A STUDY OF LEPROSY: WITH ESPECIAL REFERENCE TO THE PULSE AND TEMPERATURE.

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(Concluded from page 638.)

STUDY OF CONDITIONS THAT MAY POSSIBLY INFLUENCE TEMPERATURE AND PULSE.

Weather. A daily chart showing outside and inside temperature, direction and strength of wind, rain, fog, cloudiness, unsettled conditions and fair weather was kept. Comparisons were made in an effort to demonstrate any change in temperature and in pulse. From this study it was concluded that external temperature had not the slightest effect on the temperature and pulse of patients. On January 13 and 14 the external temperature was 2° above and 0 F. The lowest temperature was 96°, the highest 101°. The lowest pulse was 62 and the highest 114. On June 22, 23 and 29, the external temperature was 82°, 80°, 84° F. The lowest temperature was 97.4°, the highest 101.8°. The lowest pulse was 60 and the highest 100. These figures were taken at random, being highest and lowest on these days, excluding complications. The days have likewise not been especially chosen, and are not the extreme of either heat or cold.

It is unquestionably true that on foggy and rainy or excessively warm days there is a more or less general depression, considering that the patients are then forced to be indoors and are given time to reflect on their condition. It is more than likely that this factor plays as large a part as the weather conditions.

During the winter months the patients have complained of minor ailments and called for

medical attention more frequently than during the spring or summer months. Various charts were kept to determine from different points of view the condition and character of the temperature and pulse during the year divided into seasons, into months and into periods irrespective of seasons. The following table B. attempts to give graphically these results. From this it will be noticed that, with the exception perhaps of high temperature in August and high pulse in January and in contrast the low temperature in February and March and low pulse in July, August and September, no differences are noticeable for months, seasons or patients.

It is interesting to state here that chills which occur in the course of the disease and which have a marked effect on the character of the temperature and pulse curves, occurred most frequently in August, September, October and November, and that the feeling of cold was complained of most in December, January, March and April.

Observations on Effect of Exercise, etc. In leprosy physical exertion, of whatsoever nature, will give rise to an immediate and fairly prolonged reaction in temperature and pulse. This statement depends largely on the stage and condition of the disease and patient. The more advanced the stage and feeble the condition the greater the rise of temperature and pulse and the longer the duration of the reaction. The greater the activity the more variable are the temperature and pulse. Case 15 played croquet off and on for less than one hour and rested for half an hour before temperature and pulse were taken. Temperature was 102°, pulse 88. In this case the average temperature and pulse had been 99° to 100° and 70 to 80. In the other cases the same exercise caused various increases of temperature from 1.5° to 2.5° and pulse rate from 18 to 30. In most cases the reaction was still evident twelve hours after exercise and in an advanced case it was the cause of a severe

TABLE B.

SHOWING DURING WHAT MONTHS THE TEMPERATURE AND PULSE IS HIGHEST OR LOWEST TO DETERMINE THE EFFECT OF SEASON ON CONDITION OF PATIENTS.

Name.	Months of		Months of	
	Highest Temp.	Lowest Temp.	Highest Pulse.	Lowest Pulse.
F. B.	August	Jan.-Feb.	Feb., June, Nov.-Dec.	July, Aug.
I. B.	*May, June-July	Feb.-Mar.	Apr., May, June, Jan.	Oct., July, Aug.
H. C.	No difference		November	August
M. C.	Sept.-Oct.	April-May	Apr., May, June	Aug., Jan., Nov., Oct.
L. D.	*Aug.-Sept.	Feb.-Mar.	Nov., Aug., Sept.-Oct.	June, July, Dec.
M. G.	*Nov., Aug.	June-July	Mar., May, Jan.	Sept., Dec., July
S. G.	*July, Aug.-Sept.	April, June	Dec., Jan., May	July, Oct., Sept.
H. K.	No difference		Jan., May	June, April
M. M.	No difference		July, Jan., May	Nov., Sept.
F. P.	*Oct.-Nov., July	Feb., Dec.	Oct., June, Nov.	July, Sept., Feb.
L. P.	*Dec.-Jan.	October	May, June, Jan.	Nov., Oct., July
W. Q.	Aug., Dec.	Mar., June-July	Aug.-July	June, April
A. T.	Jan.-June	Sept.-Oct. Nov.	Apr., Mar., Feb.	Dec., Oct.
Y. T.	*Jan.-Feb.	June	Jan., October	June, Aug.

Month of highest temperature is given first.

In case of slight differences more than two months are given.

Two months connected by hyphen show increase in latter part of one month and first part of next month.

* During these months complications or "toxic-febrile" attacks occurred.

indisposition of several days duration. In washing both floors and clothes, where a certain amount of friction is used, patients have shown marked local and systemic reactions. In one case the average increase of temperature is 1+ degrees and pulse 16+ beats, with constant skin reaction in the nature of bullae or inflamed abrasions. The more constant and graduated the exercise the less the reaction.

Results from Resting. The year of observation was divided into alternate periods of six weeks of rest for one-half hour before temperature and six weeks when patients came directly from the various occupations to the dispensary. This again was divided into a week period when some of the patients stayed in bed for temperature and pulse readings, and readings were also made when patients were indisposed for longer or shorter periods. Two cases are given here as an illustration, as typical of all cases (Cases 5 and 8.) Study of Chart 5 shows during the periods of rest a lower and more regular temperature. "Morning pulse" was present 65% of the time. During the exercise periods pulse exacerbations were more frequent and the rate more variable. In general temperature and pulse and respiration are much higher at both morning and evening readings. "Morning pulse" was present 42% of the time. Case 8 is an early case with infrequent and slight lesions and of good physical condition. The results of partial rest upon the temperature and pulse curves are similar to those just noted. Chart 19 illustrates the effect of complete rest upon curves in case 8.

Under Abnormal Conditions. Elsewhere it has been stated that temperature and pulse reactions occur from the slightest cause. This reaction which is most markedly shown by the sudden rise and pulse rate is dependent largely upon the general health of the patient and the character of the cause. In secondary infections, diarrhea, influenza, pleuritis and common cold,

there occurs an immediate departure from the typical temperature and pulse curves of leprosy, yet different from the reaction seen in a "toxic-febrile" attack. The severe prostration, general malaise, exhaustion and marked elevation of temperature and pulse are out of all proportion to the physical findings and the speedy recovery which follows. Chart 5, studied in comparison with chart 1, and then contrasted with chart 11 will better describe these changes. A daily study of the charts will usually immediately indicate the occurrence of some impending disturbance and is almost always corroborated by the patient in a day or two. In this manner many "toxic-febrile" attacks have been prognosticated and pus, usually in the extremities, has been demonstrated early in the disorder. As a result these attacks are shortened, if not aborted. A comparison of the charts showing "toxic-febrile," attacks and reactions due to exercise or excitement will demonstrate the difference in such curves. See charts 2 and 14.

TABLE D.

GIVING THE PERCENTAGE OF "POSITIVE PULSE" INCREASE AND AVERAGE FROM JULY, 1913, TO JULY, 1914.

Month: Per Cent.	July. %	Aug. %	Sept. %	Oct. %	Nov. %	Dec. %	Jan. %	Feb. %	Mar. %	Apr. %	May. %	June. %	July. %	Av. for Period.
F. B.	41+	50	41+	71+	48+	60	72+	50	—	—	—	77+	—	56+
I. R.*	68+	70+	73+	84+	86+	68+	85+	83+	81+	†63+	†60	†58+	36+	70+
H. C.	29+	38+	45+	†34+	46+	57+	—	—	—	—	—	—	—	40+
M. C.*	26+	32	28+	13+	45+	†45+	54+	38+	55+	48	†44+	44+	54+	40+
L. D.	†27+	†64+	†45+	†14+	†21+	†47+	†67+	†48+	†65+	74+	75	70	80+	60+
M. G.	61+	86+	57+	71+	57+	58+	73+	76+	75+	84+	†66+	69+	80+	70+
S. G.	†40+	†41+	†22+	†22+	42+	38+	†40	42+	34+	62+	79+	73+	40+	44+
H. K.	—	—	—	—	64+	81+	93+	68+	58+	71+	82+	95+	90+	78
M. M.	94+	88+	50	68+	60	48+	78+	74+	76+	91+	76+	86+	70+	73+
L. P.	72+	90	37+	57+	72	†67+	†54+	60	66+	75	70	76+	90+	67+
F. P.	88+	82+	†50	†42+	61+	67+	†41+	50	80+	82+	85+	73+	18+	63
W. Q.	31+	39+	30+	33+	48+	82+	72+	50	55+	65+	39+	74+	72+	53+
A. T.	66+	48+	66+	66+	76+	79+	92+	95+	78+	73+	86+	53+	70+	74+
Y. T.	15+	39+	63+	40	44+	69+	50	28	†73+	†60+	52+	61+	70+	51+

Explanation: *Incomplete months. * Question of pulmonary tuberculosis. † Complications. ‡ Only comfortable months.

Two other patients with uncompleted charts are not included here.
H. C. Case discharged as arrested.
W. Q. Patient has shown marked improvement.
L. D., S. G., and Y. T., are cases showing severe complications during year.

Table D is an attempt to show the reduced percentage of the occurrence of the high "morning pulse" rate, due to complications. The months of the year showing the fewest complications, give the greatest percentage of "morning pulse," i. e. March, April, May and June of 1914.

Effect of Medical and Surgical Treatment. All drugs, especially those used externally in leprosy, will have some effect on the patient's temperature and pulse. The general physical condition of the patient and the presence of ulcers or other lesions determine the initial course of the disease and when any specific treatment is undertaken, the result is looked for on the chart to determine the effect of such treatment in conjunction with objective and subjective symptoms. The daily condition of the patient is more largely dependent on the presence of pus or secondary infections, as seen in "toxic-febrile" attacks, and any drug which is used, such as iodoform ointment, acting directly on the ulcer and indirectly on the system will, if effective, produce a result that is observed by fall of temperature and pulse rate and particularly, in the character of the curves. This study has been without definite results and no conclusions can be reached, as many other factors are constantly entering into the study of the immediate reactions by the internal administration of drugs, which under the present system cannot be controlled. Only by the study of the cases during long periods can the efficacy of any treatment be obtained.

General Hygiene. Under this heading there has been included bathing, clean clothes, fresh air, food and as much as possible, the effect of clean surroundings. The result can only be summed up in a general statement by saying that cleanliness and fresh air are most important adjuncts in the treatment of leprosy and sufficient emphasis can hardly be laid on this question. The reaction observed after baths is not consistent, consequently no conclusions are

made. Table E is presented here showing the loss and gain in weight for the year under observation. Explanation of the figures is seen at the bottom of the table.

Effect of Mental States. In all cases there are periods of severe depression. Lesions associated with pain, disability or loss of appetite, produce the greatest proportion of these attacks. The temperature and pulse are lower during such times, with no other marked characteristic. Excitement, especially due to anger, produces a marked increase of pulse rate. This increase is often 40 beats and more above the individual's average rate. The reaction continues for a time not less than 48 hours and often for longer periods (see chart 2) and not infrequently ends in indisposition of varying severity, accompanied by rise of temperature, malaise and digestive disturbances. Pain which is sufficiently severe to need attention, will, without exception, give rise to first, an increased pulse rate and later to a rise in temperature, the height of each being entirely dependent upon the cause of the pain. Other conditions have already been mentioned which have a depressing effect on the patient's mind.

The Effect of Age, Sex and Racial Characteristics. With the exception of one case it has been difficult to arrive at any decision regarding the effect of age on the temperature and pulse curves during the course of the disease, when complications were not present. The exception is in a patient seventy years of age. Both the temperature and pulse rate are in general lower than the temperature and pulse rate of those patients whose stage and condition are similar to his. The irregularity is more marked and reactions from slight causes more numerous, severe and prolonged. In certain periods the temperature and pulse are below the normal. In this case it has not been possible to determine how great an influence his cardiac lesions affected the readings. With the women patients it has been observed that, excluding certain affecting

TABLE E.

SHOWING MONTHLY GAIN AND LOSS IN WEIGHT FOR TEN CONSECUTIVE MONTHS, COMPARED WITH WEIGHT IN APRIL, 1913, ALSO TOTAL GAIN AND LOSS FOR THE WHOLE PERIOD.

Name.	April.	1913. Dec.	1914. Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Total. Gain.	Total. Loss.
F. B.	142	141 $\frac{1}{4}$	136 $\frac{1}{2}$	131 $\frac{1}{2}$	132	141 $\frac{1}{4}$	146 $\frac{1}{4}$	146 $\frac{1}{2}$	120 $\frac{1}{2}$	128 $\frac{1}{2}$	—	13 $\frac{1}{2}$
I. B.	109	118 $\frac{1}{4}$	115	114 $\frac{1}{2}$	112	"III"	"III"	98 $\frac{1}{2}$	97 $\frac{1}{2}$	90 $\frac{1}{2}$	—	18 $\frac{1}{2}$
M. C.	123	122 $\frac{1}{4}$	121 $\frac{1}{2}$	125	127	128 $\frac{3}{4}$	126 $\frac{3}{4}$	125 $\frac{1}{2}$	121 $\frac{1}{2}$	120 $\frac{1}{2}$	—	2 $\frac{1}{2}$
L. D.	116 $\frac{1}{4}$	119	117 $\frac{1}{2}$	"III"	"III"	120 $\frac{1}{2}$	122	122	120	118 $\frac{1}{2}$	2 $\frac{1}{4}$	—
M. G.	117 $\frac{1}{2}$	120 $\frac{3}{4}$	123	121	121	118 $\frac{1}{2}$	117 $\frac{1}{2}$	116 $\frac{3}{4}$	117	119	1 $\frac{1}{2}$	—
S. G.	119 $\frac{1}{2}$	"III"	"III"	"III"	"III"	"III"	120	117 $\frac{3}{4}$	115	114 $\frac{1}{2}$	—	5
H. K.	130*	138	140 $\frac{3}{4}$	140	140	140	138	136 $\frac{1}{2}$	131	131 $\frac{1}{2}$	1 $\frac{1}{2}$	—
M. M.	193	195	196 $\frac{1}{4}$	197 $\frac{1}{2}$	199	194 $\frac{1}{2}$	195	193 $\frac{1}{2}$	190	188	—	5
L. P.	137 $\frac{1}{4}$	147 $\frac{1}{2}$	133	147	150 $\frac{1}{2}$	147	143 $\frac{1}{2}$	140 $\frac{1}{2}$	146 $\frac{1}{2}$	144 $\frac{1}{2}$	7 $\frac{1}{4}$	—
F. P.	135 $\frac{1}{2}$	128 $\frac{3}{4}$	"III"	"III"	"III"	"III"	117	119 $\frac{3}{4}$	116	118	—	17 $\frac{1}{2}$
W. Q.	127	132 $\frac{1}{2}$	129 $\frac{1}{2}$	131 $\frac{1}{4}$	131	128 $\frac{1}{2}$	135 $\frac{3}{4}$	130 $\frac{1}{2}$	126 $\frac{1}{2}$	122 $\frac{3}{4}$	—	4 $\frac{1}{4}$
A. T.	108 $\frac{3}{4}$	112	105	107 $\frac{3}{4}$	110	106 $\frac{1}{2}$	104 $\frac{1}{2}$	105 $\frac{3}{4}$	110	108 $\frac{1}{2}$	—	$\frac{1}{4}$
Y. T.	126 $\frac{3}{4}$	127	121 $\frac{1}{4}$	128	121 $\frac{1}{2}$	116 $\frac{1}{4}$	121	121	114	112 $\frac{1}{2}$	—	14 $\frac{1}{4}$

* November.

One patient discharged, gained in weight.

Patients in most advanced stages, show greatest loss of weight.

agents and temperament, the rate is higher, reactions are more marked and disturbances more frequent. There seems to be a nervous factor which may account in part for these reactions. In the case of racial influence, it can be said that suggestion and mental treatment are of value in the Jewish patients only. These patients need constant encouragement. They react to outside influences in a more marked manner than the rest. Their habits of living make treatment more difficult. In no specific way can it be said that these reactions predominate over the reactions of leprosy. It cannot be determined without longer study of more cases.

DISCUSSION AND CONCLUSION.

In normal individuals the temperature and heart rate fall and rise together in parallel curves.

The heart's action is modified by an increase in temperature and reacts differently according to the toxins produced by the agent causing the fever. Variations occur, especially when peripheral vessels and nerves are involved. This is seen in minor febrile troubles when a slight rise of temperature is accompanied by a fall in pulse rate.

In exhausting diseases, cancer, anemia, etc., increase in the heart rate is believed to be due to an intoxication. Researches have demonstrated conclusively that the heart is invaded by specific organisms and toxins, such as occur in rheumatic fever, typhoid, diphtheria, etc.

In febrile diseases it is considered that an increase of 8 to 10 heart beats should equal a rise of temperature of one degree and in such diseases a rise of temperature increases the pulse rate and a fall diminishes it, excepting typhoid and meningitis.

It is believed that toxins, produced anywhere in the body, may evoke a rise of temperature and pulse, together with other symptoms. In all infections there is always some general intoxication produced (Pearce & Austin).

Without a nervous control the vascular system fails to meet important conditions of the normal circulation.

The vasomotor regulation system is therefore important. The vaso-constrictor fibres are present in numerous nerve trunks, but especially in those distributed to the skin. They arise from and are connected with the central nervous system, and have sympathetic connection. It is well known that, if the peripheral nerve end be stimulated, strong constriction of vessels occurs with blanching of the part and an increase of arterial pressure (Howell). The vasomotor nerves regulate the supply of blood, and their action constricting the arterioles probably produces the cold feeling (McKenzie) so common in leprosy.

6. These "toxic-febrile" attacks are usually followed by a severe lesions, most often with lo-

cal swelling, pus, pustules, bullae and later ulcers and severe glandular involvement.

7. Most of the patients have a low hemoglobin index—averaging from 35 to 55%—and a leucocytosis varying between 14 and 17 thousand. The urine in almost all cases shows an albuminuria, casts, abundance of cells and acid-fast bacilli.

8. Terminal or secondary infections are most often the cause of death.

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Clinical Department.

A CASE OF AUTOTRANSPLANTATION OF BONE FOR NASAL DEFORMITY DUE TO SYPHILIS.*

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Rhinoplasty is the name given to the art of the surgery of the nose. Rhinoplastic operations are performed either to correct defects by replacing parts or the whole of the nose, or to reestablish functions lost by disease or trauma.

The substances used in rhinoplastic operations are inert materials or living tissue. The inert materials used may be metals, wood, rubber or paraffin. The living tissues used may be soft living tissue, such as skin, fat, muscle, periosteum; or hard living tissue such as cartilage or bone.

The methods used are first autotransplantation, that is, the use of tissue from one part to the other of the same individual; secondly, heterotransplantation, that is, the use of tissue from one individual to another; and thirdly, zootransplantation, that is, the use of tissues from lower animals in man.

This paper is a report of a rhinoplastic operation on a patient referred to me by my colleague, Dr. William B. Keeler. It was performed for the double purpose of restoring the function of nasal respiration, and for the correction of a nasal deformity for cosmetic reasons. The method used was that of autotransplantation of bone.

Family History. Nothing of importance with reference to this case. Married several years. No children.

Past History. Denies venereal. Several months before coming to see me she had some "discharge" from her nose for which she was treated for some

* Read before the Visiting Staff of the Mt. Sinai Hospital, February 11, 1916.

little time at the Massachusetts General Hospital, where she had her blood examined and a report of a positive Wassermann was given.

Present Illness. On her first visit to me on Feb. 22, 1913, I saw a woman of 29 years of age, married, of comparatively small stature, fairly well developed and nourished, but somewhat pale, and breathed through her mouth.

Physical Examination. Hair, color dark, somewhat coarse. No bald spots present. Temperature, 98.6. Pulse, 82. Respiration, 18. Pupils, reacted to light and distance and of equal size.

Tongue. Protruded straight and in the median line.

Teeth. Good condition.

Throat. Mucous membrane somewhat reddened, no patches, no abnormal discoloration; no membrane, no ulcerations nor scars present.

Skin. Dry, not scaly nor discolored.

Glands. Not generally enlarged.

Lungs. Both sides of chest moved equally, respiration and resonance good throughout.

Heart. Apex in the fifth left interspace inside the nipple line, not enlarged on percussion, no abnormal sounds or murmurs heard on auscultation.

Liver. Edge of liver not palpable below costal margin.

Spleen. Not felt.

Abdomen. Not distended, no abnormal masses felt, no pain nor tenderness.

Nervous System. Routine examination was without positive finding.

Report of a later examination of her urine while at the hospital was practically negative, except for an abnormal amount of leucocytes present and the slightest possible trace of albumin.

The general examination was, therefore, negative except for the following local condition of her nose:

Inspection of the front view of the outside of the nose showed that the part of the dorsum of the nose that extends from the anterior border of the nasal bones to the tip of the nose, presented a depression

Fig. 1.

or concavity (see Fig. 1 and Cast 1), causing the broadening of the nose at that place and a corresponding drooping of the facial expression in the same area, giving rise to a decided folding of the skin in the labio-facial angle.

Inspection of the side view of the outer surface of the nose showed a concavity of the anterior part, as in Fig. 2 and Cast 1.