Observations respecting the pulse; intended to point out with greater certainty, the indications which it signifies; especially in feverish complaints ... / [William Falconer].

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TO POINT OUT WITH GREATER CERTAINTY, THE INDICATIONS WHICH IT SIGNIFIES;

ESPECIALLY IN

FEVERISH COMPLAINTS.

By W. FALCONER, M.D. F.R.S.
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Niſi pulſus cujuſvis hominis antea innotuerit; ex ſolâ ejus frequentiâ, febris certò diſcerni nequit.

BURSERII *Inſt. Med. Pract. Vol. I. p.* 9.

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OBSERVATIONS

ON THE

PULSE.

THE uſe of the examination of the pulſe, as an index both of health and of diſeaſe, is too well known to need any comment.

It appears to have been regarded in this view even from the earlieſt ages of medicine, being repeatedly mentioned by Hippocrates, and largely deſcribed by Galen and Coelius Aurelianus; whoſe ſubtile, though frivolous diſtinctions have been preſerved in medical writings down to the preſent time.

It has been reſerved for the good ſenſe and clear underſtanding of a phyſician, who does honour to our own country, to free the ſtudy of the profeſſion from many needleſs incumbrances of this kind, and to direct the attention of practitioners to the only circumſtance reſpecting the pulſe, which is capable of communicating accurate and diſtinct ideas, or of affording deciſive indications.

I ſcarcely need add that I here allude to Dr. Heberden's very uſeful, though conciſe paper on this ſubject, which is inſerted into the ſecond volume of the Medical Tranſactions.

That experienced and ſagacious phyſician, has there, very properly aſſumed the frequency or quickneſs of the pulſe, which he juſtly eſteems to be ſynonymous terms; as the only circumſtance reſpecting it, of which we can form any clear or determinate idea, and which, we can be aſſured, conveys the ſame information to others that it does to ourſelves; and on this well-founded, but, before the appearance of Dr. Heberden's paper, unavowed preſumption, he has inſtructed his readers to diſregard the other fanciful or whimſical diſtinctions, which had ſerved chiefly to perplex or embarraſs; and to direct their conduct, as far as the pulſe is concerned, by that circumſtance alone, on which any rational dependence could be placed.

It is ſomewhat remarkable, that inſtruments which meaſure with accuracy ſhort periods or intervals of time, ſhould not have been earlier * applied to this moſt important of all purpoſes.

* Sir John Floyer ſeems to have been the firſt who applied a portable inſtrument which he calls a pulſe-watch to this purpoſe. This we learn from his book entitled *The Phyſician's Pulſe-Watch*, printed A. D. 1707, and dedicated to Queen Anne. But this inſtrument appears from his own account, to have been very clumſy and aukward in its conſtruction, and at the ſame time, far from correct. See his preface to the firſt vol. of the work abovementioned.

But it is nevertheleſs certain, that although the conſtruction, and even the application of theſe inſtruments, were not unknown at the beginning of the preſent century, yet that the general uſe of them was not introduced into practice until the preſent age, wherein the advantages are become ſo manifeſt to every profeſſional man, as to render it a matter of ſurpriſe, that our predeceſſors had not availed themſelves ſooner of ſo obvious, and at the ſame time ſo important an auxiliary.

But, although the advantages of knowing accurately the number of beats which the pulſe makes in any given time, be unqueſtionable, as we are thereby enabled to compare it with itſelf at different periods and intervals, ſtill ſomewhat remains to be ſettled in order to afford to this mode of inveſtigation all the advantages, of which it may fairly enough be preſumed to be capable.

A ſecond-watch, or a minute-glaſs, the latter of which was the inſtrument firſt uſed by Fløyer, are, either of them, we know, adapted to the purpoſe of meaſuring with ſufficient accuracy the frequency of the pulſe, or the number of pulſations which the artery makes in a certain determinate time, e. g. a minute.

But *quick* and *ſlow* we alſo know to be relative terms only, and what muſt be referred to ſome ſtandard, to determine whether the number of pulſations ſo meaſured, ſhould be conſidered as falling ſhort of, or as exceeding the juſt quantity. This ſtandard, it is evident, ought to be, the number of

pulſations, which the artery of the individual ſo examined makes in a given time, under ſimilar circumſtances, in a ſtate of health.

But as phyſicians have not always opportunities of obtaining ſuch information, it has been found convenient to ſubſtitute ſome general ſtandard, which may ſerve as, at leaſt, a probable guide, on ſuch occaſions.

This has been inferred, or attempted to be drawn, from examination of a number of perſons in health, and by taking the mean number of their pulſes collectively; and from thence framing a certain medium, which may ſerve as a point from which exceſs or deficiency in the number of the pulſe may be reckoned.

A calculation of this kind, is however, from its nature, ſubject to much uncertainty and difficulty.

The pulſe is liable to vary from ſo many different circumſtances, as muſt neceſſarily render ſuch calculations inaccurate, and ſuppoſing that the pulſe could be examined freed from theſe embaraſſments, it is well known that the natural pulſe in different individuals varies conſiderably, and of courſe, what may ſerve as a ſtandard of computation in one inſtance, may prove very erroneous in another.

It is nevertheleſs perhaps poſſible to adjuſt ſuch allowances, as may bring theſe variations within ſuch limits as may ſerve to fulfil in a great meaſure moſt of the purpoſes of medicine, however inſufficient they may appear, to lay the foundation of any regular ſyſtem of phyſiology or pathology.

I wiſh I could add, that this had been done in ſuch a manner as to give reaſonable ſatisfaction, and afford ſuch grounds for practice as might in general be depended upon.

But the obſervations that muſt form the baſis of ſuch a calculation, have been in general ſo diſcordant, as not to afford ſufficient information for ſuch a purpoſe.

To inſtance this from writers of eminence, the natural pulſe of an adult has been eſtimated by one at ninety * beats in a minute, and by another at no more than at half † that number, both which calculations are far wide of the truth, and utterly inconſiſtent with one another.

I would not however be underſtood to include in this cenſure all who have formed calculations of this kind. Sir John Floyer, Dr. Bryan Robinſon, Senac, Haller, Dr. Heberden, and perhaps ſome others, have written on this ſubject with accuracy and judgment, and contributed of courſe to determine this important queſtion. To the obſervations of theſe writers I have added ſome of my own, which I ſhall preſently communicate when I come

* In homine ſano, adulto, quieſcente, plerumque ſpatio binorum minutorum ſecundorum (quorum ter mille & ſexcenta horæ ſpatium abſolvunt) tres pulſus numerantur: ubi ergo hoc temporis ſpatio pluribus vicibus micat arteria, velocior pulſus dicitur. *Van Swieten, Comm.* Vol. II. p. 7.

† Rye—Medicina Statica Britannica, quoted from Haller's Phyſiologia, Vol. II. p. 260.

to ſpeak of the circumſtances naturally occurring in health, which may accelerate or retard the pulſe.

But it will be proper firſt to explain what I underſtand by a natural pulſe.

By this term then I would ſignify the mean number of pulſations which take place in a healthy body in a minute's ſpace, during the twenty-four hours.

The uſual circumſtances by which the pulſe in a ſtate of health is ſubject to be affected are,

I.

Such as ariſe from bodily organization.

1. That of ſex.

The pulſes of women are conſiderably quicker than thoſe of men. This was remarked many years ago by Kepler, who, whilſt he eſtimated the mean pulſes of men at 70 in a minute, eſtimated thoſe of women at 80, or, at one ſeventh part more.

The obſervations I have made, nearly coincide herewith. The average number of the pulſe of ſeven women in health, between thirty and forty years of age, and each of them of moderate ſtature, was 84 in a minute, which does not differ very much from the proportion ſpecified by Kepler, conſidering that the mean number of pulſations in a man, are by me rated at 75 in a * minute.

For 70 : 80 : : 75 : 85.7. nearly.

* It is neceſſary to mention here, that the numbers ſpecified in the enſuing tables, are ſuppoſed to refer to the pulſes of men.

2. That of temperament.

The difference of temperament is another cauſe of the difference of pulſes.—Thoſe who bear marks of a ſanguineous habit, as it is uſually called, namely, light coloured and ſoft hair, blue eyes, fair and florid complexion, fleſh ſoft and ſucculent; and in the mental character, conſiderable ſenſibility of mind and diſpoſition, have generally a quicker pulſe than perſons of dark coloured hair and eyes, pale or ſallow complexion, firmneſs of the muſcular parts, and in the mental qualifications, reſolution and ſteadineſs of temper. The ſame cauſes which produce a quicker pulſe in women than in men, probably operate here, as the firſt mentioned of the above temperaments approaches nearly to the one generally found among women.

The ſame analogy holds between youth and age, as does between the abovementioned temperaments, and accounts for the difference of pulſe obſerved to take place between thoſe ſtages of life. What proportion of pulſe is found to ſubſiſt between the different temperaments and the different degrees of each, that we daily ſee; or how ſuch proportion could be eſtimated, I do not pretend to determine.

3. That of ſtature.

Dr. Bryan Robinſon, a man of great accuracy and judgment, though rather prejudiced in favour of the mechanical theory, was of opinion that the length, or ſtature of the body, had conſiderable influence on the pulſe. According to his own ac-

count, he found, from a great number of obſervations, that the mean pulſes of regular-proportioned bodies were to one another, inverſely, as the biquadrate roots of the cubes of the lengths of the bodies.* He appears to have fixed on a ſtature of ſix feet, or ſeventy-two inches, as a ſtandard, and finding the † mean pulſe of perſons of that height to be 65 in a minute, he computed from thence, in the manner above deſcribed, the number of pulſes which he judged to be naturally belonging to ſeveral other degrees of ſtature.

* Dr. Robinſon, having found by obſervation, that the pulſe of a man of ſix feet, or ſeventy-two inches in height, beat 65 times in a minute, aſſumes the two laſt of the above-mentioned numbers, as the baſis of the calculation upon which the table alluded to, is conſtructed. Thus, in order to compute the pulſe of a man of five feet, or ſixty inches in height, he ſays; as the fourth root of the third power of 72 (=24.7172, nearly) is to 65, ſo is (inverſely) the fourth root of the third power of 60 (=21.5582, nearly) to 74.525. It is ſcarcely neceſſary to add that, in the enſuing calculations, the numbers 24.7172, (the fourth root of the third power of 72) and 65, are uniformly taken as the two firſt terms, and that the third term is found, by taking the fourth root of the third power of the number of inches, which the perſon whoſe pulſe is to be examined, is in height. The fourth number is found, by working the above numbers by the Rule of Three Inverſe.

† This is not to be underſtood of the mean pulſe through the day, but the mean of ſeveral examinations, of the morning pulſe in different perſons.

A ſimilar opinion was held by Senac,* but the computations of the two writers by no means coincide.

I am inclined to think that there is ſome foundation for this opinion of Dr. Robinſon, (though undoubtedly the exceptions are numerous) and have on that account added a table on his plan, though greatly enlarged beyond that ſet down in his animal œconomy, as it extends from ninety-ſix inches, the greateſt height of which I have any well founded account, to that of eighteen inches, the length of an infant newly born.

The coincidence of theſe calculations, with actual obſervation, induces me to give them credit in

* Senac reckons the proportion of the pulſe to the height to be as in the ſhort table annexed, the laſt number of which he ſays he deduced from obſervation of one hundred men of the royal guards who were ſelected for that office on account of their tallneſs of ſtature. Traite du Coeur, Vol. II. p. 214.

Length in Inches.	Pulſe from Obſervation.
24 Inches = 2 Feet	—— 90
48 Inches = 4 Feet	—— 80
60 Inches = 5 Feet	—— 70
72 Inches = 6 Feet	—— 60

Haller appears to pay but little regard to this opinion, and brings as inſtances the Swiſs people, who are in general tall of ſtature, and their pulſes more numerous than this ſtandard. He himſelf, as he tells us, was ſix feet high, and his own pulſe beat 78 in a minute.

a general way, though the relative proportions may not perhaps under all circumſtances correſpond.

It appears to me, that the middle calculations are more to be depended upon than either of the extremes, and that thoſe reſpecting children under a year old, and not more than twenty-eight inches long, have leaſt claim to regard.

Table of proportion between the pulſe and the ſtature of the body.*

Age in Years.	Length in Inches.	Pulſes fr. Obſerv.	Pulſes fr. Theory.	Mean Pul. fr. Theory
	96=8F.		52.385	58.983
	95=7F.11I.		52.798	59.448
	94=7F.10I.		53.219	59.922
	93=7F. 9I.		53.648	60.405
	92=7F. 8I.		54.085	60.897
	91=7F. 7I.		54.53	61.398
	90=7F. 6I.		54.984	61.909
	89=7F. 5I.		55.446	62.43
	88=7F. 4I.		55.918	62.961
	87=7F. 3I.		56.399	63.503
	86=7F. 2I.		56.891	64.057
	85=7F. 1I.		57.391	64.62
	84=7F.		57.903	65.196

* It ſhould be obſerved, that the pulſes ſet down in the third column of this table, entitled *Pulſes from Obſervation*, are the pulſes of perſons in a ſitting poſture, and before breakfaſt in the morning, all which circumſtances concur to render the pulſe at that time, at leaſt as ſlow as at any other time during the day.

The pulſes ſet down in the fourth column, entitled *Pulſes from Theory*, are deduced by computation from that one in

Age in Years.	Length in Inches.	Pulſes fr. Obſerv.	Pulſes fr. Theory.	Mean Pul. fr. Theory
	83=6F.11I.		58.426	65.78
	82=6F.10I.		58.959	66.385
	81=6F. 9I.		59.504	66.994
	80=6F. 8I.		60.062	67.627
	79=6F. 7I.		60.631	68.267
	78=6F. 6I.		61.213	68.923
	77=6F. 5I.		61.808	69.593
	76=6F. 4I.		62.417	70.279
	75=6F. 3I.		63.04	70.98
24	74=6F. 2I.	60	63.678	71.699
	73=6F. 1I.		64.331	72.434
	72=6F.	65. R.	65.	73.187
	71=5F.11I.		65.685	73.958
	70=5F.10I.		66.388	74.75
	69=5F. 9I.		67.108	75.561
	68=5F. 8I.		67.847	76.393
	67=5F. 7I.		68.605	77.246
	66=5F. 6I.		69.384	78.123
	65=5F. 5I.		70.182	79.022
	64=5F. 4I.		71.003	79.946
	63=5F. 3I.	72. R.	71.847	80.896
	62=5F. 2I.		72.714	81.872

column the third, which ſpecifies 65 beats in a minute, and correſponds to 72 inches, or 6 feet in height.

Of courſe all the pulſes in column the fourth muſt be underſtood to refer to the morning pulſe.

To accommodate theſe to the mean pulſes during the day, I have added the fifth column, which is founded on a table of Dr. Robinſon's, inſerted in a ſubſequent part of this work, which table contains an account of the variation of the pulſe in two perſons, taken for each hour in the day, from eight in the morning until eleven at night, both incluſive; and continued every day for ſeveral weeks. The *mean* number of the pulſes, during the day, of the two perſons ſo examined, (and the pulſes in each perſon vary but little from one another)

Age in Years.	Length in Inches.	Pulſes fr. Obſerv.	Pulſes fr. Theory.	Mean Pul. fr. Theory
	61=5F. 1I.		73.606	82.877
	60=5F.		74.525	83.97
	59=4F.11I.		75.47	84.976
16	58=4F.10I.	76	76.448	86.077
	57=4F. 9I.		77.448	87.003
	56=4F. 8I.		78.482	88.367
14	55=4F. 7I.	77.R.	79.55	89.57
14	54=4F. 6I.	78.	80.671	90.832
	53=4F. 5I.		81.791	92.093
	52=4F. 4I.		82.968	93.418
12	51=4F. 3I.	82.R.	84.185	94.788
	50=4F. 2I.		85.443	96.205
	49=4F. 1I.		86.749	97.675
10	48=4F.	94.90	88.1	99.196
	47=3F.11I.		89.503	100.77
9	46=3F.10I.	90.R.	90.959	102.41
	45=3F. 9I.		92.471	104.12
	44=3F. 8I.		94.042	105.89
7	43=3F. 7I.	93.	95.678	107.73
6	42=3F. 6I.	97.R.	97.381	109.65
	41=3F. 5I.		99.157	111.65
	40=3F. 4I.		101.01	113.73

amounts to 73·75 in a minute. The fifth column is then conſtructed by taking two numbers; the firſt being 65·5, which is the mean of the *morning* pulſes of the two perſons in Dr. Robinſon's table, and the other number, (being 73·75, of which I have juſt ſpoken,) as the baſis of the calculation; making 65·5 the firſt number.—Thus to produce the firſt number in column the fifth, we ſay as 65·5, (the mean of the *morning* pulſes of the two perſons in Dr. Robinſon's table) is to 73·75, (the *mean* number of the pulſes of the ſame perſons during the day) ſo is 52.385 (the *morning* pulſe from theory of a perſon eight feet high) to 58.983, which laſt is the *mean* pulſe *through the day*, according to that proportion, of a perſon of that ſtature.

Age in Years.	Length in Inches.	Pulſes fr. Obſerv.	Pulſes fr. Theory.	Mean Pul. fr. Theory
	39=3F. 3I.		102.95	115.92
	38=3F. 2I.		104.97	117.92
	37=3F. 1I.		107.1	120.59
	36=3F.		109.32	123.09
3	35=2F.11I.	113.R.	111.65	125.71
	34=2F.10I.		114.11	128.78
	33=2F. 9I.		116.42	130.78
2	32=2F. 8I.	120.R.	119.41	134.45
	31=2F. 7I.		122.29	137.69
	30=2F. 6I.		125.34	140.8
	29=2F. 5I.		120.56	144.42
1	28=2F. 4I.	126.R.	131.99	148.61
	27=2F. 3I.		135.64	152.72
	26=2F. 2I.		139.54	157.11
½	25=2F. 1I.	137.R.	143.7	161.8
	24=2F.		148.17	166.83
	23=1F.11I.		152.97	172.24
	22=1F.10I.		158.16	178.08
	21=1F. 9I.		163.77	184.4
	20=1F. 8I.		168.91	190.18
	19=1F. 7I.		176.54	198.77
*recenter natus	18=1F. 6I.	150.R.	183.84	207.

The remainder of the column is conſtructed in a ſimilar manner. As this table muſt be underſtood as an enlargement of the one in Dr. Robinſon's animal œconomy, and as the number of the pulſe, according to his calculation, varies but little from the one I have adopted, I have made uſe of his proportions in ſettling the numbers in this column, taking 73.75 for the mean pulſe through the day, inſtead of 75, according to my own calculation.

* This article reſpecting the pulſe of *new-born*, or, as it ſhould be underſtood, *very young* children, is ſomewhat doubtful. Dr. Robinſon acknowledges, that he had often tried

II.

Such as ariſe from difference of time of life.

Perhaps this cauſe might in ſtrict propriety be referred to the former head, as the advance of age certainly influences the organic ſtructure of our bodies, and probably in conſequence thereof the pulſe.

But as theſe changes are not ſufficiently obvious, or indeed at all accurately diſtinguiſhable, and it not being certain that the change in the pulſe is owing to that cauſe, I have conſidered them ſeparately, taking for granted only, what is univerſally acknowledged, that the pulſe is different at different periods of life. Without entering then into any ſpeculation reſpecting the cauſes of theſe variations, I ſhall give a table of pulſes at different ages collected from various authorities, together with ſome obſerved by myſelf.

to feel it, and count its numbers, but never ſucceeded. The number in the table (150) is ſet down as the one of a child ſeven or eight days old; but it appears from Dr. Robinſon's account, that his examination of the pulſe was not to be depended on. I myſelf have tried to feel the pulſe of two children, each of them five days old, but could not diſcover any; I felt ſome obſcure pulſations indeed in the wriſt of a child fourteen days old, but they were too indiſtinct to be accurately numbered.

Table of the number of pulſes at different ages of life.

Age.	Number of Pulſes.	Authority.
New born	130 to 140	Dr. Heberden's Medical Tranſactions.
8 days	150*	Robinſon's Anim. Oec.
During 1ſt. month	120	Heberden. Loco Citato.
2 months	140	Senac, Traite du Coeur.
3 months	120	Sauvage, Embryologia, quoted from Haller.
6 months	137	Robinſon's Anim. Oecon.
1ſt. year	108 to 120	Heberden.
1ſt. year	126	Robinſon Loco Cit.
2 years	115	Senac.
2 years	120	Robinſon.
During 2d. year	90 to 100	Heberden.
3 years	112	Senac.
3 years	113	Robinſon.
During 3d. year	80 to 108	Heberden.
3 years	93	Floyer's Pulſe-Watch.
During 4th. year	80 to 108	Heberden.
5th. year	104	Senac.
5th. year	80 to 108	Heberden.
6th. year	97	Robinſon.
6th. year	80 to 108	Heberden.
7th. year	72	Heberden, *ſed rarò*.
7 years old	80	Floyer.
7 years old	90	Sauvage, quoted from Haller.
8 years	102	Senac.

* See note on the laſt article of the foregoing table.

Age.	Number of Pulſes.	Authority.
7 years	93	Bath Hoſpit.
8 years	84	Floyer.
9 years	84	Floyer.
9 years	90	Robinſon.
10 years	92	Senac.
10 years	91.875	Average of 8 Boys, from Floyer's Pulſe-Watch.
11th year	90 to 100	Hamberger, quoted from Haller.
11 years	82	Average of 3 boys, Floyer.
12 years	82	Robinſon's Anim. Oec.
12 years	ſame as an adult	Heberden.
12 years	83	Senac.
12 years	84	Average of 4 boys, Floyer.
13 years	88	Average of 5 boys, Floyer.
14 years	80	Sauvage, quoted from Haller.
14 years	77	Robinſon.
14 years	83	Average of 6 boys, Floyer.
15 years	81	Average of 3 boys, Floyer.
16 years	84	Average of 4 boys, Floyer.
16 years	76	Bath Hoſp.
17 years	72	Floyer.
18 years	72	Floyer.
20 years	76	Floyer.
Adultus	90	Van Swieten, *ſed quære.*
22 years	74	Floyer, often repeated Expt.
23	72	Floyer.
24	70	Floyer.
25	80	Floyer.
Adultus	76	Floyer, called by him the healthy natural pulſe.
Adultus	60 to 80	Haller.

Age.	Number of Pulſes.	Authority.
Adultus	60 to 80	Heberden.
Adultus	60 to 70	Burſerii, Inſt. Medic. pract. Ven. 1786, Vol. I. Intelligitur de "adulto, bene valente, quieſcente, tranquillo, & jejuno."
Adultus	60 to 70	Duplanil, Medecine Domeſtique, Vol. V. p. 431.
45 years	55 to 60	Schwenke, quoted from Haller.
Adultus	45	Rye, Medic. Static. Britan. quoted from Haller.
Adultus	60	Marquet, quoted from Haller.
Adultus	50	Guidott, quoted from Haller.
Adultus	70	Kepler, quoted from Haller.
Adultus	70 to 75	Senac.
Adultus	73	Robinſon.
Adultus	74·5	Robinſon.
Adultus	70	Rye—in Summer, quoted from Haller.
Adultus	72	Leuwenhoeck, quoted from Haller.
Adultus	74	Rolfinck, quoted from Haller.
Adultus	75	Hales, Hæmaſtaticks.
40 years	65	Floyer.
32 years	83	Floyer.
Adultus	80	Keill, quoted from Haller.
Adultus	80	Cheſelden, quoted from Haller.
Adultus	80	Tabor, quoted from Haller.
Adultus	84	Hamberger, quoted from Haller.

Age.	Number of Pulſes.	Authority.
Adultus	86	Plempius, quoted from Haller.
45 to 50	78	Haller—de ſe ipſo.
	70*	Senac.
	72	Senac.
	75	Senac.
	50	Senac.
	55	Senac.
	60	Senac.
	27†	Senac.
	35	Senac.
	39	Senac.
	40	Senac.
	47	Senac.
	53	Senac.
	55	Senac.
	58	Senac.
62‡	71	Floyer.

* This and the five following from Senac are of old perſons, but whoſe ages are not ſpecified.

Theſe pulſes, and thoſe in all the tables are to be underſtood to be thoſe of the male ſex, unleſs otherwiſe expreſſed.

† This and the ſeven following are inſtances of ſlow pulſes from Senac.

Womens pulſes I am aſſured are generally quicker than mens, but the ſloweſt pulſes I ever knew, that were well authenticated, were of women; one of them being 24 in a minute, and the other 36.

‡ "Theſe following obſervations, (ſays Floyer) I took at our hoſpital where I felt the pulſes of ſeveral old men in the morning faſting, in May laſt." *Phyſician's Pulſe Watch*, Vol. I. p. 185.

Age.	Number of Pulſes.	Authority.
67	71	Floyer.
69	76	Floyer.
69	77	Floyer.
72	78	Floyer.
75	70	Floyer.
78	71	Floyer.
78	78	Floyer.
80	97	Floyer.
83	84	Floyer.
84	81	Floyer.
85	63	Floyer.
91	71	Floyer.

Obſervations on the foregoing Table.

THE foregoing table, though the numbers ſpecified in it are neither regular nor conſiſtent, ſufficiently manifeſts, in a general way, the decreaſe of the number of the pulſe, from infancy to full age.

For many years ſucceſſively, as from twenty-one or twenty-two years, to forty or forty-five, I am inclined to think the pulſe to be nearly ſtationary, but am not very confident in this opinion, though I believe it to be nearly correct. What is the number of an adult perſon's pulſe, is a matter of conſequence, as, from that, as from a ſtandard, the calculations muſt be drawn. With a view to aſcertain this point, I ſhall examine ſuch of the calculations in the foregoing table, as I think moſt entitled to regard.

Sir John Floyer, who was a man of character, and peculiar induſtry in inveſtigating this ſubject,

found the average of the pulſes of eight healthy perſons * from twenty to forty years of age, to be ſomewhat more than 73 in a minute. One of theſe on which he ſeems to lay peculiar ſtreſs, as his examination of it was often repeated, beat 74 in a minute, in a perſon of twenty-two years of age.

His own pulſe † he deſcribes as 76 in a minute, and this he accounts to be, "its healthy natural rate." ‡

In ſome places § he tells us that "the moſt natural pulſe will have from 70 to 75 beats in a minute in perfect health," but in another, he ‖ ſays, "we muſt allow the moſt natural and moſt healthful pulſe in Great Britain, to run at 70 beats." The laſt opinion was however founded on a ſpeculative calculation, reſpecting the influence of the degrees of latitude upon the pulſe.

Senac eſtimates the natural pulſe at the ſame rate with Floyer, namely, at from 70 to 75 beats ** in

* Phyſician's Pulſe Watch, Vol. I. p. 306.

† Ibid. p. 148.—p. 318.

‡ See alſo p. 37, where he ſays that there are in health about 75 pulſes in a minute. Vol. I.

§ P. 40. p. 74.

‖ P. 299.—It appears that by each of theſe numbers he underſtands the morning pulſe. See p. 167.

** Traite du Coeur.

a minute. Dr. Bryan Robinſon,* whoſe calculations are unqueſtionably entitled to great regard, found, after an accurate examination of two healthy perſons for many weeks together, and at no leſs than 16 intervals, of an hour each, *daily*, the average number of the pulſe of one of them to be 73, and of the other 74.5, in a minute.

The calculation of Dr. Stephen Hales,† approaches nearly to the latter of Dr. Bryan Robinſon, the natural pulſe of a perſon in health being by him eſtimated at 75 beats in a minute. Neither Haller,‡ nor Dr. Heberden,§ attempt to aſcertain the number of the natural pulſe in an adult perſon, but concur in placing it between 60 and 80.

The average of more than 70 obſervations made by myſelf on the pulſe of a healthy perſon of more than fifty years old, and made at different times of the day during the ſpace of about a month, amounted to 73.116. But this perſon's pulſe was, ſome years ago, as near as poſſible to the computation of Dr. Hales, or 75 in a minute.

From a review of the authorities above ſpecified, I am inclined to adopt this laſt mentioned number

* Animal Œconomy, p. 148.

† Hæmaſtaticks, p. 43.

‡ Eam varietatem inter 60 & 80, crediderim contineri.—*Phyſiol.* Vol. II. p. 260.

§ Med. Tranſ. Vol. II.

as the ſtandard. It is I believe rather more than the average of the pulſe, when the body is in a ſtate of reſt, but is nearly what the pulſe is, when we take in its acceleration from ſuch variety of poſture, as takes place in the common domeſtic occupations of life, not including any active exertion, or exerciſe. But of the effect of theſe in quickening the pulſe I ſhall ſpeak hereafter.

What alteration in the pulſe is produced by conſiderable advance in life, is not aſcertained. Haller thinks that the pulſe in old perſons is ſlower than it is in adults, but ſome of the authorities he brings in ſupport of his opinion are* ſtrangely miſrepreſented.

* Particularly where he ſays, "Ad 55 in univerſum in ea ætate (ſenili) æſtimat Johannes Floyerus." But Floyer, in the paſſage quoted, only ſays, "That the pulſe is ſometimes deficient from 70 to 55 beats in a minute;" but he does not ſay this deficiency is uſual among old perſons. On the contrary he ſays, that old perſons are generally hectical, a ſtate by no means compatible with a ſlow pulſe. The average of the pulſes of ſeveral old perſons, mentioned by him, ſhew alſo that this was not his opinion. Floyer indeed ſays, that a ſlow pulſe in middle life indicates a probability of life's being long protracted, but does not ſay that the pulſe of perſons already arrived at a great age, is ſlower than it was in an adult ſtate.

In Haller's quotation, in the next line, from Dr. Bryan Robinſon, he has evidently miſtaken the figures (72) which were intended to denote the number of inches which the perſon who is aſſumed as the ſtandard of the table was in height, for the number of years he was old. *Halleri Phyſiol.* Vol. II. p. 261.

It ſhould however appear, from the inſtances adduced by Senac,* that there was ſome foundation for this opinion; the average number of the pulſe of ſix perſons of advanced age, being 64 beats only in a minute. Floyer on the other hand has given a liſt of thirteen † old perſons with the ages of each (which circumſtance Senac has omitted) and the average of them is exactly 76 in a minute. He alſo gives it as his opinion, that they are generally hectical.

My own opinion, of which however I am by no means confident, is, that the pulſe in a healthy perſon becomes gradually ſlower from about forty-five years of age to about ſixty, after which period it begins again to grow quicker, and to become, as ſeveral other circumſtances in the ſyſtem do alſo, more reſembling that of children. But to this there are undoubtedly many exceptions. But in what proportion the pulſe becomes ſlower towards the beginning of the decline of life, and is again accelerated as age advances, I am not prepared to determine.

Lord Bacon thought that a ſlow pulſe in the prime of life, and one rather quicker as age advanced, were marks of longævity, "pulſus juventute tardior, ſub ætatem vergentem paulo incitatior—ſigna longævitatis."—*Hiſtoria Vitæ & Mortis.*

* See the foregoing table.

† See foregoing table.

III.

Time of day.

It is well known that the pulſe, even in a ſtate of perfect health, varies conſiderably at different times of the day.

This variation may perhaps have been originally produced by the recurrence of food, exerciſe, employment of the mind, and other cauſes which occur at regular intervals in the courſe of the day, and which act as ſtimulants on the ſyſtem; and the force of habit, ſtrengthened by long duration and frequent repetition, may continue to produce the ſame effect, even in the abſence of the originally exciting cauſe. But whether this opinion concerning the original cauſe be well founded or no, there is no doubt that the pulſe is diſpoſed to be quicker at certain periods of the twenty-four hours than at others, independent of any external exciting cauſes that are obvious to our ſenſes or underſtandings. This is particularly remarkable in fevers, notwithſtanding the utmoſt care is uſually then taken to prevent the acceſs of every irritating cauſe whatſoever. But although ſuch acceleration be principally noticed in fevers, as it then produces a temporary aggravation of the diſtreſs of the ſituation, a ſimilar, and as I think, a proportional acceleration, takes place in perfect health.

This periodical variation of the pulſe was noticed by Sir John Floyer, but his obſervations were not reduced by him into any regular comparative form or table.

According to his account, his own pulſe * in the morning faſting, beat 76 times in a minute, a little before dinner 77, and after dinner 95 times.

Another time † his pulſe which was ſoon after breakfaſt 86, fell to 72 before dinner.

He alſo obſerves ‡ what I, by repeated experience, have found true, that it is nearly as ſlow, a little before dinner, as it is at waking in the morning.

Senac § in his Traite du Coeur, has left a few obſervations on the ſame ſubject. According to him the pulſe which was 62.5. in the morning, roſe to 86 after dinner.

Haller in his Opera Minora, has made a few ſimilar remarks ‖ He found that the pulſe which in the morning beat 75.3, in the evening, towards the time of reſt, beat 82.

But the moſt diſtinct and correct account of any, reſpecting this matter, is given by Dr. Bryan Robinſon, in his Animal Œconomy,** whoſe table

* Phyſician's Pulſe Watch, Vol. I. p.156, 157.

† Ibid. ‡ Ibid.

§ Vol. I. p. 247. The numbers here referred to are the mean of ſix obſervations.

‖ Vol. I. p. 186, 187. The numbers here are the mean of five obſervations.

** P. 148.

I have ſubjoined, and place on it my principal dependence, as it appears to have been framed with great accuracy and to have been the reſult of ſufficient experience.

I have added one of my own which the reader will obſerve differs but little from that of Dr. Robinſon, in the general average, though the particulars do not coincide.

Table of the number of the pulſe at different hours of the day, by Dr. Bryan Robinſon.*

	Morning.							Mean
Hours	VIII	IX	X	XI	XII	I	II	Numb.
Pulſes of A	65	67	70	73	71	69	70	70
Pulſes of B	66	71	72	68	69	67	67	68.2

	Afternoon.									Mean
Hours	III	IV	V	VI	VII	VIII	IX	X	XI	Numb.
Pulſes of A	77	77	77	77	76	76	74	74	76	76
Pulſes of B	75	81	84	81	79	77	78	78	79	78

Table of the number of the pulſe at different hours of the day, by the author of this work.

	Morning.							Mean
Hours	VIII	IX	X	XI	XII	I	II	Numb.
Pulſes	63.5	64	66	78.9	79	68.5	67.5	69.628

* Animal Œconomy, p. 148.

Afternoon.										Mean
Hours	III	IV	V	VI	VII	VIII	IX	X	XI	Numb.
Pulſes	69.4	74	75	71 75	74	76	85	79.5	80.5	76.127
Average number of A's pulſe through the day —										73.062
Average number of B's pulſe . —										74.5.
Average of pulſe in the author's table —										73.116

Obſervations on the two foregoing tables.

" The former of the two preceding tables was " added (to uſe the words of the author) in order to " ſhew the tenour of the pulſe at different hours of " the day.

" It contains the number of pulſes in a minute, " of two healthful men, A, and B, when ſitting, at " the ſeveral hours from eight o'clock in the morn- " ing till eleven at night.

" Theſe numbers are means drawn from a large " number of obſervations, thoſe of A, from the " obſervations of twelve weeks, thoſe of B, from " the obſervations of three weeks.

" A, eat his breakfaſt between nine and ten ; B, " his before nine ; they both dined together at two, " at which meal B eat more plentifully than A, " and they eat little or no ſupper.

" From this table it appears that the pulſe is " ſlower in the morning than at any other time of " the day, that it grows ſomewhat quicker before " breakfaſt, and a little more ſo after it ; that it " grows ſlower again before dinner, and quicker " immediately after dinner, and that the quickneſs

" acquired by this meal continues for about three " or four hours, and then abates a little ; and con- " tinues in that ſtate without any conſiderable " change, in bodies which eat and drink little at " night, till they go to reſt."*

The perſon alluded to in the latter of the two foregoing tables,† was rather more than fifty years old, of a healthy conſtitution and temperate way of life.—The ſame remarks are nearly applicable to this table as to the former, the average of the pulſe throughout the day is nearly alike in both tables, and the difference which may be obſerved at particular hours may fairly be deduced from the difference of cuſtom reſpecting the time of meals, &c. between the period at which Dr. Robinſon's obſervations were made and the preſent.

IV.

State of the ſyſtem reſpecting reſt or activity.

1. Sleep.

This when quiet and natural is the moſt perfect ſtate of general inactivity that can take place in health.

From the abſence, or at leaſt the ſuſpenſion, of the numerous exciting cauſes affecting both the mind and body, which take place in a waking ſtate,

* Robinſon's Animal Oeconomy, p. 148. 149. 150.

† This table was formed on an almoſt daily examination of the pulſe for more than three months ſucceſſively.

we might reaſonably ſuppoſe that the pulſe would be ſlower during ſleep.

This was the opinion of Galen,* and ſeveral of the early writers, and indeed of ſeveral of later date Some of the moderns however have maintained that the pulſe is conſiderably accelerated, and the heat of the body increaſed during ſleep. Thus according to one writer, the pulſe which when waking was 70 in a minute, was increaſed to 80 during ſleep, and in another inſtance from † 80 to 96. Another writer mentions from his own obſervation proportions not very ‡ diſſimilar to theſe, as from 70 to 80, and from 80 to 96.

I cannot ſay that the experiments I have myſelf made, are either ſufficiently correct, or ſufficiently numerous, to determine the proportion in which the number of the pulſe is diminiſhed during ſleep, but they are abundantly ſufficient to ſatisfy me that ſuch a diminution takes place. Thus I have repeatedly found the pulſe at firſt waking not to ex-

* Cauſ. Pulſ. III. C. 9. 10.

† Morgan Principl. p. 193. 399.

‡ Browne Langriſh, Med. Pract. p. 273. He ſeems however to aſcribe this increaſe of pulſe to the heat of the room and that produced by the bed-cloaths. The ſoft and warm beds of down or the fineſt feathers ſo much in uſe about that period are now generally laid aſide, and a firmer ſupport for the body ſubſtituted in their room, a change which has undoubtedly been very favourable to health.

ceed 61, 62 or 63 beats in a minute, which in a ſhort time, without any alteration of poſture, roſe to 66, 67, and 68.

I have paid ſo much attention to this point, that I have no doubt of the fact, though I cannot ſpecify the proportion.

The late Dr. Whytt, a man of acute as well as correct obſervation, takes it for granted that the pulſe, like the other vital motions, becomes ſlower during ſleep; he ſpecifies however two circumſtances which form powerful exceptions, and which have (probably from their not having been ſufficiently noticed) given riſe to moſt of the difference of opinion which has taken place reſpecting this ſubject.

The firſt is when food or liquor has been plentifully taken in a little before ſleep; the diſtention of the ſtomach occaſioned thereby, acts as an irritating cauſe, and by the ſympathy that ſubſiſts between that organ and the heart, will undoubtedly accelerate the pulſe.

The chyle likewiſe that reſults from thence, and is continually (during ſleep under ſuch circumſtances) mixing with the blood, acts as a general ſtimulant to the ſyſtem, tending to produce the ſame effect. If fermented or ſpirituous liquors have been drank with the food, the increaſe of heat and quickneſs of the pulſe * are much greater.

* It muſt not be underſtood from what is here ſaid, that it is recommended generally (in order to avoid the inconveni-

I am apt to think that under ſuch circumſtances, the repoſe of the body and its horizontal poſture, which uſually contribute to abate the quickneſs of the pulſe, have here an oppoſite effect. A load of

ences here ſpoken of) to go to reſt faſting. The flatulence and uneaſineſs uſually attendant upon an empty ſtate of the ſtomach, eſpecially in perſons of nervous habits, will often produce feveriſh heat, and uneaſy and diſturbed ſleep, much reſembling what is cauſed by an over proportion of food.

Dr. Whytt obſerves, when treating of the cure of nervous diſorders, "that when his ſtomach was weak, and when, after "being indiſpoſed, the palms of his hands were hot, and his "body languid, and apt to ſweat upon motion; that he had "often found himſelf much better for a glaſs of claret and a "bit of bread an hour or more before dinner; in this caſe the "wine cooled him, made his pulſe ſlower, and gave him more "ſpirits and ſtrength." The ſame advice is equally applicable to the evening as to the forenoon.

The luxury of the laſt age, which was principally manifeſted in plentiful and heavy ſuppers, has, from the revolutions incident to caprice, many of which we have witneſſed in our own times, been diverted into other channels, and a total abſtinence has with many perſons taken place of a luxurious indulgence. This extreme is indeed leſs dangerous to health than the former, but is nevertheleſs, like all other extremes, totally irreconcileable with reaſon or practical obſervation. It muſt indeed be owned that the extravagantly late hours at which dinner is ſerved among the higheſt ranks, and thoſe who affect to ape their cuſtoms, make ſuch forbearance in a good meaſure neceſſary, ſince the time of dinner at preſent ſcarcely varies from that of ſupper when the luxury of thoſe meals prevailed. The above advice then muſt be underſtood to refer to thoſe who have not yet adopted the faſhionable hours uſual in high life, and are nevertheleſs ſo unreaſonably abſtemious.

victuals upon the ſtomach requires an erect poſture, muſcular motion, and a degree of general exertion, in order to its being properly digeſted and forwarded through the alimentary canal. When theſe active auxiliaries then are wanting, a greater burden is laid on the proper functions of the ſtomach, and a degree of fever excited by the overſtrained efforts of that organ which is known to ſympathiſe ſo ſtrongly and ſo immediately with the circulatory ſyſtem. On this account it is hazardous, when any conſiderable exceſs of this kind has taken place, to ſuffer thoſe who have practiſed it, to go to reſt, or even to lie down in an horizontal poſture, until they have in a good meaſure recovered of the oppreſſion which ſuch imprudent repletion always occaſions. Death has frequently accompanied ſuch inſidious repoſe, probably, from the powers of nature, debilitated by the exceſs, and unaſſiſted by the uſual helps, proving too weak to ſubdue or diſcharge the load upon the ſtomach, and of courſe ſinking into a paralytic ſtate under the unequal conflict.

Another, and as I believe a very uſual cauſe of nocturnal fever and irritation ariſes from ſleeping in too hot an air, or under too great weight or thickneſs of bed cloaths. Fires in bed-chambers are I think leſs uſed than they were formerly, but the improvements in wood-work, particularly exemplified in the cloſe joints of the windows and doors, are apt I think to make theſe apartments too warm, and that in a manner particularly unfavourable to health.

Air loaded with breath and perſpiration, becomes not only heated but noxious at the ſame time; and, if carried to great exceſs, generates fevers of the moſt malignant and dangerous * kind. Such effects indeed ſeldom take place unleſs with people who are confined to their apartments; but nevertheleſs, the bad tendency of ſuch an atmoſphere, though but partially inhaled, may manifeſt itſelf in a more gradual manner, and it has been, not without reaſonable probability, ſuggeſted, that the nervous complaints ſo uſual in the preſent age ariſe in no ſmall degree from the hot, confined, and of courſe unwholeſome air, to which the modern ſtyle of domeſtic and ſocial accommodation, neceſſarily expoſes moſt of the higher ranks of people.

There is reaſon to think that a heated and foul atmoſphere is particularly injurious during ſleep. The uneaſy ſenſation which attends the breathing a hot contaminated atmoſphere, is ſuch as to make thoſe who are expoſed to it when awake, deſirous to relieve themſelves by the admiſſion of freſh air, or by change of place: but during ſleep, when the body is in a good meaſure in a ſtate of inſenſibility, ſuch uneaſineſs not being acutely painful and coming on gradually, which laſt circumſtance is very material, is not ſufficiently ſtimulant to rouſe thoſe who are expoſed to it and to put them on their guard.

* The gaol and hoſpital fevers which anſwer neareſt to this character, are undoubtedly owing to this cauſe.

The continuance of ſuch an effect for ſeveral hours together, and its frequent occurrence, may poſſibly be the occaſion of many of thoſe hectical ſymptoms which often occur in practice, and which are difficult to be accounted for.

It adds probability to this conjecture that theſe complaints are almoſt invariably obſerved to be moſt troubleſome during the night.

On the other hand when, as Dr. Whytt has obſerved, "the ſtomach is not loaded, and the air pure and cool, and the bed-cloaths not more than ſufficient to preſerve a comfortable warmth, the pulſe will in time of ſleep be unuſually ſlow."

2. Activity. Including change of poſture.

Motion and exertion of every kind is found to quicken the pulſe; even the little effort that is neceſſary to preſerve the body in a ſtanding poſture, is ſufficient to produce a very perceptible increaſe of pulſe above what it was in a ſitting or recumbent poſture.

The reſult of twenty-one accurate trials made on different days and at different times of the day, all coincided to prove this fact. The greateſt difference obſerved, was *thirteen* beats in a minute, and the leaſt difference *one* beat. Each of theſe however occurred once only. The average difference between the above poſtures was about *ſix* beats and *one third* in a minute.

It appears to me that a greater proportionable difference took place when the pulſe exceeded the

ſtandard. Thus when the pulſe of a perſon in a ſitting poſture beat 77 or 78 beats in a minute, it roſe to 88 when the body was erect and unſupported, whereas, when the pulſe was no more than 68, it increaſed only three beats by ſuch change of poſture, when 67, one beat only, when 65, *three* beats, and when 64, *four* beats.

The above numbers are not in any regular proportion, but in my opinion fully ſufficient to prove the point intended.

The pulſe in health is, as far as I can find, the ſame in a ſitting,† as in an horizontal poſture.

Exerciſe is well known to quicken the pulſe. The proportion given by Dr. Robinſon,‡ of the effects of bodily motion is as follows. Lying down, p. 64. —Sitting, 68—Standing, 78—Walking at the rate of two miles an hour, 78.—At the rate of four miles an hour, 100—Running raiſed it to 140, 150, or more. I have myſelf made ſeveral experiments to the ſame

* If theſe facts are generally true (as I believe them to be) they afford an explanation why perſons in fevers are ſo much fatigued by motion, and being got out of bed. I have frequently felt their pulſes on ſuch occaſions, and often found them too quick to be numbered.

† Some late writers obſerve that the pulſe is conſiderably quicker when the perſon, whoſe pulſe is felt, is in a ſitting poſture than in an horizontal one; but I have made ſeveral examinations to determine this, and have uniformly found the pulſe as I have repreſented.

‡ Anim. Œcon. p. 177.

purpoſe, but the reſult in each of them was ſo different that I could not reduce them to any ſtandard. They ſeemed however not to differ very much, except in what reſpects a ſitting and a recumbent poſture, from the proportions above laid down by Dr. Robinſon.

Speaking is a kind of exerciſe, which has a conſiderable effect upon the pulſe. I have often obſerved that even a few words ſpoken during the examination of the pulſe have quickened it ſeveral beats in a minute. This will be the caſe in ſome degree in perfect health, but much more in proportion when there is any tendency to fever.

Hence ſilence is very properly recommended to patients in ſuch ſituations.

3. Mental agitation.

Mental agitation of every kind affects the pulſe, and as far as I have been able to diſcover, accelerates it.

The debilitating paſſions, as fear, anxiety, grief, remorſe, tend I believe to weaken the pulſe, whilſt the ſtimulating paſſions make it more full and ſtrong.

Floyer mentions the pulſe being excited by anger to beat 104 in a minute, and that it did not return to the natural ſtandard in leſs than three or four days. I have myſelf more than once obſerved that apprehenſion reſpecting the event, has in timorous people tended to diminiſh the feveriſh heat in caſes of a ſlight inflammatory nature. When the diſorder is of a malignant or putrid tendency, the ſame

apprehenſion is ſaid to have produced bad effects by lowering the ſpirits, and of courſe the ſtrength.

It ſhould be obſerved, that although the debilitating and the ſtimulant paſſions both accelerate the pulſe; the heat of the body is not proportionally increaſed by both, the former having rather a contrary tendency, whilſt the latter (e. g. anger) is proverbial for its heating effects.

V.

State of the body with regard to temperature.

There is no doubt that the application of heat, when it exceeds the natural temperature of the body, has the power of exciting the pulſe. It has been found, by many phyſiological * experiments, to renew the motion of the heart, or punctum ſaliens, in an egg, when it had ceaſed for a conſiderable time; and common obſervation ſhews, that any accidental

* Ovo inſuper aeri frigidiori diutius expoſito, punctum ſaliens rarius pulſat, & languidius agitatur: admoto autem digito calente, aut alio blando fotu, vires ſtatim vigoremque recuperat. Quinetiam poſtquam punctum hoc ſenſim elanguit, et ſanguine plenum a motu omni ceſſans, nullumque vitæ ſpecimen exhibens, morti penitus ſuccubuiſſe viſum eſt: impoſito digito meo tepente, ſpatio viginti arteriæ meæ pulſum, ecce corculum denuo reviviſcit, erigitur, & tanquam poſtliminio ab orco redux, priſtinam choream redintegravit. Idque alio quolibet leni calore, ignis nempe, aut aquæ tepidæ, iterum iterumque a me, & aliis factitatum eſt; ut, pro libito, miſellam animam vel morti tradere, vel in lucem revocare, in noſtra poteſtate fuerit. Harveii Opera, p. 253.

application of heat, as by ſitting near a fire, will increaſe the number of the pulſe.

I have found it increaſed thereby from 75 to 85 beats in a minute. Heat produced by a ſuperabundance of bed cloaths, of which I have before ſpoken, will have a ſimilar effect.

Cold on the other hand is ſaid to diminiſh the number of the pulſe, but this I apprehend is true of it only when applied in ſuch a degree as to overcome in ſome meaſure the powers of life, in which caſe it operates as a ſtrong opiate or * ſedative to the ſyſtem in general, but when applied in ſuch a degree only, as to create uneaſy ſenſations without any material alteration of the bodily temperature, it quickens the pulſe and gives a ſtrong and very ſenſible irritation to the heart. A cold bath, provided it be only inſtantaneouſly applied, accelerates the pulſe very conſiderably. On the other hand the *gradual* acceſſion of cool air to the body when over-heated, undoubtedly tends to diminiſh the number of the pulſe.

It appears to me that either cold or heat when applied in ſuch a degree as to produce uneaſy ſenſations, quicken the pulſe by irritating the feelings. When either of them is applied only in ſuch a degree as to remove the uneaſy feelings occaſioned by the other, the pulſe is reduced nearer to the natural ſtate.

* See a remarkable account to this purpoſe in Sir Joſeph Banks's firſt voyage.

I know no method however, of bringing theſe ſtimulant cauſes to any ſtandard common to both of them, or proportionate to the effect produced.

Sir John Floyer, a man whimſical in his ideas, but I believe accurate in relating the reſult of his own perſonal experience, adopted a notion, that the natural pulſe varied in a certain proportion in all the degrees of latitude from the equator to the pole; and under this perſuaſion, and with no better foundation that I can diſcover, than an opinion (which he himſelf does not invariably adhere to) that the natural pulſe in England is about 70 beats in a minute, has conſtructed a table of pulſes for a great variety of latitudes, which for its extravagance I ſhall inſert, as a caution to medical writers againſt adopting principles in ſo important a branch of ſcience, without proper examination if the poſitions laid down, were conſiſtent with actual experience.

Table I. Floyer's Pulſe-Watch. Vol. I. p. 298.
" Containing the moſt healthful number of pul-
" ſes in one minute, according to the ſeveral
" climates, which are diſtinguiſhed by every
" fifth degree, betwixt the equator and the
" northern pole.*

Number of Pulſes.	Degrees from the Equator.
120	This number happens under the equator.
115	5th degree from the equator.
110	10
105	15
100	20
95	25
90	30
85	35
80	40
75	45
70	50
65	55
60	60
55	65
50	70
45	75
40	80
35	85
30	90

* I am inclined to think, notwithſtanding the pompous manner in which theſe calculations are introduced, that Sir John Floyer himſelf did not place much dependence on them, ſince in a ſubſequent part of the ſame work, Vol. I. p. 435. he has given the ſame table *nearly*, but reverſed, as the ſloweſt

None of the books on medicine which I have been fortunate enough to meet with, have ſpecified the rate of the natural pulſe in the country whoſe diſeaſes they have deſcribed, although they often make uſe of the term *natural pulſe*; of courſe then they muſt be ſuppoſed to mean the ſame rate of pulſe as we who are their readers have been accuſtomed to diſtinguiſh by that name.

It afforded to me much matter of ſurpriſe to find a man of the medical knowledge, experience, and general information of Haller, embracing the above-mentioned ſtrange hypotheſis of Floyer.

He has laid it down * as a fact, that in countries ſituate under, or near the equator, the rate of pulſes is much more frequent than with us, even to 120 beats in a minute, and that in ſome of the hot parts of the Eaſt-Indies, it is 100.—But I much ſuſpect

pulſe is placed under the equator, and the acceleration is put down as increaſing as we approach the poles. This he has given on the authority of the Chineſe taken from an account of an embaſſy from the Dutch Eaſt-India Company, and herein the Chineſe accounts are as extravagant in the oppoſite extreme, as Sir John Floyer's computations. According to them, the pulſe in China does not exceed 44 beats in a minute, and its general rate is not more than 37. We have the greateſt reaſon to think, that whatever encomiums on the knowledge of theſe people credulity or prejudice may beſtow, no credit whatever ſhould be given to accounts ſo obviouſly and ſo extravagantly miſrepreſented.

* Lib. VI. Sect. II. §. XVIII. Halleri Phyſiol.

the authorities he quotes for ſo extraordinary a poſition. Sir John Floyer who is the firſt he cites, gives no better reaſon than the one abovementioned, which evidently carries no weight; the work he mentions of * Dr. Rye, I have not ſeen, nor the one he cites of Lyonnet on Inſects; but the authority brought from Linguet on the credit of M. Bernier,† is on ſeveral accounts very ſuſpicious. I have examined M. Bernier's Travels to the Eaſt-Indies very carefully, and am confident no computation of the number of beats of the pulſe in a minute, or other portion of time, occurs therein. Indeed it is not probable that it ſhould, as M. Bernier's Travels to the Eaſt-Indies were publiſhed in the year 1670, a period at which the menſuration of the pulſe was ſcarcely thought of in medical practice, though it had been mentioned before that time by ‡ Kepler.

I have enquired of ſeveral perſons who have practiſed medicine in warm climates, but cannot learn from them that there is any difference in the pulſe in thoſe countries from what we find in Great-Britain. One gentleman particularly, whoſe authority from his extenſive practice, excellent judg-

* Medicina Statica Britannica, poſt Rogers Hiſtoriam Morborum Epidemicorum Hiberniæ, edita Dublini, 1734.

† Linguet in diſſertatione, ergo animantium motus eſt ab aere, Paris, 1731. Auctorem experimenti citat Cl. Bernier.

‡ Kepler died in November, 1630.

ment, and perfect integrity, I cannot but regard as decisive, has informed me that the pulse in * Jamaica is, as nearly as possible, at the same rate as with us, and that he has known instances wherein it did not exceed 60 in a minute.

It is asserted that the heat of the body in those climates, when it is not exposed to the sun, does not exceed what we find it to be in our own country. This has been ascribed to the constant perspiration which generates cold by evaporation, and to some property in the body which, though unexplained, we have great reason to think subsists, by which the body is enabled to preserve an equilibrium of temperature notwithstanding any variations in this respect that may take place in the atmosphere.

We have not the same opportunities of examining the rate of the pulse towards the poles as we have towards the equator, but no authors on the subject of medicine that I have seen, who have written in northerly climates, as at Upsal and Petersburg, notice any difference in the rate of the pulse between those countries and the southern parts of Europe.

VI.

Effects of food and abstinence.

The effects of food and abstinence, the former in accelerating, and the latter in retarding the pulse,

* Kingston in Jamaica is in the latit. 17. 5. Of course the ordinary rate of pulse there according to Sir J. Floyer's table, should be upwards of 100.

are generally acknowledged. The experiments I have made, though they all confirm the general poſition, yet there is ſo little uniformity between them, that I ſcarcely know how to reduce them to any ſtandard. I will endeavour however to give the beſt account in my power of ſuch facts as I think beſt aſcertained.

It appears from the firſt inſtance that occurs in the table of Dr. Robinſon, above quoted, that the pulſe was quickened from 67 to 70, or about one part in twenty-two, after eating breakfaſt. In the ſecond inſtance the acceleration is greater, being from 66 to 72, or one part in eleven.

The proportion of acceleration in the firſt inſtance mentioned in the table given by the author of this work, is conſiderably larger; the pulſe therein being quickened from 66 to nearly 79, which is almoſt a fifth * part.

The acceleration of the pulſe by the dinner meal, proved more regular and uniform. In the firſt of Dr. Robinſon's experiments the pulſe was increaſed at the end of the fifth hour after the perſon ſat down to dinner ſeven beats in a minute, or one tenth part, and in the ſecond experiment eight beats, or ſomewhat more than one eighth part.

* I am inclined to aſcribe this difference to the breakfaſt being taken of a warmer temperature than might be uſual at the time Dr. Robinſon's experiments were made.—Sir John Floyer obſerved, that two diſhes of coffee, which is generally drank pretty hot, had a great effect in quickening the pulſe. Phyſ. Pulſe-Watch, Vol. I. p. 156.

In the experiments made by the author of this work, the increaſe was about five beats under ſimilar circumſtances, which is only about one fourteenth part.

Sir John Floyer ſays that he has often found his own pulſe at *ſeventy* before dinner, and after it *eighty-ſix*, or even *ninety*. The loweſt of theſe numbers denotes an increaſe of more than one fifth part. He however deſcribes himſelf to be of a hectic irritable habit.

Sckwenke, an author quoted by Haller, eſtimates the increaſe of the pulſe, by eating dinner, as amounting from eight to fourteen beats.

Haller, from experiments * made on himſelf, found an increaſe of from ten to twelve beats by the ſame meal.

The reader may obſerve that, although in the ſecond of the inſtances above produced the acceleration of the pulſe after breakfaſt was nearly as great as after dinner, yet that ſuch acceleration was conſiderably leſs permanent. In the three inſtances firſt mentioned the pulſe began to diminiſh in leſs than two hours after breakfaſt, whereas after

* Haller in another place mentions that his natural pulſe (the medium pulſe I ſuppoſe through the day) was ſeventy-eight beats in a minute. The medium pulſe was therefore accelerated about one ſeventh part by this meal.—It ſhould be noticed that the experiment of Haller, here referred to, was made when he was in a weak though convaleſcent ſtate (convaleſcenti, & debili) and probably more irritable than when in health. Haller. Phyſiol. Vol. II. 261. 264.

dinner it either remained ſtationary, or was on the increaſe, until the time of going to reſt. Theſe circumſtances account for that inſtinctive nauſea which perſons in a ſtate of fever are obſerved to expreſs reſpecting animal food, and ſhew at the ſame time why, by its permanent ſtimulus, it is the propereſt food for people in health, who are obliged to undergo great labour and to practiſe great exertions of ſtrength.

I have found by repeated experience that the acceleration of the pulſe is by no means proportional to the quantity of food taken in, provided no exceſs be committed. I have obſerved the pulſe to be quickened by a few morſels of dry bread in the proportion of about five to ſeven of what it uſually was by a moderate meal. But ſuch acceleration did not continue ſo long as it did in the other caſe.

Fermented liquors are well known to quicken the pulſe, but this effect is principally obſervable in thoſe who are not much accuſtomed to their uſe. When they become habitual, provided the quantity be moderate, their effect in raiſing the pulſe at the uſual time of taking them after dinner is inconſiderable.

I have found the pulſe beat the ſame number for ſeveral hours after dinner, when no ſtronger liquor than the uſual quantity of ſmall beer had been taken, as it did when half a pint or rather more of port wine had been drank. But this muſt be underſtood only of a healthy ſtate of body, ſince, when any tendency to fever is preſent, a ſmall quantity of wine,

and a ſtill leſs in proportion of ſpirituous liquors, contributes very powerfully to increaſe the inflammatory diſpoſition.

As to abſtinence from food, I never had any opportunity of ſeeing it carried to any great degree. It is certain that the pulſe in health is invariably ſloweſt in the morning, and a little before dinner, which are the periods of longeſt abſtinence, ſo that its effect in retarding the pulſe is unqueſtionable. Whether it would produce the ſame effect if carried to the length of cauſing great uneaſineſs, I rather doubt; but have no authority to enable me to form any deciſive opinion.

Of the changes in the pulſe liable to be produced by diſeaſe.

HAVING before ſpoken of the uſual circumſtances by which the pulſe is liable to be affected in a ſtate of health, I mean now to ſpeak of the changes that are found to be produced by diſeaſe.

Before I enter on this part it will be proper again to remind the reader of the title of this work, in which the intention is expreſſed to be, "to point out with greater certainty the indications ſignified by the pulſe eſpecially in feveriſh complaints," to which, indeed, I mean to confine in a great meaſure what I have to offer.

The acceleration of the pulſe is agreed by all practitioners to be the leading mark that indicates

the preſence of fever. Some rare inſtances indeed are ſaid to have occurred wherein the pulſe has not been altered from its natural ſtandard, but theſe are too few to require being noticed in this place.

As the pulſe however is liable to be accelerated by various circumſtances in life, unconnected with diſeaſe, it will be neceſſary to aſcertain as far as lies in our power, that degree of acceleration which may be properly ſaid to denote the preſence of fever.

Moſt of the writers that I have ſeen, appear to draw their inferences of the preſence of fever from the abſolute number of pulſations which the artery makes in a given time. Thus 96 beats in a minute are I believe uſually thought to denote the commencement, or rather perhaps the loweſt degree of fever; 108 is the uſual rate of hectic fever in the male ſex; 112 is the number that uſually attends peripneumony, and indeed other internal inflammations not attended with acute pain; 120, the rate accompanying inflammatory fever; and when above this number, it is ſuppoſed to indicate the approach of delirium. When it riſes to 130 and upwards, it often denotes that ſtage that precedes or attends large confined ſuppurations. When ſymptoms of a putrid diſpoſition in fevers appear, as in the typhus, the pulſe will often riſe to the number laſt ſpecified, but never that I have ſeen without either delirium, or a degree of either fatuity or inſenſibility, that were equivalent to delirium in affording unfavourable prognoſtics.

I have not ſpecified the above numbers as univerſally acknowledged to be accurately juſt, but only as ſuch as are perhaps with ſome ſmall latitude generally received.

But it muſt be evident to every one who duly conſiders the ſubject, that this, or indeed any computation, deduced from the abſolute number of the pulſe, muſt be liable to much inaccuracy.

It can only hold true in caſes wherein the natural pulſe is of the medium ſtandard, or beats on an average 75 times in a minute, which number, though it may ſerve as a general computation, is far from being univerſally prevalent. The natural pulſe is frequently, in point of quickneſs, very different in different perſons, and if this be the caſe, we can have no reaſon to ſuppoſe that *diſorder*, which, from the meaning of the term, is underſtood to derange the regular courſe of nature, ſhould at once reduce a number of diſcordant pulſes to the ſame rate. The natural pulſe is found in ſome perſons to exceed that number which according to the foregoing calculations would imply a conſiderable degree of fever, and in others the preſence of that diſorder is ſtrongly marked, though the number of the pulſe may not reach the pitch that is ſuppoſed to indicate the loweſt degree of that diſorder.

To obviate this inconſiſtency, the number of the natural pulſe, be that what it may, has been fixed on as the ſtandard from which the increaſe ſhould be computed, and a certain number of beats ex-

ceeding this point (twenty, thirty, or more) have been aſſumed as criterions, either of the preſence of the diſorder, or of its different ſtages, and as ſuited to point out ſuch indications as * the pulſe is capable of affording.

But this method of calculation, although it may be ſomewhat leſs exceptionable than the other, which is founded on the conſideration of the abſolute number of beats in a given time, is nevertheleſs ſubject to great inaccuracy. It is evident that the addition of any given or determinate number to the pulſe cannot afford the ſame indications in all perſons. The proportion which the addition of twenty-one beats bears to a natural pulſe of ſixty in a minute, is very different from what the ſame addition would bear to one of ſeventy-five. For as ſeventy-five is to ninety-ſix, ſo is ſixty to ſeventy-ſix, eight tenths. In this latter caſe then, an addition of ſeventeen beats muſt be conſidered as equivalent and affording the ſame indication as an addition of twenty-one beats would have done, had the natural pulſe been at the rate of ſeventy-five beats in a minute. It appears then to me that the proper

* Many practitioners, and ſome authors even as early as Celſus, whoſe obſervations and directions reſpecting the examination of the pulſe are neverthleſs in general excellent, ſeem to have concluded too haſtily that leſs credit is due to the indications furniſhed by the pulſe, than I think they deſerve. This has I think originated from neglect of conſidering the natural pulſe in each individual, as the baſis of their reſpective calculations.

method muſt be to eſtimate the degree of fever according to the proportion which the accelerated pulſe bears to the natural.

Thus if the pulſe be permanently quickened in the proportion of 1.28. to 1.* we may pronounce the commencement of fever or the preſence of fever in a ſmall degree: if as † 1.44 to 1. it denotes a conſiderable degree of fever and ſuch as is the uſual ſtate of hectical perſons when the fever is not in a ſtate of exacerbation: if as 1.493 ‡ to 1. it denotes a higher degree of fever and ſuch as uſually accompanies pleuriſies, peripneumonies, and other internal inflammations not very acute. If as 1.6 to 1. § it denotes a great degree of inflammatory fever, and is indeed nearly the utmoſt pitch of permanent acceleration that is conſiſtent with the preſervation of the underſtanding.

If it riſes as high as the proportion of 1.76 ‖ to 1. it denotes the pitch at which the pulſe uſually is in malignant fevers which ſcarcely ever fails of being attended with delirium and great danger. Under ſome circumſtances this number of the pulſe is rather leſs formidable, though ſtill very threatening; I

* Equal to the proportion that 96 bears to 75.

† Equal to the proportion 108 bears to 75.

‡ Equal to the proportion 112 bears to 75.

§ Equal to the proportion 120 bears to 75.

‖ Equal to the proportion of 132 to 75.

mean in the caſe of the formation of large ſuppurations, particularly ſuch as ſometimes prove the criſes of hectic fevers.

This method of computation enables us to account for, and to reconcile many apparent irregularities and inconſiſtencies. Thus the pulſe is often thought to indicate a lower degree of fever than the other ſymptoms import to be preſent. But it is very poſſible that theſe circumſtances, however diſcordant they may appear at firſt ſight, may be nevertheleſs in ſtrict uniſon with one another. Thus I have witneſſed a caſe attended with numerous and evident ſymptoms of fever, wherein the pulſe did not exceed 40 in a minute, a number to all appearance extremely ſmall, even ſuppoſing it to be the one uſual in health. But upon the conſideration that the natural pulſe in this inſtance did not exceed twenty-four beats in a minute, the difficulty ceaſed, and the whole appeared regular and proportional. For as 24 is to 75, ſo is 40 to 125,* the laſt of which numbers ſhould be conſidered, according to the uſual computation, as the real rate of the pulſe, and which was fully adequate to the other ſymptoms of fever which then occurred.

I lately attended for a conſiderable time a perſon nearly allied in blood to the one laſt mentioned, and who had repeatedly, during my attendance on him,

* Here the addition of ſixteen beats in a minute muſt be reckoned as equivalent to the addition of 50 beats to a pulſe of the uſual ſtandard, or 75 in a minute.

evident, though not violent ſymptoms of fever, ſuch as a white tongue, hot ſkin, thirſt, laſſitude and pain in the limbs. Yet the pulſe in this caſe ſcarcely ever exceeded 78, or at moſt 80 beats in a minute. But I found on examination after his recovery that what I had before ſuſpected was true, and that his pulſe was naturally ſlow, not exceeding 54 or 55 beats in a minute. This circumſtance perfectly explained the ſeeming diſcordance of the ſymptoms. For as 54 is to 75, ſo is 78 to 108.3. which laſt number ought to be accounted the true rate of the pulſe, according to the uſual calculation, and is, as I have before obſerved, the general number of the pulſe in low fevers. Nearly about the ſame time I viſited, in conſultation with an eminent phyſician of this city, a patient who laboured under a ſevere peripneumony attended with the uſual ſymptoms, and which required three plentiful bleedings, and repeated and large evacuations of other kinds before it could be reduced. In this caſe the pulſe never exceeded (one examination only excepted) 84 beats in a minute. Yet the pulſe was in this inſtance perfectly proportional, ſince in a natural ſtate it beat no more than 56 times in a minute. For as 56 is to 75, ſo is 84 to 112.5, which laſt number implies a rate of pulſe ſufficiently quick to accord with the other concomitant ſymptoms.

But our opinions are not liable to be miſled merely from thinking the pulſe *ſlower* than what appears to correſpond with the other ſymptoms of fever: they are at leaſt equally liable to be erroneous from think-

ing the pulſe to be *quicker*, and to indicate a higher degree of fever, than might be inferred from the ſtate of the other ſymptoms. But in this caſe as well as in the former it will I apprehend be generally found, that the pulſe, as well as the other ſymptoms, are regular and proportionate to one another. If the natural pulſe be 96 in a minute, as I have repeatedly found it to be in ſome irritable habits, and not very uncommonly in the female ſex, it may riſe to 120 beats in a minute before we can pronounce a fever to be preſent: for as 75 is to 96, ſo is 96 to 121.5.

In order to reconcile theſe ſeeming irregularities, and to reduce all pulſes (provided the natural number be known) to the ſame ſtandard, the following table is conſtructed.

Every diviſion or ſection of this table is numbered in ſucceſſion, and each diviſion contains the comparative proportion which the increaſe of that number of the natural pulſe which is ſet at the head of each diviſion, bears to the increaſe of the ſtandard pulſe of 75 beats in a minute; to which laſt mentioned number the firſt number in each diviſion is always ſuppoſed to be equivalent. Thus in diviſion or ſection I. wherein 40 beats in a minute are aſſumed as the natural pulſe, and of courſe equal to 75 of the ſtandard, 41 is ſet down as equal to 76.875, 42 to 78.75, and the laſt number in this ſection, namely 82, is ſet down as equal to 153.75.

The proportions under each ſection are ſet down to as many at leaſt as are equal to 125 beats of the

ſtandard natural pulſe, of 75 in a minute, at a medium, through the day.

The utility of this table in reducing all pulſes, however diſcordant they may be in point of number, to the ſame ſtandard, is I truſt ſufficiently obvious. We are accuſtomed, and very properly, to adjuſt our expreſſions and indeed our ideas alſo, reſpecting the rate of the pulſe, to that number of the natural pulſe which is found to prevail generally amongſt mankind; and it is with a reference to this number, that the indications which we find pointed out in books of medicine, are founded, as far as ſuch indications depend upon the pulſe.

If we apply rules founded upon ſuch indications to practice, we ſhall often find them erroneous, if underſtood according to the literal expreſſion; though perhaps true, when the relative proportions are duly conſidered.

Epidemic fevers are often deſcribed by writers as being in the different inſtances nearly ſimilar to one another in the general courſe of the ſymptoms, but with conſiderable difference of the rate of the pulſe in the ſeveral ſubjects attacked by them.

It is, in my opinion, highly probable, that the pulſe, rightly attended to, would not prove leſs uniform and conſiſtent than the other ſymptoms.

Were the pulſe in every inſtance of the ſame kind of fever to beat an equal number of times in the ſame ſpace, the courſe of nature would be irregular and inconſiſtent.

We cannot imagine it to be compatible with our ideas of the operation of natural cauſes that an acceleration to the ſame pitch in point of number ſhould take place from the ſame cauſe in a perſon whoſe natural pulſe was 40 and one whoſe natural pulſe was 75 in a minute.

In order therefore that the ſame effects may virtually at leaſt be produced from the ſame cauſes, (e. g. in the caſe of infection) it is neceſſary that the correſponding appearances ſhould be ſomewhat different.

A pulſe which beat naturally 75 times in a minute, might poſſibly without much danger be accelerated to an hundred beats in the ſame time, but life would probably be terminated long before a pulſe that beat naturally only 45 times in a minute, was increaſed to the former number.

The method then here recommended, promiſes, I think, not only conſiderable improvement in practice, but may alſo ſerve to reconcile ſeveral ſeeming inconſiſtencies in the courſe of nature, and to evidence the uniform operation of natural cauſes, ſo nearly ſimilar to one another as we have reaſon to think thoſe to be, which are productive of fever.

Some difficulty however remains: in order to make a proper uſe of the tables, it is neceſſary to be acquainted with the uſual medium rate of the natural pulſe when in health, which on ſuch occaſions is not often poſſible to be diſcovered with ſufficient accuracy to ſerve this purpoſe; but if the method here recommended be attended with the ad-

vantages which I ſuppoſe, it will be worthy the attention of medical practitioners to examine and to note down the number of the natural healthy pulſe of each individual, for whom they have been, or may be likely to be concerned. This might ſerve as a guide to direct the judgment in time of ſickneſs, and to enable the practitioner at one view to reduce the proportion of the pulſe ſo examined, to the general ſtandard. Thus we may ſuppoſe an adult perſon to be affected with the uſual ſymptoms of fever in a moderate degree, yet with a pulſe not exceeding 84 beats in a minute.

This number, though rather exceeding the uſual rate, is not more than takes place ſometimes, without greatly affecting the health, and might on that account lead the perſon conſulted to aſſign ſome other cauſe for the attendant ſymptoms than what might be connected with fever, and to act accordingly. But if the natural pulſe ſhould be known to be no more than 64 in a minute, it would explain the apparent difficulty. For as 64 is to 75, ſo is 84 to 98.437. which laſt number of the pulſe is ſufficient to indicate the uſe of remedies adapted to the cure of fever. Suppoſe on the other hand a phyſician to be called to a perſon in whom appeared ſome ſlight inflammatory ſymptoms, but with a pulſe of 120 in a minute. The latter circumſtance might lead to an opinion that the ſymptoms were at variance, or elſe that the fever itſelf was of a putrid or malignant kind; in diſorders of which tendency,

the other ſymptoms of inflammation often appear, but in a moderate degree, in proportion to the rapidity of the pulſe. But had it been known in ſuch a caſe, that the natural pulſe beat at the rate of 98 times in a minute, no very uncommon circumſtance in the female ſex, it would have tended to explain the nature of the complaint, and to abate much of the apprehenſion which a pulſe ſeemingly ſo quick might occaſion. For as 98 is to 75, ſo is 120 to 91.837, which laſt number is very common in a medium pulſe, when the ſymptoms of general inflammation are but moderate.

It would be foreign to the purpoſe of the preſent work to particulariſe the different modes of treatment which would be indicated under ſuch different views of the ſubject.

As advance in age cauſes a conſiderable alteration in the pulſe, it would be proper for thoſe who make the obſervations above recommended, to repeat them at ſuch intervals of life as are likely to affect the rate of the pulſe. But the rate of the healthy pulſe of any individual above 14 years of age, and not far advanced into life, being once aſcertained, will ſerve as a ſtandard to a pretty conſiderable age, and even then may be uſeful with ſome allowance to direct our judgment, although the calculations founded thereon may not be accurate. I once meant to have formed a calculation of the changes in the pulſe as they take place at different times of life; but found the facts, though concurring to prove the general poſition, ſo variable

and irregular, that no correct inferences could be deduced from them.

I have added at the end of the calculations above referred to, a ſhort table of the proportion between the evening and the morning pulſe, at different degrees of its acceleration, beginning with the one that is ſuppoſed to mark the loweſt degree of fever, and terminating with that which is nearly as quick as is conſiſtent with life, or at leaſt with hopes of recovery. This table is founded on one given by Dr. Bryan Robinſon, and inſerted in the former part of this work, and which marks the rate of the natural pulſe at different times of the day. Thus at VIII. in the morning the mean pulſe of the two inſtances he has produced, was 65.5. and at VIII. in the evening 76.5. It ſeems highly probable and agreeable to the regularity of nature, that the ſame proportions ſhould be obſerved when the pulſe is regularly and permanently accelerated, which before took place in the natural pulſe.

A pulſe which at VIII. in the morning beats 82 times in a minute, ſhould, if no alteration takes place in the ſyſtem, beat 96 times, (or a fraction leſs) at VIII. in the evening; for as 65.5 is to 76.5, ſo is 82 to 95.771. A due attention to this circumſtance may I think enable us to explain ſeveral of the ſymptoms which occur in fevers, and to draw from thence ſome important concluſions. Every practitioner in medicine muſt have remarked, that, in continued fevers, there is a conſtant and regular acceleration of the pulſe, and aggravation of the

other ſymptoms in the evening. In ſuch a ſituation the fever is uſually ſaid to be higher in the evening than in the morning.

But ſome * acceleration of the pulſe and concomitant aggravation of the ſymptoms may take place in the evening, and yet the fever may be notwithſtanding on the decline.

Thus if we ſuppoſe the pulſe at VIII. in the morning to be 98 in a minute, and at the correſponding hour in the evening to be 108, it will appear that this latter number, though ſufficient to ſhew ſtrong marks of fever, is notwithſtanding indicatory of its decline, ſince had it been in regular proportion (ſuch as we might expect to take place had the fever been ſtationary) it ſhould have been 114 and ſome fractions over. A due attention to this circumſtance may afford important information: it may ſuggeſt the propriety of the continuance or the

* An attention to the remiſſion of the ſymptoms in a morning, and their aggravation in the evening, ſuppoſing the diſorder to be ſtationary, may furniſh ſome uſeful hints reſpecting the proper time for adminiſtering both food and medicine.

The morning ſeems the moſt proper time for offering ſupport of the nutritious kind, and the evening, the one when remedies that tend to lower the fever, might *perhaps* with moſt advantage be exhibited. Theſe, however, admit of conſiderable latitude, eſpecially in what regards medicine. It holds true though (I believe pretty generally) in reſpect to food.

Does it not ſeem likely that the vehemence of the febrile ſymptoms in the quartan ague, may proceed in part from the time of its acceſſion, which is uſually in the evening, concurring with the diurnal periodical acceleration of the pulſe?

change of medicines, and encourage the phyſician to expect a favourable remiſſion and farther abatement of the pulſe the ſucceeding morning. On the ſame principle ſhould the evening pulſe exceed the proportion, as if a pulſe that beat 98 in the morning was to riſe to 120 in the evening, it would give reaſonable cauſe of alarm, as it would indicate the fever to be on the increaſe. The apprehenſion of this, however, may ſuggeſt the trial of active remedies, ſuited to ſtop its farther progreſs.

It muſt be obſerved, that the table here given, though conſtructed ſo as to ſuit nearly the ſtandard number of the pulſe, or 75 beats in a minute, at a medium, may yet be accommodated to any number of the natural pulſe contained in the diviſions of the larger table, provided that the natural number of the pulſe be known.

Thus ſuppoſe the natural pulſe of any individual ſhould be known to beat at a medium 40 times in a minute; if this pulſe ſhould at VIII. in the morning beat 44 times in a minute, and be accompanied with other ſymptoms of fever, and at VIII. in the evening beat 51 times in the ſame ſpace, we might ſay that the fever was ſtationary. For in the firſt ſection of the larger table (intituled Natural Pulſe 40 in a minute) we find that 44 correſponds to 82.5, and 51 to more than 96 of the ſtandard pulſe. Now this is nearly the ſame proportion which takes place in the natural pulſe at the correſponding hours * above mentioned, and

* 65.5 : 76.5 : : 44 : 51.389
65.5 : 76.5 : : 82.5 : 96.356.

coincides perfectly with the first article in the smaller table.

Again, suppose the natural pulse of any individual to be known to beat at a medium 60 times in a minute, and that this pulse should (attended with other symptoms of fever) be accelerated so as to beat 72 times at VIII. in the morning. Now 72 beats of a pulse of 60 appear in Sect. XXI. of the larger table to be equal to 90 of the standard pulse; and in the smaller table it appears that a pulse of 90, at VIII. in the morning, should, if the fever continues stationary, beat 105 at VIII. in the evening. If we look for 105 in the second column of Sect. XXI. we find it corresponds with 84 in the first column. Hence it should follow that a natural pulse of 60 in a minute, which when accelerated by fever beats 72 times at VIII. in the morning, might be expected to beat 84 times at VIII. in the evening, provided the fever continued stationary.

This table is equally applicable to natural pulses which are quicker than the standard, as it is to such as are slower. Thus, suppose a natural pulse whose medium rate was known to be 84 in a minute, should at VIII. in the morning beat 98 times in that space, I find in Sect. XLV. of the larger table, that 98 is equal to 87.5 of the standard, and by the smaller table that a pulse which beats 87.5 in the morning, should in the evening beat about 102. On again consulting Sect. XLV. of the larger table, I find that 102 of the standard is nearly equal to 114 of a pulse that naturally beats at the rate of 84 in a minute.

Conſequently ſuch a pulſe, which at VIII. in the morning was 98, might be expected to be 114 at VIII. in the evening, provided the fever neither increaſed nor diminiſhed.

The reader will obſerve that the proportion which the natural pulſe bears to the ſtandard, is calculated from 40 to 130 beats in a minute, both incluſive, in the larger table which contains 91 ſections.

It is probable that 130 beats in a minute far exceeds the natural pulſe of any adult perſon, but the proportion which this, and ſeveral other numbers inferior to it, bear to the ſtandard, was inſerted with a view to aſſiſt our calculations reſpecting the pulſes of children. The irritability almoſt conſtantly attending that ſtage of life, is ſuch, that I doubt indeed, if we can with proper ſteadineſs and regularity accommodate their pulſes to the ſtandard, but I think nevertheleſs, that ſuch computations may conſiderably aid our *conjectures*, in caſes wherein our information muſt of neceſſity be both ſcanty in itſelf, and confined to a narrow compaſs.

I have thus endeavoured to explain as well as I am able the uſe of the enſuing tables, and hope the reader will think with me that they are capable of being applied to ſeveral uſeful purpoſes.

I by no means would inſinuate that the principles I have laid down will hold in all caſes, but from a cautious and perfectly unprejudiced obſervation of many remarkable inſtances, I think myſelf authorized to ſay, that experience has confirmed what I have laid down to a degree ſurpaſſing my expecta-

tion, and enabled me in ſome inſtances to form a judgment reſpecting the event, at an earlier period of the diſeaſe than I could have done without ſuch aſſiſtance. Whether the tables may ſucceed equally well with other profeſſional perſons I will not venture to determine: my wiſh is, only, that they may be ſubjected to an impartial examination and trial. If my opinion of them prove well founded, their utility will fully juſtify their publication. Should my opinions prove erroneous, I know ſcarcely any practical ill conſequences that could follow, as few practitioners place an unlimited confidence in the pulſe, but conſider it as balanced by the other ſymptoms; and the intention of this treatiſe is not to augment our confidence in any indication which the pulſe may be ſuppoſed to furniſh, but to explain what it points out as far as it is entitled to credit, and no farther.

TABLES

TABLE

OF THE

DIFFERENT RATES

OF

NATURAL PULSES,

From 40 *to* 130 *in a Minute.*

Expreſſing the Proportion which the Increaſe of each bears to the Increaſe of the Standard Pulſe, which laſt is underſtood to conſiſt of 75 Beats in a Minute at a Medium through the Courſe of the Day.

SECT. I.

Natural Pulſe, 40 in a Minute.

40	=75	62	116 25
41	76.875	63	118.125
42	78.75	64	120.
43	80.625	65	121.875
44	82.5	66	123.75
45	84.375	67	125.625
46	86.25	68	127.5
47	88.125	69	129.375
48	90	70	131 25
49	91.875	71	133.125
50	93.75	72	135
51	95.625	73	136.875
52	97.5	74	138.75
53	99.375	75	140.625
54	101.25	76	142.5
55	103.125	77	144.37
56	105	78	146.25
57	106.875	79	148.125
58	108.75	80	150
59	110 625	81	151.875
60	112.5	82	153.75
61	114.375		

SECT. II.

Natural Pulse, 41 in a Minute.

41	=75	63	115.229
42	76.829	64	117.058
43	78.658	65	118.887
44	80.487	66	120.76
45	82.316	67	122.545
46	84.145	68	124.374
47	85.974	69	126.593
48	87.803	70	128.022
49	89.632	71	129.87
50	91.461	72	131.698
51	93.29	73	133.526
52	95.119	74	135.354
53	96.948	75	137.182
54	98.777	76	139.024
55	100.606	77	140.853
56	102.435	78	142.682
57	104.264	79	144.511
58	106.093	80	146.34
59	107.922	81	148.169
60	109.751	82	149.998
61	111.58	83	151.829
62	113.4		

SECT. III.

Natural Pulse, 42 in a minute.

42	=75	64	114.36
43	76.785	65	116.145
44	78.57	66	117.93
45	80.355	67	119.715
46	82.14	68	121.5
47	83.925	69	123.285
48	85.71	70	125.07
49	87.495	71	126.855
50	89.28	72	128.64
51	91.065	73	130.425
52	92.85	74	132.21
53	94.635	75	133.995
54	96.42	76	135.78
55	98.305	77	137.565
56	100 09	78	139.35
57	101.875	79	141.135
58	103.650	80	142.92
59	105.435	81	144.705
60	107.22	82	146.48
61	109 095	83	148.265
62	110.79	84	150.05
63	112.575		

SECT. IV.

Natural Pulſe, 43 in a Minute.

43	=75	65	113.372
44	76.744	66	115.116
45	78.488	67	116.86
46	80.232	68	118.604
47	81.976	69	120.348
48	83.721	70	122.092
49	85.465	71	123.837
50	87.209	72	125.581
51	88.953	73	127.325
52	90.697	74	129.069
53	92.442	75	130.813
54	94.186	76	132.558
55	95.93	77	134.392
56	97.674	78	136.136
57	99.418	79	137.87
58	101.163	80	139.614
59	102.907	81	141.359
60	104.651	82	143.113
61	106.394	83	144.857
62	108.139	84	146.591
63	109.884	85	148.335
64	111.628		

SECT. V.

Natural Pulse, 44 in a Minute.

44	=75	66	112.506
45	76.704	67	114 211
46	78.407	68	115.916
47	80.113	69	117.614
48	81.810	70	119.318
49	83.524	71	121.022
50	85.229	72	122.726
51	86.93	73	124.43
52	88.633	74	126.134
53	90.336	75	127.838
54	92.039	76	129.542
55	93.743	77	131 246
56	95.447	78	132.95
57	97.151	79	134.656
58	98 855	80	136.361
59	100.559	81	138.066
60	102.263	82	139.771
61	103.967	83	141.476
62	105.686	84	143.181
63	107.391	85	144.886
64	109.096	86	146.591
65	110.801		

SECT. VI.

Natural Pulſe, 45 in a Minute.

45	=75	67	111.667
46	76.667	68	113.334
47	78.334	69	115.
48	80	70	116.667
49	81.667	71	118.334
50	83.334	72	120
51	85	73	121.667
52	86.667	74	123.334
53	88.334	75	125
54	90	76	126.667
55	91.667	77	128.334
56	93.334	78	130
57	95	79	131.667
58	96.667	80	133.334
59	98.334	81	135
60	100	82	136.667
61	101.667	83	138.334
62	103.334	84	140
63	105.	85	141.667
64	106.667	86	143.334
65	108.334	87	145
66	110		

SECT. VII.

Natural Pulſe, 46 in a Minute.

46	=75	68	110.86
47	76.631	69	112.494
48	78.26	70	114.125
49	79.893	71	115.756
50	81.52	72	117.36
51	83.155	73	119.021
52	84.782	74	120.652
53	86.417	75	122.283
54	88.048	76	123.814
55	89.679	77	125.545
56	91.31	78	127.176
57	92.941	79	128.807
58	94.56	80	130.438
59	96.203	81	132.069
60	97.822	82	133.7.
61	99.456	83	135.331
62	101.087	84	136.962
63	102.718	85	138 593
64	104.34	86	140.224
65	105.97	87	141.855
66	107.6	88	143.486
67	109.232		

SECT. VIII.

Natural Pulse, 47 in a minute.

47	=75	69	110.086
48	76.595	70	111.681
49	78.192	71	113.276
50	79.787	72	114.871
51	81.382	73	116.466
52	82.977	74	118.0
53	84.572	75	119.656
54	86.167	76	121.251
55	87.762	77	122.846
56	89.357	78	124.468
57	90.952	79	126.063
58	92.547	80	127.658
59	94.142	81	129.253
60	95.737	82	130.848
61	97.332	83	132.443
62	98.927	84	134 038
63	108.522	85	135 623
64	102.117	86	137.228
65	103.712	87	138 823
66	105.307	88	140.418
67	106.902	89	142.013
68	108.494		

SECT. IX.

Natural Pulse, 48 in a Minute.

48	=75	70	109.375
49	76.562	71	110.933
50	78.125	72	112.495
51	79.686	73	114.058
52	81.25	74	115.681
53	82.811	75	117.193
54	84.375	76	118.756
55	85.936	77	120.318
56	87.499	78	121.881
57	89.069	79	123.443
58	90.624	80	125.006
59	92.186	81	126.568
60	93.749	82	128.131
61	95.311	82	129.693
62	96.865	84	131.256
63	98.436	85	132.818
64	99.999	86	134.381
65	101.561	87	135.943
66	103.123	88	137.505
67	104.685	89	139.067
68	106.247	90	140.63
69	107.809		

SECT. X.

Natural Pulſe, 49 in a Minute.

49	=75	71	108.673
50	76.53	72	110.203
51	78.061	73	111.734
52	79.591	74	113.265
53	81.122	75	114.795
54	82.653	76	116.326
55	84.183	77	117.856
56	85.714	78	119.387
57	87.244	79	120.918
58	88.775	80	122.448
59	90.306	81	123.979
60	91.836	82	125.509
61	93.367	83	127.04
62	94.897	84	128.571
63	96.428	85	130.101
64	97.959	86	131.632
65	99.489	87	133.162
66	101.02	88	134.693
67	102.55	89	136.224
68	104.08	90	137.754
69	105.612	91	139.285
70	107.142		

SECT. XI.

Natural Pulſe, 50 in a Minute.

50	=75	72	108.
51	76.5	73	109.5
52	78	74	111
53	79.5	75	112.5
54	81	76	114
55	82.5	77	115.5
56	84	78	117
57	85.5	79	118.5
58	87	80	120
59	88.5	81	121.5
60	90	82	123.
61	91.5	83	124.5
62	93	84	126
63	94.5	85	127.5
64	96	86	129
65	97.5	87	130.5
66	99	88	132
67	100.5	89	133.5
68	102	90	135
69	103.5	91	136.5
70	105.	92	138
71	106.5		

SECT. XII.

Natural Pulſe, 51 in a Minute.

51	=75	73	107.373
52	76.47	74	108.843
53	77.941	75	110.314
54	79.411	76	111.785
55	80.882	77	113.255
56	82.353	78	114.726
57	83.823	79	116.196
58	85.294	80	117.667
59	86.764	81	119.138
60	88.235	82	120.608
61	89.706	83	122.079
62	91.176	84	123.549
63	92.647	85	125.020
64	94.117	86	126.491
65	95.588	87	127.961
66	97.059	88	129.432
67	98.529	89	130.902
68	100	90	132.353
69	101.47	91	133.183
70	102.941	92	135.294
71	104.412	93	136.764
72	105.882		

SECT. XIII.

Natural Pulse, 52 in a Minute.

52	=75	74	106.73
53	76.442	75	108.172
54	77.884	76	109.615
55	79.326	77	111.057
56	80.769	78	112.499
57	82.211	79	113.942
58	83.653	80	115.384
59	85.096	81	116.826
60	86.538	82	118.269
61	87.98	83	119.711
62	89.423	84	121.153
63	90.865	85	122.595
64	92.307	86	124.036
65	93.749	87	125.48
66	95.192	88	126.92
67	96.634	89	128.365
68	98.076	90	129.807
69	99.519	91	131.249
70	100.961	92	132.691
71	102.403	93	134.134
72	103.846	94	135.576
73	105.288		

SECT. XIV.

Natural Pulſe, 53 in a Minute.

53	=75	75	106.131
54	76.415	76	107.546
55	77.83	77	108.961
56	79.245	78	110.376
57	80.66	79	111.791
58	82.075	80	113.206
59	83.49	81	114.621
60	84.9	82	116.036
61	86.32	83	117.442
62	87.735	84	118.857
63	89.151	85	120.272
64	90.566	86	121.687
65	91.981	87	123.102
66	93.396	88	124.517
67	94.811	89	125.932
68	96.226	90	127.347
69	97.641	91	128.762
70	99.056	92	130.178
71	100.471	93	131.593
72	101.886	94	133.008
73	103.302	95	134.434
74	104.717		

SECT. XV.

Natural Pulſe, 54 in a Minute.

54	=75	76	105.556
55	76.387	77	106.945
56	77.774	78	108.334
57	79.151	79	109.723
58	80.538	80	111.112
59	81.925	81	112.5
60	83.312	82	113.889
61	84.7	83	115.277
62	86.111	84	116.665
63	87.5	85	118.053
64	88.888	86	119.441
65	90.277	87	120.829
66	91.661	88	122.217
67	93.054	89	123.605
68	94.443	90	124.993
69	95.833	91	126.381
70	97.222	92	127.769
71	98.611	93	129.157
72	100	94	130.545
73	101.389	95	131.933
74	102.778	96	133.333
75	104.167		

SECT. XVI.

Natural Pulſe, *55* in a Minute.

55	=*75*	77	104.999
56	76.363	78	106.363
57	77.727	79	107.727
58	79.09	80	109.09
59	80.454	81	110.454
60	81.818	82	111.818
61	83.181	83	113.182
62	84.545	84	114.545
63	85.908	85	115.909
64	87.272	86	117.273
65	88.636	87	118.636
66	89.999	88	120
67	91.363	89	121.364
68	92.726	90	122.727
69	94.09	91	124.09
70	95.454	92	125.455
71	96.817	93	126.818
72	98.181	94	128.182
73	99.545	95	129.546
74	100.908	96	130.910
75	102.272	97	132.273
76	103.636		

SECT. XVII.

Natural Pulſe, 56 in a Minute.

56	=75	78	104.465
57	76.339	79	105.804
58	77.678	80	107.144
59	79.017	81	108.483
60	80.356	82	109.823
61	81.695	83	111.162
62	83.035	84	112.501
63	84.374	85	113.84
64	85.713	86	115.179
65	87.052	87	116.518
66	88.392	88	117.857
67	89.731	89	119.196
68	91.071	90	120.535
69	92.41	91	121.874
70	93.75	92	123.213
71	95.089	93	124.552
72	96.429	94	125.89
73	97.768	95	127.23
74	99.107	96	128.569
75	100.446	97	129.908
76	101.786	98	131.247
77	103.125		

SECT. XVIII.

Natural Pulse, 57 in a Minute.

57	=75	79	103.947
58	76.315	80	105.263
59	77.631	81	106.579
60	78.947	82	107.894
61	80.263	83	109.21
62	81.578	84	110.526
63	82.894	85	111.842
64	84.21	86	113.158
65	85.526	87	114.473
66	86.842	88	115.789
67	88.157	89	117.105
68	89.473	90	118.421
69	90.789	91	119.737
70	92.105	92	121.052
71	93.421	93	122.368
72	94.736	94	123.684
73	96.052	95	125
74	97.368	96	126.315
75	98.684	97	127.631
76	100	98	128.947
77	101.316	99	130.263
78	102.631		

SECT. XIX.

Natural Pulse, 58 in a Minute.

58	=75	80	103.4482
59	76.2931	81	104.7413
60	77.5862	82	106.0344
61	78.8793	83	107.3275
62	80.1724	84	108.6206
63	81.4655	85	109.9137
64	82.7586	86	111.2068
65	84.0517	87	112.4999
66	85.3448	88	113.793
67	86.6379	89	115.0861
68	87.931	90	116.3792
69	89.2241	91	117.6723
70	90.5172	92	118.9654
71	91.8103	93	120.2585
72	93.1034	94	121.5516
73	94.3965	95	122.8447
74	95.6896	96	124.1378
75	96.9827	97	125.4309
76	98.2758	98	126.724
77	99.5689	99	128.0171
78	100.862	100	129.3102
79	102.1551		

SECT. XX.

Natural Pulſe, 59 in a Minute.

59	=75	81	102.9642
60	76.2711	82	104.2353
61	77.5422	83	105.5064
62	78.8133	84	106.7775
63	80.0844	85	108.0486
64	81.3555	86	109.3197
65	82.6266	87	110.5908
66	83.8977	88	111.8619
67	85.1688	89	113.1330
68	86.4399	90	114.4041
69	87.7110	91	115.6752
70	88.9821	92	116.9463
71	90.2532	93	118.2174
72	91.5243	94	119.4885
73	92.7954	95	120.7596
74	94.0665	96	122.0307
75	95.3376	97	123.3018
76	96.6087	98	124.5729
77	97.8798	99	125.8440
78	99.1509	100	127.1151
79	100.4220	101	128.3862
80	101.6931		

SECT. XXI.

Natural Pulse, 60 in a Minute.

60	=75	82	102.5
61	76.25	83	103.75
62	77.5	84	105
63	78.75	85	106.25
64	80	86	107.5
65	81.25	87	108.75
66	82.5	88	110
67	83.75	89	111.25
68	85	90	112.5
69	86.25	91	113.75
70	87.5	92	115
71	88.75	93	116.25
72	90	94	117.5
73	91.25	95	118.75
74	92.5	96	120
75	93.75	97	121.25
76	95	98	122.5
77	96.25	99	123.75
78	97.5	100	125
79	98.75	101	126.25
80	100	102	125.5
81	101.25		

SECT. XXII.

Natural Pulſe, 61 in a Minute.

61	=75	83	102.148
62	76.2295	84	103.3775
63	77.459	85	104.607
64	78.6885	86	105.8365
65	79.918	87	107.066
66	81.1475	88	108.2955
67	82.377	89	109.525
68	83.6065	90	110.7545
69	84.936	91	111.984
70	86.1655	92	113.2135
71	87.395	93	114.3442
72	88.6245	94	115.5739
73	89.853	95	116.8032
74	91.0825	96	118.0327
75	92.312	97	119.2622
76	93.5415	98	120.4918
77	94.771	99	121.7213
78	96.0005	100	122.9508
79	97.23	101	124.1803
80	98.4595	102	125.4098
81	99.689	103	126.6393
82	100.9185		

SECT. XXIII.

Natural Pulſe, 62 in a Minute.

62	=75	84	101.613
63	76.209	85	102.822
64	77.419	86	104.032
65	78.629	87	105.242
66	79.838	88	106.451
67	81.048	89	107.661
68	82.258	90	108.871
69	83.467	91	110.08
70	84.677	92	111.29
71	85.887	93	112.5
72	87.096	94	113.709
73	88.306	95	114.919
74	89.516	96	116.129
75	90.725	97	117.338
76	91.935	98	118.548
77	93.145	99	119.758
78	94.354	100	120.967
79	95.564	101	122.177
80	96.774	102	123.387
81	97.983	103	124.596
82	99.193	104	125.806
83	100.403		

SECT. XXIV.

Natural Pulſe, 63 in a Minute.

63	=75	85	101.19
64	76.19	86	102.38
65	77.38	87	103.57
66	78.57	88	104.76
67	79.76	89	105.95
68	80.95	90	107.14
69	82.14	91	108.33
70	83.33	92	109.52
71	84.52	93	110.71
72	85.71	94	111.9
73	86.9	95	113
74	88.09	96	114.285
75	89.28	97	115.476
76	90.47	98	116.666
77	91.66	99	117.857
78	92.85	100	119.047
79	94.04	101	120.238
80	95.23	102	121.428
81	96.42	103	122.619
82	97.61	104	123.809
83	98.8	105	125
84	100		

SECT. XXV.

Natural Pulſe, 64 in a Minute.

64	=75	86	100.781
65	76.171	87	101.953
66	77.343	88	103.125
67	78.515	89	104.296
68	79.687	90	105.468
69	80.859	91	106.64
70	82.031	92	107.812
71	83.203	93	108.992
72	84.375	94	110.156
73	85.546	95	111.328
74	86.718	96	112.5
75	87.89	97	113.671
76	89.062	98	114.843
77	90.234	99	116.015
78	91.406	100	117.187
79	92.578	101	118.359
80	93.75	102	119.531
81	94.921	103	120.703
82	96.093	104	121.875
83	97.265	105	123.046
84	98.437	106	124.218
85	99.609	107	125.391

SECT. XXVI.

Natural Pulſe, 65 in a Minute.

65	=75	88	101.538
66	76.153	89	102.692
67	77.307	90	103.846
68	78.461	91	105
69	79.615	92	106.153
70	80.769	93	107.307
71	81.923	94	108.461
72	83.076	95	109.615
73	84.23	96	110.769
74	85.384	97	111.923
75	86.538	98	113.076
76	87.692	99	114.23
77	88.846	100	115.384
78	90	101	116.538
79	91.153	102	117.692
80	92.307	103	118.846
81	93.461	104	120
82	94.615	105	121.153
83	95.769	106	122.307
84	96.923	107	123.461
85	98.076	108	124.615
86	99.23	109	125.769
87	100.384		

SECT. XXVII.

Natural Pulſe, 66 in a minute.

66	=75	89	101.136
67	76.136	90	102.272
68	77.272	91	103.409
69	78.409	92	104.545
70	79.545	93	105.681
71	80.681	94	106.818
72	81.818	95	107.954
73	82.954	96	109.09
74	84.09	97	110.227
75	85.227	98	111.363
76	86.363	99	112.499
77	87.499	100	113.636
78	88.636	101	114.772
79	89.772	102	115.909
80	90.909	103	117.045
81	92.945	104	118.181
82	93.181	105	119.318
83	94.318	106	120.454
84	95.454	107	121.590
85	96.590	108	122.727
86	97.727	109	123.864
87	98.863	110	125
88	100		

SECT. XXVIII.

Natural Pulſe, 67 in a Minute.

67	=75	90	100.746
68	76.119	91	101.865
69	77.238	92	102.985
70	78.358	93	104.104
71	79.477	94	105.224
72	80.597	95	106.343
73	81.716	96	107.462
74	82.835	97	108.582
75	83.955	98	109.701
76	85.074	99	110.821
77	86.194	100	111.940
78	87.313	101	113.059
79	88.432	102	114 179
80	89.552	103	115.298
81	90.671	104	116.418
82	91.791	105	117.537
83	92.910	106	118.657
84	94.029	107	119.776
85	95.149	108	120.895
86	96.268	109	122.014
87	97.388	110	123.134
88	98.507	111	124.253
89	99.626	112	125.38

SECT. XXIX.

Natural Pulſe, 68 in a Minute.

68	=75	92	101.470
69	76.102	93	102.573
70	77.205	94	103.676
71	78.308	95	104.779
72	79.411	96	105.882
73	80.514	97	106.985
74	81.617	98	108.087
75	82.720	99	109.190
76	83.823	100	110.293
77	84.926	101	111.397
78	86.029	102	112.499
79	87.132	103	113.612
80	88.235	104	114.705
81	89.338	105	115.808
82	90.441	106	116.911
83	91.543	107	118.014
84	92.646	108	119.117
85	93.749	109	120.220
86	94.852	110	121.323
87	95.955	111	122.426
88	97.058	112	123.528
89	98.161	113	124.631
90	99.264	114	125.734
91	100.470		

SECT. XXX.

Natural Pulse, 69 in a Minute.

69	=75	93	101.086
70	76.086	94	102.173
71	77.173	95	103.260
72	78.260	96	104.347
73	79.347	97	105.434
74	80.434	98	106.521
75	81.521	99	107.608
76	82.608	100	108.695
77	83.695	101	109.782
78	84.782	102	110.869
79	85.869	103	111.956
80	86.956	104	113.043
81	88.043	105	114.130
82	89.130	106	115.217
83	90.217	107	116.304
84	91.304	108	117.391
85	92.391	109	118.478
86	93.478	110	119.565
87	94.565	111	120.652
88	95.652	112	121.739
89	96.739	113	122.826
90	97.826	114	123.913
91	98.913	115	125
92	100	116	

SECT. XXXI.

Natural Pulſe, 70 in a Minute.

70	=75	94	100.714
71	76.071	95	101.785
72	77.142	96	102.857
73	78.214	97	103.928
74	79.285	98	105
75	80.357	99	106.071
76	81.428	100	107.142
77	82.499	101	108.214
78	83.571	102	109.285
79	84.642	103	110.357
80	85.714	104	111.428
81	86.785	105	112.499
82	87.857	106	113.571
83	88.928	107	114.642
84	90	108	115.714
85	91.071	109	116.785
86	92.142	110	117.857
87	93.214	111	118.928
88	94.285	112	120
89	95.357	113	121.071
90	96.428	114	122.142
91	97.499	115	123.214
92	98.571	116	124.285
93	99.642	117	125.357

SECT. XXXII.

Natural Pulse, 71 in a Minute.

71	=75	96	101.408
72	76.056	97	102.464
73	77.112	98	103.521
74	78.169	99	104.577
75	79.225	100	105.633
76	80.281	101	106.690
77	81.338	102	107.746
78	82.394	103	108.802
79	83.450	104	109.859
80	84.507	105	110.915
81	85.563	106	111.971
82	86.619	107	113.028
83	87.676	108	114.084
84	88.732	109	115.140
85	89.788	110	116.197
86	90.845	111	117.253
87	91.901	112	118.309
88	92.957	113	119.366
89	94.014	114	120.422
90	95.070	115	121.478
91	96.126	116	122.535
92	97.183	117	123.591
93	98.239	118	124.647
94	99.295	119	125.704
95	100.352		

SECT. XXXIII.

Natural Pulſe, 72 in a Minute.

72	=75	97	101.041
73	76.041	98	102.083
74	77.083	99	103.124
75	78.124	100	104.166
76	79.166	101	105.208
77	80.208	102	106.249
78	81.249	103	107.291
79	82.291	104	108.333
80	83.333	105	109.374
81	84.374	106	110.416
82	85.416	107	111.458
83	86.458	108	112.499
84	87.499	109	113.541
85	88.541	110	114.583
86	89.583	111	115.624
87	90.624	112	116.666
88	91.666	113	117.708
89	92.708	114	118.75
90	93.75	115	119.791
91	94.791	116	120.833
92	95.833	117	121.874
93	96.874	118	122.916
94	97.916	119	123.958
95	98.958	120	125.
96	100		

SECT. XXXIV.

Natural Pulſe, 73 in a Minute.

73	=75	99	101.712
74	76.027	100	102.739
75	77.054	101	103.767
76	78.082	102	104.794
77	79.109	103	105.821
78	80.136	104	106.849
79	81.164	105	107.876
80	82.191	106	108.904
81	83.219	107	109.931
82	84.246	108	110.958
83	85.273	109	111.986
84	86.301	110	113.027
85	87.328	111	114.041
86	88.356	112	115.068
87	89.383	113	116.096
88	90.410	114	117.123
89	91.430	115	118.151
90	92.465	116	119.178
91	93.493	117	120.205
92	94.520	118	121.233
93	95.547	119	122.260
94	96.575	120	123.288
95	97.602	121	124.315
96	98.630	122	125.342
97	99.657	123	
98	100.684		

SECT. XXXV.

Natural Pulſe, 74 in a Minute.

74	=75	100	101.351
75	76.013	101	102.364
76	77.027	102	103.378
77	78.040	103	104.391
78	79.054	104	105.405
79	80.067	105	106.418
80	81.081	106	107.432
81	82.094	107	108.445
82	83.108	108	109.459
83	84.121	109	110.472
84	85.135	110	111.486
85	86.148	111	112.5
86	87.162	112	113.513
87	88.175	113	114.527
88	89.189	114	115.540
89	90.202	115	116.554
90	91.216	116	117.567
91	92.229	117	118.581
92	93.243	118	119.594
93	94.256	119	120.608
94	95.270	120	121.621
95	96.283	121	122.635
96	97.297	122	123.648
97	98.310	123	124.662
98	99.324	124	125.675
99	100.337		

SECT. XXXVI.

Natural Pulſe, 75 in a Minute.

75	Standard.	101	
76		102	
77		103	
78		104	
79		105	
80		106	
81		107	
82		108	Hectic Fever
83		109	
84		110	
85		111	
86		112	Peripneumony
87		113	
88		114	
89		115	
90		116	
91		117	
92		118	
93		119	
94		120	Inflᵛ. Fever.
95		121	
96	Beg. of Fever.	122	
97		123	
98		124	
99		125	
100			

SECT. XXXVII.

Natural Pulse, 76 in a Minute.

76	=75	102	100.657
77	75.986	103	101.644
78	76.973	104	102.631
79	77.960	105	103.618
80	78.947	106	104.605
81	79.934	107	105.592
82	80.921	108	106.578
83	81.907	109	107.565
84	82.894	110	108.552
85	83.881	111	109.539
86	84.868	112	110.526
87	85.855	113	111.513
88	86.842	114	112.499
89	87.828	115	113.486
90	88.815	116	114.473
91	89.802	117	115.460
92	90.789	118	116.447
93	91.776	119	117.434
94	92.763	120	118.421
95	93.749	121	119.407
96	94.736	122	120.394
97	95.723	123	121.381
98	96.710	124	122.368
99	97.697	125	123.355
100	98.684	126	124.342
101	99.671	127	125.328

SECT. XXXVIII.

Natural Pulſe, 77 in a Minute.

77	=75	104	101.298
78	75.974	105	102.272
79	76.948	106	103.246
80	77.922	107	104.220
81	78.896	108	105.194
82	79.870	109	106.168
83	80.844	110	107.142
84	81.818	111	108.116
85	82.792	112	109.096
86	83.766	113	110.064
87	84.740	114	111.038
88	85.714	115	112.012
89	86.688	116	112.987
90	87.662	117	113.961
91	88.636	118	114.935
92	89.610	119	115.909
93	90.584	120	116.883
94	91.558	121	117.857
95	92.532	122	118.831
96	93.506	123	119.805
97	94.480	124	120.779
98	95.454	125	121.753
99	96.428	126	122.724
100	97.402	127	123.698
101	98.376	128	124.672
102	99.350	129	125.649
103	100.324		

SECT. XXXIX.

Natural Pulſe, 78 in a Minute.

78	=75	103	99.037
79	75.961	104	99 998
80	76.923	105	100.959
81	77.884	106	101.921
82	78.846	107	102.882
83	79.807	108	103.844
84	80.768	109	104.805
85	81.729	110	105.767
86	82.691	111	106.728
87	83.652	112	107.689
88	84.614	113	108.651
89	85.575	114	109.612
90	86.537	115	110.574
91	87.499	116	111.535
92	88.461	117	112.497
93	89.422	118	113.458
94	90.384	119	114.42
95	91.345	120	115.381
96	92.307	121	116.343
97	93.268	122	117.304
98	94.230	123	118.266
99	95.191	124	119.227
100	96.153	125	120.189
101	97.114	126	121.150
102	98.076		

SECT. XL.

Natural Pulse, 79 in a Minute.

79	=75	106	100.633
80	75.949	107	101.582
81	76.898	108	102.531
82	77.848	109	103.481
83	78.797	110	104.430
84	79.746	111	105.380
85	80.696	112	106.329
86	81.645	113	107.278
87	82.594	114	108.228
88	83.544	115	109.177
89	84.493	116	110.126
90	85.443	117	111.076
91	86.392	118	112.025
92	87.341	119	112.974
93	88.291	120	113.924
94	89.240	121	114.873
95	90.189	122	115.823
96	91.139	123	116.772
97	92.088	124	117.721
98	93.037	125	118.671
99	93.986	126	119.620
100	94 936	127	120 569
101	95.886	128	121.519
102	96.835	129	122.468
103	97.784	130	123.418
104	98.734	131	124.367
105	99.683	132	125.316

SECT. XLI.

Natural Pulſe, 80 in a Minute.

80	=75	108	101.250
81	75.937	109	102.187
82	76.875	110	103.125
83	77.812	111	104.062
84	78.750	112	105
85	79.687	113	105.937
86	80.625	114	106.875
87	81.562	115	107.812
88	82.5	116	108.750
89	83.437	117	109.687
90	84.375	118	110.625
91	85.312	119	111.562
92	86.250	120	112.5
93	87.187	121	113.437
94	88.125	122	114.375
95	89.062	123	115.312
96	90	124	116.250
97	90.937	125	117.187
98	91.875	126	118.125
99	92.812	127	119.062
100	93.750	128	120.
101	94.687	129	120 937
102	95.625	130	121 875
103	96.562	131	122.812
104	97.5	132	123.750
105	98.437	133	124.687
106	99.375	134	125.625
107	100.312		

SECT. XLII.

Natural Pulſe, 81 in a Minute.

81	=75	109	100.925
82	75.925	110	101.851
83	76.851	111	102.777
84	77.777	112	103.703
85	78.703	113	104.629
86	79.629	114	105.555
87	80.555	115	106.481
88	81.481	116	107.407
89	82.407	117	108.333
90	83.333	118	109.259
91	84.259	119	110.185
92	85.185	120	111.111
93	86.111	121	112.037
94	87.037	122	112.963
95	87.963	123	113.888
96	88.888	124	114.814
97	89.814	125	115.740
98	90 740	126	116.666
99	91.666	127	117.592
100	92.592	128	118.518
101	93.518	129	119.444
102	94.444	130	120 370
103	95.370	131	121.296
104	96 296	132	122.222
105	97.222	133	123.148
106	98.148	134	124.074
107	99.074	135	125
108	100		

SECT. XLIII.

Natural Pulse, 82 in a Minute.

82	=75	110	100.609
83	75.914	111	101.524
84	76.829	112	102.439
85	77.743	113	103.353
86	78.658	114	104.268
87	79.573	115	105.183
88	80.487	116	106.097
89	81.402	117	107.012
90	82.317	118	107.926
91	83.201	119	108.841
92	84.146	120	109.756
93	85.060	121	110.670
94	85.975	122	111.585
95	86.890	123	112.5
96	87.804	124	113.414
97	88.719	125	114.329
98	89.634	126	115.243
99	90.548	127	116.158
100	91.463	128	117.073
101	92.378	129	117.987
102	93.292	130	118.902
103	94.207	131	119.817
104	95.122	132	120.731
105	96.036	133	121.646
106	96.951	134	122.561
107	97.865	135	123.475
108	98.780	136	124.390
109	99.695	137	125.304

SECT. XLIV.

Natural Pulſe, 83 in a Minute.

83	=75	112	101.204
84	75.903	113	102.108
85	76.807	114	103.012
86	77.710	115	103.915
87	78.614	116	104.819
88	79.518	117	105.722
89	80.421	118	106.626
90	81.325	119	107.530
91	82.228	120	108.433
92	83.132	121	109.337
93	84.036	122	110.240
94	84.939	123	111.144
95	85.843	124	112.048
96	86.746	125	112.951
97	87.650	126	113.855
98	88.554	127	114.759
99	89.457	128	115.662
100	90.361	129	116.566
101	91.265	130	117.469
102	92.168	131	118.373
103	93.072	132	119.277
104	93.975	133	120.18
105	94.879	134	121.084
106	95.783	135	121.987
107	96.686	136	122.819
108	97.590	137	123.795
109	98.493	138	124.698
110	99.397	139	125.602
111	100.301		

SECT. XLV.

Natural Pulſe, 84 in a minute.

84	=75	113	100.892
85	75.892	114	101.785
86	76.785	115	102.678
87	77.678	116	103.571
88	78.571	117	104.464
89	79.464	118	105.357
90	80.357	119	106.25
91	81.25	120	107.142
92	82.142	121	108.035
93	83.035	122	108.928
94	83.928	123	109.821
95	84.821	124	110.714
96	85.714	125	111.607
97	86.607	126	112.5
98	87.5	127	113.392
99	88.392	128	114.285
100	89.285	129	115.178
101	90.178	130	116.071
102	91.071	131	116.964
103	91.964	132	117.857
104	92.857	133	118.750
105	93.750	134	119.642
106	94.642	135	120.535
107	95.535	136	121.428
108	96.428	137	122.321
109	97.321	138	123.214
110	98.214	139	124.107
111	99.107	140	125
112	100		

SECT. XLVI.

Natural Pulse, 85 in a Minute.

85	=75	114	100.588
86	75.882	115	101.470
87	76.764	116	102.352
88	77.647	117	103.235
89	78.529	118	104.117
90	79.411	119	105
91	80.294	120	105.882
92	81.176	121	106.764
93	82.058	122	107.647
94	82.941	123	108.529
95	83.823	124	109.411
96	84.705	125	110.294
97	85.588	126	111.176
98	86.470	127	112.058
99	87.352	128	112.941
100	88.235	129	113.823
101	89.117	130	114.705
102	90	131	115.588
103	90.882	132	116.470
104	91.764	133	117.352
105	92.647	134	118.235
106	93.529	135	119.117
107	94.411	136	120
108	95.294	137	120.882
109	96.176	138	121.764
110	97.058	139	122.647
111	97.941	140	123.529
112	98.823	141	124.411
113	99.705	142	125.294

SECT. XLVII.

Natural Pulſe, 86 in a Minute.

86	=75	116	101.162
87	75.872	117	102.035
88	76.744	118	102.907
89	77.616	119	103.779
90	78.488	120	104.651
91	79.360	121	105.523
92	80.232	122	106.395
93	81.104	123	107.267
94	81.976	124	108.139
95	82.848	125	109.011
96	83.720	126	109.883
97	84.593	127	110.756
98	85.465	128	111.628
99	86.337	129	112.5
100	87.209	130	113.372
101	88.081	131	114.244
102	88.953	132	115.116
103	89.825	133	115.988
104	90.697	134	116.860
105	91.569	135	117.732
106	92.442	136	118.604
107	93.314	137	119.476
108	94.186	138	120.348
109	95.058	139	121.220
110	95.930	140	122.093
111	96.802	141	122.965
112	97.674	142	123.837
113	98.546	143	124.709
114	99.418	144	125.581
115	100.290		

SECT. XLVIII.

Natural Pulſe, 87 in a Minute.

87	=75	117	100.862
88	75.862	118	101.724
89	76.724	119	102.586
90	77.586	120	103.448
91	78.448	121	104.310
92	79.310	122	105.172
93	80.172	123	106.034
94	81.034	124	106.896
95	81.896	125	107.758
96	82.758	126	108.620
97	83.620	127	109.482
98	84.482	128	110.344
99	85.344	129	111.206
100	86.206	130	112.068
101	87.068	131	112.931
102	87.931	132	113.793
103	88.793	133	114.655
104	89.655	134	115.517
105	90.517	135	116.379
106	91.379	136	117.241
107	92.241	137	118.103
108	93.103	138	118.965
109	93.965	139	119.827
110	94.827	140	120.689
111	95.689	141	121.551
112	96.551	142	122.413
113	97.413	143	123.275
114	98.275	144	124.137
115	99.137	145	125.
116	100	146	

SECT. XLIX.

Natural Pulſe, 88 in a Minute.

88	=75	118	100.568
89	75.852	119	101.420
90	76.704	120	102.272
91	77.556	121	103.124
92	78.409	122	103.977
93	79.261	123	104.829
94	80.113	124	105.681
95	80.965	125	106.534
96	81.818	126	107.386
97	82.670	127	108.238
98	83.522	128	109.09
99	84.374	129	109.943
100	85.227	130	110.795
101	86.079	131	111.647
102	86.931	132	112.5
103	87.784	133	113.352
104	88.636	134	114.204
105	89.488	135	115.056
106	90.340	136	115.909
107	91.193	137	116.761
108	92.045	138	117.613
109	92.897	139	118.465
110	93.75	140	119.318
111	94.602	141	120.170
112	95.454	142	121.022
113	96.306	143	121.874
114	97.159	144	122.727
115	98.011	145	123.579
116	98.863	146	124.431
117	99.715	147	125.284

SECT. L.

Natural Pulſe, 89 in a Minute.

89	=75	120	101.123
90	75.843	121	101.966
91	76.685	122	102.808
92	77.528	123	103.651
93	78.370	124	104.494
94	79.213	125	105.337
95	80.056	126	106.179
96	80.898	127	107.022
97	81.741	128	107.865
98	82.584	129	108.707
99	83.426	130	109.55
100	84.269	131	110.393
101	85.112	132	111.235
102	85.955	133	112.078
103	86.797	134	112.921
104	87.640	135	113.764
105	88.483	136	114.606
106	89.325	137	115.449
107	90.168	138	116.292
108	91.011	139	117.134
109	91.853	140	117.977
110	92.696	141	118.820
111	93.539	142	119.662
112	94.382	143	120.505
113	95.224	144	121.348
114	96.067	145	122.181
115	96.910	146	123.023
116	97.752	147	123.866
117	98.595	148	124.709
118	99.438	149	125.55
119	100.280		

SECT. LI.

Natural Pulse, 90 in a Minute.

90	=75	121	100.833
91	75.833	122	101.666
92	76.666	123	102.5
93	77.5	124	103.333
94	78.333	125	104.166
95	79.166	126	105
96	80	127	105.833
97	80.833	128	106.666
98	81.666	129	107.5
99	82.5	130	108.333
100	83.333	131	109.166
101	84.166	132	110
102	85	133	110.833
103	85.833	134	111.666
104	86.666	135	112.5
105	87.5	136	113.333
106	88.333	137	114.166
107	89.166	138	115
108	90	139	115.833
109	90.833	140	116.666
110	91.666	141	117.5
111	92.5	142	118.333
112	93.333	143	119.166
113	94.166	144	120
114	95	145	120.833
115	95.833	146	121.666
116	96.666	147	122.5
117	97.5	148	123.333
118	98.333	149	124.166
119	99.166	150	125
120	100		

SECT. LII.

Natural Pulse, 91 in a Minute.

91	=75	122	100.549
92	75.824	123	101.373
93	76.648	124	102.197
94	77.472	125	103.021
95	78.296	126	103.846
96	79.120	127	104.670
97	79.945	128	105.494
98	80.769	129	106.318
99	81.593	130	107.142
100	82.417	131	107.967
101	83.241	132	108.791
102	84.065	133	109.615
103	84.890	134	110.439
104	85.714	135	111.263
105	86.538	136	112.087
106	87.362	137	112.912
107	88.186	138	113.736
108	89.010	139	114.560
109	89.835	140	115.384
110	90.659	141	116.208
111	91.483	142	117.032
112	92.307	143	117.857
113	93.131	144	118.681
114	93.956	145	119.505
115	94.780	146	120.329
116	95.604	147	121.153
117	96.428	148	121.978
118	97.252	149	122.802
119	98.076	150	123.626
120	98.901	151	124.450
121	99.725	152	125.274

SECT. LIII.

Natural Pulse, 92 in a Minute.

92	=75	124	101.086
93	75.815	125	101.9
94	76.630	126	102.717
95	77.445	127	103.532
96	78.260	128	104.347
97	79.076	129	105.163
98	79.891	130	105.978
99	80.706	131	106.793
100	81.521	132	107.6
101	82.336	133	108.423
102	83.152	134	109.239
103	83.967	135	110.054
104	84.782	136	110.869
105	85.597	137	111.684
106	86.413	138	112.5
107	87.228	139	113.315
108	88.043	140	114.130
109	88.858	141	114.945
110	89.673	142	115.760
111	90.489	143	116.576
112	91.304	144	117.391
113	92.119	145	118.206
114	92.934	146	119.021
115	93.749	147	119.836
116	94.565	148	120.652
117	95.380	149	121.467
118	96.195	150	122.282
119	97.01	151	123.097
120	97.826	152	123.913
121	98.641	153	124.728
122	99.456	154	125.543
123	100.271		

SECT. LIV.

Natural Pulſe, 93 in a Minute.

93	=75	125	100.806
94	75.806	126	101.612
95	76.612	127	102.419
96	77.419	128	103.225
97	78.225	129	104.032
98	79.032	130	104.838
99	79.838	131	105.645
100	80.645	132	106.451
101	81.451	133	107.258
102	82.258	134	108.064
103	83.064	135	108.870
104	83.870	136	109.677
105	84.677	137	110.483
106	85.483	138	111.290
107	86.290	139	112.096
108	87.096	140	112.903
109	87.903	141	113.709
110	88.709	142	114.516
111	89.516	143	115.322
112	90.322	144	116.129
113	91.129	145	116.935
114	91.935	146	117.741
115	92.741	147	118.548
116	93.548	148	119.354
117	94.354	149	120.161
118	95.161	150	120.967
119	95.967	151	121.774
120	96.774	152	122.580
121	97.580	153	123.387
122	98.387	154	124.193
123	99.193	155	125.
124	100		

SECT. LV.

Natural Pulſe, 94 in a Minute.

94	=75	126	100.531
95	75.797	127	101.329
96	76.595	128	102.127
97	77.393	129	102.925
98	78.191	130	103.723
99	78.989	131	104.521
100	79.787	132	105.319
101	80.585	133	106.116
102	81.382	134	106.914
103	82.180	135	107.712
104	82.978	136	108.510
105	83.776	137	109.308
106	84.574	138	110.106
107	85.372	139	110.904
108	86.170	140	111.702
109	86.968	141	112.5
110	87.765	142	113.297
111	88.563	143	114.095
112	89.361	144	114.893
113	90.159	145	115.691
114	90.957	146	116.489
115	91.755	147	117.287
116	92.553	148	118.085
117	93.351	149	118.882
118	94.148	150	119.680
119	94.946	151	120.478
120	95.744	152	121.276
121	96.542	153	122.074
122	97.340	154	122.872
123	98.138	155	123.670
124	98.936	156	124.468
125	99.733	157	125.265

SECT. LVI.

Natural Pulse, 95 in a Minute.

95	=75	128	101.052
96	75.789	129	101.842
97	76.578	130	102.631
98	77.368	131	103.421
99	78.157	132	104.210
100	78.947	133	105
101	79.736	134	105.789
102	80.526	135	106.578
103	81.315	136	107.368
104	82.105	137	108.157
105	82.894	138	108.947
106	83.684	139	109.736
107	84.473	140	110.526
108	85.263	141	111.315
109	86.052	142	112.105
110	86.842	143	112.894
111	87.631	144	113.684
112	88.421	145	114.473
113	89.210	146	115.263
114	90	147	116.052
115	90.789	148	116.842
116	91.578	149	117.631
117	92.368	150	118.421
118	93.157	151	119.210
119	93.947	152	120
120	94.736	153	120.789
121	95.526	154	121.578
122	96.315	155	122.368
123	97.105	156	123.157
124	97.894	157	123.947
125	98.684	158	124.736
126	99.473	159	125.526
127	100.263		

SECT. LVII.

Natural Pulse, 96 in a Minute.

96	=75	129	100.781
97	75.781	130	101.562
98	76.562	131	102.343
99	77.343	132	103.125
100	78.125	133	103.906
101	78.906	134	104.687
102	79.687	135	105.468
103	80.468	136	106.250
104	81.250	137	107.031
105	82.031	138	107.812
106	82.812	139	108.593
107	83.593	140	109.375
108	84.375	141	110.156
109	85.156	142	110 937
110	85.937	143	111.718
111	86.718	144	112.5
112	87.5	145	113.281
113	88.281	146	114.062
114	89.062	147	114.843
115	89.843	148	115.625
116	90.625	149	116.406
117	91.406	150	117.187
118	92.187	151	117.968
119	92.968	152	118.750
120	93.750	153	119.531
121	94.531	154	120.312
122	95.312	155	121.093
123	96.093	156	121.875
124	96.875	157	122.656
125	97.656	158	123.437
126	98.437	159	124.218
127	99.218	160	125
128	100		

SECT. LVIII.

Natural Pulse, 97 in a Minute.

97	=75	130	100.515
98	75.773	131	101.288
99	76.546	132	102.061
100	77.319	133	102.835
101	78.092	134	103.608
102	78.866	135	104.381
103	79.639	136	105.154
104	80.412	137	105.927
105	81.185	138	106.701
106	81.958	139	107.474
107	82.732	140	108.247
108	83.505	141	109.020
109	84.278	142	109.793
110	85.051	143	110.567
111	85.824	144	111.340
112	86.598	145	112.113
113	87.371	146	112.886
114	88.144	147	113.659
115	88.917	148	114.432
116	89.690	149	115.206
117	90.464	150	115.979
118	91.237	151	116.752
119	92.010	152	117.525
120	92.783	153	118.298
121	93.556	154	119.072
122	94.33	155	119.845
123	95.103	156	120.618
124	95.876	157	121.391
125	96.649	158	122.164
126	97.422	159	122.938
127	98.195	160	123.711
128	98.969	161	124.484
129	99.742	162	125.257

SECT. LIX.

Natural Pulſe, 98 in a Minute.

98	=75	132	100.020
99	75.765	133	101.785
100	76.530	134	102.551
101	77.295	135	103.316
102	78.061	136	104.081
103	78.826	137	104.846
104	79.591	138	105.612
105	80.357	139	106.377
106	81.122	140	107.142
107	81.887	141	108.908
108	82.653	142	108.673
109	83.418	143	109.438
110	84.183	144	110.204
111	84.948	145	110.970
112	85.714	146	111.735
113	86.479	147	112.5
114	87.244	148	113.266
115	88.010	149	113.031
116	88.775	150	114.795
117	89.540	151	115.561
118	90.306	152	116.326
119	91.071	153	117.091
120	91.836	154	117.857
121	92.602	155	118.622
122	93.367	156	119.387
123	94.132	157	120.153
124	94.897	158	120.918
125	95.663	159	121.683
126	96.428	160	122.448
127	97.193	161	123.214
128	97.959	162	123.979
129	98.724	163	124.744
130	99.489	164	125.510
131	100.255		

SECT. LX.

Natural Pulse, 99 in a Minute.

99	=75	133	100.757
100	75.757	134	101.515
101	76.515	135	102.272
102	77.272	136	103.030
103	78.030	137	103.787
104	78.787	138	104.545
105	79.545	139	105.303
106	80.303	140	106.060
107	81.060	141	106.821
108	81.821	142	107.578
109	82.578	143	108.333
110	83.333	144	109.090
111	84.090	145	109.848
112	84.848	146	110.606
113	85.606	147	111.363
114	86.363	148	112.121
115	87.121	149	112.878
116	87.878	150	113.636
117	88.636	151	114.393
118	89.393	152	115.151
119	90.151	153	115.909
120	90.909	154	116.666
121	91.666	155	117.424
122	92.424	156	118.181
123	93.181	157	118.939
124	93.939	158	119.696
125	94.696	159	120.454
126	95.454	160	121.212
127	96.212	161	121.969
128	96.969	162	122.727
129	97.727	163	123.484
130	98.484	164	124.242
131	99.242	165	125.
132	100		

SECT. LXI.

Natural Pulse, 100 in a Minute.

100	=75	134	100.5
101	75.75	135	101.25
102	76.5	136	102
103	77.25	137	102.75
104	78	138	103.5
105	78.75	139	104.25
106	79.5	140	105
107	80.25	141	105.75
108	81	142	106.5
109	81.75	143	107.25
110	82.5	144	108
111	83.25	145	108.75
112	84	146	109.5
113	84.75	147	110.25
114	85.5	148	111
115	86.25	149	111.75
116	87	150	112.5
117	87.75	151	113.25
118	88.5	152	114
119	89.25	153	114.75
120	90	154	115.5
121	90.75	155	116.25
122	91.5	156	117
123	92.25	157	117.75
124	93	158	118.5
125	93.75	159	119.25
126	94.5	160	120
127	95.25	161	120.75
128	96	162	121.5
129	96.75	163	122.25
130	97.5	164	123
131	98.25	165	123.75
132	99	166	124.5
133	99.75	167	125.25

SECT. LXII.

Natural Pulse, 101 in a Minute.

101	=75	136	100.99
102	75.742	137	101.732
103	76.485	138	102.475
104	77.227	139	103.217
105	77.970	140	103.960
106	78.712	141	104.703
107	79.455	142	105.445
108	80.198	143	106.188
109	80.940	144	106.930
110	81.683	145	107.673
111	82.425	146	108.415
112	83.168	147	109.158
113	83.910	148	109.9
114	84.653	149	110.643
115	85.396	150	111.386
116	86.138	151	112.128
117	86.881	152	112.871
118	87.623	153	113.613
119	88.366	154	114.356
120	89.108	155	115.099
121	89.851	156	115.772
122	90.594	157	116.514
123	91.336	158	117.257
124	92.079	159	118.069
125	92.821	160	118.811
126	93.564	161	119.554
127	94.306	162	120.296
128	95.049	163	121.038
129	95.792	164	121.781
130	96.534	165	122.523
131	97.277	166	123.266
132	98.019	167	124.008
133	98.762	168	124.752
134	99.504	169	125.445
135	100.247		

SECT. LXIII.

Natural Pulse, 102 in a Minute.

102	=75	137	100.735
103	75.735	138	101.470
104	76.470	139	102.205
105	77.205	140	102.941
106	77.941	141	103.671
107	78.671	142	104.411
108	79.411	143	105.147
109	80.147	144	105.882
110	80.882	145	106.617
111	81.617	146	107.352
112	82.352	147	108.088
113	83.088	148	108.823
114	83.823	149	109.558
115	84.558	150	110.294
116	85.294	151	111.029
117	86.029	152	111.764
118	86.764	153	112.499
119	87.499	154	113.235
120	88.235	155	113.970
121	88.970	156	114.705
122	89.705	157	115.441
123	90.441	158	116.176
124	91.176	159	116.911
125	91.911	160	117.646
126	92.646	161	118.382
127	93.382	162	119.117
128	94.117	163	119.852
129	94.852	164	120.588
130	95.588	165	121.323
131	96.323	166	122.058
132	97.058	167	122.794
133	97.794	168	123.529
134	98.529	169	124.264
135	99.264	170	125
136	100		

SECT. LXIV.

Natural Pulse, 103 in a Minute.

103	=75	138	100 485
104	75·728	139	101.213
105	76.456	140	101.941
106	77.184	141	102.670
107	77·912	142	103.398
108	78.640	143	104.126
109	79·368	144	104.854
110	80.097	145	105.582
111	80.825	146	106.310
112	81.553	147	107.038
113	82.281	148	107.766
114	83.009	149	108.495
115	83·737	150	109.223
116	84.466	151	109.951
117	85.194	152	110.679
118	85 922	153	111.407
119	86.650	154	112.135
120	87·378	155	112.864
121	88.106	156	113·592
122	88.834	157	114.320
123	89.563	158	115.048
124	90.291	159	115·776
125	91.019	160	116.504
126	91·747	161	117.233
127	92·475	162	117.961
128	93.203	163	118.689
129	93·932	164	119.417
130	94.660	165	120.145
131	95.388	166	120.873
132	96.116	167	121.601
133	96.844	168	122.330
134	97·572	169	123.058
135	98.301	170	123.786
136	99.029	171	124·514
137	99·757	172	125.242

SECT. LXV.

Natural Pulse, 104 in a Minute.

104	=75	140	100.961
105	75.721	141	101.682
106	76.442	142	102.403
107	77.163	143	103.125
108	77.884	144	103.846
109	78.605	145	104.567
110	79.326	146	105.288
111	80.048	147	106.009
112	80.769	148	106.730
113	81.490	149	107.451
114	82.211	150	108.173
115	82.932	151	108.894
116	83.653	152	109.615
117	84.374	153	110.336
118	85.096	154	111.057
119	85.817	155	111.778
120	86.538	156	112.5
121	87.260	157	113.221
122	87.981	158	113.942
123	88.702	159	114 663
124	89.423	160	115.384
125	90.144	161	116.105
126	90.865	162	116.826
127	91.586	163	117.548
128	92.307	164	118.269
129	93.028	165	118.990
130	93.75	166	119.711
131	94.471	167	120.432
132	95.192	168	121.153
133	95.913	169	121.874
134	96.635	170	122.596
135	97.356	171	123.317
136	98.077	172	124.038
137	98.798	173	124.759
138	99.519	174	125.480
139	100.240		

SECT. LXVI.

Natural Pulse, 105 in a Minute.

105	=75	141	100.714
106	75.714	142	101.428
107	76.428	143	102.142
108	77.142	144	102.857
109	77.857	145	103.571
110	78.571	146	104.285
111	79.285	147	105
112	80	148	105.714
113	80.714	149	106.428
114	81.428	150	107.142
115	82.142	151	107.857
116	82.857	152	108.571
117	83.571	153	109.284
118	84.285	154	110
119	85.	155	110.714
120	85.714	156	111.428
121	86.428	157	112.142
122	87.142	158	112.857
123	87.857	159	113.571
124	88.571	160	114.285
125	89.285	161	115
126	90	162	115.714
127	90.714	163	116.428
128	91.428	164	117.142
129	92.142	165	117 857
130	92.857	166	118.571
131	93.571	167	119.285
132	94.285	168	120
133	95	169	120.714
134	95.714	170	121.428
135	96.428	171	122.142
136	97.142	172	122.857
137	97.857	173	123.571
138	98.571	174	124.285
139	99.285	175	125
140	100		

SECT. LXVII.

Natural Pulſe, 106 in a Minute.

106	=75	143	101.259
107	75.707	144	101.948
108	76.415	145	102.655
109	77.122	146	103.363
110	77.830	147	104.009
111	78.537	148	104.716
112	79.245	149	105.424
113	79.952	150	106.132
114	80.660	151	106.839
115	81.367	152	107.547
116	82.075	153	108.254
117	82.783	154	108.962
118	83.490	155	109.669
119	84.198	156	110.377
120	84.903	157	111.084
121	85.611	158	111.792
122	86.318	159	112.5
123	87.026	160	113.207
124	87.733	161	113.915
125	88.441	162	114.622
126	89.149	163	115.330
127	89.856	164	116.037
128	90.564	165	116.745
129	91.271	166	117.452
130	91.979	167	118.160
131	92.688	168	118.867
132	93.396	169	119.575
133	94.103	170	120.283
134	94.811	171	120.990
135	95.518	172	121.698
136	96.226	173	122.405
137	96.933	174	123.113
138	97.641	175	123.820
139	98.348	176	124.528
140	99.055	177	125.235
141	99.763	178	
142	100.471		

SECT. LXVIII.

Natural Pulse, 107 in a Minute.

107	=75	144	100.934
108	75.706	145	101.635
109	76.401	146	102.336
110	77.102	147	103.037
111	77.803	148	103.738
112	78.504	149	104.439
113	79.205	150	105.140
114	79.906	151	105.841
115	80 607	152	106.542
116	81.308	153	107.242
117	82.009	154	107.943
118	82.710	155	108.644
119	83.411	156	109.345
120	84.112	157	110.046
121	84.813	158	110.747
122	85.514	159	111.448
123	86.214	160	112.149
124	86.915	161	112.850
125	87.616	162	113.551
126	88.317	163	114.252
127	89.018	164	114.953
128	89 719	165	115.654
129	90.420	166	116.355
130	91.121	167	117.056
131	91.822	168	117.756
132	92.523	169	118.457
133	93.224	170	119.158
134	93.925	171	119.859
135	94.626	172	120.560
136	95.327	173	121.261
137	96.028	174	121.962
138	96.728	175	122.663
139	97.429	176	123.364
140	98.130	177	124.065
141	98.831	178	124.766
142	99.532	179	125.467
143	100.233		

SECT. LXIX.

Natural Pulſe, 108 in a Minute.

108	=75	145	100.694
109	75.694	146	101.388
110	76.388	147	102.083
111	77.083	148	102.777
112	77.777	149	103.472
113	78.472	150	104.166
114	79.166	151	104.861
115	79.861	152	105.555
116	80.555	153	106.25
117	81.25	154	106.944
118	81.944	155	107.638
119	82.638	156	108.333
120	83.333	157	109.027
121	84.027	158	109.722
122	84.722	159	110.416
123	85.416	160	111.111
124	86.111	161	111.805
125	86.805	162	112.5
126	87.5	163	113.194
127	88.194	164	113.888
128	88.888	165	114.583
129	89.583	166	115.277
130	90.277	167	115.972
131	90.972	168	116.666
132	91.666	169	117.361
133	92.361	170	118.055
134	93.055	171	118.75
135	93.75	172	119.444
136	94.444	173	120.138
137	95.138	174	120.833
138	95.833	175	121.527
139	96.527	176	122.222
140	97.222	177	122.916
141	97.916	178	123.611
142	98.611	179	124.305
143	99.305	180	125
144	100		

SECT. LXX.

Natural Pulse, 109 in a Minute.

109	=75	146	100.458
110	75.688	147	101.146
111	76.376	148	101.834
112	77.064	149	102.522
113	77.752	150	103.210
114	78.440	151	103.899
115	79.128	152	104.587
116	79.816	153	105.275
117	80.504	154	105.963
118	81.192	155	106.651
119	81.880	156	107.339
120	82.568	157	108.027
121	83.256	158	108.715
122	83.944	159	109.493
123	84.633	160	110.091
124	85.321	161	110.779
125	86.009	162	111.467
126	86.697	163	112.155
127	87.385	164	112.844
128	88.073	165	113.532
129	88.761	166	114.220
130	89.449	167	114.908
131	90.137	168	115.596
132	90.825	169	116.284
133	91.513	170	116.972
134	92.201	171	117.660
135	92.889	172	118.348
136	93.577	173	119.036
137	94.266	174	119.724
138	94.954	175	120.412
139	95.642	176	121.100
140	96.330	177	121.788
141	97.018	178	122.476
142	97.706	179	123.164
143	98.394	180	123.852
144	99.082	181	124.541
145	99.770	182	125.229

SECT. LXXI.

Natural Pulse, 110 in a Minute.

110	=75	148	100.909
111	75.681	149	101.590
112	76.363	150	102.272
113	77.045	151	102.954
114	77.727	152	103.636
115	78.409	153	104.318
116	79.090	154	105.
117	79.772	155	105.681
118	80.454	156	106.363
119	81.136	157	107.045
120	81.818	158	107.727
121	82.5	159	108.409
122	83.181	160	109.090
123	83.863	161	109.772
124	84.545	162	110.454
125	85.227	163	111.136
126	85.909	164	111.818
127	86.590	165	112.5
128	87.272	166	113.181
129	87.954	167	113.863
130	88.636	168	114.545
131	89.318	169	115.227
132	90	170	115.909
133	90.681	171	116.590
134	91.363	172	117.272
135	92.045	173	117.954
136	92.727	174	118.636
137	93.409	175	119.318
138	94.090	176	120
139	94.772	177	120.681
140	95.454	178	121.363
141	96.136	179	122.045
142	96.818	180	122.727
143	97.5	181	123.409
144	98.181	182	124.090
145	98.863	183	124.772
146	99.545	184	125.454
147	100.227		

SECT. LXXII.

Natural Pulse, 111 in a Minute.

111	=75	149	100.675
112	75.675	150	101.351
113	76.351	151	102.027
114	77.027	152	102.702
115	77.702	153	103.378
116	78.378	154	104.054
117	79.054	155	104.729
118	79.729	156	105.405
119	80.405	157	106.081
120	81.081	158	106.756
121	81.756	159	107.432
122	82.432	160	108.108
123	83.108	161	108.783
124	83.783	162	109.459
125	84.459	163	110.135
126	85.135	164	110.810
127	85.810	165	111.486
128	86.486	166	112.162
129	87.162	167	112.837
130	87.837	168	113.513
131	88.513	169	114.189
132	89.189	170	114.864
133	89.864	171	115.540
134	90.540	172	116.216
135	91.216	173	116.891
136	91.891	174	117.567
137	92.567	175	118.243
138	93.243	176	118.918
139	93.918	177	119.594
140	94.594	178	120.270
141	95.270	179	120.945
142	95.945	180	121.621
143	96.621	181	122.297
144	97.297	182	122.972
145	97.972	183	123.648
146	98.648	184	124.324
147	99.324	185	125
148	100	186	

SECT. LXXIII.

Natural Pulse, 112 in a Minute.

112	=75	150	100.446
113	75.669	151	101.116
114	76.339	152	101.785
115	77.008	153	102.455
116	77.678	154	103.124
117	78.348	155	103.794
118	79.017	156	104.464
119	79.687	157	105.133
120	80.357	158	105.803
121	81.026	159	106.473
122	81.696	160	107.142
123	82.366	161	107.812
124	83.035	162	108.482
125	83.705	163	109.151
126	84.375	164	109.821
127	85.044	165	110.491
128	85.714	166	111.160
129	86.383	167	111.830
130	87.053	168	112.499
131	87.723	169	113.169
132	88.392	170	113.839
133	89.062	171	114.508
134	89.732	172	115.178
135	90.401	173	115.848
136	91.071	174	116.517
137	91.741	175	117.187
138	92.410	176	117.857
139	93.080	177	118.526
140	93.749	178	119.196
141	94.419	179	119.866
142	95.089	180	120.535
143	95.758	181	121.205
144	96.428	182	121.874
145	97.098	183	122.544
146	97.767	184	123.214
147	98.437	185	123.883
148	99.107	186	124.553
149	99.776	187	125.223

SECT. LXXIV.

Natural Pulse, 113 in a Minute.

113	=75	152	100.884
114	75.663	153	101.548
115	76.327	154	102.212
116	76.991	155	102.876
117	77.654	156	103.539
118	78.318	157	104.203
119	78.982	158	104.867
120	79.646	159	105.530
121	80.309	160	106.194
122	80.973	161	106.858
123	81.637	162	107.522
124	82.3	163	108.185
125	82.964	164	108.849
126	83.628	165	109.513
127	84.292	166	110.176
128	84.955	167	110.840
129	85.619	168	111.504
130	86.283	169	112.168
131	86.946	170	112.831
132	87.610	171	113.495
133	88.274	172	114.159
134	88.938	173	114.823
135	89.601	174	115.486
136	90.265	175	116.150
137	90.929	176	116.814
138	91.592	177	117.477
139	92.256	178	118.141
140	92.920	179	118.805
141	93.584	180	119.469
142	94.247	181	120.132
143	94.911	182	120.796
144	95.575	183	121.460
145	96.238	184	122.123
146	96.902	185	122.787
147	97.566	186	123.451
148	98.230	187	124.115
149	98.893	188	124.778
150	99.557	189	125.442
151	100.221		

SECT. LXXV.

Natural Pulse, 114 in a Minute.

114	=75	153	100.657
115	75.657	154	101.315
116	76.315	155	101.973
117	76.973	156	102.631
118	77.631	157	103.289
119	78.289	158	103.947
120	78.947	159	104.605
121	79.605	160	105.263
122	80.263	161	105.921
123	80.921	162	106.578
124	81.578	163	107.236
125	82.236	164	107.894
126	82.894	165	108.552
127	83.552	166	109.210
128	84.210	167	109.868
129	84.868	168	110.526
130	85.526	169	111.184
131	86.184	170	111.842
132	86.842	171	112.5
133	87.5	172	113.157
134	88.157	173	113.815
135	88.815	174	114.473
136	89.473	175	115.131
137	90.131	176	115.789
138	90.789	177	116.447
139	91.447	178	117.105
140	92.105	179	117.763
141	92.763	180	118.421
142	93.421	181	119.078
143	94.078	182	119.736
144	94.736	183	120.394
145	95.394	184	121.052
146	96.052	185	121.710
147	96.710	186	122.368
148	97.368	187	123.026
149	98.026	188	123.684
150	98.684	189	124.342
151	99.342	190	125
152	100		

SECT. LXXVI.

Natural Pulſe, 115 in a Minute.

115	=75	154	100.434
116	75.652	155	101.086
117	76.304	156	101.739
118	76.956	157	102.391
119	77.608	158	103.043
120	78.260	159	103.695
121	78.913	160	104.347
122	79.565	161	105.
123	80.217	162	105.652
124	80.869	163	106.304
125	81.521	164	106.956
126	82.173	165	107.608
127	82.826	166	108.260
128	83.478	167	108.913
129	84.130	168	109.565
130	84.782	169	110.217
131	85.434	170	110.869
132	86.086	171	111.521
133	86.739	172	112.173
134	87.391	173	112.826
135	88.043	174	113.478
136	88.695	175	114.130
137	89.347	176	114.782
138	90	177	115.434
139	90.652	178	116.086
140	91.304	179	116.739
141	91.956	180	117.391
142	92.608	181	118 043
143	93.260	182	118.695
144	93.913	183	119.347
145	94.565	184	120
146	95.217	185	120.652
147	95.869	186	121.304
148	96.521	187	121.956
149	97.173	188	122.608
150	97.826	189	123.260
151	98.478	190	123.913
152	99.130	191	124.565
153	99.782	192	125.217

SECT. LXXVII.

Natural Pulse, 116 in a Minute.

116	=75	156	100.862
117	75.646	157	101.508
118	76.293	158	102.155
119	76.939	159	102.801
120	77.586	160	103.448
121	78.232	161	104.094
122	78.879	162	104.741
123	79.525	163	105.387
124	80.172	164	106.034
125	80.818	165	106.680
126	81.465	166	107.327
127	82.112	167	107.974
128	82.758	168	108.620
129	83.405	169	109.267
130	84.051	170	109.913
131	84.698	171	110.560
132	85.344	172	111.206
133	85.991	173	111.853
134	86.637	174	112.499
135	87.284	175	113.146
136	87.931	176	113.793
137	88.577	177	114.439
138	89.224	178	115.086
139	90.870	179	115.732
140	91.517	180	116.379
141	92.163	181	117.025
142	92.810	182	117.672
143	93.456	183	118.318
144	94.103	184	118.965
145	94.749	185	119.611
146	95.396	186	120.258
147	95.043	187	120.905
148	95.689	188	121.551
149	96.336	189	122.198
150	96.982	190	122.844
151	97.629	191	123.491
152	98.275	192	124.137
153	98.922	193	124.784
154	99.568	194	125.431
155	100.215		

SECT. LXXVIII.

Natural Pulse, 117 in a Minute.

117	=75	157	100.641
118	75.641	158	101.282
119	76.282	159	101.923
120	76.923	160	102.564
121	77.564	161	103.205
122	78.205	162	103.846
123	78.846	163	104.487
124	79.487	164	105.128
125	80.128	165	105.769
126	80.769	166	106.410
127	81.410	167	107.051
128	82.051	168	107.692
129	82.692	169	108.333
130	83.333	170	108.974
131	83.974	171	109.615
132	84.615	172	110.256
133	85.256	173	110.897
134	85.897	174	111.538
135	86.538	175	112.179
136	87.179	176	112.820
137	87.820	177	113.461
138	88.461	178	114.102
139	89.102	179	114.743
140	89.743	180	115.384
141	90.384	181	116.025
142	91.025	182	116.666
143	91.666	183	117.307
144	92.307	184	117.953
145	92.953	185	118.594
146	93.594	186	119.235
147	94.235	187	119.876
148	94.876	188	120.517
149	95.517	189	121.158
150	96.158	190	121.799
151	96.799	191	122.440
152	97.440	192	123.081
153	98.081	193	123.722
154	98.722	194	124.363
155	99.363	195	125
156	100		

SECT. LXXIX.

Natural Pulse, 118 in a Minute.

118	=75	158	100.423
119	75.635	159	101.059
120	76.271	160	101.794
121	76.906	161	102.330
122	77.542	162	102.966
123	78.177	163	103.601
124	78.813	164	104.237
125	79.449	165	104.872
126	80.084	166	105.508
127	80.720	167	106.144
128	81.355	168	106.779
129	81.991	169	107.415
130	82.627	170	108.050
131	83.262	171	108.686
132	83.898	172	109.322
133	84.533	173	109.957
134	85.169	174	110.593
135	85.805	175	111.228
136	86.440	176	111.864
137	87.076	177	112.499
138	87.711	178	113.135
139	88.347	179	113.771
140	88.983	180	114.406
141	89.618	181	115.042
142	90.254	182	115.677
143	90.889	183	116.313
144	91.525	184	116.948
145	92.161	185	117.584
146	92.896	186	118.220
147	93.432	187	118.855
148	94.067	188	119.491
149	94.703	189	120.126
150	95.339	190	120.762
151	95.974	191	121.398
152	96.610	192	122.033
153	97.245	193	122.669
154	97.881	194	123.305
155	98.516	195	123.940
156	99.152	196	124.576
157	99.788	197	125.211

SECT. LXXX.

Natural Pulſe, 119 in a Minute.

119	=75	160	100.840
120	75.630	161	101.470
121	76.260	162	102.100
122	76.890	163	102.731
123	77 521	164	103.361
124	78.151	165	103.991
125	78 781	166	104 621
126	79.411	167	105.252
127	80.042	168	105.882
128	80.672	169	106.512
129	81.302	170	107.142
130	81.932	171	107.773
131	82.563	172	108.403
132	83.193	173	109.033
133	83.823	174	109.663
134	84.453	175	110.294
135	85.084	176	110.924
136	85.714	177	111.554
137	86 344	178	112.184
138	86 974	179	112.815
139	87.605	180	113.445
140	88.235	181	114.075
141	88.865	182	114.705
142	89 495	183	115.336
143	90.126	184	115.966
144	90.756	185	116.596
145	91 386	186	117.226
146	92 016	187	117.857
147	92.647	188	118.487
148	93.277	189	119.117
149	93.907	190	119.747
150	94.537	191	120.378
151	95.168	192	121.008
152	95.798	193	121.638
153	96.428	194	122.268
154	97.058	195	122.899
155	97.689	196	123.529
156	98.319	197	124.159
157	98.949	198	124.789
158	99.579	199	125.420
159	100.210		

SECT. LXXXI.

Natural Pulſe, 120 in a minute.

120	=75	161	100.625
121	75.625	162	101.25
122	76.25	163	101.875
123	76.875	164	102.5
124	77.5	165	103.125
125	78.125	166	103.75
126	78.75	167	104.375
127	79.375	168	105
128	80	169	105.625
129	80.625	170	106.25
130	81.25	171	106.875
131	81.875	172	107.5
132	82.5	173	108.125
133	83.125	174	108.75
134	83.75	175	109.375
135	84.375	176	110
136	85	177	110.625
137	85.625	178	111.25
138	86.25	179	111.875
139	86.875	180	112.5
140	87.5	181	113.125
141	88.125	182	113.75
142	88.75	183	114.375
143	89.375	184	115
144	90	185	115.625
145	90.625	186	116.250
146	91.25	187	116.875
147	91.876	188	117.5
148	92.5	189	118.125
149	93.125	190	118.75
150	93.75	191	119.375
151	94.375	192	120
152	95	193	120.625
153	95.625	194	121.25
154	96.25	195	121.875
155	96.875	196	122.5
156	97.5	197	123.125
157	98.125	198	123.75
158	98.75	199	124.375
159	99.375	200	125
160	100		

SECT. LXXXII.

Natural Pulse, 121 in a Minute.

121	=75	162	100.413
122	75.619	163	101.033
123	76.239	164	101.652
124	76.859	165	102.272
125	77.479	166	102.892
126	78.099	167	103.512
127	78.719	168	104.132
128	79.338	169	104.752
129	79.958	170	105.371
130	80.578	171	105.991
131	81.198	172	106.611
132	81.818	173	107.231
133	82.438	174	107.851
134	83.057	175	108.471
135	83.677	176	109.090
136	84.297	177	109.710
137	84.917	178	110.330
138	85.537	179	110.950
139	86.157	180	111.570
140	86.776	181	112.190
141	87.396	182	112.809
142	88.016	183	113.429
143	88.636	184	114.049
144	89.256	185	114.669
145	89.876	186	115.289
146	90.495	187	115.909
147	91.115	188	116.529
148	91.735	189	117.148
149	92.355	190	117.768
150	92.975	191	118.388
151	93.595	192	119.008
152	94.214	193	119.628
153	94.834	194	120.248
154	95.454	195	120.867
155	96.074	196	121.487
156	96.694	197	122.107
157	97.314	198	122.727
158	97.933	199	123.347
159	98.553	200	123.967
160	99.173	201	124.586
161	99.793	202	125.206

SECT. LXXXIII.

Natural Pulse, 122 in a Minute.

122	=75	164	100.819
123	75.614	165	101.434
124	76.229	166	102.049
125	76.844	167	102.663
126	77.459	168	103.278
127	78.073	169	103.893
128	78.688	170	104.508
129	79.303	171	105.122
130	79.918	172	105.737
131	80.532	173	106.352
132	81.147	174	106.967
133	81.762	175	107.581
134	82.377	176	108.196
135	82.991	177	108.811
136	83.606	178	109.426
137	84.221	179	110.040
138	84.836	180	110.655
139	85.450	181	111.270
140	86.065	182	111.885
141	86.680	183	112.5
142	87.295	184	113.114
143	87.909	185	113.629
144	88.524	186	114.244
145	89.139	187	114.859
146	89.754	188	115.473
147	90.368	189	116.088
148	90.983	190	116.703
149	91.598	191	117.418
150	92.213	192	118.032
151	92.827	193	118.647
152	93.442	194	119.262
153	94.057	195	119.876
154	94.672	196	120.490
155	95.286	197	121.105
156	95.901	198	121.721
157	96.516	199	122.336
158	97.131	200	122.950
159	97.745	201	123.565
160	98.360	202	124.180
161	98.975	203	124.795
162	99.590	204	125.409
163	100.204		

SECT. LXXXIV.

Natural Pulse, 123 in a Minute.

123	=75	165	100.609
124	75.609	166	101.219
125	76.219	167	101.829
126	76.829	168	102.439
127	77.439	169	103.048
128	78.048	170	103.658
129	78.658	171	104.268
130	79.268	172	104.878
131	79.878	173	105.487
132	80.487	174	106.097
133	81.097	175	106.707
134	81.707	176	107.317
135	82.317	177	107.926
136	82.926	178	108.536
137	83.536	179	109.146
138	84.146	180	109.756
139	84.756	181	110.365
140	85.365	182	110.975
141	85.975	183	111.585
142	86.585	184	112.195
143	87.195	185	112.804
144	87.804	186	113.414
145	88.414	187	114.024
146	89.024	188	114.634
147	89.634	189	115.243
148	90.243	190	115.853
149	90.853	191	116.463
150	91.463	192	117.073
151	92.073	193	117.682
152	92.682	194	118.292
153	93.292	195	118.902
154	93.902	196	119.512
155	94.512	197	120.121
156	95.121	198	120.731
157	95.731	199	121.341
158	96.341	200	121.951
159	96.951	201	122.560
160	97.560	202	123.170
161	98.170	203	123.780
162	98.780	204	124.390
163	99.390	205	125
164	100	206	

SECT. LXXXV.

Natural Pulse, 124 in a Minute.

124	=75	166	100.403
125	75.604	167	101.008
126	76.209	168	101.612
127	76.814	169	102.217
128	77.419	170	102.822
129	78.024	171	103.427
130	78.629	172	104.032
131	79.233	173	104.637
132	79.838	174	105.241
133	80.443	175	105.846
134	81.048	176	106.451
135	81.653	177	107.056
136	82.258	178	107.661
137	82.862	179	108.266
138	83.467	180	108.870
139	84.072	181	109.475
140	84.677	182	110.080
141	85.282	183	110.685
142	85.887	184	111.290
143	86.491	185	111.895
144	87.096	186	112.499
145	87.701	187	113.104
146	88.306	188	113.709
147	88.911	189	114.314
148	89.516	190	114.919
149	90.120	191	115.524
150	90.725	192	116.129
151	91.330	193	116.733
152	91.935	194	117.338
153	92.540	195	117.943
154	93.145	196	118.548
155	93.749	197	119.153
156	94.354	198	119.758
157	94.959	199	120.362
158	95.564	200	120.967
159	96.169	201	121.572
160	96.774	202	122.177
161	97.379	203	122.782
162	97.983	204	123.387
163	98.588	205	123.991
164	99.193	206	124.596
165	99.798	207	125.201

SECT. LXXXVI.

Natural Pulse, 125 in a Minute.

125	=75	168	100.8
126	75.6	169	101.4
127	76.2	170	102
128	76.8	171	102.6
129	77.4	172	103.2
130	78	173	103.8
131	78.6	174	104.4
132	79.2	175	105
133	79.8	176	105.6
134	80.4	177	106.2
135	81	178	106.8
136	81.6	179	107.4
137	82.2	180	108
138	82.8	181	108.6
139	83.4	182	109.2
140	84	183	109.8
141	84.6	184	110.4
142	85.2	185	111
143	85.8	186	111.6
144	86.4	187	112.2
145	87	188	112.8
146	87.6	189	113.4
147	88.2	190	114
148	88.8	191	114.6
149	89.4	192	115.2
150	90	193	115.8
151	90.6	194	116.4
152	91.2	195	117
153	91.8	196	117.6
154	92.4	197	118.2
155	93	198	118.8
156	93.6	199	119.4
157	94.2	200	120
158	94.8	201	120.6
159	95.4	202	121.2
160	96	203	121.4
161	96.6	204	122.8
162	97.2	205	123
163	97.8	206	123.6
164	98.4	207	124.2
165	99	208	124.8
166	99.6	209	125.4
167	100.2		

SECT. LXXXVII.

Natural Pulse, 126 in a Minute.

126	=75	169	100.595
127	75.595	170	101.190
128	76,190	171	101.785
129	76.785	172	102.380
130	77.380	173	102.976
131	77.976	174	103.571
132	78.571	175	104.166
133	79.166	176	104.761
134	79.761	177	105.357
135	80.357	178	105.952
136	80.952	179	106.547
137	81.547	180	107.142
138	82.142	181	107.737
139	82.737	182	108.333
140	83 333	183	108.928
141	83.928	184	109.523
142	84.523	185	110.119
143	85.119	186	110.714
144	85.714	187	111 309
145	86.309	188	111.904
146	86.904	189	112.5
147	87.5	190	113.095
148	88.095	191	113,690
149	88.690	192	114.285
150	89.285	193	114.880
151	89.880	194	115.476
152	90.476	195	116.071
153	91.071	196	116 666
154	91.666	197	117.261
155	92.261	198	117.857
156	92.857	199	118.452
157	93.452	200	119.047
158	94.047	201	119.642
159	94.642	202	120.237
160	95.237	203	120.833
161	95.833	204	121.428
162	96.428	205	122.023
163	97.023	206	122.619
164	97.619	207	123.214
165	98.214	208	123.809
166	98.809	209	124.404
167	99.404	210	125
168	100		

SECT. LXXXVIII.

Natural Pulſe, 127 in a Minute.

127	=75	170	100.393
128	75.590	171	100.984
129	76.181	172	101.574
130	76.771	173	102.165
131	77.362	174	102.755
132	77.952	175	103.346
133	78.543	176	103.936
134	79.133	177	104.527
135	79.724	178	105.118
136	80.314	179	105.708
137	80.905	180	106.299
138	81.496	181	106.889
139	82.086	182	107.480
140	82 677	183	108.070
141	83.267	184	108.661
142	83.858	185	109.251
143	84.448	186	110.842
144	85.039	187	110.433
145	85.629	188	111.023
146	86.220	189	111.614
147	86.811	190	112.204
148	87.401	191	112.795
149	87.992	192	113.385
150	88.582	193	113.976
151	89.173	194	114.566
152	89.763	195	115.157
153	90 354	196	115.748
154	90.944	197	116.338
155	91.535	198	116.929
156	92.125	199	117.519
157	92.716	200	118.110
158	93.307	201	118.700
159	93.897	202	119.291
160	94.488	203	119.881
161	95.078	204	120.472
162	95.669	205	121.062
163	96.259	206	121.653
164	96.850	207	122.244
165	97.440	208	122.834
166	98.031	209	123.425
167	98.622	210	124.015
168	99.212	211	124.606
169	99.803	212	125.196

SECT. LXXXIX.

Natural Pulſe, 128 in a Minute.

128	=75	172	100.781
129	75.585	173	101.367
130	76.171	174	101.953
131	76.757	175	102.539
132	77.343	176	103.124
133	77.929	177	103.710
134	78.515	178	104.296
135	79.101	179	104.882
136	79.687	180	105.468
137	80 273	181	106.054
138	80 859	182	106.640
139	81.445	183	107.226
140	82.031	184	107.812
141	82.617	185	108.398
142	83.203	186	108 984
143	83.789	187	109.570
144	84.375	188	110.156
145	84.960	189	110.742
146	85.546	190	111.328
147	86.132	191	111.914
148	86.718	192	112.5
149	87.304	193	113.085
150	87.890	194	113.671
151	88.476	195	114.257
152	89.062	196	114.843
153	89.648	197	115.429
154	90.234	198	116.015
155	90.820	199	116 601
156	91.406	200	117.187
157	91.992	201	117.773
158	92.578	202	118.359
159	93 164	203	118.945
160	93.750	204	119.531
161	94.335	205	120.117
162	94 921	206	120.703
163	95.507	207	121.289
164	96.093	208	121.875
165	96.679	209	122.460
166	97.265	210	123 046
167	97.851	211	123 632
168	98.437	212	124.218
169	99 023	213	124.804
170	99 609	214	125.390
171	100.195		

SECT. XC.

Natural Pulse, 129 in a Minute.

129	=75	173	100.581
130	75.581	174	101.162
131	76.162	175	101.744
132	76.744	176	102.325
133	77.325	177	102.906
134	77.906	178	103.488
135	78 488	179	104.069
136	79.069	180	104 651
137	79.651	181	105.232
138	80.232	182	105.813
139	80.813	183	106.395
140	81.395	184	106.976
141	81.976	185	107.558
142	82.558	186	108.139
143	83.139	187	108.720
144	83.720	188	109.302
145	84.302	189	109 883
146	84.883	190	110.465
147	85.465	191	111.046
148	86.046	192	111.627
149	86.627	193	112.209
150	87.209	194	112.790
151	87.790	195	113.372
152	88.372	196	113.953
153	88.953	197	114.534
154	89.534	198	115.116
155	90.116	199	115.697
156	90.697	200	116.279
157	91.279	201	116.860
158	91.860	202	117.441
159	92.441	203	118.023
160	93 023	204	118.604
161	93.604	205	119.186
162	94.186	206	119.767
163	94.767	207	120.348
164	95 348	208	120.930
165	95.930	209	121.511
166	96.511	210	122.093
167	97.093	211	122.674
168	97.674	212	123.255
169	98.255	213	123.837
170	98.837	214	124.418
171	99.418	215	125
172	100		

SECT. XCI.

Natural Pulse, 130 in a Minute.

130	=75	174	100·384
131	75·576	175	100·961
132	76·153	176	101·538
133	76·730	177	102·115
134	77·307	178	102.692
135	77·884	179	103·269
136	78·461	180	103·846
137	79·038	181	104·423
138	79·615	182	105
139	80·192	183	105·576
140	80·769	184	106·153
141	81·346	185	106·730
142	81 923	186	107 307
143	82·5	187	107 884
144	83·076	188	108 461
145	83·653	189	109·038
146	84·230	190	109·615
147	84·807	191	110·192
148	85·384	192	110·769
149	85·961	193	111·346
150	86·538	194	111·923
151	87·115	195	112·5
152	87·692	196	113·076
153	88.269	197	113.653
154	88.846	198	114·230
155	89·423	199	114·807
156	90	200	115·384
157	90·576	201	115.961
158	91·153	202	116.538
159	91·730	203	117.115
160	92·307	204	117.692
161	92.884	205	118.269
162	93·461	206	118.846
163	94·038	207	119·423
164	94.615	208	120
165	95·192	209	120·576
166	95 769	210	121·153
167	96 346	211	121 730
168	96·923	212	122 307
169	97·5	213	122.884
170	98.076	214	123.461
171	98.653	215	124.038
172	99.230	216	124.615
173	99.807	217	125.192

Table of the Proportion between the Morning and Evening Pulse, intended to mark the Increase or Diminution of Fevers.

Morning	Evening.	Morning	Evening.
82	95.771	102	119.13
83	96.939	103	120.298
84	98.107	104	121.466
85	99.275	105	122.634
86	100.449	106	123.802
87	101.611	107	124.97
88	102.778	108	126.038
89	103.946	109	127.206
90	105.114	110	128.374
91	106.282	111	129.542
92	107.45	112	130.71
93	108.618	113	131.97
94	109.786	114	133.046
95	110.994	115	134.214
96	112.122	116	135.382
97	113.29	117	136.55
98	114.458	118	137.718
99	115.626	119	138.886
100	116.794	120	140.054
101	117.962		

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