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The Vital Statistics  
OF AN  
Apache Indian Community.

BY

W. C. BORDEN, M. D.,

CAPTAIN, MEDICAL DEPARTMENT, UNITED STATES ARMY.

*Reprinted from the Boston Medical and Surgical Journal  
of July 6, 1893.*

UNIV. OF  
CALIFORNIA

BOSTON:

DAMRELL & UPHAM, PUBLISHERS,

No. 21, WASHINGTON STREET.

1893.

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S. J. PARKHILL & CO., PRINTERS  
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THE VITAL STATISTICS OF AN APACHE IN-  
DIAN COMMUNITY.

BY W. C. BORDEN, M.D.,  
*Captain, Medical Department, United States Army.*

THESE statistics are of a community of nearly pure-blooded Indians living in abnormal environment.

As accurate vital statistics of American Indians are rare, if not unknown, this, and the fact that they show the effect of changed environment upon a nomadic people, give these statistics their particular interest. The lack of other accurate statistics of Indian communities gives no normal averages for purposes of comparison, making it impossible to determine the exact amount of divergence from usual rates which changed environment has caused in this community. The extent of the effect produced must, therefore, remain inferential; but that there has been a decided departure from the normal will be plainly seen from the statistics themselves.

These statistics, which are for a period of five years, from July 1, 1887, to June 20, 1892, were compiled by the writer from the official records of the military post at Mount Vernon Barracks, Ala., while on duty there during the summer of 1892, and are those of the Apache Indians now kept there under military supervision and control. This Indian community numbers about four hundred (men, women and children, see Table I), and is composed of various Apache bands, among them being the noted Geronimo and his followers, of Arizona fame.

The Apaches have lived for generations in Arizona and the adjacent parts of Old and New Mexico, becom-

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ing thereby constitutionally adapted to the dry, rarefied air and clear, diathermic atmosphere of the elevated regions of the southwestern part of the United States.

They are essentially nomadic and warlike in habit, and deserving of their appellation "Ishmaelites of the West"; they have not only been notoriously hostile to the whites but to alien Indian tribes as well.

This hostility to, and non-affiliation with aliens, has kept these Indians remarkably free from an admixture of foreign blood; so much so, that in this community of about four hundred, there are but five persons in whom white blood can be traced. In 1886, after numerous outbreaks and hostilities and their capture by United States troops, the Indians now forming this community were removed from Arizona and taken to Fort Marion and Fort Pickens, Fla. They remained there but a few months, and, in April, 1887, they were removed to Mount Vernon Barracks, where they now are.

Their condition during their stay in Florida was extremely bad. Brought in from the fatigues of the war-path and the destitution of their hunted camps, they were taken from the clear, dry and rarefied air of Arizona to the humid atmosphere and debilitating climate of the Florida sea-coast. They were supplied with rations and clothing, but were crowded into damp and improperly ventilated quarters.

Here the first effects of such radical change of environment began to manifest themselves, and clearly pointed to the necessity of an attempt to better their condition. Their removal to Mount Vernon Barracks effected a temporary improvement; as on their arrival there, they were placed in tents while a village of log cabins for their occupancy was being built. This village was completed before the end of the year; but the cabins were of the worst type of construction, and

the site was unsanitary, being in a low, damp hollow so shaded by trees that free circulation of air and penetration of sunlight were greatly interfered with — a serious matter where, as in Southern Alabama, the humidity of the atmosphere is great and the rain-fall excessive.

They lived in this village for four years, during which time its condition and the health of the Indians became so bad that finally it was found necessary to build another; and in 1891, a much better village of framed houses was built on a hill near by, where the disadvantages of the old site did not obtain. In May of the same year, 46 of the able-bodied men were enlisted as privates in the United States Army, forming Company I, Twelfth Infantry, which was increased by the arrival of 32 Tonto Apaches from Arizona, some two months later. Captain W. W. Wotherspoon, U. S. A., who had been placed in charge of the Indians shortly before, and by whose efforts the building of the new village was undertaken, was given command of the company, and ably instituted reforms in the general and sanitary condition of the community. A commodious barrack was built for the Indian enlisted men; and a hospital with male and female wards was completed the same year. By these means the condition of the community was greatly improved.

In fact, as regards its sanitary condition during the five years for which statistics are given, there are two distinct periods.

During the first period of about four years, they lived under the unsanitary conditions of bad location, wretched habitation and accumulating filth. Their village was on a damp and overshadowed soil, and their cabins were of the worst construction. They were built of rough logs, with mud or rough board floors, and with windows too small to admit sufficient sun-



light. The roofs leaked, and the crevices between the logs were imperfectly closed. They, therefore, afforded but poor protection against the inclemency of the weather, and were damp, gloomy, dirty, and in every way unsanitary. The Indians being unused to living in permanent dwellings, allowed dirt to accumulate in and about them, as they were accustomed to do with their temporary "wickyups" in Arizona. The latter, however, being frail structures of poles and brush-wood, lasted but a short time, and were generally abandoned before dirt had accumulated to an unsanitary extent, while the cabins, being permanent, gradually accumulated filth until they became veritable incubators of disease.

The Indians themselves were in no better condition than their habitations. They received regular and abundant issues of rations and clothing; but as none of them were regularly employed at paid labor, they were without money, and, although forbidden, they sold all they could of both food and clothing to obtain it. The money so received they spent to no advantage to themselves.

Captivity, unaccustomed restraint and enforced idleness operated to prevent the mental stimulus of personal endeavor and combined with their unsanitary surroundings to produce a condition of mental and physical demoralization. As a result, the death-rate (see Table 1) gradually increased until for the year ending June 30, 1891, it reached the extremely high rate of 142 per 1,000 of living.

During the last period of one year, beginning July 1, 1891, the condition of the community was improved in all ways.

Their new village being on the crest of a hill has plenty of sunlight and free circulation of air. The houses are of fairly good construction, are well lighted

by good-sized windows, are plainly built, and are easily kept clean.

The enlistment of many of the men, and the employment of most of the others at paid labor about the village and garrison, removed the demoralizing effect of enforced idleness and gave the Indians a mental stimulus the effects of which can hardly be overrated.

They are now well clothed and well supplied with the necessities of life, while cleauliness of person and habitation is enforced by rigid military inspections and method. The Iudian company, in neatness and in the well-kept condition of its barrack, compares favorably with any white company in the United States Army.

The improved condition of the community during the last year, over that of the preceding four years, is shown by the following extract from a report of an inspection made by Colonel Charles Page, Medical Director of the Department of the East, in which he says: "The Indian camp and hospital have been much improved and the quarters with surroundings occupied by the prisoners are as clean as those occupied by the soldiers. The transformation from squalor to neat and tidy condition of quarters and grounds is remarkable."

This bettered condition produced a marked effect upon the mortality of the community and the death-rate fell (see Table I) from 142.58 per 1,000, of the preceding year, to 109.75. The number of deaths from all causes except tuberculosis fell (see Table II) from 35 to 18; and had the deaths from tuberculosis decreased in like ratio, the death-rate would have been lowered remarkably. Instead of this, the deaths from tuberculosis decidedly increased in number — the germs of the disease having been so thoroughly disseminated during the preceding years.

This general description of the condition of these Indians during the five years will make clear the circumstances under which the following statistics were produced :

TABLE I. — Showing the mean number, according to age and sex, of Apache Indians present at Mount Vernon Barracks, Ala., for each of the five years beginning July 1, 1887, and ending June 30, 1892; the number of deaths according to age and sex; the number of births; and the birth- and death-rates per 1,000 for the same years.

Year.	Mean number present (corrected for time).				Deaths.				Births.			Death-rate per 1,000.	Birth-rate per 1,000.
	Men.	Women.	Children.*	Total.	Men.	Women.	Children.*	Total.	Males.	Females.	Total.		
1887-88 . . .	78	170	118	366	1	11	8	20	9	8	17	54.64	46.44
1888-89 . . .	86	179	123	388	2	7	10	19	7	10	17	48.96	43.66
1889-90 . . .	92	176	124	392	6	13	24	43	6	28	34	109.69	86.73
1890-91 . . .	99	165	107	371	9	11	33	53	10	8	18	142.58	48.51
1891-92 . . .	122	169	119	410	10	11	24	45	16	15	31	109.75	75.61
Totals . . .					28	53	99	180	48	69	117		

Mean death-rate for the five years . . . . .	93.12
Mean birth-rate for the five years . . . . .	60.19
Excess of deaths over births . . . . .	63
Excess of female births over male . . . . .	21

\* Under twelve years of age. The division is made at this age, as official record is so kept on account of those over twelve receiving a full ration from the government, while those under that age receive one-half a ration.

The high birth- and death-rates at once attract attention. The mean birth-rate of 60.1 is nearly double

that of civilized communities. The general average in European countries for 1882 was 34.1 per 1,000 of population, the lowest rate being 24.8, and the highest 44.6, while the lowest rate of this community during the five years was 43.6, and the highest 86.7.

The mean number of women over twelve years of age, present during the five years, was 171; and as there were 117 births, the number of births during that time was equal to 68.4 per cent. of the mean number of women present, including those past and those who had not reached the menstrual period.

During the year of lowest birth-rate there was one birth to every ten women; and during the year of highest rate, one woman in every five gave birth to a child.

There are two main causes for the high birth-rate: great freedom of union of the sexes, and the practice of polygamy.

By great freedom of union of the sexes, unchastity is not meant, but, as most of the conditions which with a civilized people lead to sexual restraint, do not obtain with these Indians, early union of the sexes occurs, and the ties so formed are easily broken that other connections may be made. Infidelity is rare during their marital alliances, but these alliances are generally broken at the caprice of either party. The wife is usually obtained by purchase; but curiously, the right of the parents, and particularly of the mother, to a daughter so disposed of, does not end with her marriage. The husband only retains her during their approval; and payments of money or other valuables are extorted from him under threat of taking her from him. Curiously, also, the right of the mother seems not to be questioned by the married daughter; and she, obediently and apparently willingly, returns to her parents when, deeming that insufficient tribute is paid, they order her to do so.

Polygamy is practised; and as the women approach the menopause, the men form new ties with younger women. It will be seen that the family is not developed as with civilized people, but that sexual relations are generally formed on the basis of sexual activity.

As shown by Table I, the women are about double the men in number; but the practice of polygamy and of the men taking younger wives when the older are past the child-bearing period, gives as great opportunity for all the women to bear children as there would be in a community where there was an equal number of each sex. In consequence of the excess of women, it must be borne in mind, when comparing the birth-rate of this community with that of a civilized people, that an increase of men would not increase the births, but would decrease the birth rate.

At the same time, consideration must be given the probability that this condition is a normal one for this and other uncivilized people—the greater exposure of the men from warfare and other conditions of life, probably tending constantly to keep their number reduced below that of the women.

It may be well to state, that it does not follow, because of their practice of polygamy and the ease with which their marriages are made and broken, that these Indians are immoral. Their standard of morals is different from that of a people of higher civilization. It is in keeping with their conditions of life and stage of race development; and judged by it, they have always been considered virtuous. They are quite free from venereal diseases. During the five years there were treated but two cases of syphilis, one case of urethral stricture, one of gleet, and thirteen cases of gonorrhœa. As before stated, there are but five individuals of mixed (Indian and white) blood in the community.

It is claimed by persons having long acquaintance with these Apaches, that they have always practised infanticide of all infants of mixed blood; but as they have never well affiliated with the whites, it is probable that occasion for such practice has been infrequent. During the five years of close observation at Mount Vernon Barracks no instance of such practice has been observed; and but one half-breed child has been born. ✓

What effect, if any, their changed environment has had upon the birth-rate of these people, is difficult of determination.

Their enforced idleness during the first four years, so different from the activity of their former nomadic life, may have had a tendency to increase the rate; but, on the other hand, it would seem that a decreased rate would be produced by the high death-rate and the increased amount of sickness which would necessarily accompany it.

How high the death-rate was will be seen from Table I, which shows a minimum rate of 48.9, a maximum of 142.5, and a mean of 93.1 per 1,000 of living; so that in spite of the very high birth-rate, the deaths exceeded the births by 63.

The following table shows the causes of death which produced this high rate, and the relative frequency of each cause (see next page):

This table shows at once that tuberculosis, diarrhoeal diseases, and malnutrition of children were the great causes of death.

Of the total of 180 deaths, 78, 43½ per cent. were caused by tuberculosis alone; while malnutrition of children and diarrhoeal diseases together caused 49 deaths, or 27½ per cent. leaving but 53 deaths, or 29½ per cent. for all other diseases. It is plain from these figures, that the high death-rate of these Indians is

TABLE II.—*Showing the causes of death, the number of deaths from each cause during each year and during the five years, and the percentage of deaths from each cause to the total number of deaths.*

Causes of death.	Number of deaths each year.					Total, 5 yrs.	Per cent.
	'87-88	'88-89	'89-90	'90-91	'91-92		
Tuberculosis . . . . .	11	4	18	18	27	78	43.33
Scrofula . . . . .	..	..	..	1	..	1	.55
Chronic rheumatism . .	..	..	..	..	2	2	1.11
General debility, adults .	1	1	..	..	..	2	1.11
Old age . . . . .	2	4	..	2	..	8	4.44
Malnutrition, children .	..	1	3	5	1	10	5.55
Acute diarrhœa . . . . .	..	3	7	13	3	26	14.44
Chronic diarrhœa . . . .	1	1	5	4	2	13	7.22
Obstruction of bowels . .	..	1	1	..	..	2	1.11
Peritonitis . . . . .	1	..	..	3	1	5	2.77
Stomatitis . . . . .	..	..	..	1	1	2	1.11
Asphyxia of new-born . .	1	..	1	..	..	2	1.11
Croup . . . . .	..	..	..	..	2	2	1.11
Capillary bronchitis . .	..	..	..	1	1	2	1.11
Chronic pleurisy . . . . .	1	..	..	..	..	1	.55
Pneumonia . . . . .	1	1	3	..	..	5	2.77
Asthma . . . . .	..	..	..	..	1	1	.55
Acute nephritis . . . . .	..	1	..	..	..	1	.55
Chronic nephritis . . . .	1	..	..	1	..	2	1.11
Convulsions . . . . .	..	1	1	..	..	2	1.11
Erysipelas . . . . .	..	1	..	..	..	1	.55
Poisoned, Ind'n medicine	..	..	2	2	1	5	2.77
Suicide . . . . .	..	..	..	..	1	1	.55
Unknown, infant . . . . .	..	..	2	2	2	6	3.33
Totals . . . . .	20	19	43	53	45	180	100.00

due, primarily, to the prevalence of tuberculosis among them, and secondarily, to diseases of the alimentary organs. The reasons for the prominence of intestinal disease as a cause of death are readily ascertained. Most of the deaths from diarrhoeal diseases were of children, as will be seen from the following, which gives the number of adults and of children dying of these diseases :

	Infants.	Adults.	Total.
Acute diarrhoea . . . . .	21	5	26
Chronic diarrhoea . . . . .	11	2	13
Totals . . . . .	<u>32</u>	<u>7</u>	<u>39</u>

So that of the 39 deaths from diarrhoeal diseases, the large number of 32, or 82 per cent., were of children. These 32 deaths added to the 10 deaths of children from malnutrition account for 42 of the 180 deaths.

The infant mortality of civilized people is notoriously high; and it is naturally to be expected that with these people the rate would be still higher, as the great causes of infant mortality, namely, ignorance in regard to the proper care and feeding of children, would exist in greater degree. Improper care exists at all times; improper feeding generally does not begin until the time for weaning approaches. It is rare to find an Indian mother who cannot nurse her child, for in the past, in those cases where the child could not be nursed, it died, so, gradually, through the law of the survival of the fittest, a race was produced whose women can nurse their children — a condition general with uncivilized people — the resources of civilization being necessary to produce the common occurrence of deficient mammary function by saving the lives of non-nursing mothers and so transmitting the tendency. But, when weaning occurs, the Indian children pass directly to the diet of the adults; and as



the diet range of the Indians is limited, and their knowledge of cooking very imperfect, children with weak digestion are almost sure to contract acute bowel complaints, which, aggravated by continued improper feeding, generally prove fatal.

The improper feeding of children was undoubtedly as common with these Indians previous to their removal from Arizona as it has been since, but other disease-predisposing factors have been added by their change to their present place of abode, which have helped to produce a high infant mortality. In the hot and moist air of summer, which prevails in Southern Alabama during seven months of the year, putrefactive changes quickly occur; the improperly kept and poorly cooked food of the Indians is apt to take such change, and is, consequently, often given to the children when in anything but proper condition. From the elevation of Arizona and New Mexico, the air there is dry, and putrefactive changes are much less apt to occur. There the Indians habitually preserve their meat by drying in the sun and air; but in Southern Alabama meat so treated (and the Indians from habit still attempt to so cure it) almost invariably spoils, and is frequently eaten by them and fed to the children after it has begun to decompose.

To improper feeding is added improper clothing. During the first four years the clothing of the children was insufficient to protect them against the ill effects of temperature changes; and this, together with great dampness of the ground from frequent rains, had great effect in producing, or predisposing to, intestinal catarrhs.

It is probable, therefore, that the change of climate from Arizona to Southern Alabama, together with the unsanitary conditions of the first four years, produced a decided increase of infant mortality from intestinal

diseases. But, while the death-rate from these diseases was very high, that from tuberculosis was still higher; and the effect of changed environment in producing a high death-rate from this disease was most marked. How fatal tuberculosis was, and that it was the main cause of death, is shown by Table II and by the following table or tabulated comparisons:

TABLE III. — *Showing comparative death-rate for 1,000 living.*

	Men.	Women.	Children.	Totals.
Mean number present during } the five years . . . . }	95.4	171.8	118.2	385.4
Died of tuberculosis . . . .	21	29	28	78
Died, all other causes . . . .	7	24	71	102
Died, all causes . . . . .	28	53	99	180
Death-rate from tuberculosis,	42.53	32.67	46.1	40.45
Death-rate, all other causes .	14.17	27.03	116.8	52.65
Death-rate, all causes . . . .	56.7	59.7	162.9	93.10

Death-rate, England and Wales, all causes, 1881-90 . . . 19.15

Death-rate, England and Wales, tuberculosis, 1881-90 . . 2.15

The death-rate of the men, women and children from tuberculosis is remarkably similar for so small a number of observations, and shows how uniformly fatal the disease has been. While the mean death-rate of the world from tuberculosis is not far from 2 per 1,000 of living, the average death-rate of this community from it has been 40.35. This rate shows the virulency and epidemic quality of this disease in this community; for the rate exceeds that of cholera in the worst infected districts during an epidemic, and is more than four times greater than was the rate from small-pox in London during the years from 1771 to 1781, when the latter disease was at its height.

The high death-rate of the children, from causes other than tuberculosis (116.8), is accounted for by the prevalence of diarrhoeal and malnutrition diseases, before referred to.

The death-rate of adults, from causes other than

tuberculosis, 14.17 for the men, and 27.03 for the women, is not high, being a mean of only a little over 20 per 1,000 of living, which is about that of the world at large; so that, so far as the adults are concerned, had their mortality-rate from tuberculosis been the usual one of 2 per 1,000, their rate, while high for adults, would have been but 22 per 1,000 of living.

It is generally accepted, however, that the death-rate of Indians from tuberculosis is always greatly increased whenever they are confined to given localities and their usual habits of free life interfered with. Nor can such increased death-rate be considered strange, for, in their natural state, an unconscious adaptation of themselves to their environment has taken place for them by which a normal balance of life is obtained.

The Apaches have lived for generations in the clear, dry, rarefied air of the Rocky Mountain uplands. Their habitations are of the frailest kind, open to the drying air and penetrating sunlight of those regions. From their nomadic habits, they move frequently from place to place, leaving behind them the dirt accumulated by living, and abandoning their frail and soiled habitations for new ones. When one of their number dies, the habitation in which the death occurs is burned, and the belongings of the deceased person are also burned or buried. In this way, by abandonment and burning—natural disinfection methods—communicable diseases, of which tuberculosis is one, were in large part avoided.

Only through long generations of gradual adaptation and natural training can a nomadic people adjust themselves to the living requirements of permanent habitation. With these Indians the experiment was made—unintentional as an experiment, it is true—of taking them suddenly from nomadic life and thrust-

ing them unprepared by previous natural training into a life of quiescence and permanent habitation. The result is shown by the extremely high death-rate, particularly from tuberculosis. The relative frequency with which this disease in its different forms caused death among the men, women and children is given in the following table:

Forms of Tuberculosis.	Deaths from each form.			Totals.	Per cent.
	Men.	Women.	Children.		
Pulmonary . . . .	19	27	11	57	73
Enteric . . . . .	1	2	11	14	17.9
Meningeal . . . .	..	..	6	6	7.6
Acute . . . . .	1	..	..	1	1.2
Totals . . . . .	21	29	28	78	

The frequency of pulmonary tuberculosis as a cause of death with adults, and of enteric and meningeal forms with children, is noticeable, and in keeping with general observations upon this disease.

The great frequency in children of mesenteric tuberculosis has been frequently observed before, and the ingestion of infected milk has been considered as the main cause. This view seems to be supported by these statistics, as the prevalence of tuberculosis among the mothers would, in this way, produce many cases other than pulmonary even were the children not infected when born.

The great predominance of pulmonary tuberculosis among the adults is also in keeping with general observations — the infection with them generally occurring by way of the lungs.

It is not so plain why deaths from this disease have been proportionately so much greater among the men of this community than among the women, unless it is that the somewhat less active life of the women has given them a certain degree of immunity. It is more probable, however, that this is not the case, and that no such difference would be found if the numbers from which the statistics are derived were larger. In fact, the whole question of immunity to tuberculosis, and of the different susceptibility of different races to this disease, is not yet settled. It is well known that certain races, as the nomads of Persia, Syria and Armenia, and the inhabitants of certain localities, as those of Iceland and the islands of Faroe, Shetland and the Hebrides, are almost, if not entirely free from the disease; while among negroes in this country, and Indians, when under restraint and in contact with civilization, it is particularly prevalent. It is also known that under changed conditions the same race exhibits an apparently varying susceptibility to the disease, as is shown by its appearance among the nomadic races above referred to as soon as they abandon their wandering life.

Also, it is known to vary according to differences in locality or climate; its spread being favored by vitiated and damp air and a moist soil, and retarded by purity and dryness of the air, and a large amount of sunshine. In view of these facts, it seems probable that tuberculosis acts as does any other infectious disease, being most prevalent where the conditions favoring its spread most obtain; and that the presence of these conditions, more than racial or individual susceptibility, are the important factors favoring its prevalence. This view is supported by the death-rate from this disease of the community under consideration.

For some months previous to their arrival at Mount

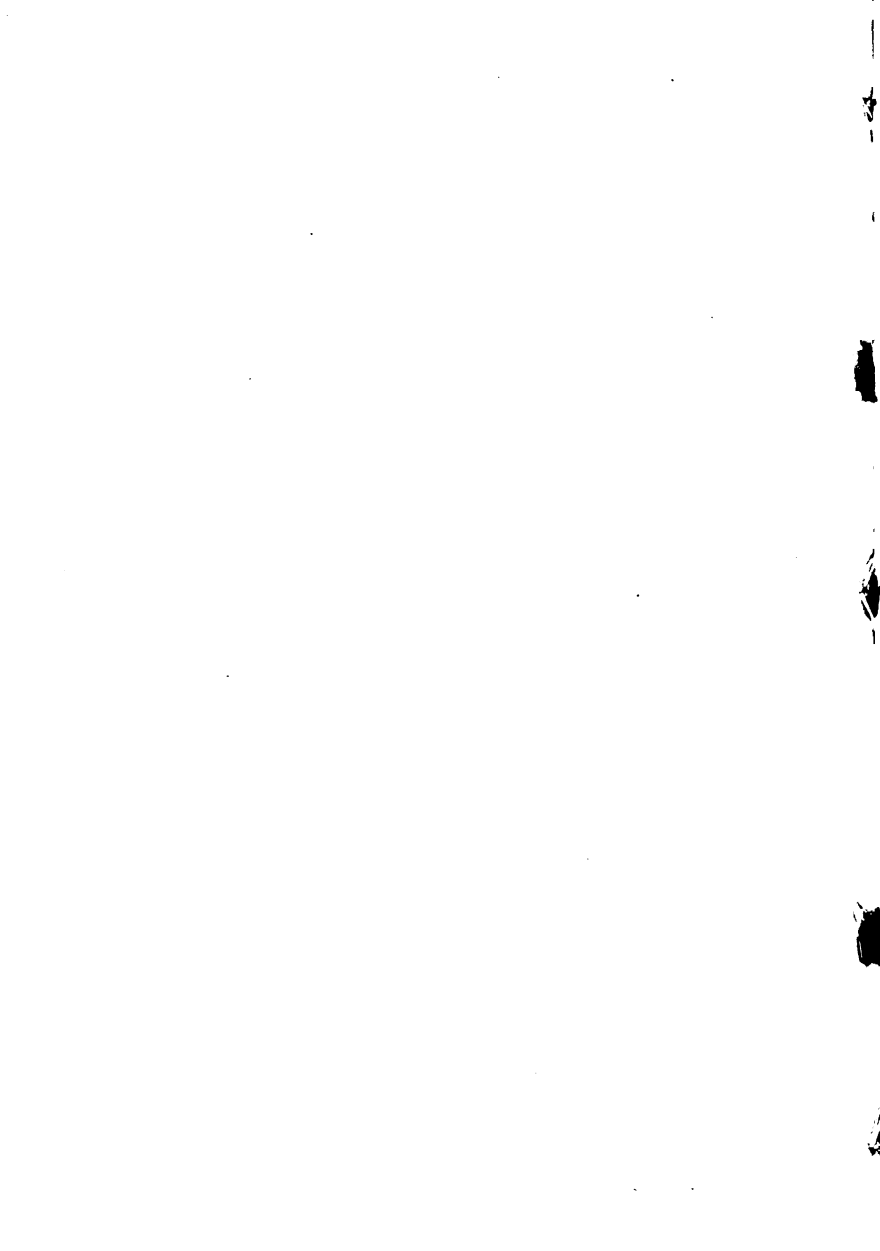
Vernon Barracks, and during the first four years of their stay there, all the conditions most favorable to the spread of the disease existed ; and the deaths from it ran as follows : First year 11, second year 4, third year 18, fourth year 18, fifth year 27.

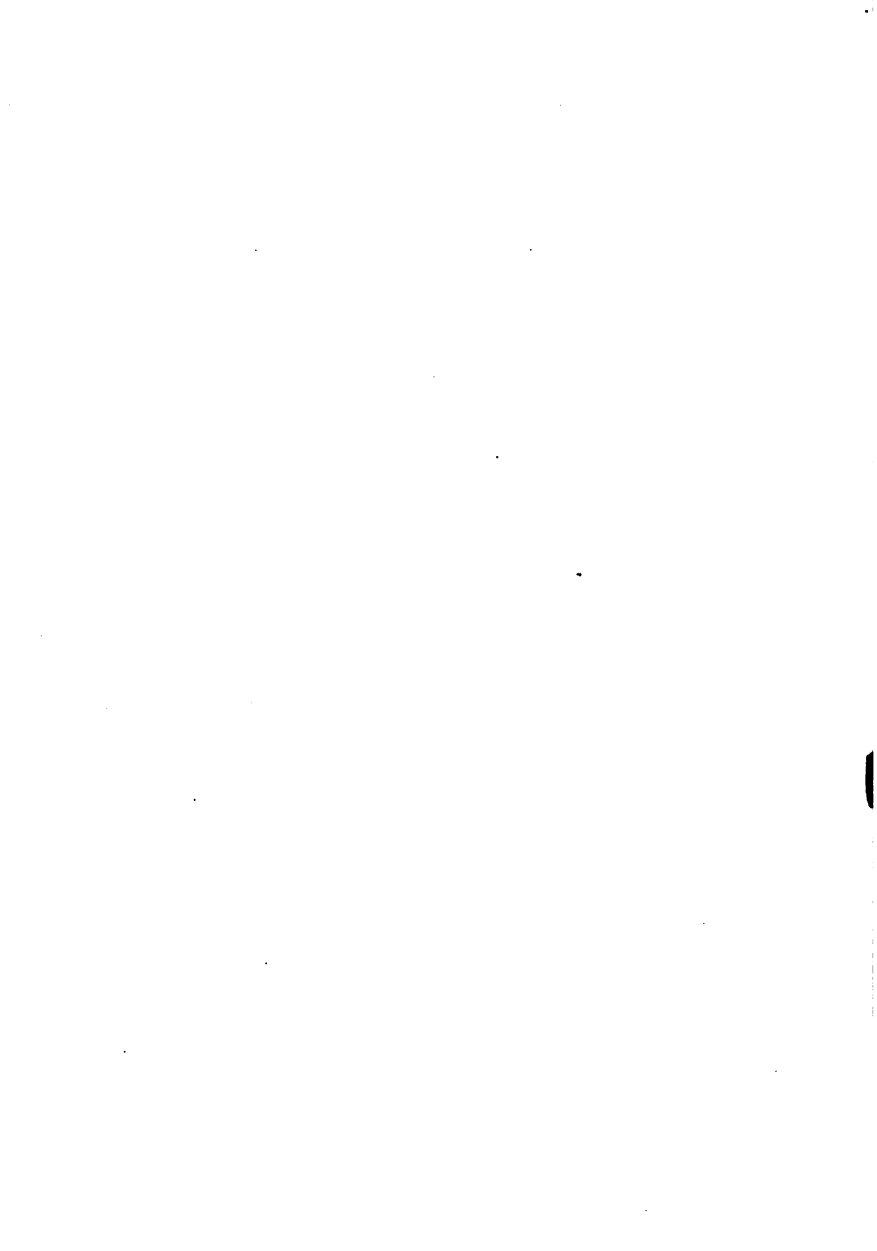
During the fifth year, though the condition of the Indians was greatly improved, the number of deaths from this disease was greater than before, as the disease had gained such a foothold during the preceding four years that no decrease could be looked for in so short a time. The disease is so slow in development and in running its course, that when unusually prevalent in a community, no sudden return to ordinary rates can be expected, but only a slow decline made possible by most thorough sanitary measures.

Whether the system of disinfection and enforced cleanliness now being carried out in this community together with its bettered condition, will be effective in staying the ravages from this disease remains to be seen, for the unfavorable conditions of changed climate and altered modes of life still remain.

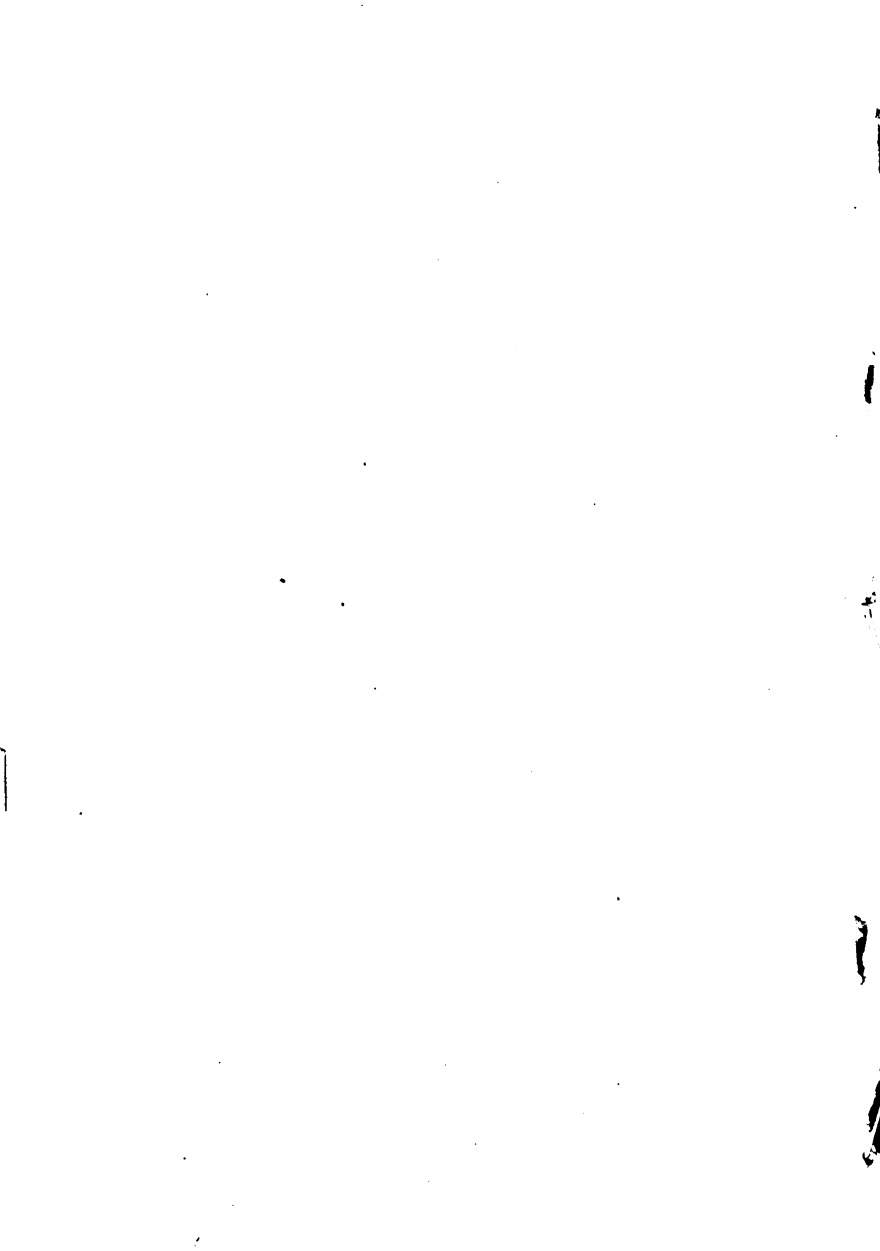
It is to be hoped, however, that this most insidious of diseases can be controlled by the means taken and notwithstanding that the past five years have shown a steady increase of the disease, due to the presence of all the conditions most favorable to its spread, that the following years, through the absence of many of these conditions and the use of suppression methods, may show a steady decline.

Should such decline occur, it will be of interest in that it will show the adaptation of the community to its new environment, and the effectiveness of modern sanitary methods, when enforced.









— THE BOSTON —  
MEDICAL AND SURGICAL JOURNAL.

A FIRST-CLASS WEEKLY MEDICAL NEWSPAPER. PUBLISHED EVERY THURSDAY.

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