XIV. *On the Temperature of Man.*

By John Davy, *M.D., F.R.S.L. & E., Inspector-General of Army Hospitals.*

Received May 8,—Read June 19, 1845.

It has been too generally taken for granted that the temperature of man in health, as measured by a thermometer placed under the tongue, is a constant one. I have endeavoured to prove from the results of observations, that this is not strictly correct; that when not disturbed by disease it is subject to variation, to rise and fall under certain influences, especially of heat and cold, rest and exercise*.

In the present communication I propose to submit to the Royal Society some further observations on the same subject, made with an instrument better adapted for the inquiry than the medical thermometer commonly used, and which has afforded results of a precise and satisfactory kind.

The thermometer I have employed is a bent one, about twelve inches and a half long, its bulb about an inch long, and, where widest, half an inch thick; its curvature about three and a half inches from the bulb, and its stem, to which the scale is attached, nearly at right angles to the bulb, so that when inserted under the tongue, the observer has no difficulty in distinguishing accurately the degrees himself, whether near-sighted or the contrary; in the latter instance using merely a common magnifying glass. Each degree of the scale is a little more than half an inch (·6 inch), and is divided into ten parts; and each of these parts is sufficiently large to admit of subdivision by the eye.

It may be right to premise a few words regarding the manner of observing with this instrument; and to notice some precautions which it is necessary to take to avoid error.

First, as to the placing of the thermometer: it is requisite that the bulb should be introduced under the tongue, and as far back as possible; and that whilst in the mouth, respiration should be carried on entirely through the nostrils. If the thermometer is placed in the side of the mouth, between the teeth and the cheek, the temperature indicated is from three-tenths to one-tenth of a degree less, according to the degree of coldness of the atmosphere.

Next, as to time: it is necessary that the thermometer remain in the mouth many minutes, till the observer is sure that the maximum height is attained. If the mouth has been kept closed for a quarter of an hour previously, a shorter time is required, than if allowed to be open and the passage of respiration. This is well shown by trials with the thermometer raised a few degrees above the temperature of the mouth

* Researches, Physiological and Anatomical, vol. i. p. 162; and Philosophical Transactions for 1844, p. 61.

before introduction. In the one case, the thermometer slowly falls to the temperature of the mouth, and is stationary; in the other case, after having fallen it again rises, continuing to rise till the maximum temperature of the closed mouth is acquired.

The observations which I have made with this thermometer have been altogether on myself; it would have been difficult indeed to have made them on another, with the requisite degree of accuracy, as they are tedious, demanding so much time and care. They were begun in August last, and have been continued almost daily up to the present time, with the exception of the greater part of the month of October, when they were interrupted until a second thermometer could be procured to supply the place of the first, which was then broken, and which was even more delicate than the second. It was my intention to have extended them to a period of twelve months before collecting the results; but this I am not able to accomplish, having received an order to prepare and hold myself in readiness for foreign service. Abroad I hope to be able to continue them, and as that will be in a tropical climate, I am the more desirous of communicating now the information I have already obtained; the comparison of the two sets may prove interesting.

In conjunction with the temperature under the tongue, I have in most instances noticed the pulse and respiration, considering it a desideratum so to do, and with the hope that the observations on the latter may be useful data, and may in some measure tend to throw light on the former, there being such an intimate connexion between them. The posture in which the pulse and respiration have been counted has always been a sitting one.

Of the many problems which might be proposed regarding the temperature of the body, I shall now only touch on a small number; and I shall be well-pleased if the information I have to give shall be considered merely as a contribution towards their solution, a beginning of an inquiry to be extended.

1. *Of the Variation of Temperature during the twenty-four hours.*

To endeavour to determine what is the extent of this variation, I have made on several occasions, observations every second or third hour, from the time of rising to that of going to rest, confining myself to the house during the whole time and to rooms of nearly the same temperature, the greater part of it, and varying but little my occupation. The following for a single day will give a pretty accurate idea of the result:—

	Temperature under tongue.	Pulse.	Respirations.	Temperature of air of room.	
April 13. 7 A.M.	98·5°	54	15	49°	Just after rising.
9 A.M.	98·4	74	16	53	Just after breakfast.
11 A.M.	98·4	60	15	53	
2 P.M.	98·7	54	15	55	
4 P.M.	98·9	54	15	55	
5 P.M.	98·7	54	15	55	
6½ P.M.	98·3	62	16	57	Shortly after dinner.
7½ P.M.	97·7	66	15	56	Before drinking tea.
11 P.M.	98·1	52	15	64	
14. 1 A.M.	97·6	54	15	60	

During the whole period, I have almost constantly tried the temperature under the tongue on rising and before going to rest, and in many instances in the middle of the day, between 2 and 4 P.M., when the circumstances were favourable. These observations I shall give in detail in tables appended; here it may be sufficient to notice the mean of each month's observations.

	Temperature under tongue.			Pulse.			Respirations.			Temperature of air of room.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
August	98°·7	98°·5	98°·0	56·9	52·5	53·1	15·3	15·1	15	61°	63°	67°
September ..	98·8	98·9	98·0	59·3	55·2	55·8	15·5	15	15·4	66	63	65
November ..	98·9	98·6	97·9	57·8	57·6	54·5	16·7	17·1	15·8	51	48	64
December ..	98·7	98·2	97·9	58·9	55·2	56·5	15·7	16	15·4	42	47	60
January	98·8	98·07	97·9	58·7	59·3	57·9	15·5	15·3	15·1	45	55	60
February ..	98·6	98·6	97·9	55·5	54·4	52·3	15·5	15	15·1	42	48	61
March	98·74	98·59	97·93	57	53	54	15·1	15·1	15	46	54	60
April	98·66	98·57	97·88	56·5	54·8	53·6	15·4	15	14·8	54·6	59·8	62·4
	98·74	98·52	97·92	57·6	55·2	54·7	15·6	15·4	15·2	50·9	54·7	62

During this period, comprising eight months, the health of the observer (aged fifty-five) was pretty good, almost uninterruptedly so, excepting in December and January, when he experienced slight lumbago, not preventing the taking of exercise; and for a few days in November and January an attack of catarrh in a mild form.

As I wish to be as concise as possible, I shall comment very little on the results of the summary of observations. They seem to prove in a decided manner that the temperature under the tongue, when under no disturbing influence, is about its maximum after waking after the repose of the night; that it continues high, but fluctuating more or less (probably owing to disturbing circumstances) till towards nightfall; and that it is lowest about midnight. Its lowness at the last-mentioned time is the more remarkable, as the temperature of the room in which the observer sat at night was almost uniformly higher than of that which he occupied during the day.

2. *Of the Variation of Temperature during different seasons of the year.*

The following Table exhibits the mean results of the observations made during the eight months, at the different periods of the day, both of the temperature under the tongue and of the air of the room.

	Mean temperature under the tongue.	Air of room.
August	98°·4	63°·7
September ..	98·57	64·7
November ..	98·47	54·3
December ..	98·27	49·7
January	98·36	53·3
February ..	98·37	50·3
March	98·42	53·3
April	98·37	55·5

These results give an average temperature of 98·4, that of the air being about 55·5. They show a slight relation between the temperature of the body and of the air, but less perhaps than might be expected, and less unquestionably than would have been exhibited under circumstances not equally favourable for the preservation of an equable warmth, especially at night, in the uniform temperature of the sitting-room; and when at rest, from warm bed-clothes, and during the day from sitting in cold weather near a fire, and from the clothing then, as well as at night, being varied with the degree of cold to be resisted, having in view the preserving of an agreeable feeling. The effect and perhaps best sign of the happy temperate mean in some facts which I shall have presently to bring forward, may aid in illustrating the remark just made.

3. *Of the Effect of Active Exercise on the Temperature.*

By active exercise, I mean that which occasions acceleration of the heart's action, and of respiration, and commonly a feeling of increased warmth, such as fast walking and riding, in contradistinction to the passive kind, as that which is taken in an easy carriage.

The following detail exhibits the results of observations made immediately after active exercise, in different months and under various circumstances:—

	Tongue.	Pulse.	Respirations.	Air.
August 15, 5 P.M. After fly-fishing by the river side, and riding about seven hours; feet and hands warm	99°·4	80	18	63°
August 17, 3 P.M. After a walk of three miles; gently perspiring	99·0	70	16	56
August 20, 5 P.M. After fishing five hours; gently perspiring	99·3	80	20	62
August 27, 2 P.M. After a ride (pretty fast) of five miles; feet and hands warm	98·7	58	16	64
August 29, 5 P.M. After a ride (pretty fast) of about fourteen miles; sun powerful; perspiring	99·5	84	18	64
August 31, 12 M. After a ride of ten miles; perspiring	99·1	60	16	65
August 31, 4 P.M. After an hour's walk; sun powerful; perspiring	99·3	64	18	70
September 2, 12 M. After a walk of two hours; the sun powerful; perspiring	99·2	64	18	72
October 30, 5 P.M. After a ride of ten miles (pretty fast); feet and hands warm	99·3	78	16	49
November 16, 4 P.M. After fishing two hours; slightly perspiring	98·9	62	18	55
December 31, 3 P.M. After riding and walking several hours; feet and hands warm	99·1	74	16	34
February 3. After a walk of seventeen miles; moderately warm	99·1	98	22	32
March 7, 5 P.M. After a mountain excursion on foot for several hours, and riding ten miles	99·2	90	17	33
March 20, 3 P.M. After a ride of ten miles; feet and hands warm	98·9	56	16	37
March 31, 1 P.M. After two hours' fishing; pleasantly warm	98·9	62	16	54
April 2, 1 P.M. After riding ten miles; moderately warm	98·9	62	16	54
April 11, 4 P.M. After five hours' fishing; not heated	99·0	70	16	40
April 17, 2 P.M. After four hours' fishing; slightly perspiring	99·2	84	18	55

These observations, selected from a large number of similar bearing, show in a decided manner, that active exercise, not carried to the extent of exhausting fatigue, raises the temperature of the body; and that the increase is, at least within a certain limit, proportional to the degree of muscular exertion made.

4. *Of the Effect of Carriage Exercise on the Temperature.*

The observations which follow, were made immediately after getting out of the carriage, which was a close one, and its windows commonly closed; and the dress worn, at the time of being out, was warm.

		Tongue.	Pulse.	Respiration.	Air.
		°			°
Nov. 17. 1 P.M.	After a drive of 8 miles.	97·7	52	18	53
19. 3 P.M.	After a drive of 10 miles.	97·7	48	16	48
25. 2 P.M.	After a drive of 10 miles.	97·0	56	16	44
27. 12 M.	After a drive of 8 miles.	97·5	56	18	42
30. 12 M.	After a drive of 8 miles.	97·4	56	16	44
Jan. 5. 5 P.M.	After a drive of 7 miles.	97·7	50	17	32

Feet and hands cool, almost cold, as was experienced in all the preceding instances.

These results are strongly contrasted with those given in the preceding section, showing the exalting effect of active exercise on the temperature. I have other results, equally proving how gentle exercise, in a cold atmosphere, has a depressing effect, whether taken in a carriage, on horseback, or on foot, walking slowly.

5. *Of the Effect of Exposure to Cold Air without exercise.*

The few observations I have collected on this point, have been made the instant after returning from an adjoining church, the temperature of which in the cold weather of winter is little above the freezing-point, no attempt being made to warm it, and the congregation which assembles in it at that season being small.

	Tongue.	Pulse.	Respirations.	Air.
	°			°
Nov. 24. 1 P.M.	97·0	52	16	42
Jan. 12. 1 P.M.	97·1	50	15	40
Feb. 9. 1 P.M.	96·7	48	15	33
March 16. 1 P.M.	95·9	44	16	32

In each of the above instances, in spite of warm clothing, the sensation experienced by the observer was that of disagreeable chilliness, and in the feet and hands, of coldness; a feeling of drowsiness was also perceived, as if the condition induced were an approach to the state of temperature of a hybernating animal, or to that which is probably the prelude to the sleep in the human being resulting from long exposure to severe cold without exercise.

6. *Of the Effect of Excited and Sustained Attention on the Temperature.*

The state of mind referred to is that accompanied with exertion, such as is experienced in composition, or in reading a work of exciting interest.

The observations which follow have been made entirely at night, after from two to five hours of sustained attention. Many more were made by day; but these are not given, as they are not so well fitted for comparison.

	Tongue.	Pulse.	Respirations.	Air.
	°			°
Aug. 19. 12 P.M.	98·45	58	15	68
29. 11 P.M.	98·5	62	16	62
Sept. 23. 1 A.M.	98·5	54	16	65
Nov. 26. 12 P.M.	98·4	56	15	60
28. 12 P.M.	98·7	60	16	62
Dec. 14. 1 A.M.	98·5	56	15	64
20. 1 A.M.	98·7	58	16	60
30. 1 A.M.	98·0	56	16	55
Jan. 23. 12 P.M.	98·35	60	14	61
Feb. 3. 1 A.M.	98·4	60	17	60
12. 12 P.M.	98·2	58	16	60
21. 1 A.M.	98·4	54	15	60
24. 2 A.M.	98·4	58	14	60
26. 2 A.M.	98·0	56	15	60
Mar. 4. 1 A.M.	98·5	56	15	60
11. 12 P.M.	98·5	52	14	60
14. 1 A.M.	98·2	54	15	61
April 3. 12 P.M.	98·4	58	16	68
	98·4			

These observations show an increase of temperature after sustained exertion of mind. Though the increase is slight, yet I think it must be admitted to be decided, comparing the mean (98·4) with the average result of the observations (97·92) made at the same period of the twenty-four hours, when the attention was not roused, when it was rather in a passive indolent state, as in reading merely for amusement, or in the mechanical process of copying writing, both which seem to have, as is indeed generally believed, rather a sedative influence than an exciting one; and are to the former very like what passive bodily exercise is to active muscular exertion.

7. *Of the Effect of taking Food on the Temperature.*

The following observations were made after rising from the dinner-table, at which the observer commonly sat down at 5 o'clock, and partook pretty fully, using a mixed diet,—never taking anything between the breakfast and dinner-hour,—and using wine commonly at the latter meal, to the extent of three or four glasses, to the exclusion of malt liquor.

	Tongue.	Pulse.	Respirations.	Air.
	°			°
Aug. 15. 7 P.M.	98·2			
22. 6½ P.M.	97·9	60	16	60
25. 6½ P.M.	98·1	62	15	59
27. 6½ P.M.	98·4	58	16	62
28. 7 P.M.	98·6	76	16	68
29. 7 P.M.	98·3	82	16	63
Sept. 2. 6 P.M.	98·5	68	18	17
3. 6 P.M.	98·3	60	15	70
8. 8 P.M.	97·8	60	15	65
22. 6½ P.M.	98·4	70	15	55
29. 6 P.M.	98·5	68	16	62
Nov. 16. 7 P.M.	97·9	62	15	60
23. 7½ P.M.	98·1	70	18	54
Dec. 21. 7 P.M.	97·9	70	14	63
28. 7 P.M.	97·7	64	15	58
29. 8 P.M.	98·0	70	15	55
Jan. 2. 6½ P.M.	97·9	68	15	55
Mar. 24. 6½ P.M.	98·5	66	15	52
	98·1			

The majority of these results (the mean temperature of the whole being 98·1) seem to prove, that the amount of heat is reduced by a full meal. In the observer's case, as in most others, drowsiness followed this meal, thus approximating the condition of the animal system to that which precedes sleep. On particular occasions, when a larger quantity of wine than usual was taken, the reduction of temperature was commonly most strongly marked. A light meal, such as that of breakfast, consisting of tea, with a portion of toasted bread with butter, and often an egg, has had little effect in depressing or altering materially the temperature. It may be noticed, as regards the habits of the observer, in connexion with the observations on temperature made at a late hour, that after dinner he never took solid food, only two or three cups of tea, and this about 8 P.M.

The preceding observations, generally considered, appear to indicate clearly that the temperature of man, as determined in the manner described, is like the animal functions and secretions, constantly fluctuating within certain limits; and like them, observing in its fluctuation a certain order, constituting as it were two series; one regular, as the diurnal, connected with rest and refreshment from rest; the other, casual or accidental, depending on varying circumstances of irregular occurrence, as exercise, mental exertion, exposure to heat, and the contrary.

As the observations brought forward have been made on one individual, the inferences from them as regards extended application, can be held to be only probable, but probable, I cannot but think, in a high degree, the average temperature of the observer being nowise peculiar; and the results moreover being what might be expected reasoning on the subject, taking for data the proportions of oxygen which have been ascertained to be consumed, and of carbonic acid evolved in respiration, at different periods of the twenty-four hours, and under different circumstances.

Should observations similarly made on others present the like results (and I cannot but be confident that they will), more particular inferences may be drawn from them, especially in conjunction with respiration and the heart's action, not without interest to physiology; and they may admit of important practical application to the regulation of clothing, the taking of exercise, the warming of dwelling-rooms, in brief, to various measures conducive to comfort, the prevention of disease, and its cure. A step in advance is made, if it is only determined, as I believe it to be, that in the healthiest condition of the system, there is danger attending either extreme, either of low uniform temperature, or of a high uniform temperature, and that the circumstances which are proper to regulate variability within certain limits, not prevent it, are those which conduce most to health, as well as to agreeable sensation, enjoyment and length of life.

The Oaks, Ambleside,
May 1, 1845.

Appendix.

The Tables which follow, containing the monthly observations, require little additional explanation. It may be right to state, that they do not include the observations made under the influence of accidental disturbing circumstances, as active exercise, &c., the most distinct of which have been given apart in a section appropriated to them. The observations in these Tables, made under ordinary circumstances, or nearly such, will, I believe, be useful for comparison with the former, and I would hope, for reference, in progress of inquiry. In most instances, it will be found on comparison, that an unusual elevation of temperature has been followed by unwonted depression, and *vice versâ*.

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
	°	°	°							°	°	°
Aug. 6.	98·3	....	97·9									
7.	98·8	....	98·2	56	....	54	13	....	15	63	....	68
8.	98·6	98·5	97·8	56	52	52	13	14	16	63	60	66
9.	98·8	....	98·2	60	....	62	14	....	16	63	....	70
10.	98·8	....	97·8	....	....	70	....	....	14	....	....	70
11.	98·5	98·6	98·0	56	50	58	14	15	16	62	59	67
12.	98·6	....	98·0	....	....	58	....	....	14	....	....	68
13.	98·7	98·5	97·7	52	52	58	14	15	16	61	62	68
14.	98·8	98·7	98·1	56	60	52	15	16	15	62	64	61
15.	98·7	....	....	58	....	....	16	....	....	64		
16.	98·5	98·5	97·6	56	50	50	16	14	15	63	63	63
17.	98·8	98·5	98·1	54	50	50	15	15	14	62	62	68
18.	98·7	98·4	98·2	62	54	56	16	15	16	60	68	68
19.	98·8	98·4	98·4	66	50	58	18	14	15	60	63	68
20.	98·7	....	97·9	54	....	58	16	....	15	62	....	68
21.	98·6	....	98·0	58	.. .	56	16	....	15	62	....	66
22.	99·0	....	98·0	56	....	58	16	....	15	60	....	68
23.	98·6	....	97·7	52	....	52	16	....	16	60	....	68
24.	98·5	98·5	97·8	52	50	48	16	16	14	60	61	68
25.	98·7	98·8	98·4	56	54	60	15	15	16	60	54	66
26.	99·0	....	98·1	58	....	50	15	....	15	60	....	65
27.	98·7	....	98·2	54	....	52	15	....	15	60	....	62
28.	98·7	98·8	98·1	60	54	54	15	17	17	62	72	68
29.	98·8	....	98·5	54	....	62	16	....	16	61	....	62
30.	98·9	98·8	97·7	62	54	50	16	15	16	60	63	63
31.	98·7	....	97·8	62	....	58	16	....	16	65	....	68
	98·7	98·5	98·0	56·9	52·5	53·1	15·3	15·1	15	61	63	67

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
Sept. 1.	98°·7	98°·7	97°·8	62	56	56	17	16	15	67°	67°	67°
2.	98·8	98·7	98·1	54	54	54	16	16	16	68	71	68
3.	98·9	98·7	98·3	58	54	54	16	15	16	70	71	68
4.	99·0	....	98·1	60	....	48	16	....	14	72	....	70
5.	98·8	98·6	98·1	62	54	60	16	16	15	70	68	68
6.	98·8	....	....	60	....	....	15	...	....	69	....	....
7.	98·7	98·7	98·2	60	60	56	15	16	16	68	68	68
8.	98·8	98·9	97·8	54	60	52	15	15	16	62	65	64
9.	99·0	99·0	98·1	58	....	50	15	....	15	64	....	64
10.	99·0	....	....	60	....	....	15	....	....	64	....	....
11.	....	....	97·6	....	....	50	....	....	....	....	....	67
12.	98·7	....	98·2	56	....	50	15	....	15	62	....	64
13.	98·8	98·8	98·1	66	52	54	16	17	16	62	60	68
14.	99·0	98·7	98·0	62	52	50	16	16	15	61	60	60
15.	99·0	99·0	98·2	66	58	54	16	18	17	63	60	69
16.	98·8	....	97·9	66	....	52	16	....	15	62	....	68
17.	98·6	....	97·7	64	....	64	15	....	16	62	....	68
18.	99·0	....	98·4	62	....	50	17	....	14	62	....	61
19.	99·0	99·0	97·9	64	60	54	15	16	16	60	62	63
20.	99·0	....	98·3	58	....	52	15	....	16	60	....	58
21.	99·0	....	98·1	60	....	54	16	....	15	58	....	58
22.	99·0	99·0	98·5	54	48	54	15	16	16	58	55	65
23.	99·0	....	97·7	56	....	52	16	....	14	65	....	68
24.	98·7	....	98·3	54	....	56	14	....	15	58	....	63
25.	99·2	....	97·2	58	....	48	16	....	16	63	....	66
26.	98·3	99·0	98·3	58	56	54	16	16	16	58	58	67
27.	98·9	....	98·0	58	....	50	16	....	15	60	....	68
28.	98·6	....	97·7	60	....	62	16	....	14	62	....	69
29.	98·6	98·9	98·3	54	56	52	15	16	16	59	63	68
30.	99·0	....	....	56	....	....	16	....	....	58	....	
	98·8	98·9	98·0	59·3	55·2	55·8	15·5	16	15·4	66	63	65

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
Nov. 1.	98°·75	98°·8	97°·6	54	58	....	16	17	16	53°	54°	62°
2.	98·8	98·5	97·7	60	58	54	17	18	16	52	44	60
3.	98·6	98·5	97·9	52	48	48	16	17	17	50	55	65
4.	98·7	....	97·9	60	....	70	16	....	16	51	....	66
5.	98·9	....	97·6	64	....	52	16	....	16	52	....	68
6.	99·2	....	98·0	66	....	58	17	....	16	50	....	63
7.	98·7	98·7	98·3	58	58	58	16	16	16	51	46	62
8.	99·5	....	97·8	63	....	54	17	....	17	52	....	68
9.	98·8	....	....	62	....	....	16	....	....	51	....	....
11.	99·3	98·3	97·8	62	61	50	17	17	15	52	54	68
12.	98·6	98·7	98·2	60	56	52	17	17	15	47	40	65
13.	98·8	98·7	98·1	56	62	54	16	17	16	52	50	62
14.	98·5	....	98·0	58	....	58	16	....	16	51	....	64
15.	98·8	98·7	97·9	56	56	60	16	17	17	54	55	63
16.	98·9	98·9	97·7	56	62	58	15	18	15	55	55	68
17.	98·7	....	97·5	52	....	52	18	....	15	53	....	65
18.	98·6	....	....	54	....	....	15	....	....	55	....	....
19.	99·1	....	98·2	60	....	56	17	....	16	55	....	66
20.	99·1	....	98·1	56	....	56	17	....	15	55	....	65
21.	98·9	....	98·0	60	....	58	17	....	15	55	....	62
22.	99·0	....	98·0	60	....	56	16	....	14	55	....	66
23.	99·0	....	98·2	60	....	62	16	....	16	53	....	65
24.	99·0	....	98·2	58	....	62	16	....	16	52	....	64
25.	99·2	....	98·1	56	....	56	17	....	16	48	....	60
26.	98·8	....	98·4	54	....	56	15	....	15	44	....	60
27.	98·7	....	97·4	60	...	50	16	....	16	43	....	62
28.	98·6	....	....	54	....	....	17	....	....	48	....	....
29.	99·2	....	98·2	54	....	60	16	...	17	49	....	64
30.	99·0	....	97·4	54	....	56	17	....	16	46	....	62
	98·9	98·6	97·9	57·8	57·6	54·3	16·7	17·1	15·8	51	48	64

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
Dec. 1.	98°·7	98°·6	98°·3	62	58	50	17	16	16	50°	54°	64°
2.	98·8	....	....	54	....	....	16	....	....	48	....	....
3.	....	....	97·0	....	....	56	....	....	15	....	....	62
4.	98·7	98·7	97·7	56	60	50	16	19	15	44	32	58
5.	98·7	....	98·2	58	....	58	16	....	15	40	....	62
6.	98·9	97·8	98·3	56	56	60	16	17	16	38	43	60
7.	98·6	98·0	98·2	56	54	60	15	16	14	36	47	62
8.	98·5	98·4	98·1	56	50	54	16	16	16	38	43	60
10.	98·4	98·2	97·9	56	54	52	16	16	16	40	44	62
11.	98·5	....	....	58	....	....	16	....	....	40	....	....
13.	98·6	....	98·5	58	....	56	17	....	15	38	....	64
14.	98·4	....	97·9	60	....	58	16	....	16	40	....	58
15.	99·0	98·6	98·3	63	54	56	15	15	16	42	48	62
16.	98·4	97·9	98·1	56	56	66	16	15	16	42	58	60
17.	99·0	97·7	98·0	60	50	58	15	17	14	45	50	64
18.	98·7	....	98·2	60	....	58	15	....	16	45	....	62
19.	98·8	....	....	58	....	....	15	....	....	45	....	....
20.	98·8	98·0	97·5	64	56	54	15	16	15	43	43	65
21.	98·6	....	98·2	58	....	50	15	....	15	43	....	58
22.	98·8	98·4	97·8	52	52	62	16	15	14	43	50	66
23.	98·9	....	97·9	60	....	54	15	....	16	43	....	62
24.	98·6	....	98·2	60	....	54	15	....	15	....	....	65
25.	99·2	....	....	60	....	....	15	....	....	43	....	....
26.	98·8	98·4	98·3	58	64	52	16	17	15	41	34	50
27.	98·5	....	97·7	58	....	66	16	....	16	43	....	....
28.	99·3	98·7	97·5	66	58	52	16	16	15	41	53	55
29.	98·2	98·6	98·0	50	52	56	16	15	16	45	58	55
30.	98·8	98·9	97·3	60	62	66	16	15	16	43	58	58
31.	98·5	....	98·0	58	....	....	16	....	....	43	....	55
	98·7	98·2	97·9	58·9	55·2	56·5	15·7	16	15·4	42	47	60

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
	°	°	°							°	°	°
Jan. 1.	98·5	....	97·5	58	....	58	16	....	15	40		
2.	98·4	....	....	54	....	....	16	....	....	42		
3.	99·0	....	97·9	64	....	58	16	....	17	42	....	55
4.	98·8	....	....	66	....	....	17	....	16	48	....	....
5.	99·1	....	98·7	64	....	60	18	....	15	46	....	56
6.	99·7	....	98·1	70	....	66	18	....	....	48	....	66
7.	100·0	98·9	98·1	72	60	52	18	17	16	50	58	65
8.	99·1	....	98·1	62	....	56	16	....	15	49	....	68
9.	99·0	....	98·3	60	....	60	16	....	16	46	....	61
10.	99·1	98·6	98·3	60	58	54	16	15	16	46	53	60
11.	98·7	....	97·4	56	....	58	14	....	14	47	....	60
12.	98·7	....	98·0	54	....	60	14	....	16	47	....	64
13.	98·9	98·7	98·1	52	60	62	16	14	16	46	53	61
14.	99·2	....	97·9	56	....	60	14	....	15	46	....	65
15.	98·8	....	97·7	58	....	56	14	....	16	47	....	64
16.	98·7	....	97·7	56	....	60	16	....	16	47	....	62
17.	98·9	....	98·1	54	....	60	15	....	14	47	....	62
18.	98·9	....	98·2	60	....	58	15	....	14	47	....	55
19.	98·8	....	97·8	60	....	56	14	....	15	47	....	60
20.	98·8	....	98·0	56	....	54	15	....	14	44	....	60
21.	98·7	....	97·9	58	....	62	16	....	16	44	....	63
22.	9·88	....	97·9	60	....	50	16	....	14	47	....	63
23.	98·8	....	....	56	....	....	16	....	....	47	....	....
24.	98·9	....	97·3	58	....	54	15	....	15	49	....	68
25.	98·6	....	....	54	....	....	15	....	....	47	....	....
26.	98·6	....	98·1	58	....	62	15	....	16	48	....	66
27.	98·7	....	97·9	58	....	54	15	....	14	45	....	62
28.	99·0	....	97·6	62	....	58	15	....	15	43	....	62
29.	98·5	....	97·9	56	....	56	15	....	15	42	....	60
30.	98·5	....	98·2	56	....	58	14	....	15	41	....	60
31.	98·8	....	97·9	60	....	62	16	....	16	38	....	62
	98·8	98·07	97·9	58·7	59·3	57·9	15·5	15·3	15·1	45	55	60

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
Feb. 1.	98·8	....	97·5	60	....	52	16	....	15	39	....	62
2.	98·5	98·7	....	60	52	....	16	14	....	38	48	
3.	98·7	....	....	60	....	....	16	....	....	41		
5.	98·6	....	....	64	....	....	18	....	....	44		
6.	98·8	....	97·9	56	....	54	15	....	15	43	....	60
7.	98·5	....	98·1	56	....	62	14	....	15	39	....	60
8.	98·9	....	98·0	52	....	54	16	....	16	40	....	60
9.	98·1	98·5	97·9	52	56	54	14	15	15	38	50	61
10.	98·7	98·9	97·7	54	58	52	16	15	15	40	48	60
11.	98·7	....	97·7	56	....	54	16	....	15	40	....	60
12.	98·7	....	98·2	50	....	58	14	....	16	40	....	60
13.	98·4	....	98·2	50	....	54	15	....	15	40	....	60
14.	98·2	98·4	97·8	50	54	54	17	15	17	41	48	63
15.	98·8	....	97·6	54	....	54	17	....	15	43	....	60
16.	98·6	98·7	98·1	54	52	52	15	....	16	43	48	62
17.	98·5	....	98·2	54	....	50	16	16	15	44	....	60
18.	99·0	....	98·2	58	....	56	16	....	15	45	....	60
19.	98·7	....	97·7	56	....	48	15	....	15	44	....	60
20.	98·7	....	....	52	....	....	15	....	....	45		
21.	98·8	....	98·1	52	....	58	14	....	15	45	....	60
22.	99·0	....	97·4	60	....	60	15	....	15	44	....	62
23.	98·6	....	98·3	58	....	52	15	....	15	43	....	62
24.	98·3	....	97·8	58	....	54	16	....	16	42	....	62
25.	99·0	....	97·9	56	....	50	15	....	15	43	....	62
26.	98·3	....	98·0	56	....	60	16	....	14	46	....	62
27.	99·0	....	97·8	58	....	52	16	....	14	47	....	62
28.	98·7	....	98·5	54	....	60	15	....	15	47	....	60
	98·6	98·6	97·9	55·5	54·4	52·3	15·5	15	15·1	42	48	61

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
March 1.	99°·0	98°·6	97°·6	58	56	58	16	16	16	45°	52°	60°
2.	99·1	98·7	97·9	58	52	46	16	15	16	44	55	60
3.	98·5	....	98·5	52	....	56	15	....	15	47	....	60
4.	99·0	98·3	98·0	60	54	54	15	16	15	45	52	60
5.	98·6	....	98·0	58	....	66	17	....	15	43	....	60
6.	99·0	....	98·2	60	....	54	16	....	15	43	....	60
7.	99·0	....	98·0	60	....	64	14	....	15	44	....	62
8.	99·2	....	98·1	60	....	60	16	....	15	46	....	60
9.	99·1	98·7	98·0	60	48	54	15	15	15	48	54	58
10.	99·0	....	97·5	60	....	54	16	....	15	48	....	60
11.	98·8	....	97·9	56	....	48	15	....	14	47	....	58
12.	98·4	....	97·7	54	....	56	16	...	14	47	....	61
13.	98·8	....	98·2	60	....	54	15	....	15	43	....	61
14.	98·6	....	97·9	54	....	46	14	....	14	44	....	58
15.	98·2	....	97·5	54	....	60	14	....	14	42	....	62
16.	98·7	....	98·1	58	....	62	15	....	14	43	....	58
17.	98·6	....	98·0	60	....	52	15	....	15	40	....	58
18.	98·5	98·7	98·0	62	58	48	15	15	15	43	53	60
19.	98·5	....	98·4	56	....	54	14	....	15	43	....	58
20.	98·6	....	97·5	54	....	54	15	....	15	42	....	60
21.	98·8	98·6	98·1	54	50	50	14	14	14	44	53	60
22.	99·0	98·5	97·8	56	54	54	15	15	13	48	58	60
23.	99·0	....	97·8	58	....	52	15	....	14	50	....	61
24.	98·7	....	98·0	58	....	48	15	....	13	53	....	58
25.	98·4	....	98·0	54	....	48	14	....	14	52	....	60
26.	98·4	....	98·2	54	....	60	15	....	15	51	....	62
27.	98·8	....	97·8	60	....	52	15	....	16	52	....	64
28.	98·7	....	98·3	54	....	54	16	....	15	50	....	64
29.	98·7	....	97·3	56	....	54	14	....	14	50	....	65
30.	98·6	98·6	97·8	55	52	48	15	15	15	51	54	62
31.	98·6	....	97·5	54	....	54	15	....	15	51	....	63
	98·74	98·59	97·93	57	53	54	15·1	15·1	15	46	54	60

Date.	Temperature under the tongue.			Pulse.			Respirations.			Temperature of air.		
	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.	7–8 A.M.	3–4 P.M.	12 P.M.
April 1.	98·3	....	98·0	58	....	58	16	....	15	53	....	62
2.	98·7	98·8	97·7	58	58	52	15	16	15	53	62	64
3.	98·8	....	97·7	56	....	48	15	....	14	55	....	62
4.	98·8	....	97·8	54	....	60	15	....	14	58	....	64
5.	98·9	....	98·1	60	....	64	15	....	16	58	....	64
6.	99·3	98·8	97·9	62	60	50	15	15	15	55	61	62
7.	98·8	98·8	98·2	54	56	56	14	15	16	58	61	63
8.	98·5	....	97·9	56	....	56	15	....	15	58	....	61
9.	98·6	....	98·1	60	....	58	14	....	15	54	....	62
10.	98·5	98·3	98·0	62	52	62	14	14	15	52	52	63
11.	98·7	....	97·6	60	....	54	14	....	15	51	....	63
12.	98·4	....	97·9	56	....	50	15	....	15	49	....	59
13.	98·5	98·7	97·6	54	54	54	15	15	15	49	55	60
14.	98·7	....	98·0	56	....	54	15	....	14	52	....	60
15.	98·6	98·8	....	56	60	....	15	14	....	49	58	
16.	98·4	....	97·7	58	....	52	15	....	15	52	....	62
17.	98·8	....	97·8	56	....	50	15	....	14	56	....	58
18.	98·4	98·8	98·1	60	54	54	15	15	15	60	60	66
19.	98·7	98·6	97·6	60	52	50	15	16	15	58	60	62
20.	98·7	....	98·3	58	....	54	15	....	15	60	....	64
21.	98·7	....	97·3	58	....	56	16	....	13	60	....	62
22.	98·4	98·1	98·0	60	56	50	16	15	15	62	65	64
23.	98·5	....	97·7	56	....	54	15	....	15	62	....	62
24.	98·7	98·2	97·7	58	52	52	16	16	15	64	64	65
25.	98·6	98·4	97·9	64	52	52	16	15	16	65	63	62
26.	99·0	....	98·0	58	....	50	15	....	14	62	....	62
27.	98·8	98·8	97·9	54	52	50	15	14	15	60	57	63
28.	98·6	....	....	58	....	....	16	....	....	58		
29.	....	98·3	98·2	....	54	52	....	15	15	....	60	64
30.	98·9	98·7	98·2	58	56	48	14	15	14	58	58	65
	98·66	98·57	97·88	56·5	54·8	53·6	15·4	15	14·8	54·6	59·8	62·4