and Albers (17) found body temperatures higher at higher relative humidities, as in this study. Their method of exposure differed from that used here, and they found that respiratory rate varied directly with relative humidity. These experiments indicate that total

ventilation might provide better assessment of the effects of increasing relative humidity than respiratory rate. Their conclusion was that the temperature of the mucosa in the upper respiratory tract was a factor in triggering the hyperventilation. Although the present study was not designed to ascertain triggering mechanisms it does support their conclusion. At least it is evident that skin temperature is not the sole driving force of total ventilatory rate. Figure 3 shows that skin temperature was not greatly influenced by relative humidity while ventilation was influenced by relative humidity as previously mentioned. It demonstrates how both the ambient temperature of the air and the cooling available due to different vapor-pressure gradients could influence the temperature of the mucosa of the upper respiratory tract, and thus supports the temperature of this site as a plausible triggering mechanism.

Under the conditions of this study it cannot be determined whether the upper limits of respiratory rate were reached. It is evident that both ambient temperature and relative humidity are drives for increasing respiratory rate. It is also known, however, that the lowered blood level of CO_2 serves as an inhibitory influence on respiratory rate. Whether the highest respiratory rates achieved during these exposures are the net result of these two opposing drives, or are a result of the thermal stimulus overriding the CO_2 stimulus, cannot be decided on the basis of the data obtained.

The plasma ion concentrations provide some unusual information, although the explanation of them is not in all cases clear. The control values for all of the ions reported are quite similar to acceptable

values reported by others (30).

The calcium concentration showed an increase in all of the short-term exposures as did magnesium for all but one (Tables XIV through XVIII). However, for those experiments which were carried out for the full 150 minutes the patterns were irregular for both of these ion concentrations (Tables X through XIII). In the experiments by Iampietro et al. (14) in which humans were exposed to varying high temperatures and humidities, pre- and post-exposure plasma-calcium determinations were made. Irregular results were reported for calcium, and there was no definitive relationship to the severity of the exposure.

Potassium-ion concentrations dropped in all those exposures which lasted the full two and one-half hours (Tables X through XIII). These results are similar to those reported by Kanter (11) for a three hour exposure. Kanter also measured urinary potassium excretion and found it to be very high. He explained the drop in plasma concentrations by the high urinary excretion values found for potassium. Potassium is thought to be mobilized from the intracellular compartment during heat stress (31,32,33). It appears evident that this mobilization takes place because the reported potassium excreted in the urine during prolonged heat exposures exceeds the amount available in the plasma alone.

The short-term exposures of this study all showed an increase in potassium concentration over control values. This is in contrast with the results reported for the 150 minute exposures of this research and for Kanter's work. This might be explained by the fact that during the more severe heat-loading experiments the kidney's extraction of potassium from the plasma has not yet exceeded the rate of mobilization of

potassium from the intracellular compartment. It is also possible that the mobilization from the intracellular compartment might have been facilitated by the more rapid rate of change of blood pH during the more severe conditions. It was also noticed that during the more severe conditions of this research there was some hemolysis of red cells. Although no measure of hemolysis is available, the more severe the exposure the darker the plasma appeared as compared to control samples. Hemolysis could account for additional release of intracellular potassium to the plasma.

The observed hemolysis during the more severe heat stresses cannot be accounted for merely as a consequence of venipunctures since it did not occur during the less severe exposures where more blood samples were taken. It could be due to some mechanical damage incurred during the more stressful panting, or possibly some damage could accrue due to disturbances of certain enzymatic or hormonal systems.

Although it was not well-defined in all instances (Tables XI and XVI for sodium and Table XIV for chloride) the pattern was for an increased sodium and chloride concentration in plasma during heat exposure. These results are consistent with those of other authors (11, 31,32,33) and may be explained by the increased hematocrit and reduction in the extracellular compartment which occurs during dehydration.

CHAPTER V

CONCLUSIONS

The hypothesis: "Thermal panting is a mechanism which increases evaporative cooling and as such alters only those physiological parameters concerned with temperature regulation," proves to be false.

A number of changes can be directly or indirectly attributed to the thermally induced hyperventilation. The changes in CO_2 concentration and resultant alkalosis (evidenced by the increasing pH) appear to be logical consequences of the panting. That portion of O_2 concentration increase attributed to the pH shifting the O_2 dissociation curve is an indirect result of the hyperventilation. That portion of the blood O_2 change attributed to the reflex peripheral vasodilation, increased cardiac output, with a resulting increased peripheral blood flow and consequent decreased tissue O_2 extraction per unit volume, can probably be attributed to a response to heat alone and is not necessarily associated with the panting.

The changes in potassium are quite possibly linked with hyperventilation since changes in kidney function are attributed by other investigators (11,31,32,33) to changes in blood pH and regulation by the kidney which tend to offset the respiratory alkalosis. The changes in sodium and chloride concentration, on the other hand, may be accounted for

merely on the basis of the dehydration accompanying the heat stress.

All of the conditions studied are above threshhold for changes attributable to thermal panting. There probably are conditions which would invoke panting without these changes. This is evidenced by the fact that the mildest condition studied (100°F, 30% relative humidity) caused only slight changes in those parameters influenced by the hyperventilation. The pH rose only 0.02 over control values. CO_2 concentration fell only 4.51 volumes percent and the animals were able to regulate internal body temperature at pre-exposure levels.

Humidity proved to be a very important consideration in determining heat load. In most parameters where the stress evoked established patterns of change (rectal temperature, mean body temperature, pH, CO_2 concentration, O_2 concentration and plasma potassium level) increases in humidity, as well as increases in ambient temperature, facilitated the rate of response.

This study points out the need for additional investigations. The data indicate that the phenomenon of panting should be evaluated more completely in terms of homeostatic mechanisms other than body temperature control, particularly acid-base balance with specific attention to some of the plasma and urine concentrations of ions.

The seemingly paradoxical rise in pH and decline in CO_2 in the face of a decreased rate of respiration during some of the exposures indicates the need for studies in which measures of total ventilation are employed and not merely respiratory rate.

There is the possibility that respiratory patterns during hyperthermia could be influenced by the lowered blood CO_2 levels imposing

control limits. The interaction between thermal drive for panting and the respiration-inhibiting effect of lowered CO_2 concentration in the blood require further study.

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APPENDIX A

Sample calculation for determining mean weighted skin temperature and mean body temperature:

Conditions: 110°F, 30% relative humidity.

Time: Thirty minutes after the animal was introduced into the environmental chamber.

Skin temperatures	X	weighting factors	
Head - 37.2	X	0.16	= 5.95
Chest - 38.0	X	0.26	= 9.88
Elbow - 38.3	X	0.09	= 3.45
Paw - 34.7	X	0.11	= 3.82
Hip - 40.1	X	0.14	= 5.61
Flank - 40.5	X	0.24	= 9.72

Mean weighted skin temperature= Total = 38.43°C.

Mean body temperature = 0.7 X rectal temperature + 0.3 X mean weighted skin temperature.

If rectal temperature at this time were 40.60°C, then mean body temperature would be:

(0.7 X 40.60°C) + (0.3 X 38.43°C) = 28.42°C + 11.53°C = 39.95°C.

APPENDIX B

In determining the relative stress values of the ambient temperature and the relative humidity, weighting factors can be assigned for dry bulb temperature and wet bulb temperature (determined from relative humidity). The weighted average is often referred to as WD, which is the expression for the severity of combined wet bulb and dry bulb temperatures. WD is obtained by multiplying the dry-bulb temperature by its weighting factor and adding this product to the wet-bulb temperature multiplied by its weighting factor. The time required for animals to reach a rectal temperature of 42.0°C is used as an end point for assessing the weighting values for wet bulb and dry bulb temperatures for these experiments. Those values which yield the best straight line relationship between time and WD are selected as the appropriate weightings.

For the conditions studied a value of 0.55 for dry bulb (DB) and 0.45 for wet bulb (WB) provided the best fitting straight-line relationship (figure 19).

Since all conditions were not severe enough to elevate rectal temperature to 42.0°C only those five conditions which did can be used for this determination.

The wet bulb values for the five conditions are:

116°F for 120°F ambient at 90% relative humidity;

102°F for 120°F ambient at 60% relative humidity;

80°F for 120°F ambient at 30% relative humidity;

106°F for 110°F ambient at 90% relative humidity;

93°F for 110°F ambient at 60% relative humidity;

The average time required for the animals to reach a rectal temperature of 42.0°C under these five conditions are:

120°F, 90% relative humidity - 15 minutes;

120°F, 60% relative humidity - 23 minutes;

120°F, 30% relative humidity - 38 minutes;

110°F, 90% relative humidity - 28 minutes;

110°F, 60% relative humidity - 37 minutes;

Reporting WD for these five conditions in the same order as above the values are:

0.55 (120) + 0.45 (116) = 118.2

0.55 (120) + 0.45 (102) = 111.9

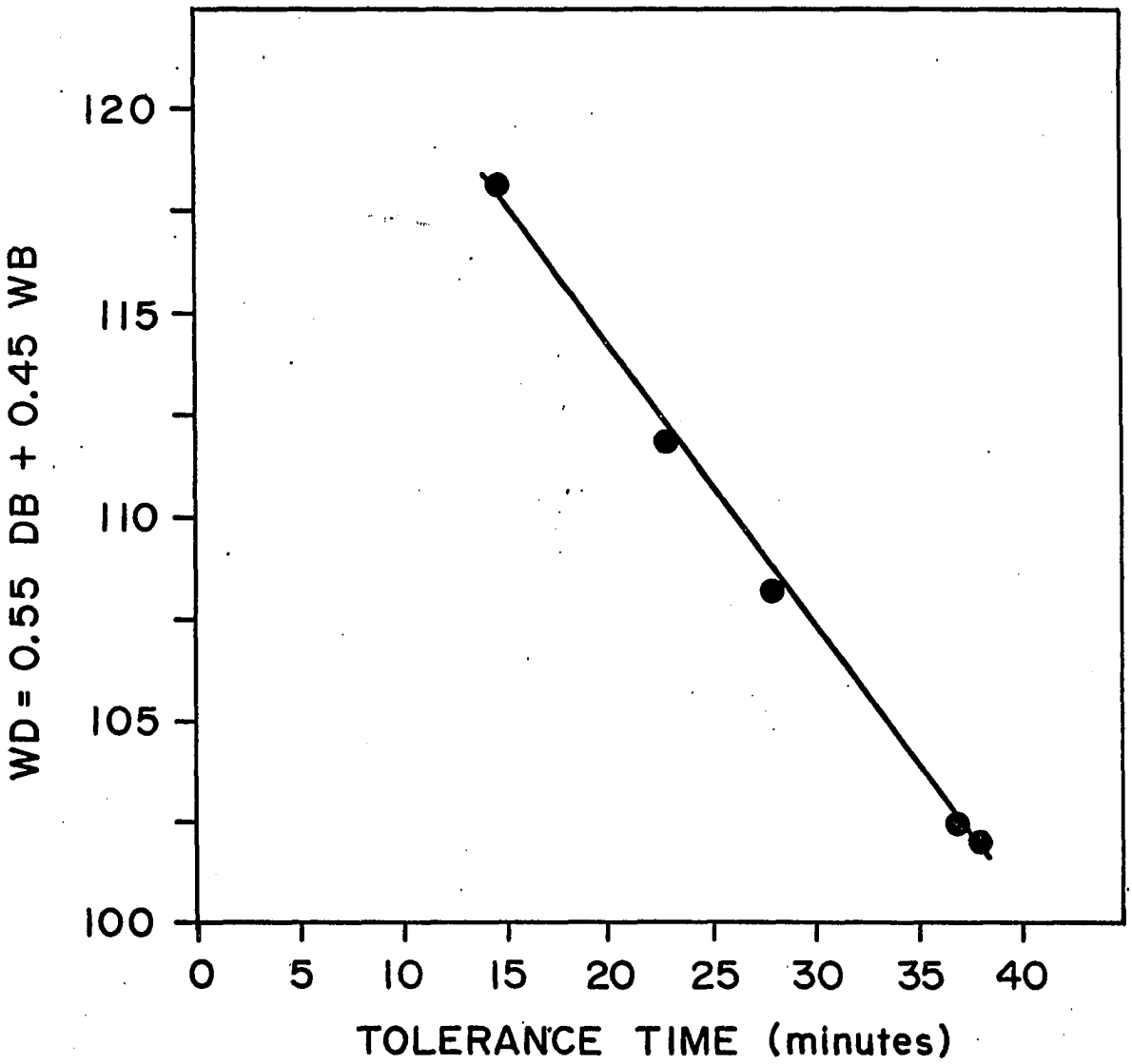
0.55 (120) + 0.45 (80) = 102.0

0.55 (110) + 0.45 (106) = 108.2

0.55 (110) + 0.45 (93) = 102.4

A plot of WD against time is shown on the next page in figure 19.

Figure 19



Weighted Dry Bulb and Wet Bulb Temperatures Determined As a Function of Time Required for Rectal Temperature to Reach 42.0°C

APPENDIX C

Tables XIX through LXII give the results for individual experiments. The conditions and experiment numbers are listed at the top of each table. Time is reported in minutes. The other columns are values for the measurements listed below.

Ts1 = Skin temperature at the flank (degrees centigrade);

Ts2 = Skin temperature at the head (degrees centigrade);

Ts3 = Skin temperature at the foreleg paw (degrees centigrade);

Ts4 = Skin temperature at the foreleg elbow (degrees centigrade);

Ts5 = Skin temperature at the upper hind leg (degrees centigrade);

Ts6 = Skin temperature at the chest (degrees centigrade);

Tsmw = Mean weighted skin temperature (degrees centigrade);

Tr = Rectal temperature (degrees centigrade);

Tmb = Mean body temperature (degrees centigrade);

RR = Respiratory rate (breaths per minute).

TABLE XIX

100°F, 30% Relative Humidity

Experiment Number 11

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.6	35.6	35.6	35.2	36.4	36.0	35.78	39.18	38.16	16
-25	35.6	35.4	35.8	34.5	36.0	35.7	35.57	39.18	38.10	16
-20	34.9	35.2	34.9	34.2	35.8	35.5	35.17	39.05	37.88	24
-15	35.4	35.0	35.4	34.1	36.0	35.2	35.25	38.98	37.86	12
-10	35.4	35.2	35.4	34.4	36.0	35.5	35.39	38.93	37.87	12
- 5	35.4	35.2	35.4	33.9	36.0	35.2	35.27	38.95	37.85	8
0	37.0	37.4	37.0	36.5	38.0	38.5	37.55	38.98	38.55	42
5	38.0	38.0	38.0	37.4	38.6	39.2	38.34	38.90	38.73	306
10	38.4	38.6	38.5	38.3	38.8	39.3	38.46	38.78	38.63	198
15	38.4	38.8	38.5	39.2	38.8	39.3	38.84	38.70	38.74	378
20	38.4	39.0	38.5	39.5	38.8	39.3	38.90	38.65	38.73	306
25	38.5	39.1	38.5	39.5	38.6	39.3	38.91	38.60	38.69	372
30	38.4	38.8	38.3	39.3	38.6	39.2	38.77	38.50	38.58	360
35	38.1	38.8	38.1	39.0	38.4	38.8	38.52	38.47	38.49	360
40	38.1	38.8	38.1	39.2	38.4	38.8	38.54	38.43	38.46	342
45	38.1	38.6	38.1	39.2	38.4	38.8	38.50	38.35	38.40	396
50	38.1	38.6	38.1	38.6	38.4	38.8	38.45	38.28	38.33	330
55	38.1	38.6	38.0	38.9	38.4	38.8	38.47	38.28	38.34	276
60	38.1	38.8	38.0	38.6	38.6	39.0	38.55	38.38	38.43	360
65	38.4	39.0	38.4	39.1	38.8	39.0	38.77	38.40	38.51	366
70	38.4	39.1	38.4	38.9	38.9	38.8	38.73	38.35	38.46	384
75	38.4	38.8	38.5	39.2	38.9	38.8	38.72	38.38	38.48	360
80	38.4	38.8	38.4	38.9	39.0	38.8	38.70	38.38	38.48	288
85	38.3	39.1	38.3	38.9	38.8	39.0	38.73	38.38	38.49	384
90	38.3	39.0	38.3	39.2	38.9	39.0	38.76	38.35	38.47	300
95	38.3	39.0	38.3	39.1	38.8	39.2	38.79	38.30	38.45	336
100	38.3	39.1	38.3	38.4	38.8	39.0	38.70	38.33	38.44	348
105	38.0	39.0	37.9	38.6	38.8	39.2	38.63	38.35	38.43	342
110	38.3	39.0	38.3	38.6	38.8	39.2	38.74	38.38	38.49	342
115	38.3	39.0	38.3	38.9	38.8	39.0	38.72	38.33	38.45	342
120	38.1	39.0	38.1	38.3	38.8	38.8	38.54	38.26	38.34	342
125	38.1	38.8	38.3	38.3	38.6	38.8	38.50	38.33	38.38	348
130	38.1	38.8	38.3	38.4	38.6	38.8	38.51	38.28	38.35	342
135	38.4	39.0	38.4	38.6	38.6	38.8	38.65	38.13	38.29	366
140	38.3	39.0	38.3	38.6	38.2	38.8	38.56	38.08	38.22	360
145	38.0	38.8	38.0	38.6	38.0	39.0	38.44	38.03	38.15	396
150	38.0	38.8	38.0	38.4	38.0	38.8	38.27	38.00	38.11	318

TABLE XX

100°F, 30% Relative Humidity

Experiment Number 13

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	36.1	35.5	33.4	35.0	36.4	37.8	36.09	39.45	38.44	114
-25	35.9	35.8	33.5	34.7	36.4	37.2	35.92	39.28	38.27	102
-20	35.9	36.0	33.8	34.[illegible]	35.9	37.2	35.92	39.10	38.15	114
-15	35.8	36.0	33.4	34.4	35.9	37.5	35.90	39.00	38.07	162
-10	35.9	36.0	33.1	34.8	35.9	37.5	35.93	38.95	38.04	150
- 5	36.0	36.0	31.4	35.0	35.5	37.5	35.72	38.80	37.88	126
0	37.1	37.[illegible]	34.5	37.0	37.3	39.2	37.38	39.10	38.58	84
5	38.1	38.0	35.3	37.7	37.9	39.3	38.02	39.03	38.71	144
10	38.6	38.5	36.4	38.7	38.4	39.8	38.64	39.00	38.89	270
15	38.5	38.8	37.1	39.4	38.8	39.8	38.86	39.25	39.13	414
20	38.8	39.0	38.0	39.4	38.8	40.1	39.14	39.33	39.27	318
25	39.0	39.1	38.8	39.4	39.0	40.1	39.32	39.38	39.36	270
30	38.9	39.1	38.5	39.5	39.0	39.8	39.19	39.50	39.41	168
35	39.1	39.1	39.0	39.7	39.3	40.0	39.41	39.60	39.54	336
40	39.3	39.1	39.3	39.7	39.5	40.3	39.59	39.70	39.67	288
45	39.3	39.4	39.1	40.0	39.5	40.4	39.67	39.63	39.64	300
50	39.1	39.4	39.0	39.8	39.5	40.3	39.5[illegible]	39.70	39.66	342
55	38.8	39.3	39.3	39.7	39.8	40.3	39.55	39.75	39.69	390
60	38.9	39.4	39.4	39.8	39.8	40.4	39.63	39.70	39.68	324
65	39.0	39.4	39.3	39.8	39.8	40.4	39.65	39.68	39.67	342
70	39.0	39.3	38.4	39.4	39.8	40.3	39.47	39.58	39.55	378
75	39.3	39.4	39.3	39.8	39.8	40.3	39.69	39.55	39.59	384
80	39.3	39.3	39.3	39.8	39.9	40.3	39.69	39.58	39.61	324
85	39.1	39.3	39.0	39.2	39.5	40.3	39.50	39.50	39.50	342
90	39.[illegible]	39.3	39.1	39.1	39.5	40.4	39.53	39.50	39.51	342
95	39.1	39.3	39.1	39.2	39.8	40.1	39.50	39.38	39.42	312
100	39.1	39.4	38.8	39.2	39.8	40.3	39.53	39.50	39.51	336
105	39.2	39.3	39.1	39.2	39.9	40.1	39.54	39.65	39.62	324
110	39.3	39.3	39.1	39.8	39.8	40.4	39.68	39.55	39.59	378
115	39.3	39.4	39.3	39.8	39.5	40.4	39.68	39.63	39.65	330
120	39.3	39.3	39.3	39.2	39.4	40.1	39.51	39.63	39.59	342
125	39.0	39.1	39.1	39.5	39.4	40.3	39.47	39.60	39.56	372
130	38.[illegible]	38.8	38.8	39.1	39.4	40.4	39.28	39.39	39.36	330
135	38.6	38.8	38.5	38.7	39.3	40.1	39.12	39.25	39.21	372
140	38.6	38.8	38.4	38.7	39.0	40.1	39.07	39.10	39.09	390
145	38.6	38.5	38.4	38.7	39.0	40.1	39.02	38.95	38.97	408
150	38.6	38.5	38.5	39.1	39.0	40.0	39.04	38.95	38.98	312

TABLE XXII

100°F, 30% Relative Humidity

Experiment Number 35

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	31.1	35.4	25.9	30.3	28.2	33.1	31.26	38.99	36.67	48
-25	31.4	35.7	25.6	29.8	28.2	33.4	31.38	38.99	36.70	84
-20	31.4	35.8	25.0	30.1	28.5	36.8	32.28	38.99	36.98	90
-15	31.1	35.8	24.9	29.8	29.2	33.6	31.44	39.05	36.77	264
-10	31.3	36.0	24.7	30.3	29.0	34.0	31.26	39.10	36.86	216
- 5	31.3	35.7	24.6	30.8	28.7	33.6	31.46	39.13	36.83	96
0	31.6	36.7	28.0	34.0	30.3	36.7	33.38	39.20	37.45	264
5	34.4	38.1	29.7	34.8	30.8	37.2	34.74	39.13	37.81	252
10	35.2	38.8	31.7	35.4	31.1	37.7	35.49	38.99	37.94	294
15	35.2	38.8	32.4	35.2	31.1	37.8	35.57	38.95	37.98	330
20	35.5	39.0	33.7	35.7	31.1	38.0	35.91	38.95	38.04	330
25	35.7	39.0	34.7	35.7	31.1	38.0	36.07	38.95	38.09	336
30	35.8	39.2	35.0	35.7	31.3	37.8	36.15	38.95	38.11	264
35	35.7	39.2	35.2	35.5	31.4	37.8	36.13	39.10	38.21	294
40	35.5	38.8	35.0	35.5	31.4	38.0	36.05	39.10	38.19	330
45	35.7	39.0	35.0	35.5	31.4	38.0	36.13	39.10	38.21	300
50	35.7	39.0	35.0	35.7	31.4	37.8	36.10	39.09	38.19	282
55	35.7	38.5	35.0	35.7	31.4	38.0	36.10	39.10	38.20	264
60	35.7	39.0	35.4	35.7	31.3	38.1	36.20	39.10	38.23	210
65	35.5	39.0	35.0	35.7	31.4	38.0	36.10	39.03	38.15	312
70	35.7	39.0	35.2	35.5	31.4	38.1	36.18	39.00	38.15	330
75	35.7	39.0	35.0	35.5	31.4	38.0	36.13	39.00	38.14	336
80	35.5	39.0	35.0	35.8	31.4	37.8	36.07	39.03	38.14	360
85	35.7	39.0	34.7	35.8	31.4	38.0	36.12	39.03	38.16	336
90	35.7	39.0	32.4	35.5	31.6	38.0	35.87	39.10	38.13	258
95	35.7	39.2	31.6	35.4	31.6	37.8	35.75	39.11	38.10	306
100	35.7	39.0	34.4	35.4	31.4	37.8	36.00	39.15	38.21	306
105	35.5	39.0	35.0	36.0	31.3	37.8	36.06	39.21	38.27	264
110	35.7	39.0	35.2	35.5	31.4	38.0	36.15	39.21	38.29	258
115	35.7	39.2	35.2	35.8	31.6	38.1	36.26	39.25	38.35	264
120	35.7	39.0	34.7	35.8	31.4	37.8	36.07	39.21	38.27	318
125	35.5	39.2	34.8	35.5	31.4	37.8	36.04	39.17	38.23	294
130	35.7	38.5	34.8	35.7	31.3	37.8	35.98	39.12	38.18	306
135	35.4	39.0	34.7	35.7	31.3	37.5	35.90	39.12	38.14	294
140	35.4	39.0	34.8	35.5	31.3	37.8	35.97	39.03	38.11	312
145	35.7	38.5	35.0	35.5	31.4	38.0	36.05	39.05	38.15	252
150	35.5	38.8	34.8	35.2	31.3	37.7	35.91	39.05	38.11	84

TABLE XXIV

100°F, 60% Relative Humidity

Experiment Number 3

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	36.0	32.0	34.7	35.8	35.5	36.1	35.16	39.90	38.49	22
-25	35.6	31.5	34.5	35.5	35.0	36.0	34.83	39.80	38.31	28
-20	35.3	31.7	34.3	35.5	35.6	36.0	34.86	39.65	38.21	22
-15	35.3	31.5	33.7	34.8	35.2	36.0	34.64	39.57	38.09	16
-10	35.3	31.9	33.2	35.2	35.3	36.0	34.70	39.45	38.03	24
- 5	34.9	31.8	33.5	35.0	34.9	36.3	34.62	39.35	37.93	26
0	36.8	33.2	33.5	37.2	38.7	39.3	37.55	39.68	39.04	-
5	39.1	34.2	34.2	38.5	39.1	40.0	37.96	39.62	39.12	-
10	39.8	34.4	35.7	38.7	39.8	40.5	38.57	39.78	39.42	-
15	39.9	34.5	37.2	38.8	39.8	40.5	38.78	39.73	39.45	-
20	40.1	34.5	38.3	39.4	40.0	40.7	39.09	40.00	39.73	-
25	40.1	35.0	38.9	39.7	40.5	40.8	39.35	40.03	39.83	342
30	40.5	34.9	39.1	39.9	39.8	40.6	39.32	40.10	39.87	342
35	40.5	34.9	39.7	40.3	40.6	40.8	39.59	40.19	40.01	360
40	40.5	34.9	40.0	40.5	40.7	40.9	39.68	40.00	39.90	384
45	40.6	35.0	40.1	40.6	39.7	41.1	39.65	39.95	39.86	378
50	40.1	34.8	39.9	39.9	40.0	40.9	49.41	39.90	39.75	378
55	40.5	34.8	40.3	40.3	40.5	41.1	39.70	39.90	39.84	390
60	40.7	35.0	40.1	40.6	40.6	41.2	39.83	39.88	39.87	378
65	40.7	34.8	39.8	40.6	40.1	41.3	39.72	39.90	39.85	396
70	40.5	35.0	39.9	40.7	40.9	41.8	39.97	39.90	39.92	396
75	40.8	35.2	39.8	40.1	39.3	39.9	39.29	39.82	39.66	390
80	40.5	34.7	39.7	40.0	39.8	41.2	39.52	39.80	39.72	384
85	40.7	34.8	40.1	40.7	40.7	41.2	39.82	39.75	39.77	384
90	40.7	34.9	40.0	40.5	40.5	40.7	39.65	39.77	39.73	378
95	40.5	34.5	39.9	40.1	40.1	40.7	39.43	39.77	39.67	390
100	40.7	34.8	40.0	40.5	40.6	41.2	39.78	39.70	39.72	396
105	40.8	35.0	40.1	40.6	40.9	41.3	39.92	39.87	39.89	396
110	40.5	34.7	38.8	38.8	38.9	39.8	39.83	39.85	39.54	408
115	40.5	34.8	40.1	40.0	40.3	41.2	39.65	39.91	39.83	408
120	40.5	35.0	40.1	40.3	40.9	41.2	39.80	39.90	39.87	420
125	-	-	-	-	-	-	-	39.91	-	390
130	40.0	34.7	40.1	39.7	40.6	41.2	39.53	39.91	39.80	384
135	40.3	34.7	40.1	39.4	40.3	40.9	39.48	39.90	39.77	402
140	40.5	35.0	40.5	39.7	40.7	41.2	39.76	39.90	39.86	414
145	40.5	34.5	39.7	39.3	40.1	40.7	39.34	39.90	39.73	396
150	40.3	34.8	38.6	39.3	40.6	41.2	39.42	39.80	39.69	396

TABLE XXV

100°F, 60% Relative Humidity

Experiment Number 9

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	[illegible]	31.4	30.5	36.4	35.3	36.3	33.96	38.70	37.28	98
-25	32.8	31.2	30.4	35.7	35.0	36.0	33.68	38.64	37.15	108
-20	32.6	31.2	30.1	35.2	34.7	35.7	33.44	38.50	36.98	94
-15	32.8	31.0	29.7	35.0	34.3	35.7	33.33	38.30	36.81	88
-10	32.8	31.2	29.3	35.5	34.4	35.7	33.38	38.25	36.79	80
- 5	32.7	31.0	29.2	34.5	34.2	35.0	33.01	38.20	36.64	84
0	34.9	32.6	32.3	37.0	37.7	38.8	35.84	38.25	37.53	234
5	36.4	33.4	34.7	37.5	38.5	39.1	36.83	38.50	38.00	318
10	37.3	33.5	36.5	37.8	38.7	39.7	37.47	38.58	38.25	330
15	37.8	33.7	37.1	37.1	38.7	39.8	37.65	38.58	38.30	336
20	38.5	33.9	37.8	38.5	38.8	40.3	38.20	38.58	38.47	330
25	38.9	34.2	37.9	38.6	39.1	40.5	38.46	38.60	38.56	336
30	39.1	34.3	38.3	38.9	39.1	40.5	38.59	38.62	38.61	324
35	39.3	34.4	38.5	38.9	39.3	40.6	38.73	38.64	38.67	336
40	39.4	34.2	38.5	39.0	39.3	40.6	38.73	38.62	38.65	342
45	39.4	34.0	38.1	38.8	38.9	40.1	38.45	38.62	38.57	342
50	39.4	33.9	38.5	38.5	38.9	40.1	38.45	38.55	38.52	324
55	39.1	33.9	38.1	38.5	39.1	40.1	38.35	38.55	38.49	330
60	39.1	33.9	38.5	38.5	39.3	39.9	38.38	38.59	38.53	312
65	39.4	34.0	38.6	38.7	39.1	40.5	38.63	38.60	38.61	336
70	39.5	34.2	38.5	38.7	39.5	40.8	38.81	38.55	38.63	336
75	39.7	34.0	38.7	38.5	39.3	40.3	38.67	38.66	38.66	336
80	39.7	33.9	38.1	38.7	39.4	39.9	38.52	38.65	38.61	330
85	39.4	33.9	38.1	38.6	39.4	39.7	38.38	38.60	38.53	324
90	39.4	34.0	38.1	38.7	39.1	39.8	38.39	38.58	38.52	330
95	39.4	33.9	38.1	38.5	39.1	39.8	38.36	38.57	38.51	336
100	39.4	34.2	38.5	38.8	39.4	40.0	38.57	38.65	38.63	330
105	39.7	34.0	38.5	38.7	39.4	40.1	38.63	38.66	38.65	354
110	39.7	34.0	38.3	38.7	39.5	39.9	38.57	38.63	38.61	324
115	39.7	33.9	38.1	38.7	39.4	39.9	38.52	38.69	38.64	354
120	39.4	33.9	37.6	38.1	39.4	39.4	38.21	38.63	38.50	324
125	39.3	33.7	37.9	38.3	38.9	39.1	38.05	38.59	38.43	324
130	39.3	33.7	38.1	38.7	39.3	39.7	38.32	38.59	38.51	312
135	39.4	33.7	38.8	38.7	39.1	40.0	38.47	38.61	38.57	318
140	39.7	33.9	37.8	38.1	39.4	40.0	38.46	38.57	38.54	324
145	39.7	33.9	37.9	38.6	39.4	40.1	38.54	38.57	38.56	324
150	39.7	34.0	37.9	37.8	39.1	40.3	38.49	38.57	38.55	318

TABLE XXVI

100°F, 60% Relative Humidity

Experiment Number 14

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.0	31.4	34.8	35.7	36.3	36.3	34.99	39.20	37.94	144
-25	34.8	31.4	34.4	35.0	35.6	36.0	34.65	39.10	37.77	78
-20	35.6	31.1	35.7	35.2	35.8	35.3	34.81	38.95	37.71	42
-15	35.8	31.1	35.2	34.8	35.5	35.5	34.77	38.80	37.59	48
-10	35.5	31.2	35.7	34.8	35.5	35.2	34.69	38.75	37.53	30
- 5	35.6	31.0	35.5	34.0	34.9	35.5	34.59	38.75	37.50	56
0	37.3	33.2	37.0	36.0	37.8	39.1	37.03	38.70	38.20	84
5	39.1	34.2	38.3	37.8	39.7	40.5	38.56	38.80	38.73	288
10	39.8	34.3	37.9	38.6	39.8	40.5	38.79	38.92	38.88	342
15	39.8	34.2	38.8	38.8	39.7	40.8	38.95	39.00	38.99	336
20	40.0	34.3	38.6	39.1	40.1	41.3	39.21	39.10	39.13	312
25	40.3	34.5	39.1	39.4	40.0	41.8	39.51	39.10	39.22	342
30	40.1	34.9	39.5	39.7	39.9	41.3	39.45	39.08	39.19	342
35	40.5	35.0	39.7	39.7	40.5	41.8	39.80	39.20	39.38	336
40	40.5	34.5	39.1	39.5	39.9	39.4	38.93	39.15	39.08	336
45	40.1	34.5	38.9	39.1	39.9	40.0	38.93	39.18	39.11	354
50	39.9	34.4	39.0	39.5	40.0	40.8	39.13	39.18	39.17	342
55	40.0	34.2	39.0	39.4	39.7	41.2	39.18	39.22	39.21	342
60	40.0	34.4	39.4	39.7	40.1	41.2	39.34	39.33	39.33	330
65	40.1	34.4	39.4	39.4	40.0	41.2	39.32	39.29	39.30	306
70	40.5	34.7	39.1	39.8	40.5	41.1	39.46	39.33	39.37	336
75	40.6	34.7	39.1	39.8	40.1	40.6	39.35	39.33	39.34	342
80	39.9	34.3	38.5	39.0	39.5	40.0	38.74	39.29	39.13	354
85	39.5	33.9	38.7	38.9	39.8	40.1	38.66	39.27	39.09	348
90	39.7	34.2	39.1	39.1	39.9	40.5	38.94	39.33	39.21	348
95	39.9	34.2	39.0	39.4	40.0	40.6	39.04	39.29	39.22	342
100	40.0	34.4	39.3	39.4	40.1	40.7	39.17	39.19	39.18	336
105	40.1	34.3	39.1	39.4	40.0	40.7	39.14	39.14	39.14	342
110	39.9	34.2	38.8	39.1	39.7	40.3	38.87	39.20	39.10	336
115	39.7	34.2	38.7	38.8	39.8	40.3	38.80	39.30	39.15	354
120	39.7	34.0	39.1	39.1	40.0	40.6	38.94	39.31	39.20	300
125	39.9	34.3	39.1	39.1	39.9	40.7	39.05	39.38	39.28	318
130	39.9	34.4	39.1	39.3	39.9	39.9	38.88	39.33	39.20	354
135	39.8	34.0	38.8	39.0	39.7	40.0	38.73	39.30	39.13	348
140	39.5	34.2	38.8	38.8	39.8	40.1	38.71	39.20	39.05	342
145	39.7	34.0	38.8	38.8	39.8	40.5	38.83	39.28	39.15	318
150	39.8	34.2	39.0	38.9	40.0	40.6	38.97	39.37	39.25	336

TABLE XXVII

100°F, 60% Relative Humidity

Experiment Number 23

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	34.7	30.8	31.5	35.5	35.5	38.6	34.92	38.58	37.48	198
-25	35.0	30.9	31.0	36.4	35.3	38.3	34.93	38.65	37.53	60
-20	35.0	30.6	30.9	36.3	35.3	38.1	34.81	38.68	37.52	96
-15	34.9	30.5	30.3	35.8	35.2	37.8	34.57	38.68	37.45	150
-10	34.9	30.8	29.7	35.5	34.9	37.7	34.45	38.72	37.44	66
- 5	34.8	30.8	29.5	36.4	35.0	37.8	34.53	38.68	37.44	186
0	37.8	33.0	32.4	38.9	39.4	39.4	37.11	39.00	38.43	342
5	38.9	33.5	-	39.0	39.4	39.9	37.78	39.15	38.74	378
10	39.4	34.2	36.5	39.1	39.5	40.5	38.52	39.30	39.07	408
15	39.8	34.4	36.5	39.3	39.7	40.5	38.70	39.30	39.12	408
20	39.8	34.4	37.3	39.4	39.7	40.7	38.85	39.33	39.19	408
25	40.0	34.4	37.5	39.3	39.7	40.7	38.91	39.18	39.10	402
30	39.8	34.3	37.3	38.9	39.7	40.7	38.78	39.18	39.06	408
35	39.7	34.3	37.5	39.0	39.7	40.5	38.74	39.18	39.05	408
40	39.8	34.3	38.1	39.0	39.7	40.5	38.83	39.18	39.08	408
45	39.8	34.4	38.3	39.0	39.5	40.5	38.84	39.10	39.02	414
50	39.9	34.4	38.5	-	39.5	40.6	38.90	39.00	38.97	420
55	39.8	34.3	38.3	-	39.4	40.5	38.79	39.03	38.96	396
60	39.8	34.3	38.3	-	39.4	40.5	38.79	38.95	38.90	408
65	39.7	34.4	38.7	-	39.7	40.5	38.88	39.03	38.99	408
70	39.7	34.3	38.7	-	39.5	40.5	38.83	39.00	38.95	408
75	39.7	34.3	38.5	-	39.5	40.5	38.80	39.00	38.94	408
80	39.8	34.4	38.9	-	39.7	40.6	38.95	39.23	39.15	408
85	39.8	34.4	39.0	-	39.8	40.7	39.01	39.31	39.22	408
90	39.8	34.4	39.1	-	39.7	40.8	39.04	39.33	39.24	414
95	39.9	34.5	39.1	-	39.7	40.7	39.05	39.37	39.27	420
100	39.8	34.3	39.0	-	39.7	40.7	38.98	39.41	39.28	414
105	39.8	34.3	38.9	-	39.7	40.8	38.99	39.37	39.26	402
110	39.8	34.2	38.9	-	39.7	40.7	38.95	39.33	39.22	408
115	39.8	34.3	38.9	-	39.7	40.7	38.97	39.30	39.20	408
120	39.8	34.3	38.5	-	39.7	40.6	38.89	39.21	39.11	420
125	39.9	34.3	38.7	-	39.8	40.6	38.95	39.20	39.13	414
130	39.8	34.0	38.1	-	39.4	40.5	38.71	39.19	39.05	408
135	39.7	33.9	38.1	-	39.3	40.5	38.65	39.14	38.99	402
140	39.5	34.2	37.7	-	39.5	40.3	38.58	39.12	38.96	402
145	39.5	34.2	37.9	-	39.4	40.3	38.59	39.08	38.93	396
150	39.7	34.3	37.8	-	39.7	40.3	38.69	39.00	38.91	402

TABLE XXVIII

100°F, 60% Relative Humidity

Experiment Number 39

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.9	32.1	31.5	35.0	36.8	36.4	34.50	38.95	37.62	34
-25	34.0	34.8	31.2	34.7	36.4	36.3	34.82	38.90	37.68	24
-20	34.0	31.9	31.1	34.2	36.0	35.7	34.09	38.85	37.42	54
-15	33.9	31.9	31.0	34.5	36.8	35.6	34.16	38.75	37.37	40
-10	34.4	31.8	30.3	34.2	37.0	35.3	34.11	38.72	37.34	56
- 5	34.0	32.3	30.4	34.4	37.6	35.5	34.26	38.72	37.38	60
0	37.3	34.2	34.7	37.6	40.1	39.0	37.38	39.10	38.58	378
5	38.6	34.7	35.5	38.6	40.3	39.5	38.11	39.30	38.94	390
10	39.1	34.9	36.8	38.9	40.5	39.9	38.56	39.45	39.18	408
15	39.4	34.7	37.5	39.3	40.5	39.9	38.71	39.61	39.34	396
20	39.7	34.9	38.3	39.5	40.1	39.9	38.87	39.56	39.35	408
25	39.9	34.9	39.0	40.0	40.1	40.1	39.09	39.51	39.38	378
30	40.5	35.2	39.3	40.1	40.3	40.3	39.40	39.61	39.55	402
35	40.3	35.2	37.1	40.1	40.3	40.3	39.11	39.49	39.38	414
40	40.3	35.0	38.6	40.1	40.1	40.1	39.17	39.47	39.38	420
45	40.3	35.2	38.3	40.0	40.5	40.1	39.21	39.49	39.41	432
50	40.3	35.3	38.5	40.0	40.3	40.1	39.22	39.56	39.46	426
55	40.3	35.0	38.3	40.3	40.3	40.1	39.18	39.56	39.45	414
60	40.0	34.8	38.5	39.9	40.1	40.0	39.01	39.62	39.44	420
65	39.9	34.9	38.8	39.7	40.3	39.9	39.02	39.49	39.35	426
70	40.0	35.0	37.1	40.1	40.1	40.3	38.98	39.47	39.32	426
75	40.0	35.2	37.8	39.9	40.3	40.5	39.15	39.47	39.37	420
80	40.1	35.0	38.9	40.5	40.1	40.1	39.19	39.49	39.40	420
85	40.1	35.2	39.1	40.1	40.1	40.1	39.21	39.40	39.34	432
90	40.1	34.9	39.4	39.9	40.1	40.1	39.17	39.46	39.37	420
95	40.0	34.9	39.4	39.8	40.3	40.1	39.17	39.41	39.34	414
100	40.1	35.0	39.5	39.8	40.3	40.0	39.19	39.34	39.30	420
105	40.1	34.9	39.4	40.0	40.1	40.1	39.18	39.36	39.31	432
110	40.3	34.9	39.5	40.1	40.1	40.1	39.25	39.38	39.34	420
115	40.1	34.9	39.1	39.8	40.0	39.9	39.07	39.34	39.26	426
120	39.9	34.7	39.4	39.8	39.7	39.9	38.98	39.41	39.28	420
125	39.9	34.8	39.5	39.7	39.9	40.1	39.07	39.29	39.22	420
130	40.0	35.0	39.7	40.0	40.0	40.1	39.19	39.23	39.22	420
135	40.1	35.0	39.5	40.1	39.9	39.9	39.14	39.28	39.24	420
140	40.0	35.0	39.3	39.9	40.1	39.9	39.10	39.34	39.27	414
145	40.1	35.0	39.1	40.1	40.1	40.1	39.17	39.38	39.32	426
150	40.3	35.0	39.4	40.0	40.1	40.1	39.25	39.49	39.42	426

TABLE XXIX

100°F, 90% Relative Humidity

Experiment Number 1

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.7	31.8	33.5	33.6	34.9	38.9	35.37	38.70	37.70	48
-25	37.1	31.7	32.4	33.6	35.8	38.9	35.69	38.95	37.97	44
-20	36.8	31.7	32.0	33.2	35.2	38.8	35.42	39.00	37.95	28
-15	36.8	31.8	32.0	34.2	35.8	38.9	35.64	38.88	37.91	44
-10	37.7	31.8	31.4	34.3	36.4	39.0	35.91	39.25	38.25	76
- 5	37.8	31.9	31.0	34.4	35.8	38.7	35.75	39.25	38.20	68
0	39.0	33.4	34.2	39.0	39.8	41.2	38.26	39.75	39.30	302
5	39.9	34.0	36.5	39.5	40.0	41.2	38.90	39.85	39.57	366
10	41.5	34.3	38.3	39.4	39.9	41.0	39.45	40.00	39.84	366
15	40.3	34.8	39.3	40.0	40.1	41.1	39.46	40.15	39.94	372
20	40.7	35.2	39.9	40.0	40.9	41.4	39.88	40.30	40.10	360
25	41.0	35.3	40.1	40.1	41.0	41.5	40.04	40.45	40.33	366
30	40.9	35.0	39.5	37.9	40.3	41.8	39.68	40.55	40.29	378
35	40.5	35.2	39.7	37.1	40.3	41.1	39.39	40.55	40.20	396
40	40.5	35.5	39.0	37.2	40.5	41.1	39.39	40.50	40.17	402
45	40.5	35.2	39.4	37.8	40.3	41.5	39.52	40.40	40.14	396
50	40.5	35.0	39.7	38.3	40.1	41.2	39.46	40.45	40.15	396
55	40.3	35.5	39.9	39.3	40.7	41.2	39.69	40.60	40.33	400
60	40.7	35.7	40.1	40.1	41.0	42.0	40.16	40.60	40.47	396
65	40.8	35.7	40.1	40.1	41.0	42.0	40.18	40.70	40.54	396
70	40.9	35.7	40.1	40.0	41.0	42.0	40.20	40.73	40.57	396
75	41.0	35.6	40.1	39.4	40.7	41.7	40.04	40.75	40.53	390
80	40.9	35.5	39.7	37.9	40.7	41.4	39.74	40.75	40.45	402
85	40.0	35.0	39.4	35.3	39.7	40.9	38.90	40.73	40.18	402
90	39.9	34.9	39.3	36.3	39.8	40.9	38.76	40.65	40.14	-
95	39.8	34.9	39.3	37.3	39.9	40.9	39.04	40.60	40.13	402
100	39.9	35.0	39.7	37.8	39.9	41.0	39.19	40.55	40.14	384
105	40.1	35.2	39.7	39.1	40.5	41.7	39.65	40.50	40.25	384
110	40.5	35.2	39.9	39.8	40.5	41.7	39.84	40.45	40.27	384
115	40.9	35.5	39.8	39.9	40.6	41.5	39.94	40.50	40.33	396
120	41.0	35.5	39.7	40.1	40.7	41.8	40.06	40.50	40.37	408
125	41.1	35.7	40.5	40.7	41.0	42.0	40.35	40.60	40.53	390
130	41.2	35.7	40.5	41.2	41.4	41.9	40.45	40.60	40.56	378
135	41.4	36.0	38.8	41.8	41.4	42.5	40.57	40.75	40.70	390
140	41.7	35.7	37.8	38.5	40.9	41.8	39.94	40.88	40.60	384
145	40.5	35.3	39.0	38.5	40.9	41.7	39.69	40.90	40.54	378
150	40.9	35.7	39.4	39.1	40.6	41.7	39.91	40.85	40.57	372

TABLE XXX

100°F, 90% Relative Humidity

Experiment Number 24

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.5	32.0	27.1	32.5	35.7	34.4	33.01	39.78	37.75	48
-25	34.4	31.7	26.7	33.1	36.0	34.7	33.31	39.81	37.86	30
-20	33.5	32.1	26.4	32.6	36.0	34.3	32.97	39.81	37.76	66
-15	33.4	31.8	26.2	34.3	35.4	33.8	32.82	39.73	37.66	36
-10	33.1	31.6	25.8	33.7	34.7	35.2	32.88	39.68	37.64	36
- 5	32.8	31.6	25.6	32.8	34.4	35.5	32.74	39.56	37.51	36
0	32.8	33.4	31.6	36.1	38.1	38.3	35.23	39.45	38.18	72
5	38.4	33.8	33.7	37.1	38.5	38.9	37.17	39.61	38.88	138
10	39.0	33.8	34.7	37.6	38.5	38.9	37.47	39.60	38.96	246
15	39.3	33.9	37.6	38.0	38.8	39.2	38.04	39.68	39.19	366
20	39.6	33.9	37.9	38.3	38.9	39.2	38.18	39.76	39.29	384
25	39.7	34.1	36.0	38.5	38.9	39.2	38.05	39.96	39.39	402
30	39.7	34.2	37.6	38.4	39.0	39.2	38.24	40.10	39.54	402
35	39.7	34.2	38.4	38.3	39.2	39.4	38.40	40.21	39.67	420
40	39.8	34.2	38.4	38.5	39.2	39.4	38.45	40.29	39.74	414
45	39.8	34.3	38.6	39.2	39.4	39.4	38.57	40.41	39.86	420
50	40.0	34.4	38.6	39.2	39.2	39.6	38.66	40.50	39.95	432
55	40.0	34.4	38.9	38.9	39.2	39.6	38.67	40.60	40.02	426
60	39.4	33.9	38.4	38.9	39.2	39.3	38.31	40.52	39.86	426
65	40.1	34.4	38.9	39.2	39.6	39.7	38.80	40.56	40.03	426
70	40.1	34.3	38.9	39.2	39.7	39.7	38.80	40.68	40.12	420
75	40.2	34.4	38.9	39.6	39.2	39.4	38.72	40.68	40.09	426
80	40.3	34.4	39.2	39.7	38.3	39.7	38.75	40.77	40.16	420
85	40.5	34.4	39.2	39.7	38.3	39.7	38.80	40.90	40.27	408
90	40.3	34.6	39.0	39.6	37.9	40.0	38.77	40.94	40.29	414
95	40.3	34.7	39.2	39.6	38.3	40.0	38.86	41.00	40.36	396
100	40.5	34.7	38.8	39.3	37.6	39.4	38.59	41.00	40.28	408
105	40.5	34.7	38.1	39.7	38.1	39.7	38.69	41.03	40.33	402
110	40.5	34.7	38.1	40.0	38.1	40.0	38.80	41.05	40.38	396
115	40.5	34.7	37.9	39.8	37.9	39.8	38.68	41.07	40.35	396
120	-	-	-	-	-	-	-	-	-	-
125	40.5	34.7	38.1	39.7	38.0	40.0	38.76	41.10	40.40	402
130	40.6	34.7	38.1	39.0	38.3	39.3	38.58	41.07	40.32	378
135	40.5	34.8	38.0	39.6	37.9	39.4	38.57	41.07	40.32	384
140	40.5	34.8	38.0	39.7	38.0	39.4	38.61	41.05	40.32	402
145	40.5	34.7	38.0	39.7	38.1	39.4	38.60	41.00	40.28	402
150	40.3	34.9	38.1	39.7	38.1	39.6	38.65	41.00	40.30	390

TABLE XXXI

100°F, 90% Relative Humidity

Experiment Number 32

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	36.3	31.7	33.1	34.1	35.5	35.5	34.69	39.00	37.71	60
-25	36.1	31.7	33.0	33.7	35.5	35.7	34.65	39.08	37.75	72
-20	36.1	31.6	33.0	33.7	35.5	35.6	34.61	39.02	37.70	60
-15	36.0	31.6	33.4	34.1	35.7	35.6	34.69	39.00	37.71	36
-10	35.9	31.8	33.4	33.9	35.5	35.1	34.53	38.95	37.62	48
- 5	36.3	31.8	33.5	33.7	35.4	35.2	34.63	38.91	37.63	48
0	37.9	33.0	36.8	36.7	37.3	38.4	36.93	38.89	38.30	72
5	39.0	33.4	37.2	37.2	37.6	38.8	37.50	38.95	38.52	354
10	39.6	33.7	37.9	37.9	38.0	39.0	37.94	39.03	38.70	318
15	39.7	33.9	38.3	38.1	38.1	39.2	38.12	39.18	38.86	378
20	40.0	34.1	38.6	38.6	38.5	39.3	38.38	39.30	39.02	342
25	40.0	34.2	38.8	38.6	38.6	39.3	38.44	39.45	39.15	348
30	40.0	34.2	38.9	38.6	38.9	39.4	38.52	39.57	39.26	354
35	40.1	34.3	38.9	38.8	38.9	39.6	38.63	39.66	39.35	360
40	40.1	34.2	39.0	38.9	39.0	39.6	38.64	39.80	39.45	360
45	40.2	34.2	38.9	38.8	39.0	39.6	38.65	39.90	39.53	354
50	40.3	34.4	39.2	39.0	39.2	39.7	38.81	39.99	39.64	372
55	40.5	34.4	39.4	39.0	39.2	39.6	38.85	40.11	39.73	372
60	40.3	34.4	39.4	39.0	39.3	39.7	38.84	40.20	39.79	366
65	40.5	34.4	39.3	39.2	39.4	39.7	38.92	40.23	39.84	366
70	40.5	34.6	39.4	39.2	39.4	39.7	38.96	40.31	39.91	378
75	40.6	34.7	39.6	39.3	39.4	39.8	39.05	40.39	39.99	372
80	40.7	34.7	39.6	39.3	39.6	39.7	39.08	40.43	40.03	354
85	40.7	34.7	39.2	39.4	39.7	39.8	39.08	40.47	40.05	372
90	40.7	34.7	39.6	39.4	39.7	40.0	39.18	40.52	40.12	360
95	40.9	34.8	39.6	39.4	39.7	40.0	39.24	40.56	40.16	360
100	40.9	34.9	39.6	39.6	39.7	40.0	39.28	40.61	40.21	372
105	40.9	34.9	39.6	39.7	39.8	40.0	39.30	40.68	40.27	360
110	40.9	34.9	39.2	39.7	39.8	40.2	39.31	40.72	40.30	366
115	41.0	34.9	38.9	39.8	40.0	40.2	39.34	40.80	40.36	348
120	41.0	35.1	38.1	39.7	40.0	40.3	39.30	40.83	40.37	386
125	41.0	34.9	38.3	40.0	40.0	40.3	39.32	40.90	40.43	348
130	41.1	34.9	38.8	39.8	40.1	40.3	39.39	40.94	40.48	354
135	41.1	35.1	38.6	40.0	40.1	40.3	39.42	41.00	40.53	348
140	41.1	35.1	38.3	40.0	40.2	40.5	39.45	41.03	40.56	342
145	41.3	35.1	38.9	40.2	40.3	40.5	39.60	41.10	40.65	330
150	41.1	35.1	39.2	40.1	40.2	40.3	39.51	41.14	40.65	330

TABLE XXXII

100°F, 90% Relative Humidity

Experiment Number 36

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	37.1	31.6	31.6	34.9	35.2	36.8	35.07	38.92	37.77	30
-25	37.2	31.3	31.1	34.7	35.4	36.4	34.90	38.92	37.71	24
-20	37.1	31.3	30.8	34.4	34.2	36.1	34.57	38.88	37.59	42
-15	36.9	31.3	30.3	34.3	34.2	36.1	34.46	38.83	37.52	36
-10	36.9	31.1	29.7	34.3	34.4	36.3	34.44	38.80	37.49	42
- 5	37.1	31.1	29.3	34.1	34.8	35.9	34.41	38.80	37.48	30
0	38.4	32.6	32.4	36.8	37.3	38.4	36.51	38.62	37.99	66
5	38.9	33.1	33.1	37.1	37.7	38.6	36.93	38.66	38.14	102
10	39.3	33.5	35.9	38.6	38.1	38.9	37.66	38.74	38.42	342
15	39.6	33.8	37.7	38.9	38.4	39.2	38.13	38.81	38.61	336
20	39.7	33.8	38.4	39.2	38.6	39.4	38.34	38.97	38.78	366
25	39.8	33.9	38.6	39.4	38.9	39.4	38.46	39.16	38.95	362
30	40.1	34.2	39.0	39.4	39.0	39.4	38.64	39.31	39.11	390
35	39.6	33.5	38.0	37.6	38.3	39.0	37.93	39.41	38.97	396
40	39.7	33.7	38.3	38.3	38.4	39.2	38.15	39.47	39.07	402
45	39.8	33.8	38.9	38.8	38.9	39.4	38.42	39.51	39.18	402
50	40.1	34.1	38.6	38.6	38.8	39.7	38.55	39.69	39.35	408
55	40.3	34.2	38.9	38.9	39.3	40.0	38.80	39.79	39.49	408
60	40.5	34.2	38.9	38.9	39.3	40.0	38.87	39.79	39.51	402
65	40.2	33.9	38.6	38.6	39.0	39.7	38.57	39.82	39.45	402
70	40.2	34.1	38.8	38.8	39.2	40.0	38.75	39.83	39.51	408
75	40.5	34.2	38.9	38.9	39.2	40.0	38.86	39.94	39.62	390
80	40.6	33.9	38.9	38.9	39.2	40.0	38.84	39.99	39.65	390
85	40.5	33.9	38.9	38.9	39.2	40.1	38.84	40.00	39.65	390
90	40.6	34.2	38.5	38.9	39.4	40.2	38.92	39.99	39.67	396
95	40.6	34.1	38.5	38.9	39.3	40.2	38.89	39.97	39.65	402
100	40.5	34.1	38.4	38.9	39.3	40.2	38.86	39.97	39.64	390
105	40.7	34.2	38.5	38.9	39.4	40.2	38.94	40.05	39.72	384
110	40.7	33.7	38.6	39.0	39.7	40.3	38.95	40.12	39.77	378
115	40.7	33.9	37.9	38.9	39.7	40.2	38.87	40.17	39.78	372
120	40.7	34.1	38.6	39.0	39.7	40.2	38.99	40.14	39.80	384
125	40.9	34.2	38.6	39.0	39.8	40.5	39.15	40.20	39.89	372
130	41.0	34.2	38.6	39.2	40.0	40.5	39.22	40.23	39.93	366
135	41.0	34.2	38.9	39.2	40.1	40.5	39.26	40.23	39.94	372
140	41.0	34.2	38.9	38.9	40.2	40.5	39.25	40.28	39.97	366
145	41.0	34.3	38.9	39.2	40.5	40.5	39.34	40.32	40.03	354
150	41.1	34.4	38.6	39.2	40.5	40.6	39.37	40.41	40.10	348

TABLE XXXIII

100°F, 90% Relative Humidity

Experiment Number 45

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.5	35.2	33.7	38.3	35.0	36.0	35.57	39.10	38.04	24
-25	35.5	35.2	34.2	37.8	34.7	36.0	35.53	39.01	37.97	24
-20	35.4	35.2	34.4	37.5	34.4	36.2	35.52	38.92	37.90	20
-15	35.4	35.2	34.2	38.3	35.0	36.2	35.65	38.89	37.92	32
-10	35.0	35.7	34.4	38.3	35.0	36.0	35.60	38.87	37.89	24
- 5	35.2	35.7	34.4	38.8	35.0	36.2	35.75	38.82	37.90	24
0	36.7	37.3	36.3	41.1	38.8	39.3	38.12	39.12	38.82	216
5	38.1	38.3	37.0	40.9	38.8	39.3	38.67	39.31	39.12	216
10	38.3	39.0	37.8	41.4	39.0	39.7	39.10	39.59	39.44	342
15	38.8	39.3	38.0	41.6	39.3	39.8	39.37	39.85	39.71	366
20	39.0	39.8	38.3	41.3	39.3	39.7	39.48	40.01	39.85	390
25	39.0	39.5	37.0	41.6	39.3	39.8	39.34	40.20	39.94	390
30	39.2	39.7	38.3	41.9	40.0	40.1	39.77	40.32	40.16	390
35	39.3	40.1	37.2	41.9	39.7	40.1	39.70	40.49	40.25	366
40	39.5	40.0	37.7	41.9	39.7	40.1	39.78	40.60	40.35	366
45	39.5	40.3	38.0	42.1	40.0	40.9	40.13	40.68	40.52	354
50	39.7	40.1	37.2	42.4	40.0	40.9	40.09	40.82	40.60	354
55	39.7	40.0	37.7	42.6	40.0	41.3	40.25	40.93	40.73	324
60	39.8	40.3	38.3	42.8	40.1	41.3	40.42	40.99	40.82	318
65	40.1	40.3	38.3	42.4	40.1	41.4	40.48	41.04	40.87	312
70	40.0	40.6	38.0	43.1	40.1	41.4	40.53	41.17	40.98	306
75	40.1	40.6	38.1	43.1	40.3	41.1	40.52	41.28	41.05	300
80	40.3	40.9	37.0	42.8	40.5	41.3	40.55	41.09	40.93	312
85	40.5	40.6	36.7	43.3	40.5	41.3	40.56	41.21	41.02	306
90	40.6	40.5	38.0	32.8	40.8	41.3	40.71	41.30	41.12	282
95	40.5	40.5	38.0	43.1	40.3	41.1	40.59	41.33	41.11	264
100	40.6	40.6	38.0	43.3	40.8	41.3	40.77	41.41	41.22	294
105	40.3	40.5	38.0	42.6	40.8	41.6	40.64	41.43	41.19	270
110	40.3	40.3	38.1	43.1	40.8	41.6	40.72	41.42	41.21	282
115	40.6	40.6	37.3	43.3	40.9	41.6	40.78	41.51	41.29	288
120	40.6	40.3	38.3	42.9	40.9	41.3	40.73	41.51	41.28	246
125	40.6	40.6	38.5	43.3	40.8	41.3	40.82	41.59	41.36	282
130	40.6	40.6	38.3	43.3	40.9	41.3	40.81	41.61	41.37	276
135	40.6	40.3	37.3	43.3	40.8	41.8	40.77	41.71	41.43	282
140	40.6	40.9	38.0	42.8	39.8	41.3	40.63	41.66	41.35	252
145	40.8	40.8	38.1	42.9	39.8	41.3	40.68	41.69	41.39	246
150	40.9	40.8	38.3	42.8	38.3	40.9	40.41	41.71	41.32	288

TABLE XXXIV

110°F, 30% Relative Humidity

Experiment Number 7

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.7	33.2	32.4	29.0	34.7	34.4	33.38	39.83	37.90	14
-25	33.7	33.1	32.6	28.7	34.0	34.5	33.28	39.75	37.81	18
-20	33.4	32.6	31.9	28.3	34.0	34.0	32.89	39.55	37.55	18
-15	33.7	32.9	31.1	27.8	33.7	34.4	32.94	39.50	37.53	12
-10	33.4	32.9	31.1	27.8	33.9	33.7	32.71	39.35	37.36	18
- 5	33.4	32.7	29.8	28.2	33.4	33.7	32.50	39.35	37.30	20
0	34.4	35.5	33.2	30.8	37.0	38.1	35.45	39.29	38.14	20
5	35.7	36.7	34.4	31.7	38.3	39.0	36.58	39.50	38.62	21
10	36.2	37.0	35.0	33.4	39.0	39.7	37.25	39.75	39.00	32
15	36.7	37.3	37.0	33.9	39.3	39.3	37.62	40.03	39.31	228
20	36.7	37.7	37.7	34.4	40.0	40.0	38.08	40.23	39.59	324
25	37.0	38.0	38.0	34.5	40.3	40.0	38.29	40.35	39.73	300
30	37.3	38.0	38.3	34.7	40.1	40.5	38.51	40.60	39.97	348
35	37.2	37.8	38.1	34.7	40.6	39.8	38.32	40.70	39.99	372
40	37.3	38.0	38.8	35.0	40.6	40.1	38.56	40.75	40.09	372
45	37.7	37.7	39.0	34.8	40.5	40.0	38.57	40.80	40.13	366
50	37.7	37.7	38.3	34.7	40.3	40.3	38.54	40.89	40.19	360
55	37.7	37.7	38.3	35.0	40.5	40.1	38.54	40.90	40.19	360
60	37.7	37.7	38.5	34.7	40.5	40.3	38.59	40.90	40.21	366
65	37.5	37.7	38.0	34.7	40.9	40.0	38.46	40.93	40.19	366
70	37.7	37.8	38.1	35.0	40.6	40.3	38.60	40.95	40.25	336
75	37.7	37.7	38.1	34.8	40.9	39.7	38.45	40.89	40.16	348
80	37.2	37.5	37.7	34.8	41.1	39.7	38.28	40.80	40.04	366
85	37.5	37.5	37.5	34.4	40.9	39.5	38.22	40.73	39.98	378
90	37.3	37.3	37.3	34.4	40.3	39.8	38.11	40.75	39.96	360
95	37.3	37.3	37.8	34.7	40.8	39.7	38.24	40.82	40.05	360
100	37.3	37.3	38.3	34.5	40.6	39.7	38.24	40.73	39.98	360
105	37.3	37.3	39.5	34.5	40.8	39.7	38.40	40.69	40.00	354
110	37.2	37.3	40.3	34.4	40.5	39.7	38.42	40.50	39.94	330
115	37.2	37.2	40.0	34.4	40.6	39.7	38.38	40.63	39.96	360
120	37.3	37.3	34.5	34.4	40.5	39.5	38.30	40.59	39.90	366
125	37.2	37.0	40.9	34.4	40.5	39.7	38.44	40.63	39.97	372
130	37.3	37.3	40.9	34.4	40.1	39.7	38.45	40.59	39.95	372
135	37.3	37.3	40.9	34.4	40.1	39.7	38.45	40.54	39.91	360
140	37.3	37.2	41.1	34.4	40.6	39.8	38.55	40.52	39.93	348
145	37.3	37.0	40.9	34.4	40.6	39.5	38.42	40.52	39.89	318
150	37.2	36.8	40.5	34.2	40.6	39.7	38.36	40.55	39.89	336

TABLE XXXV

110°F, 30% Relative Humidity

Experiment Number 20

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	31.1	32.0	31.1	31.7	35.7	35.7	33.14	39.10	37.31	288
-25	31.1	32.1	32.9	30.6	35.3	34.7	33.12	38.90	37.17	54
-20	30.6	32.1	34.3	32.2	35.0	34.7	33.07	38.85	37.12	24
-15	30.9	32.4	34.4	32.8	34.7	34.7	33.22	38.78	37.11	24
-10	31.9	32.4	34.4	32.0	35.3	34.3	33.39	38.80	37.18	24
- 5	31.1	32.4	34.4	32.0	35.5	34.5	33.25	38.90	37.21	78
0	35.8	36.0	37.4	35.7	38.8	37.3	36.81	38.90	38.27	216
5	36.9	38.4	38.8	37.2	40.3	38.8	38.35	38.93	38.76	204
10	37.6	40.1	40.1	37.9	40.9	40.3	39.47	38.98	39.13	216
15	37.8	40.9	40.1	38.6	40.9	40.7	39.81	39.03	39.26	306
20	37.5	40.9	40.4	38.4	40.9	40.7	39.75	39.10	39.30	246
25	37.8	41.2	40.9	38.7	41.5	41.2	40.17	39.05	39.39	336
30	38.0	41.5	40.9	39.1	41.5	41.5	40.38	39.08	39.47	336
35	38.0	41.5	40.9	38.7	41.5	41.3	40.29	39.20	39.53	294
40	37.8	41.5	40.9	39.2	41.5	41.0	40.21	39.25	39.54	354
45	37.6	41.4	40.5	39.4	41.5	40.7	40.04	39.30	39.52	312
50	36.6	41.2	40.9	39.4	41.5	40.7	39.81	39.30	39.45	336
55	37.9	41.8	40.5	39.4	41.5	41.0	40.26	39.35	39.62	306
60	37.6	42.0	37.8	39.1	41.5	41.0	39.89	39.40	39.55	348
65	37.6	41.8	40.0	39.1	41.5	41.0	40.10	39.45	39.65	354
70	37.8	41.7	40.4	38.7	41.5	41.3	40.22	39.55	39.75	354
75	37.8	41.8	40.7	38.7	41.5	41.5	40.32	39.70	39.89	336
80	37.9	42.2	41.0	39.1	41.5	41.5	40.48	39.70	39.93	312
85	38.0	41.8	40.2	39.1	41.5	41.3	40.30	39.53	39.76	318
90	37.9	41.8	40.4	39.1	41.5	41.3	40.30	39.53	39.76	312
95	38.1	41.8	40.9	39.2	41.5	41.0	40.33	39.58	39.81	294
100	38.3	40.0	41.1	40.1	41.7	41.3	40.62	39.55	39.87	294
105	38.8	42.4	41.4	40.1	41.7	42.0	41.02	39.63	40.05	318
110	37.4	41.7	40.7	38.9	41.5	41.2	40.15	39.65	39.80	336
115	37.3	41.2	40.7	38.9	41.5	41.0	39.99	39.55	39.68	360
120	37.5	41.2	40.4	38.9	41.5	41.0	40.01	39.65	39.76	318
125	37.8	41.5	41.0	38.6	41.7	41.3	40.27	39.68	39.86	300
130	37.8	41.7	41.2	39.4	41.7	42.0	40.58	39.65	39.93	288
135	37.8	42.2	40.7	38.6	41.7	42.0	40.53	39.65	39.91	330
140	37.8	42.0	40.7	39.2	41.7	42.0	40.56	39.68	39.94	300
145	38.0	42.2	41.0	39.5	41.7	42.0	40.70	39.68	39.99	324
150	38.0	42.0	40.5	39.1	41.7	42.0	40.51	39.68	39.95	294

TABLE XXXVI

110°F, 30% Relative Humidity

Experiment Number 37

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.4	35.0	32.1	35.5	35.4	37.1	35.42	39.68	38.40	102
-25	35.4	35.4	32.1	34.7	35.4	37.1	35.42	39.60	38.35	36
-20	35.8	35.4	34.9	34.7	33.9	36.9	35.55	39.40	38.25	12
-15	36.0	35.3	34.5	34.2	33.9	36.7	35.45	39.33	38.17	12
-10	35.8	35.1	33.1	33.9	34.5	36.7	35.27	39.25	38.06	30
- 5	35.5	35.4	33.4	33.4	35.3	36.7	35.35	39.25	38.08	30
0	37.9	39.1	36.8	39.4	37.5	39.7	38.52	39.25	39.03	42
5	38.4	40.4	38.3	39.7	39.3	40.4	39.47	39.28	39.34	228
10	39.3	40.5	39.5	39.1	40.5	40.7	40.03	39.23	39.47	306
15	39.5	40.7	40.3	40.1	40.5	41.0	40.36	39.23	39.57	252
20	40.0	41.4	40.9	40.5	40.5	41.3	40.78	39.28	39.73	360
25	40.1	41.0	40.9	41.0	40.4	41.5	40.82	39.55	39.93	354
30	40.4	41.5	40.9	41.4	40.5	41.7	41.07	39.55	40.01	342
35	40.5	41.3	40.9	41.8	41.0	41.8	41.20	39.80	40.22	366
40	40.4	41.3	41.0	42.0	41.0	42.0	41.25	39.83	40.26	372
45	40.6	41.8	41.0	42.1	41.5	42.1	41.49	39.88	40.36	324
50	40.8	41.0	41.3	42.3	41.8	42.1	41.50	40.00	40.45	360
55	40.5	41.1	41.5	42.4	41.8	42.3	41.53	40.07	40.51	384
60	41.0	41.3	41.3	42.5	41.8	42.4	41.69	40.10	40.58	396
65	40.8	41.5	41.1	42.0	41.5	42.3	41.54	40.10	40.53	372
70	40.8	41.5	41.1	42.2	41.9	42.1	41.56	40.10	40.54	348
75	40.8	41.4	40.5	42.3	42.8	42.3	41.67	40.08	40.55	372
80	40.6	41.3	40.5	42.2	43.3	42.0	41.59	40.03	40.50	360
85	40.6	41.0	40.7	42.2	43.8	42.0	41.63	40.03	40.51	366
90	40.6	41.0	40.3	42.0	43.0	42.0	41.46	40.10	40.51	342
95	40.6	41.0	40.5	41.8	42.9	42.0	41.45	40.20	40.58	396
100	40.6	41.1	40.3	41.7	43.4	42.0	41.50	40.15	40.56	342
105	41.0	41.1	41.0	41.5	44.0	42.0	41.74	40.08	40.58	390
110	40.6	41.1	41.0	42.2	43.4	42.0	41.62	40.08	40.54	390
115	40.8	41.0	40.1	41.7	43.8	42.0	41.57	39.94	40.43	396
120	40.8	40.9	40.1	42.0	43.9	41.8	41.54	39.88	40.38	306
125	40.6	41.0	40.1	41.5	43.5	42.0	41.46	39.95	40.40	378
130	40.6	41.0	40.4	41.2	43.5	41.8	41.41	40.00	40.42	390
135	40.6	41.1	40.7	41.5	43.5	41.8	41.49	40.05	40.48	384
140	40.5	40.4	40.5	41.5	42.5	41.8	41.19	40.05	40.39	378
145	40.5	40.7	40.5	41.5	43.0	41.8	41.21	40.03	40.38	408
150	40.5	40.9	40.7	41.7	42.3	41.8	41.28	40.20	40.52	402

TABLE XXXVII

110°F, 30% Relative Humidity

Experiment Number 40

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.8	36.4	34.1	37.2	36.8	37.2	36.34	39.55	38.59	72
-25	35.4	36.2	33.6	37.9	36.6	37.1	36.17	39.53	38.52	258
-20	35.6	36.2	34.0	38.2	36.8	37.2	36.34	39.38	38.47	300
-15	35.8	36.0	33.4	38.2	36.4	37.1	36.21	39.25	38.34	180
-10	35.4	36.0	33.0	37.4	36.2	37.1	35.97	39.18	38.22	156
- 5	35.6	36.2	32.5	37.4	36.8	36.7	35.97	39.28	38.29	84
0	37.8	39.1	37.1	39.7	38.2	40.1	38.76	39.43	39.23	174
5	39.4	40.4	38.4	39.8	39.4	41.2	39.95	39.50	39.64	330
10	39.8	40.9	39.1	40.4	40.0	41.7	40.48	39.50	39.79	360
15	40.1	41.0	40.2	40.4	40.4	42.0	40.82	39.40	39.83	408
20	40.5	41.0	40.5	41.1	40.6	42.0	41.04	39.40	39.89	420
25	41.0	41.0	40.9	40.4	40.8	42.4	41.27	39.48	40.02	420
30	41.0	41.2	40.9	41.1	40.8	42.4	41.37	39.40	39.99	414
35	41.4	41.2	40.7	41.5	40.9	42.6	41.54	39.55	40.15	420
40	41.5	41.4	40.9	41.5	41.2	42.6	41.66	39.70	40.29	444
45	41.3	41.4	41.1	41.8	41.0	42.3	41.56	39.70	40.26	396
50	41.3	41.2	40.7	41.5	41.2	42.3	41.48	39.60	40.16	438
55	41.5	41.1	40.7	41.7	41.2	42.4	41.56	39.73	40.28	432
60	41.4	41.1	40.7	41.4	41.2	42.4	41.51	39.75	40.28	456
65	41.4	41.1	40.2	41.5	41.0	42.3	41.41	39.73	40.23	432
70	41.4	41.1	40.5	41.5	41.2	42.3	41.47	39.75	40.27	396
75	41.4	41.0	40.2	41.5	41.2	42.3	41.42	39.73	40.24	432
80	41.1	41.0	40.2	41.5	41.0	42.3	41.32	39.68	40.17	392
85	41.1	41.0	40.0	41.4	41.2	42.6	41.39	39.50	40.07	414
90	41.3	41.0	40.4	41.2	41.2	42.3	41.39	39.63	40.16	438
95	41.4	41.0	40.4	41.2	41-0	42.0	41.31	39.63	40.13	420
100	41.4	41.1	40.4	41.2	41.2	42.0	41.35	39.58	40.11	432
105	41.3	41.1	40.1	41.4	40.9	42.0	41.27	39.58	40.09	456
110	41.1	40.5	39.8	41.2	40.9	42.0	41.08	39.49	39.97	426
115	41.3	40.9	40.2	41.1	41.0	42.0	41.24	39.49	40.02	414
120	41.3	40.7	40.2	41.4	41.0	42.0	41.23	39.47	40.00	438
125	40.6	40.7	40.0	41.2	41.0	42.0	41.02	39.44	39.91	414
130	41.1	40.7	40.1	40.7	41.0	42.0	41.11	39.38	39.90	414
135	41.1	40.7	40.2	40.9	40.9	42.4	41.23	39.25	39.84	450
140	41.1	40.7	40.2	40.6	41.0	42.4	41.22	39.28	39.86	414
145	41.1	40.7	40.0	40.9	40.9	42.3	41.18	39.25	39.84	414
150	41.5	40.5	40.1	40.9	41.0	42.3	41.27	39.25	39.86	438

TABLE XXXVIII

100°F, 30% Relative Humidity

Experiment Number 41

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	36.3	35.3	30.5	32.0	36.9	33.8	34.55	38.73	37.48	78
-25	36.3	35.5	30.0	31.3	36.9	33.2	34.31	38.80	37.45	78
-20	36.1	35.8	29.6	31.3	36.4	32.7	34.06	38.80	37.38	90
-15	36.1	35.8	29.5	30.5	36.4	32.8	34.03	38.80	37.37	168
-10	36.1	35.5	29.1	30.7	36.3	32.4	33.81	38.78	37.29	96
- 5	36.1	35.4	28.5	35.2	36.3	32.0	34.03	38.83	37.39	204
0	38.5	38.8	32.3	37.7	38.4	39.2	37.96	38.83	38.57	264
5	39.5	39.8	33.8	38.6	39.5	39.8	38.92	38.80	38.84	282
10	39.9	40.5	34.9	39.4	40.0	40.4	39.55	38.80	39.03	240
15	39.9	40.7	37.1	39.8	39.9	41.0	40.00	38.83	39.18	294
20	40.1	40.9	37.5	40.5	40.3	41.0	40.24	38.85	39.27	234
25	40.3	41.0	39.8	41.7	40.4	41.3	40.76	38.98	39.51	354
30	40.3	41.0	39.1	41.0	40.5	41.0	40.55	39.08	39.52	300
35	40.1	41.0	49.4	40.5	40.5	41.0	40.49	39.08	39.50	366
40	40.1	41.0	40.0	41.0	40.8	41.3	40.72	39.13	39.61	414
45	40.4	41.0	39.3	41.1	40.8	42.6	41.07	39.35	39.87	384
50	40.4	41.0	40.1	41.2	40.8	42.0	41.01	39.35	39.85	384
55	40.4	41.0	39.8	40.7	40.8	42.1	40.96	39.40	39.87	378
60	40.5	41.3	40.3	41.5	40.8	42.4	41.23	39.40	39.95	354
65	40.4	41.1	39.8	41.7	40.9	42.3	41.13	39.40	39.92	396
70	40.4	41.3	40.3	41.7	41.0	42.0	41.15	39.55	40.03	346
75	40.5	41.0	39.8	41.7	40.9	41.7	40.98	39.64	40.04	354
80	40.4	41.0	39.8	41.0	41.0	41.7	40.91	39.60	39.99	396
85	40.5	41.1	37.8	41.2	41.0	42.4	40.93	39.53	39.95	390
90	40.5	41.1	39.1	41.7	41.0	42.1	41.04	39.53	39.98	396
95	40.0	41.0	39.8	40.8	40.9	42.1	40.88	39.53	39.94	390
100	40.5	41.0	39.8	41.2	40.9	42.6	41.17	39.56	40.04	384
105	40.6	41.0	40.0	41.7	41.0	42.9	41.35	39.66	40.17	396
110	40.5	41.3	40.0	41.8	41.3	42.3	41.27	39.58	40.09	390
115	40.4	41.3	40.0	41.5	41.4	42.3	41.23	39.53	40.04	396
120	40.4	41.4	37.3	41.5	41.5	41.7	40.81	39.50	39.89	354
125	40.4	41.4	39.4	40.8	41.5	42.0	41.06	39.45	39.93	372
130	40.4	41.3	38.4	40.8	41.4	42.1	40.94	39.45	39.90	372
135	40.4	41.4	40.1	41.2	41.5	42.4	41.27	39.45	40.00	402
140	40.4	41.4	40.0	41.5	41.4	42.1	41.20	39.40	39.94	420
145	40.1	41.1	40.0	41.3	41.4	42.6	41.19	39.45	39.97	402
150	40.4	41.3	40.4	41.8	41.3	42.3	41.29	39.45	40.00	408

TABLE XXXIX

110°F, 60% Relative Humidity

Experiment Number 18

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.2	36.3	35.4	34.4	38.7	32.4	34.61	39.72	38.18	60
-25	33.4	36.2	35.4	34.0	38.5	32.4	34.58	39.67	38.14	144
-20	33.1	36.0	35.2	33.9	38.3	32.4	34.41	39.63	38.06	60
-15	33.4	36.0	35.0	33.7	38.0	32.1	34.33	39.45	37.91	36
-10	33.1	36.3	34.7	33.7	37.8	32.1	34.24	39.49	37.91	60
- 5	32.9	36.2	34.5	33.4	37.8	32.1	34.13	39.47	37.87	54
0	34.7	40.0	40.1	35.8	40.9	34.7	37.11	39.38	38.70	234
5	36.8	40.3	36.5	36.3	41.6	35.7	37.67	39.53	38.97	264
10	37.0	41.6	37.3	37.3	42.8	36.7	38.53	39.63	39.30	324
15	38.1	41.9	37.8	37.8	43.3	37.3	39.17	39.98	39.74	378
20	38.3	42.4	39.7	38.1	43.6	37.5	39.63	40.28	40.09	390
25	38.5	42.1	42.3	38.3	43.9	37.7	40.02	40.52	40.37	402
30	38.5	41.9	43.3	38.3	43.9	37.3	40.00	40.80	40.56	390
35	38.7	41.9	37.3	38.3	-	37.3	38.65	41.10	40.37	360
40	38.7	42.3	40.9	38.5	-	37.7	39.33	41.32	40.72	414
45	39.0	42.8	42.3	39.0	-	38.0	39.83	41.45	40.96	342
50	39.3	42.9	42.6	39.0	-	38.3	40.06	41.67	41.19	366
55	39.3	42.9	42.1	39.3	-	38.3	40.03	41.80	41.27	294
60	39.3	43.3	42.3	39.5	-	38.7	40.27	41.95	41.45	306

TABLE XL

110°F, 60% Relative Humidity

Experiment Number 22

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	34.0	36.3	31.7	31.4	40.3	33.4	34.61	39.19	37.82	84
-25	33.9	35.7	31.7	31.1	40.0	33.1	34.34	39.25	37.78	90
-20	33.6	35.7	31.6	30.5	39.3	32.9	34.05	39.25	37.69	66
-15	33.4	34.8	31.1	30.8	39.0	32.9	33.79	39.25	37.61	54
-10	33.9	35.4	32.6	30.8	39.8	33.1	34.34	39.25	37.78	90
- 5	33.6	35.4	32.1	30.9	39.3	33.1	34.15	39.23	37.71	30
0	35.5	39.2	37.8	36.5	41.9	35.0	37.20	39.28	38.66	264
5	37.3	40.6	39.8	37.7	42.9	36.3	38.66	39.38	39.16	348
10	38.0	41.3	41.8	38.5	-	37.3	38.94	39.55	39.37	360
15	38.5	42.3	42.6	38.8	-	37.2	39.37	39.70	39.60	342
20	38.8	42.9	42.9	39.5	-	37.7	39.83	40.02	39.96	360
25	39.0	42.9	43.6	39.5	-	38.3	40.15	40.30	40.26	330
30	39.3	42.9	42.9	40.1	-	38.0	40.12	40.65	40.49	300
35	39.3	43.3	42.9	40.3	-	38.7	40.43	41.02	40.75	306
40	40.0	43.6	43.4	40.3	-	38.8	40.77	41.55	41.32	282
45	39.8	43.6	43.9	40.6	-	39.3	40.96	41.95	41.65	252

TABLE XLI

110°F, 60% Relative Humidity

Experiment Number 27

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.0	36.7	35.8	34.4	39.3	34.4	35.75	39.80	38.59	20
-25	34.4	36.3	36.0	34.0	39.2	34.0	35.41	39.63	38.36	16
-20	34.2	36.3	35.0	33.6	38.7	34.0	35.15	39.48	38.18	16
-15	34.4	36.0	35.0	33.1	38.5	33.6	34.97	39.33	38.02	12
-10	34.4	36.0	35.0	33.9	38.3	33.6	35.02	39.27	38.00	16
- 5	34.2	35.8	33.9	33.4	38.5	33.9	34.88	39.21	37.91	20
0	35.8	39.3	39.0	35.0	41.3	35.0	37.20	39.15	38.57	36
5	37.0	40.9	40.1	36.5	42.6	36.3	38.52	39.45	39.17	48
10	38.0	42.1	41.4	37.5	43.6	37.0	39.51	39.75	39.68	204
15	38.1	42.9	43.1	38.3	44.2	37.3	40.08	40.15	40.13	330
20	38.7	42.9	43.1	-	44.6	38.0	40.68	40.78	40.75	246
25	39.5	43.3	43.3	-	45.7	38.7	41.35	41.70	41.60	234

TABLE XLII

110°F, 60% Relative Humidity

Experiment Number 29

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	32.7	33.6	36.5	35.4	30.1	30.1	32.47	38.58	36.75	152
-25	32.7	33.2	37.3	35.4	34.5	30.0	33.08	38.46	36.85	104
-20	32.6	33.6	36.5	34.5	33.6	30.0	32.82	38.37	36.71	64
-15	32.4	33.6	36.2	34.2	33.2	30.0	32.66	38.42	36.69	32
-10	32.6	33.6	36.5	34.0	33.1	29.5	32.58	38.52	36.74	48
- 5	35.8	36.0	40.0	37.7	39.5	33.7	36.44	38.42	37.83	24
0	38.7	37.7	41.8	39.0	40.9	35.8	38.46	38.48	38.47	88
5	40.0	38.7	42.9	40.1	41.6	37.2	39.62	38.65	38.94	342
10	40.6	38.0	42.9	41.1	41.6	37.7	39.87	38.95	39.23	378
15	40.8	38.7	42.9	41.6	42.3	38.0	40.25	39.30	39.59	390
20	40.6	39.0	44.0	42.4	42.6	38.0	40.48	39.75	39.97	414
25	44.2	38.8	42.3	42.8	42.9	38.7	41.39	40.25	40.59	432
30	41.6	39.0	44.2	42.8	42.6	38.7	40.96	40.73	40.80	426
35	42.4	39.5	38.7	43.4	43.6	39.3	40.98	41.02	41.01	408
40	42.6	40.0	-	43.4	43.9	39.8	41.60	41.35	41.43	396

TABLE XLIII

110°F, 60% Relative Humidity

Experiment Number 43

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.4	39.0	35.8	36.2	32.7	38.7	36.57	39.43	38.57	360
-25	36.5	38.3	35.7	35.7	33.3	38.3	36.65	39.13	38.37	264
-20	36.5	38.0	35.4	36.2	32.4	38.1	36.43	38.86	38.13	224
-15	35.7	38.0	34.5	35.5	32.9	38.1	36.15	38.82	38.02	312
-10	35.5	38.3	34.2	35.5	32.6	38.3	36.13	38.78	37.99	324
- 5	35.7	38.3	34.0	35.2	33.1	38.3	36.20	38.63	37.90	186
0	35.4	42.9	37.3	38.5	36.3	40.6	38.73	38.70	38.71	36
5	39.5	42.9	39.0	40.5	38.1	42.1	40.56	39.05	39.50	288
10	41.1	43.7	41.4	40.9	38.3	43.7	41.82	39.45	40.16	366
15	41.6	43.1	42.1	42.1	38.8	43.9	42.15	39.82	40.52	372
20	42.1	44.4	42.9	42.9	39.3	44.2	42.78	40.20	40.97	378
25	42.6	44.7	43.3	42.6	39.7	45.0	43.23	40.65	41.42	366
30	42.9	45.2	42.1	43.6	40.3	44.9	43.40	41.15	41.83	336
35	43.3	44.7	39.2	43.1	40.6	45.5	43.25	41.60	42.10	324

TABLE XLIV

110°F, 90% Relative Humidity

Experiment Number 2

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.1	34.7	27.2	37.3	36.5	36.5	34.45	39.20	37.78	21
-25	34.2	34.5	29.7	37.3	36.0	37.0	34.98	39.16	37.91	12
-20	34.5	35.0	31.3	37.0	35.7	36.7	35.19	38.99	37.85	9
-15	34.0	35.0	31.6	36.7	35.5	37.0	35.13	38.88	37.76	15
-10	34.4	35.0	32.7	36.5	35.0	36.7	35.18	38.80	37.71	10
- 5	34.2	35.4	32.7	36.0	35.2	36.8	35.21	38.72	37.67	12
0	37.0	37.7	37.2	39.3	37.7	38.7	37.88	38.62	38.40	20
5	39.0	39.3	38.8	40.9	39.0	40.3	39.54	38.70	38.95	16
10	40.3	40.3	40.0	42.1	39.5	40.8	40.45	38.99	39.43	32
15	40.8	40.3	40.1	42.1	40.0	41.3	40.78	39.32	39.76	116
20	41.3	41.1	40.8	42.3	40.6	41.6	41.28	39.71	40.18	340
25	41.6	41.3	41.4	43.6	41.1	41.6	41.64	40.05	40.53	376
30	41.9	41.6	41.1	44.9	41.3	40.9	41.69	40.49	40.85	384
35	41.9	44.6	40.9	42.6	41.9	42.1	42.34	40.89	41.33	312
40	42.1	43.6	40.6	43.7	41.9	42.6	42.42	41.22	41.58	318
45	41.9	41.6	40.8	44.6	42.3	41.9	42.03	41.62	41.74	258

TABLE XLV

110°F, 90% Relative Humidity

Experiment Number 5

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	35.2	36.7	33.9	38.1	36.2	35.8	35.85	39.20	38.20	24
-25	35.0	36.7	35.4	38.1	36.0	36.2	36.05	39.12	38.20	16
-20	35.0	36.7	36.5	37.5	35.5	35.7	35.91	38.95	38.04	16
-15	34.7	36.2	35.0	37.5	35.4	35.4	35.51	38.99	37.95	28
-10	34.7	36.3	34.7	37.7	35.4	35.7	35.58	39.18	38.10	24
- 5	34.7	36.8	35.5	38.3	36.0	35.5	35.84	39.12	38.14	24
0	37.7	39.5	37.8	40.9	39.2	38.8	38.78	38.88	38.85	44
5	39.5	40.3	40.3	41.8	40.3	40.6	40.32	39.31	39.61	100
10	40.1	40.8	40.9	42.1	40.6	40.6	40.68	39.77	40.04	320
15	40.3	41.3	41.3	43.3	40.8	41.4	41.20	40.20	40.50	384
20	41.1	41.6	41.8	43.7	41.3	41.8	41.70	40.69	40.99	360
25	41.4	41.9	41.9	44.0	41.9	41.9	41.97	41.26	41.47	320
30	41.9	42.4	42.1	44.4	42.3	42.6	42.47	41.89	42.06	240

TABLE XLVI

110°F, 90% Relative Humidity

Experiment Number 17

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	32.1	34.7	27.1	33.7	35.0	35.0	33.27	39.80	37.84	22
-25	32.7	34.0	28.0	33.7	35.2	35.5	33.56	39.63	37.81	20
-20	32.4	34.0	28.8	33.4	34.8	35.7	33.54	39.38	37.63	26
-15	32.6	33.4	29.2	33.2	35.2	35.2	33.45	39.38	37.60	22
-10	32.9	34.0	30.1	34.2	35.0	35.2	33.78	39.38	37.70	25
- 5	33.1	35.2	30.3	34.0	35.2	35.2	34.05	39.38	37.78	18
0	35.8	38.3	37.0	37.2	37.7	38.1	37.32	39.38	38.76	20
5	37.3	39.3	38.7	37.7	38.7	39.0	38.45	39.42	39.13	228
10	38.3	40.0	40.9	39.0	39.5	39.8	39.48	39.82	39.72	366
15	39.2	40.3	41.8	39.3	40.1	40.6	40.16	40.50	40.40	366
20	39.7	40.9	40.9	40.0	40.9	41.3	40.64	41.25	41.07	342
25	41.1	41.6	41.6	40.0	40.9	41.8	41.29	41.90	41.72	288

TABLE XLVII

110°F, 90% Relative Humidity

Experiment Number 21

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	31.4	35.7	33.7	35.4	33.9	35.4	34.06	39.80	38.07	30
-25	31.7	35.4	34.4	34.5	33.7	36.0	34.21	39.68	38.04	22
-20	32.4	35.5	36.2	34.4	33.6	35.7	34.50	39.62	38.08	26
-15	32.4	35.4	36.7	34.0	33.1	35.5	34.38	39.56	38.00	24
-10	32.1	35.7	36.3	34.0	33.6	35.2	34.31	39.52	37.95	30
- 5	32.1	35.4	36.7	33.7	33.2	35.2	34.21	39.52	37.92	20
0	37.3	38.1	40.5	38.3	37.3	39.0	38.29	39.48	39.12	390
5	38.7	40.0	41.1	39.7	39.0	42.3	40.23	39.64	39.81	414
10	40.0	41.3	41.6	40.0	39.7	31.9	40.81	40.20	40.38	414
15	39.5	41.3	42.3	40.9	40.6	42.8	41.22	40.76	40.89	330
20	40.0	42.3	42.6	40.9	40.6	42.8	41.53	41.36	41.40	240

TABLE XLVIII

110°F, 90% Relative Humidity

Experiment Number 25

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	34.0	33.7	30.9	33.2	35.0	33.4	33.50	39.12	37.43	22
-25	33.9	34.2	27.4	32.4	35.7	35.0	33.61	38.96	37.35	16
-20	34.0	33.9	27.2	32.1	35.2	35.8	33.68	38.89	37.32	18
-15	33.7	34.0	27.2	31.9	34.5	36.0	33.57	38.85	37.27	18
-10	33.6	34.4	26.3	32.4	35.0	36.2	33.67	38.85	37.30	20
- 5	33.7	34.0	26.1	32.6	34.5	35.4	33.35	38.90	37.23	17
0	37.2	35.0	34.4	37.7	37.3	39.7	37.23	39.02	38.47	36
5	38.8	39.8	39.3	38.8	39.5	40.9	39.64	39.17	39.31	282
10	39.3	40.6	-	39.2	39.8	41.6	40.25	39.88	39.98	360
15	40.0	41.1	42.8	40.3	40.0	41.6	40.91	40.63	40.71	306
20	39.3	40.9	42.8	40.8	40.3	42.8	41.11	41.55	41.42	360

TABLE XLIX

120°F, 30% Relative Humidity

Experiment Number 6

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	31.7	34.0	33.7	33.1	33.4	35.4	33.61	39.13	37.47	44
-25	31.9	34.2	32.4	33.4	33.2	35.0	33.45	39.25	37.51	54
-20	32.4	33.6	33.1	33.6	32.9	34.8	33.47	39.25	37.52	126
-15	32.6	34.2	33.9	33.6	33.4	34.8	33.77	39.27	37.62	56
-10	32.4	34.2	34.7	32.7	33.6	34.7	33.73	39.35	37.66	84
- 5	32.9	33.9	34.4	32.2	33.1	34.8	33.68	39.35	37.65	44
0	35.8	38.0	40.3	37.5	37.0	38.0	37.54	39.35	38.81	117
5	38.5	38.8	41.3	38.3	38.3	40.0	39.20	39.45	39.38	288
10	39.3	40.1	39.7	39.7	39.3	41.1	39.98	39.63	39.74	300
15	39.8	40.8	41.6	40.5	39.7	41.4	40.62	39.85	40.08	366
20	39.8	41.1	42.9	40.6	40.0	42.1	41.05	40.23	40.48	360
25	39.7	41.8	41.9	40.5	39.2	41.9	40.85	40.65	40.71	360
30	40.0	41.4	41.8	40.3	39.8	43.6	41.36	40.90	41.04	324
35	40.3	40.9	40.0	40.8	39.7	43.3	41.10	41.22	41.18	288
40	40.8	41.3	40.0	42.1	40.1	43.3	41.46	41.35	41.38	282
45	40.8	41.4	41.8	43.7	40.5	44.6	42.21	41.75	41.89	270

TABLE L

120°F, 30% Relative Humidity

Experiment Number 8

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.7	34.0	33.1	33.2	34.4	31.7	33.22	39.64	37.71	20
-25	33.6	34.2	32.7	33.4	33.7	31.9	33.15	39.60	37.67	24
-20	33.4	34.0	32.7	33.9	33.9	32.2	33.22	39.60	37.69	16
-15	33.6	34.4	33.4	33.9	33.9	33.9	33.85	39.55	37.84	18
-10	33.4	33.9	33.7	34.0	34.0	33.7	33.73	39.55	37.80	16
- 5	33.2	33.9	33.2	33.7	33.7	33.6	33.53	39.42	37.65	14
0	37.0	39.3	-	38.0	37.8	41.3	38.90	39.45	39.29	30
5	38.7	40.6	40.9	38.8	39.5	43.3	40.56	39.72	39.97	92
10	40.0	41.8	42.6	39.8	40.1	43.7	41.53	40.25	40.63	306
15	40.9	42.9	43.6	40.8	40.3	43.7	42.15	40.65	41.10	354
20	41.1	42.4	43.4	41.8	40.8	43.7	42.26	41.25	41.55	354
25	41.6	42.6	44.7	42.1	41.8	43.7	42.72	41.90	42.15	336

TABLE LI

120°F, 30% Relative Humidity

Experiment Number 16

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	32.2	34.7	33.9	33.4	32.4	36.0	33.91	38.78	37.32	54
-25	32.4	34.8	34.5	33.1	32.2	35.4	33.83	38.74	37.27	264
-20	32.2	34.7	33.7	33.1	32.4	35.4	33.71	38.58	37.12	240
-15	31.4	34.0	33.9	32.7	32.4	35.0	33.28	38.51	36.94	36
-10	31.4	34.0	33.1	32.7	32.4	35.0	33.20	38.51	36.92	30
- 5	31.3	33.9	32.9	32.2	32.1	34.7	32.97	38.48	36.83	36
0	36.7	38.7	-	37.3	37.3	38.7	36.97	38.40	37.97	246
5	38.7	39.2	38.7	38.0	38.3	39.7	38.92	38.55	38.66	258
10	38.5	39.2	-	38.3	39.0	41.1	39.44	39.05	39.17	300
15	39.7	-	41.9	-	39.0	42.6	40.90	39.50	39.92	330
20	40.3	42.9	40.6	-	39.7	41.3	40.99	40.03	40.32	324
25	40.9	43.9	42.6	38.7	40.3	44.6	42.25	40.65	41.13	306
30	41.4	44.2	40.5	40.3	41.3	42.8	42.00	41.20	41.44	294
35	40.3	-	41.8	-	41.3	43.6	41.85	41.80	41.82	318

TABLE LII

120°F, 30% Relative Humidity

Experiment Number 19

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.7	31.6	29.7	35.2	34.0	36.3	33.78	38.22	36.89	24
-25	34.0	32.4	29.8	35.4	32.9	36.3	33.85	38.22	36.91	20
-20	34.4	32.1	30.5	34.8	32.2	36.3	33.83	38.15	36.85	26
-15	34.0	31.7	30.1	35.0	32.2	37.0	33.82	38.18	36.87	24
-10	34.0	32.4	30.3	35.0	32.6	37.0	34.01	38.15	36.91	20
- 5	34.4	31.9	30.5	34.5	31.9	36.7	33.83	38.10	36.82	12
0	36.2	35.8	34.2	38.5	36.3	38.8	36.81	38.15	37.75	28
5	40.6	37.8	36.5	41.3	37.7	40.3	39.28	38.25	38.56	36
10	41.9	39.3	38.7	42.3	38.8	41.9	40.81	38.53	39.21	36
15	42.6	40.0	41.6	43.9	39.0	42.8	41.74	38.87	39.73	248
20	42.6	40.1	42.6	44.4	39.3	43.7	42.19	39.20	40.10	312
25	42.9	40.6	42.9	43.9	39.8	44.0	42.47	39.54	40.42	312
30	43.3	40.6	43.4	44.7	40.3	44.9	43.00	40.05	40.94	352
35	43.9	40.8	43.3	43.9	39.3	45.0	42.98	40.38	41.16	304
40	43.9	41.1	44.6	43.7	39.8	45.5	43.35	40.85	41.60	288
45	43.9	41.1	-	45.4	40.3	45.7	43.51	41.25	41.93	232
50	43.9	41.6	-	44.9	40.6	46.8	43.92	41.60	42.30	208

TABLE LIII

120°F, 30% Relative Humidity

Experiment Number 26

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	34.7	32.2	31.7	36.5	33.7	38.3	34.93	38.57	37.48	300
-25	35.0	32.2	31.1	36.2	33.4	37.7	34.71	38.42	37.31	312
-20	35.4	31.7	30.5	35.8	33.1	37.8	34.61	38.32	37.21	150
-15	35.0	31.9	29.5	35.2	32.9	37.3	34.22	38.33	37.10	102
-10	35.2	31.9	29.5	35.2	33.2	38.0	34.49	38.40	37.23	90
- 5	35.2	31.7	28.7	35.0	33.1	37.7	34.26	38.44	37.19	90
0	38.7	35.0	36.2	39.7	35.7	43.6	38.78	38.56	38.63	312
5	40.9	36.7	37.0	41.9	37.0	44.4	40.25	38.56	39.07	324
10	42.3	38.3	40.0	42.8	37.8	43.9	41.24	38.70	39.46	330
15	43.6	39.3	45.2	43.3	38.5	44.0	42.45	38.92	39.98	318
20	43.6	39.7	44.4	43.9	39.2	44.9	42.81	39.30	40.35	312
25	43.6	39.7	42.8	44.6	39.5	45.9	43.00	39.55	40.59	300
30	43.6	40.0	-	44.0	39.7	45.5	42.93	40.07	40.93	282
35	43.9	39.5	-	43.9	40.0	46.0	43.11	40.40	41.21	270
40*	43.9	39.3	-	4419	40.5	46.4	43.37	40.95	41.68	204

* Animal choking - experiment terminated at this time.

TABLE LIV

120°F, 60% Relative Humidity

Experiment Number 4

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	34.0	34.5	34.0	32.6	35.0	36.7	34.79	38.82	37.60	120
-25	34.0	34.4	32.9	33.1	34.8	36.3	34.55	38.73	37.47	136
-20	34.0	35.0	34.0	32.9	34.5	37.0	34.91	38.70	37.56	124
-15	33.7	35.0	34.2	33.9	34.4	37.2	34.97	38.70	37.58	220
-10	33.4	34.4	35.4	33.4	34.5	36.7	34.78	38.62	37.46	120
- 5	33.7	34.2	34.8	33.6	34.8	36.7	34.80	38.62	37.47	116
0	36.7	39.0	40.0	38.7	37.3	39.7	38.46	38.70	38.62	96
5	39.8	40.3	-	40.1	39.7	41.3	40.31	39.00	39.39	348
10	40.8	41.3	-	40.5	40.5	42.1	41.18	39.52	40.01	336
15	41.6	41.9	-	41.3	40.9	42.9	41.87	40.22	40.71	294
20	41.9	42.8	-	41.9	41.1	43.3	42.32	40.95	41.36	252
25	42.6	43.3	41.9	41.9	42.3	43.9	42.85	41.76	42.08	246

TABLE LV

120°F, 60% Relative Humidity

Experiment Number 15

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.4	35.5	33.4	35.0	37.0	31.7	33.93	39.02	37.48	140
-25	32.7	35.2	28.5	34.4	37.0	31.1	32.96	39.02	37.19	92
-20	32.7	35.4	28.5	34.2	36.3	31.4	32.94	38.98	37.17	156
-15	32.4	35.7	28.2	33.9	35.8	31.4	32.80	38.93	37.09	112
-10	32.7	35.4	29.7	34.0	36.2	32.1	33.23	38.98	37.25	60
- 5	32.9	35.4	28.8	33.6	36.2	31.3	32.93	39.12	37.25	132
0	36.7	40.0	42.3	40.1	40.1	40.1	39.50	39.02	39.16	252
5	39.5	41.3	-	41.9	40.9	41.9	40.97	39.12	39.67	342
10	40.9	41.4	43.1	42.3	41.9	42.8	41.96	39.52	40.24	384
15	41.4	42.6	44.2	42.6	42.9	43.1	42.65	40.20	40.93	336
20	42.9	43.1	-	44.2	44.2	43.3	43.37	40.92	41.65	354
25	42.9	43.9	44.7	44.2	44.6	44.0	43.87	41.53	42.23	294

TABLE LVI

120°F, 60% Relative Humidity

Experiment Number 28

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	30.6	36.3	28.7	30.9	34.7	35.2	33.10	38.63	36.97	276
-25	30.6	36.7	32.2	34.7	35.4	34.7	33.86	38.70	37.25	180
-20	31.3	37.0	31.4	34.4	35.2	35.4	34.11	38.63	37.27	216
-15	30.9	37.0	31.1	34.0	34.8	35.8	34.00	38.63	37.24	96
-10	31.6	36.7	30.5	33.2	35.0	35.7	33.98	38.68	37.27	216
- 5	31.6	36.5	29.8	32.6	34.8	34.7	33.53	38.68	37.14	264
0	35.7	40.9	38.3	39.8	38.5	40.6	38.85	38.64	38.70	264
5	39.3	42.6	41.9	41.6	40.6	40.6	40.84	38.85	39.45	300
10	41.3	43.3	44.4	40.9	42.1	44.6	42.90	39.38	40.44	288
15	42.3	44.9	45.0	43.6	42.3	43.7	43.49	40.15	41.15	264
20	43.6	44.2	44.2	41.6	43.6	45.4	44.02	41.10	41.98	234

TABLE LVII

120°F, 60% Relative Humidity

Experiment Number 38

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	34.7	36.0	32.2	31.1	34.7	22.4	31.11	38.78	36.48	20
-25	35.0	35.8	32.4	33.4	34.7	22.3	31.35	38.78	36.55	15
-20	35.0	35.5	35.5	35.4	35.0	22.8	32.00	38.70	36.69	24
-15	34.8	35.5	35.8	35.2	34.5	22.8	31.90	38.60	36.59	18
-10	34.5	35.2	36.7	34.7	34.2	22.6	31.74	38.60	36.54	26
- 5	34.4	35.4	37.7	34.4	34.0	22.6	31.80	38.58	36.55	14
0	37.7	41.8	41.4	39.5	39.3	42.9	40.50	38.58	37.06	22
5	39.8	43.9	43.7	42.3	41.3	44.2	42.46	38.75	39.86	72
10	40.8	43.7	45.4	42.9	41.9	45.0	43.21	39.30	40.47	408
15	41.6	44.6	44.6	43.4	42.6	45.7	43.78	40.00	41.13	408
20	42.4	44.9	-	44.0	43.4	46.2	44.28	40.89	41.91	408

TABLE LVIII

120°F, 60% Relative Humidity

Experiment Number 42

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.9	36.0	33.9	35.8	35.5	36.0	35.18	38.62	37.59	336
-25	33.9	35.8	33.9	35.0	35.5	35.2	34.87	38.58	37.47	318
-20	34.0	35.8	32.7	34.4	35.7	35.5	34.81	38.52	37.41	336
-15	33.7	35.7	33.4	34.7	35.4	35.0	34.65	38.46	37.32	324
-10	33.4	36.0	33.4	35.5	35.4	35.0	34.70	38.46	37.33	354
- 5	33.2	35.4	32.7	36.0	35.2	34.8	34.45	38.44	37.24	354
0	36.3	41.1	40.6	40.3	41.1	40.8	39.79	38.44	38.85	324
5	39.2	42.6	42.9	41.4	42.8	42.8	41.79	38.80	39.70	366
10	41.1	43.7	43.7	44.4	44.4	44.6	43.47	39.38	40.61	360
15	42.3	44.2	44.6	44.2	44.9	45.4	44.20	40.22	41.41	264
20	43.9	44.9	43.9	44.9	46.5	46.5	45.19	40.85	42.15	228
25	43.9	45.0	43.9	44.6	46.8	47.3	45.43	41.65	42.78	222

TABLE LIX

120°F, 90% Relative Humidity

Experiment Number 10

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	33.6	35.4	30.8	35.7	37.0	36.8	35.08	39.28	38.02	16
-25	34.0	35.5	33.2	35.0	36.8	36.7	35.34	39.20	38.04	44
-20	34.4	35.5	32.2	34.5	36.7	36.5	35.21	39.11	37.94	24
-15	33.4	35.7	32.6	34.4	36.8	36.3	35.00	39.01	37.81	12
-10	33.7	35.4	31.4	35.2	36.8	36.3	34.96	39.01	37.80	20
- 5	33.7	34.7	31.6	35.0	36.3	36.0	34.71	38.96	37.69	16
0	39.8	40.3	39.7	42.3	42.3	40.8	40.70	38.88	39.43	-
5	42.1	41.6	41.9	41.8	42.9	42.6	42.21	39.45	40.28	270
10	43.6	42.6	42.8	43.3	43.6	43.4	43.27	40.35	41.23	276
15	44.6	43.3	42.9	44.2	44.9	44.2	44.11	41.30	42.14	204

TABLE LX

120°F, 90% Relative Humidity

Experiment Number 12

Time	Ts1	Ts2	Ts3	Ts4	Ts5	Ts6	Tsmw	Tr	Tmb	RR
-30	31.7	35.5	30.9	34.8	35.2	33.4	33.43	39.49	37.67	48
-25	31.7	35.0	30.9	34.7	35.0	33.4	33.31	39.45	37.61	44
-20	31.7	35.4	31.3	34.7	35.4	33.6	33.53	39.39	37.63	48
-15	31.3	35.0	31.6	34.2	35.4	34.2	33.51	39.39	37.63	84
-10	30.5	35.5	31.4	34.8	35.0	34.4	33.43	39.28	37.53	48
- 5	31.7	35.5	31.7	34.5	35.0	34.4	33.72	39.22	37.57	28
0	37.0	39.0	41.1	40.3	41.6	41.6	39.91	39.28	39.47	78
5	40.6	41.1	41.3	41.8	43.3	43.1	41.89	39.35	40.11	270
10	42.3	42.4	43.9	43.6	44.4	44.4	43.45	40.65	41.49	270
15	43.9	44.0	44.4	43.7	44.9	44.9	44.35	41.89	42.63	228

TABLE LXI

120°F, 90% Relative Humidity

Experiment Number 30

Time	Ts1	Ts2	Ts3	Ts4	Ts6	Ts6	Tsmw	Tr	Tmb	RR
-30	34.4	35.4	25.9	35.8	34.2	35.4	33.98	39.50	37.84	56
-25	34.4	35.0	25.6	35.7	33.4	34.2	33.45	39.45	37.65	64
-20	34.4	35.4	25.4	35.2	34.0	34.7	33.66	39.31	37.62	24
-15	33.9	35.5	25.6	34.7	33.2	35.0	33.50	39.20	37.49	32
-10	34.0	35.5	25.8	34.7	32.9	34.0	33.25	39.18	37.40	36
- 5	34.0	35.7	26.4	34.4	32.9	35.4	33.68	39.20	37.54	56
0	40.5	41.1	39.0	38.8	44.2	41.9	41.16	39.30	39.86	264
5	42.3	41.9	41.9	40.0	44.9	43.9	42.77	39.88	40.75	282
10	43.9	43.3	44.9	41.9	46.2	43.7	44.00	41.00	41.90	210
15	44.6	44.2	44.9	43.3	46.4	44.2	44.60	42.00	42.78	-

TABLE LXIV

100°F, 30% Relative Humidity

Experiment Number 11

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.27	46.5	49.21	13.61	141	4.2	115	1.30	4.58
30	7.34	47.0	43.73	13.90	146	4.4	116	1.32	4.83
60	7.32	48.0	44.72	14.00	139	4.1	115	1.30	4.50
90	7.35	49.0	40.31	15.01	147	4.1	120.5	1.32	5.20
120	7.39	50.0	31.52	19.98	142	4.0	120.5	1.36	5.65
150	7.38	49.5	32.17	20.72	149	3.9	120	1.34	5.18

TABLE LXV

100°F, 30% Relative Humidity

Experiment Number 13

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.27	38.0	40.05	11.88	150	4.9	121	1.34	5.57
30	7.28	43.0	34.50	18.81	149	5.1	120	1.36	5.85
60	7.33	46.0	35.46	17.29	149	5.0	119.5	1.34	5.75
90	7.30	43.0	34.83	18.59	152	4.9	119.5	1.36	5.80
120	7.30	42.0	36.41	16.02	156	4.9	125.5	1.44	6.08
150	7.25	41.5	35.58	16.92	154	4.8	125.5	1.32	5.30

TABLE LXVI

100°F, 30% Relative Humidity

Experiment Number 34

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.34	32.0	47.11	11.81	148	4.3	111.5	1.28	5.51
30	7.33	32.0	47.52	12.51	149	4.6	113	1.24	5.63
60	7.30	34.0	47.24	12.66	149	4.7	110	1.32	5.40
90	7.29	33.0	47.39	13.00	147	4.7	116	1.32	5.40
120	7.30	32.5	46.33	12.30	144	4.6	118	1.40	5.15
150	7.30	32.5	47.10	11.87	150	4.3	119	1.26	5.30

TABLE LXVII

100°F, 30% Relative Humidity

Experiment Number 35

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.29	45.5	46.18	11.67	146	4.9	117.5	1.48	5.18
30	7.34	46.0	40.08	14.75	147	4.9	117.5	1.38	4.72
60	7.32	46.0	40.47	13.67	149	4.8	119.5	1.44	5.00
90	7.31	46.5	45.08	14.96	146	4.6	119.5	1.30	4.62
120	7.31	46.5	46.48	15.10	147	4.5	118	1.50	5.32
150	7.28	46.5	46.58	15.53	148	4.1	121.5	1.30	4.85

TABLE LXVIII

100°F, 30% Relative Humidity

Experiment Number 44

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.30	45.0	40.83	14.48	160	5.0	123	1.64	5.22
30	7.35	45.0	38.17	18.42	156	4.5	128.5	1.54	5.15
60	7.39	44.0	33.74	19.37	156	4.3	129.5	1.46	4.88
90	7.39	44.5	37.90	16.23	157	4.5	130	1.60	5.47
120	7.33	42.5	38.93	15.61	164	4.9	127	1.80	5.54
150	7.35	43.0	39.40	16.11	160	4.4	126	1.70	5.15

TABLE LXIX

100°F, 60% Relative Humidity

Experiment Number 3

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.21	36.0	45.60	5.22	167	4.0	95	1.94	5.65
30	7.38	36.0	-	-	143	4.7	111.5	1.36	5.72
60	7.43	33.5	38.12	12.05	149	4.7	109	1.28	5.85
90	7.43	35.0	38.61	10.66	144	4.5	117.5	1.68	5.96
120	7.38	34.0	32.54	11.43	146	4.2	115.5	1.52	6.65
150	7.53	36.0	30.66	11.88	167	4.6	139	1.80	6.62

TABLE LXX

100°F, 60% Relative Humidity

Experiment Number 9

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-[$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.23	40.0	44.25	15.42	151	4.5	119	1.42	5.38
30	7.40	42.0	39.86	16.40	147	4.6	110	1.30	5.71
60	7.42	42.0	37.04	21.79	148	4.3	114.5	1.52	5.74
90	7.42	41.5	33.24	17.91	145	4.2	117	1.42	5.50
120	7.42	43.0	35.90	17.00	148	4.7	116	1.24	6.30
150	7.42	42.0	36.74	14.77	146	4.9	114.5	1.56	5.45

TABLE LXXI

100°F, 60% Relative Humidity

Experiment Number 14

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.34	41.5	43.97	17.42	152	4.3	118.5	1.66	5.74
30	7.50	43.0	35.62	20.45	145	4.5	121.5	1.70	5.65
60	7.59	45.0	32.01	20.01	144	4.2	124	1.66	5.30
90	7.59	44.5	32.32	19.81	135	4.0	121	1.74	5.40
120	7.50	44.5	31.78	21.37	146	4.1	125	1.92	5.68
150	7.43	45.0	33.37	19.23	144	3.5	121.5	1.82	5.48

TABLE LXXII

100°F, 60% Relative Humidity

Experiment Number 23

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.35	50.5	46.41	17.23	158	4.6	122	1.84	5.42
30	7.60	49.5	36.06	19.54	163	5.0	127.5	1.82	5.74
60	7.60	50.0	32.51	20.73	154	4.7	126.5	1.90	5.62
90	7.54	49.0	28.78	21.61	157	4.5	119	1.76	5.42
120	7.50	49.0	25.89	22.94	156	4.4	124.5	1.68	5.62
150	7.45	49.0	30.56	23.04	159	4.5	124.5	1.94	5.91

TABLE LXXIII

100°F, 60% Relative Humidity

Experiment Number 39

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.23	40.0	39.67	12.35	150	4.5	114	1.70	5.62
30	7.49	40.0	38.31	14.92	152	4.7	114	1.66	5.69
60	7.52	40.5	-	-	157	5.4	127	1.78	5.22
90	7.56	40.0	30.28	15.33	161	4.2	125	1.60	4.80
120	7.54	39.5	29.17	17.06	156	4.0	119.5	1.70	5.12
150	7.53	39.0	28.93	15.11	165	4.2	120	1.72	5.15

TABLE LXXIV

100°F, 90% Relative Humidity

Experiment Number 1

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.27	42.0	49.39	13.98	156	5.2	95.5	2.36	5.85
30	7.42	38.0	35.35	17.78	166	5.1	65.5	2.36	6.05
60	7.64	42.0	29.15	19.24	156	4.5	91	2.00	5.61
90	7.55	41.5	29.66	18.66	167	4.6	81.5	2.12	5.92
120	7.63	40.5	29.84	15.16	151	4.2	107.5	2.44	5.80
150	-	-	-	-	165	4.4	125	2.08	5.80

TABLE LXXV

100°F, 90% Relative Humidity

Experiment Number 24

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.29	42.0	41.27	14.94	159	4.4	116	2.16	3.73
30	7.57	47.5	37.19	17.68	151	4.4	114.5	1.96	4.16
60	7.59	47.0	28.05	22.19	151	3.9	120.5	1.54	4.77
90	7.64	47.5	19.91	23.16	147	4.1	119	2.16	4.13
120	7.67	44.5	18.56	22.68	147	4.2	132	1.80	5.88
150	7.54	47.0	18.54	22.95	157	4.1	119.5	2.00	4.92

TABLE LXXVI

100°F, 90% Relative Humidity

Experiment Number 32

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.31	36.5	41.04	9.36	152	4.6	119	1.50	5.41
30	7.53	36.0	37.09	12.56	153	4.9	120	1.44	5.49
60	7.71	35.5	27.79	13.98	151	4.6	120.5	1.20	5.27
90	7.70	36.0	21.87	15.99	154	4.3	128	1.16	4.55
120	7.69	36.5	19.00	16.44	154	4.3	129	1.22	4.47
150	7.71	36.5	17.84	16.35	155	4.2	126	1.30	4.47

TABLE LXXVII

100°F, 90% Relative Humidity

Experiment Number 36

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.35	39.5	42.46	12.70	152	4.7	119.5	1.52	4.97
30	7.38	41.5	38.47	18.12	152	4.8	119.5	1.58	5.26
60	7.47	42.5	24.51	18.88	152	4.5	120	1.44	5.26
90	7.40	45.0	20.73	19.68	152	4.7	123	1.58	4.27
120	7.45	45.0	17.12	21.02	159	5.0	128	2.12	4.80
150	7.41	46.0	17.53	20.40	155	4.4	125.5	1.64	4.82

TABLE LXXVIII

100°F, 90% Relative Humidity

Experiment Number 45

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.29	43.0	44.93	16.93	153	4.5	119	1.70	4.80
30	7.59	46.5	27.58	22.42	152	4.3	121.5	1.60	5.09
60	7.65	47.5	22.98	22.93	160	4.6	128	1.72	5.52
90	7.76	52.5	20.40	22.61	155	4.8	125	1.60	5.12
120	7.77	54.5	20.60	22.76	163	4.7	132	1.92	5.68
150	7.70	57.5	20.91	25.80	157	4.8	129.5	1.92	5.46

TABLE LXXIX

110°F, 30% Relative Humidity

Experiment Number 7

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.32	37.0	47.29	12.43	142	4.1	118	1.32	5.11
30	7.48	38.0	37.56	12.92	143	4.5	117	1.34	5.42
60	7.54	37.5	32.04	14.50	142	3.9	115.5	.96	4.53
90	7.52	37.0	33.64	15.13	145	4.0	116.5	1.16	4.67
120	7.49	37.5	34.29	13.95	153	3.9	119.5	1.16	5.05
150	7.49	37.5	34.19	13.81	149	3.8	120	1.20	4.45

TABLE LXXX

110°F, 30% Relative Humidity

Experiment Number 20

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.29	44.5	45.89	14.27	138	4.0	111.5	1.10	4.27
30	7.49	47.5	35.39	20.18	145	4.6	115	1.10	4.60
60	7.52	49.0	34.27	19.72	141	4.2	113	1.40	4.92
90	7.56	48.0	33.07	19.96	154	4.2	113	1.38	5.58
120	7.58	47.0	31.46	19.96	153	4.1	121	1.40	5.35
150	7.57	46.5	32.22	19.11	160	3.6	118.5	1.42	5.45

TABLE LXXXI

110°F, 30% Relative Humidity

Experiment Number 37

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.27	34.0	43.89	10.46	145	4.7	117	1.22	4.57
30	7.38	39.5	40.54	14.63	149	4.9	122	1.22	5.13
60	7.50	40.0	31.08	16.98	148	4.7	123	1.18	5.09
90	7.51	39.5	31.08	17.13	152	4.7	128	1.18	5.18
120	7.51	39.5	31.44	16.94	153	4.6	124.5	1.22	4.87
150	7.49	38.5	32.30	16.58	156	4.5	127.5	1.20	4.77

TABLE LXXXII

110°F, 30% Relative Humidity

Experiment Number 40

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.33	42.0	42.89	13.95	141	4.4	117	1.30	5.05
30	7.32	43.0	39.75	13.86	143	4.5	117	1.32	5.04
60	7.34	42.5	36.26	17.23	143	4.6	118.5	1.40	5.01
90	7.38	42.5	36.03	17.12	143	4.5	121.5	1.34	5.10
120	7.36	42.0	36.43	18.03	156	4.8	118.5	1.40	5.55
150	7.30	42.5	38.16	17.55	147	4.4	117.5	1.32	5.38

TABLE LXXXIII

110°F, 30% Relative Humidity

Experiment Number 41

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.29	34.0	44.98	12.02	138	4.2	116	1.46	5.32
30	7.33	35.5	39.23	15.16	146	4.2	116.5	1.30	5.18
60	7.32	36.0	37.54	16.34	146	4.3	120.5	1.28	5.35
90	7.35	36.0	35.82	17.99	143	4.1	118	1.26	4.83
120	7.36	37.0	31.52	19.26	148	4.1	124	1.30	4.95
150	7.40	37.5	27.21	22.08	146	4.0	124.5	1.32	4.95

TABLE LXXXIV

110°F, 60% Relative Humidity

Experiment Number 18

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.30	37.5	39.69	12.78	139	4.4	120	1.34	5.58
30	7.47	40.0	32.35	14.89	144	4.7	123	1.34	5.82
60	7.69	42.0	19.75	18.99	148	4.6	112	1.40	5.53

TABLE LXXXV

110°F, 60% Relative Humidity

Experiment Number 22

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.29	37.5	48.88	14.22	143	4.1	117	1.54	5.00
30	7.72	44.0	20.41	20.80	150	4.5	123	1.40	5.00
45	7.77	46.5	14.77	21.45	148	4.4	117.5	1.40	5.46

TABLE LXXXVI

110°F, 60% Relative Humidity

Experiment Number 27

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.26	38.5	46.65	13.56	146	4.1	122	1.34	5.65
25	7.60	43.5	19.08	20.99	153	5.0	121.5	1.30	5.39

TABLE LXXXVII

110°F, 60% Relative Humidity

Experiment Number 29

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.26	39.5	52.12	15.25	146	4.6	113	1.48	5.11
30	7.79	43.5	28.48	17.38	145	4.9	121	1.50	5.19
45	7.83	44.0	24.50	17.72	161	5.3	117	1.72	6.65

TABLE LXXXVIII

110°F, 60% Relative Humidity

Experiment Number 43

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.33	50.5	47.94	18.38	151	4.3	116.5	1.70	5.65
30	7.68	52.5	15.47	23.37	146	4.4	118	1.76	5.77

TABLE LXXXIX

110°F, 90% Relative Humidity

Experiment Number 2

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.25	40.5	48.46	12.06	151	4.7	118	1.64	4.62
30	7.54	41.5	24.51	16.94	159	5.4	125.5	1.76	5.40
45	7.67	43.5	12.68	19.75	153	5.1	122	1.64	5.12

TABLE XC

110°F, 90% Relative Humidity

Experiment Number 5

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.34	39.0	50.53	12.07	148	4.8	116.5	1.50	4.07
30	7.56	40.0	22.72	18.45	155	5.2	126	1.34	5.12

TABLE XCIV

120°F, 30% Relative Humidity

Experiment Number 6

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.34	47.5	43.42	14.77	158	4.9	126	1.50	5.09
30	7.57	49.5	25.34	16.72	154	4.8	128.5	1.44	5.25
45	7.67	52.0	17.02	19.10	155	4.4	131	1.34	4.78

TABLE XCV

120°F, 30% Relative Humidity

Experiment Number 8

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.32	42.0	43.99	14.67	149	4.6	121.5	1.44	3.48
25	7.59	43.5	22.23	17.00	150	5.5	123.5	-	5.21

TABLE XCVI

120°F, 30% Relative Humidity

Experiment Number 16

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.25	40.5	46.80	14.97	154	4.7	117	1.30	5.00
30	7.59	43.0	21.53	17.80	147	4.8	118	1.30	5.54

TABLE XCVII

120°F, 30% Relative Humidity

Experiment Number 19

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.24	37.5	49.20	12.61	148	4.4	116	1.56	4.08
30	7.62	44.5	38.02	15.07	149	5.1	118.5	1.50	5.29
55	7.88	50.0	17.69	16.58	153	5.2	119	1.40	5.24

TABLE XCVIII

120°F, 30% Relative Humidity

Experiment Number 26

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.34	43.5	48.56	13.26	155	4.6	121	1.68	4.85
30	7.95	48.5	19.40	21.85	152	4.4	122.5	1.48	5.73

TABLE XCIX

120°F, 60% Relative Humidity

Experiment Number 4

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.25	44.0	46.28	14.56	156	4.8	122	1.50	5.06
25	7.60	44.5	16.34	17.80	162	5.1	127.5	1.66	5.80

TABLE C

120°F, 60% Relative Humidity

Experiment Number 15

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.27	41.0	43.29	13.38	147	4.3	117	1.24	3.98
25	7.77	42.5	15.60	19.38	149	4.7	124	1.32	5.25

TABLE CI

120°F, 60% Relative Humidity

Experiment Number 28

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.29	48.0	39.47	18.08	150	4.1	116	1.80	5.06
25	7.59	49.5	15.18	23.28	156	4.5	127	1.94	5.50

TABLE CII

120°F, 60% Relative Humidity

Experiment Number 38

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.33	-	48.05	15.11	150	4.4	117.5	1.28	4.78
25	7.63	-	17.33	24.70	155	5.2	124	1.30	4.95

TABLE CIII

120°F, 60% Relative Humidity

Experiment Number 42

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.27	45.5	37.60	15.37	142	4.6	118	1.56	4.40
25	7.80	46.0	14.14	19.66	154	4.8	128	1.86	4.85

TABLE CIV

120°F, 90% Relative Humidity

Experiment Number 10

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.30	43.0	42.26	16.19	156	4.3	120	1.74	4.30
20	7.74	46.0	12.68	22.02	155	4.6	126	1.44	4.15

TABLE CV

120°F, 90% Relative Humidity

Experiment Number 12

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.32	42.0	44.18	16.36	145	3.7	126	1.62	4.55
15	7.50	45.5	24.46	21.70	156	3.8	112.5	1.32	3.61

TABLE CVI

120°F, 90% Relative Humidity

Experiment Number 30

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.28	41.5	44.07	14.89	155	3.8	128.5	1.24	3.50
15	7.58	42.0	20.78	20.39	151	5.0	121.5	1.40	4.30

TABLE CVII

120°F, 90% Relative Humidity

Experiment Number 31

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.28	38.5	45.40	14.63	151	4.2	121	1.36	4.31
10	7.48	41.5	22.72	20.06	163	5.4	123	1.68	4.80

TABLE CVIII

120°F, 90% Relative Humidity

Experiment Number 33

Time	pH	hct	$[CO_2]$	$[O_2]$	$[Na^+]$	$[K^+]$	$[Cl^-]$	$[Mg^{++}]$	$[Ca^{++}]$
0	7.27	42.0	42.88	14.44	149	4.0	113.5	1.44	4.12
15	7.70	45.5	11.28	20.69	156	4.7	126.5	1.60	5.25

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