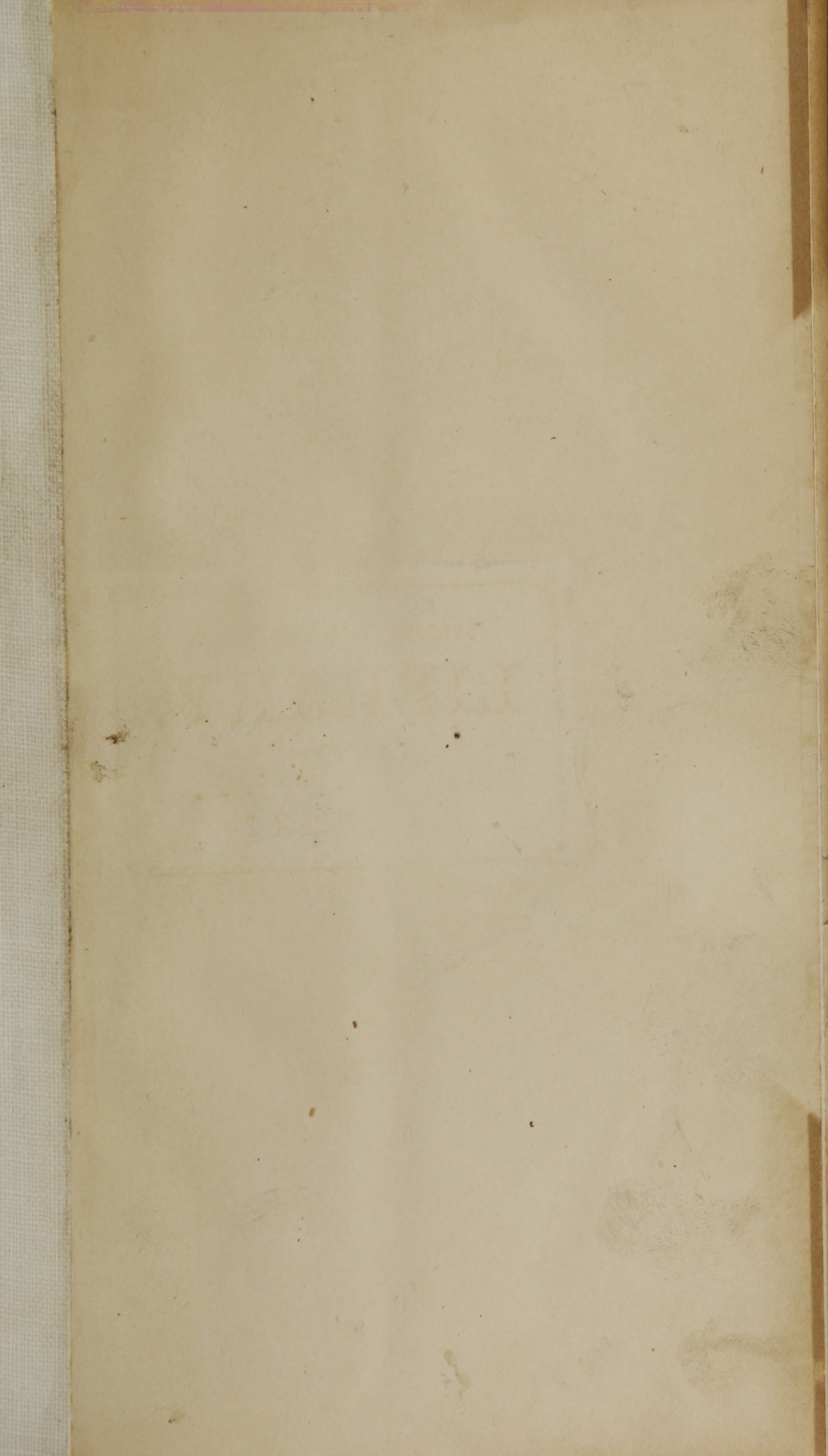


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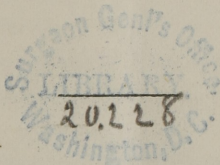
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REPORT

ON THE

SANITARY RELATIONS

OF THE

STATE OF KANSAS.



BY

C. A. LOGAN, M. D.

LAWRENCE:

JOHN SPEER, PRINTER TO THE STATE.

1866.

REPORT

SANITARY RELATIONS

OF THE STATE OF KANSAS

C. A. JOGAN, M. D.

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JOHN SPERRY, PRINTER TO THE STATE.

1888

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## INTRODUCTION.

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LEAVENWORTH CITY, KANSAS, Dec. 1st, 1865.

PROF. G. C. SWALLOW, *State Geologist*,

DEAR SIR:—In the organization of your geological corps, you erected a department devoted to the Sanitary Relations of the State, and requested me to preside over it.

The idea of linking together, in one movement, two subjects so closely allied, the one with the material interests of man, and the other with his health and life, is not only entirely new, but eminently proper and praiseworthy.

Comprehending the enlarged spirit which prompted the inauguration of so important a movement in our new State, I have felt it my duty to accept the proffered position, and have made such a report as my leisure and the nature of the subject have permitted.

A little reflection, however, will reveal the fact that this cannot be, properly, a report on the Sanitary Relations of the State.

The Sanitary Relations of a State, in general terms, may be said to be those conditions, either of atmospheric influence, physical conformation, or habits of life, which affect the health of the people, collectively and individually, either favorably or unfavorably. The knowledge of such conditions can best be ascertained through the agency of a *Sanitary Survey*.

To obtain some idea of the amount of time and labor necessarily consumed in making such a survey, it may be stated in the words of a committee of the Massachusetts State Medical Association, that it should be the object of a sanitary survey, "to ascertain the hygienic resources and influences of the State; to know the amount of vitality, of life and

health enjoyed by the people; to learn whether there are any differences in regard to life and health among the people, and what those differences are." Having become acquainted with these facts, it will readily suggest itself, that these are but the first steps in an inquiry, which has for its direct purpose an object so important to the general welfare. It follows that the next measure would be to open up the chain of causes which might be in operation, either throughout the whole State, or in a particular district of the State, to produce a low per centum of vitality, of life and health among the people. Here the field of inquiry would enlarge and send a communicating road into almost every branch of science. Among the questions to be solved in such a connection, are those relating to the *Climatology*, embracing the temperature; the average fall of rain and snow during each month and each year; the prevalence and direction of the winds, &c., &c.; those relating to the *physical aspect* of the State, in its parts and in the whole, embracing its hydrography or drainage, with the considerations of the size and extent of its water-courses and its water-sheds, breadth of river bottom, and quantity of marshy or springy soil; the *topography*, embracing the questions of area and altitude, location and size of principal towns, general character of surface, principal valleys and eminences, amount of surface under cultivation, with amount, character and location of timber; the *geology* in its bearings upon the geological position, actual location, dip, direction and extent of the different formations; character of soil, subsoil and subjacent rocks; source and nature of water used for domestic purposes; and, finally, those relating to the *habits and mode of life* of the people themselves. Under this latter head would come the consideration of those circumstances connected with the daily life of man,—his occupation, his residence, either in the pure air of the country or in the vitiated atmosphere of an over-crowded and unhealthy city; his abode, whether cleanly and ventilated, or foul and unventilated; in short, everything, either external to man, or connected with his own person, which may affect deleteriously his health and life.

The satisfactory completion of such a work, requires not

only time and labor, and the compilation of mortuary statistics, but is necessarily attended with much expense. The Legislature, as yet, has not authorized a survey to be made with a view to determining the sanitary relations of the State, nor appropriated the sum necessary to defray the expense.

From these considerations, it will appear that this report is not a systematic and exhaustive essay upon the subject. Its immediate object will be to awaken our people and our legislators to the great necessity of laws for the promotion of public and private health; and, in the furtherance of this object, the subject of Hygiene or Health will be treated of as fully as possible, and the sanitary relations of the State, so far as they have been ascertained, will be set forth.

As the subject is of vital concern to every one, whether professional or unprofessional, it is proper that the language should be stripped of technicalities so far as possible, that it may be adapted to the comprehension of every intelligent person. For the same reason, it has not been thought amiss to depart from the systematic arrangement belonging to professional essays, where perspicuity to the popular reader might seem to demand it.

That it is imperfect in many of its features, I am fully sensible; but if it shall accomplish the one object of drawing attention to a subject which has so prominently occupied the attention of the scientific world for the past forty years, whereby measures may be taken to put a State just entering upon a career of commercial greatness, upon a *health-footing*, I shall have done all that may be done as a preliminary movement.

Respectfully yours,

C. A. LOGAN.

# SANITARY RELATIONS OF KANSAS.

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## HISTORICAL SKETCH OF THE SUBJECT.

In all ages of the world, it has been the first great desire of man to enjoy the blessings of health, and to reap the pleasures of longevity. In a sound and healthful condition of mind, there can be no exception to the truth of this observation. With this purpose in view, every man, however little he may be versed in the science of human health, forms for himself certain ideas, and digests therefrom certain principles in regard to the maintenance of his corporeal well-being. These ideas are frequently crude, and oftentimes totally fallacious, but, in the absence of more enlightened views, they form a code whereby the individual would, (even if through carelessness or the gratification of appetite he does not,) govern himself. Looking back through the most authentic records, to the earliest history of the human race, this one idea of prolonging life is associated with every period of man's existence. And it further appears, that from the most primeval times, the idea has not been left to be decided and acted upon by every individual for himself, but that with the first and rudest forms of government and of law, there have been associated imperative precepts and commandments concerning the preservation of health. It is remarked by the Massachusetts committee, in their very able report, that "The sanitary movement goes back to great antiquity,

and is traced up to the direct revelation of the Supreme Law-Giver. 'In the day that thou eatest thereof, thou shalt surely die,' may be regarded as the first sanitary as well as moral precept. And from that time, down through the patriarchal ages, there is evidence that the preservation of health was inculcated as one of the primitive duties." The laws propounded by the prophet-legislator, Moses, for the preservation of the health of his people, may be cited as an evidence of the antiquity of the subject, as well as the rare sagacity of that great and wise man. The full details of these laws and regulations may be found in the book of Leviticus, and are well worthy a careful perusal. It is more than probable, however, that the idea of incorporating hygienic laws with religious belief, dates anterior to the time of Moses, and was suggested to him by the knowledge that the first sovereigns of Egypt instituted similar observances. The example set by Moses was followed by the founders of the Greek cities, and furnished to them the basis for their sanitary laws, to which additions and improvements were made. Chief among these were the bath and gymnasium, the latter of which produced the finest athletes of that or any succeeding age. It is an interesting page of history, which recounts the practices of the Greeks, for the purpose of producing, physically, an iron race of men. Not the least wonderful part of it all is, the acumen and wisdom displayed in some of their health regulations. It is sufficient to say that many of these were elaborated by such men as Lycurgus, Hippocrates, Plato and Aristotle, and in correctness have scarcely been surpassed to this day. In Sparta, so fixed was the policy of rearing only robust and vigorous men, that it was an affair of the State, to which all parental feelings of tenderness and love were compelled to yield.

The object had in view by the Grecians in thus creating a hardy race, had reference, however, more to building up the power of the country as a great and conquering nation, than to promoting the happiness of the people.

With the Romans, the purpose, while partaking in a measure of the same idea of war and conquest, was largely composed of better motives; motives looking to the building up

of a people who should rule the world, not only by the force of arms, but by the power of a superior intellect. *Mens sana in corpore sano*, was an early maxim with them, and the effort was made to accomplish the ideal expressed in it. "But the Romans were the most sagacious and extensive legislators in such matters. They were in many things masters of the practical; and have left vestiges still pregnant with the wisdom of experience. With them, nothing seems to have been deemed 'common or unclean' that could protect the public health. We find Pliny writing to Trajan about a fetid stream passing through Amastris, as if it were an affair of State. The Cloacæ of the Tarquins are still among the architectural wonders of the world. The censors, ediles and curators who at different periods had charge of the buildings and the apparatus for the removal of impurities, were invested with great powers for the execution of their functions, and derived a corresponding dignity from them. The arrangements for supplying the houses of Rome with water were most minute. Those for ventilation and drainage, still traceable in the several remains of Roman amphitheatres, have struck our most advanced sanitarians with surprise at their remarkable adaptation to their purpose; while Mr. Chadwick tells the commissioners of sewers that he has lately received from a friend in Zurich a specimen of exactly such an earthenware pipe as he is now recommending for the distribution of sewage. It had been laid down by the Romans, and has worked, until recent times, under 500 feet of pressure. Indeed, it is easy to see from Vitruvius, and from portions of the collection of Grævius, that the rules and operations for the protection of health in Rome were of a very radical and peremptory character, and allowed no minor interests to interfere with them. It seems to have been a rule with them, that from the time when the foundation of a city was laid, to that of the summit of its greatness, no structural operation, public or private, should be permitted to take a shape, which might render it a harbor either for disease or crime; and it is to this vigilant forethought that, in the absence of other organizing agencies discovered only in our later times, we may attribute the success with which that remarkable people preserved social or-

der throughout so dense and vast a mass of human beings as the inhabitants of the Imperial City in the days of its greatness." \*

When the light of this great nation was extinguished by the incursions of the barbarians, there ensued a period which has been aptly termed by historians, the dark ages; during which the world was plunged into the depths of ignorance and superstition for nearly seven hundred years. Were it possible to have compiled statistics, showing the mean duration of life under a state of existence when the human race partook of the nature of the savage, and lived according to the dictates of the lowest intelligence and most debased moral perception, such a compilation, when presented in contrast with the mental and physical condition of man during the nineteenth century, would be the most perfect and conclusive argument that could be adduced in favor of an enlightened and scientific regulation of life.

In the fourteenth century, John II., of France, instituted the first sanitary regulations, which have been regarded as the commencement of a sanitary reform. These regulations were of a very crude character, but served to give the impetus which carried the movement in a few centuries to a great degree of perfection, and at length culminated in the admirable system presented at this time by certain of the European governments. France now enjoys, though a very complicated, a very efficient system of sanitary police. Great Britain, though only aroused fully to the importance of the subject within the last forty years, has largely reduced the mortality of the country by wise and stringent sanitary regulations. In the German and Prussian States, systems of sanitary and medical police have been fabricated and put into operation, probably more perfect in their details and more salutary in their results, than in any other portion of the world.

In our own country, the sanitary movement is as yet in its infancy. During the past twenty years, however, eminent medical men have constantly agitated the question of a sanitary reform, which, founded upon the basis of our present

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\* Edinburgh Review, January, 1850; quoted by Shattuck.

knowledge, shall develop itself into a code insuring to each community the maximum of life, health and vigor compatible with the Almighty fiat.

An important movement of this kind was projected by the American Medical Association in 1849, through which sanitary sketches of a number of the larger cities of the Union were received; these sketches being published by that body as a valuable contribution to the subject. In 1850, growing out of the new direction given to the current by these and other movements, Massachusetts, ever foremost in the investigation and adoption of measures promotive of the intelligence, health and happiness of her people, appointed, by legislative authority, a sanitary commission, "to prepare and report to the next General Court a plan for a sanitary survey of the State, embracing a statement of such facts and suggestions as they may think proper to illustrate the subject." This commission, composed of Lemuel Shattuck, Nath. P. Banks, Jr., and Jehiel Abbott, discharged the important duty entrusted to them, and compiled a report which has become a standard contribution to the literature of the subject, and which should have a place in every public and private library in the country. This action upon the part of Massachusetts is, perhaps, the only State executive attempt as yet made in our country looking to the establishment of a systematized code of sanitary laws, enforced by the strong arm of executive authority.

That there should have been no organized effort for the systematic promotion of public and private health as yet in our country, is, perhaps, fully accounted for by our form of government. All power coming from the people, and supposed to reflect but the will and sentiment of the people, there can be no movement so restrictive and imperative in its operations, put into thorough practice until the people themselves shall see the necessity of it, and at least acquiesce in, if not demand it. The same question has been tested in various ways, and has uniformly failed, because the masses have not been convinced of the necessity or propriety of the measure proposed. At the meeting of the American Medical Association, in 1863, a committee was appointed by that body



to prepare a memorial to Congress, praying for the passage of a law rendering it imperative for every man, woman and child in the country to be periodically vaccinated. One would suppose that having witnessed the benefits of vaccination as a protective against the ravages of that dread disease, small-pox, for the last forty years, the world would be ready to acquiesce in any measure that would make its adoption universal. But the committee reported that the passage of such a law, so far as they could learn, would be premature and in a great measure useless, because the people, in mass, were not educated up to the necessity of the measure. The committee were then empowered to prepare and circulate such documents as would pave the way for a general acquiescence upon the part of the people; after which, it was hoped, such a law might be made operative.

As illustrative of the necessity of a perfected code of sanitary laws, no more striking example than this could be adduced. Before the discovery of vaccination by Jenner, small-pox, directly and indirectly, filled more graves than any other single cause, or, perhaps, than any other half dozen causes known to man. It was "as the pestilence which walketh by noon-day," striking down at least one-half of every community which it entered, and carrying off to a loathesome grave one out of every four it attacked; to say nothing of those who, having resisted the immediate onslaught, subsequently succumbed to its dread power through the long line of other diseases, which it nurtures and calls into life. Since the discovery, however, that the vaccine disease prevents the establishment of small-pox in an immensely large majority of cases, and that the mortality is reduced to a very small ratio in those who are attacked, after having been subject to vaccination, small-pox is a disease which no longer assumes the terror of a plague, nor counts its yearly victims by millions. Vaccination is, therefore, a sanitary measure of the greatest importance, more particularly as it is thought by men of extensive experience, that through the efficient and universal practice of vaccination and re-vaccination, that once dreaded scourge would disappear from the face of the earth. Truly, no more sublime spectacle could be presented than that which shows

us the triumph of man's intellect in vanquishing the elements of a fallen nature, and in lifting himself to that pinnacle which proclaims him as being formed after the likeness of his Maker, and the master-type of His handiwork.

While such miraculous results have followed the discovered prevention of small-pox, others not so specific, yet no less striking, have followed as the consequence of a strict observance of those measures preventive of the influences out of which disease is nurtured and death is born into the world.

As an illustration of the fact which is here designed to be represented, may be cited the example of the city of Geneva, in Switzerland. Here an accurate record of the population, births and deaths has been kept for more than three centuries past, or since the year 1560. By a series of historical and statistical compilations, M. Mallet has ascertained that from the year 1560 to the year 1600, the mean duration of the lives of the people was, in round numbers, twenty-one years and two months. During the seventeenth century, the mean life had increased to twenty-five years and nine months, and in 1833 it had reached forty-five years and five months, being nearly double what it was about two centuries before. This result was brought about by a most salutary regulation of the public health, through which much of the former unnecessary sickness was prevented.

#### THE UNIVERSAL IMPORTANCE OF THE SUBJECT.

This is a striking instance of what may be done, as a preventive of disease, and to lengthen out the term of life; or, more properly, to insure to each individual the full quota of years allotted to him by the Almighty decree. The records of sanitary science abound with the most surprising examples of the unnecessary destruction of human life in the attempt to live. The aggregate of lives lost by the engines of war each year, and by all other causes of violence combined, presents but a trifling mortality beside the sum total of those sacrificed at the shrine of the ubiquitous monarch, Disease.

“In England alone, the average annual number of deaths from disease is, in round numbers, 300,000; while that of deaths from the mere decay and exhaustion of the human

frame by the progress of time, is 35,000. In the difference between these two numbers, we see the vast and vital field in which the sanitary reformer proposes to work. That disease shall ever be entirely exterminated, is, of course, beyond the belief or hope of the most sanguine. *But every disease has, somewhere, its specific and efficient cause, and that these causes can be removed, or much weakened in their action, in very many instances, is not only within the bounds of hope, but has been satisfactorily proved.*

“When sanitary legislation gives us its successful results, they will be represented by the reduction of the number of those who die of disease in their early days or in the prime of life—and in the increased number of those who have completed their allotted course in health, and been peacefully gathered to their fathers. Accordingly, sanitary improvements have not directly in view the extension of the natural period of human life, but only the removal of influences which artificially curtail it.”\*

Some forty years ago the people of Great Britain were startled into the realization of an excessive mortality bill, made all the more appalling by the conviction that, to a great extent, it was entirely unnecessary. At varying intervals the attention of the authorities was called to the matter by committees from the House of Commons, and by various scientific documents, emanating from persons of high standing. Commissions of investigation were appointed from time to time, and efforts at reform were made. These, like all great works, were necessarily slow, and but partial in their results. The following extracts, gleaned from various sources and quoted by Shattuck, will prove interesting, not only in a historical sense, but also as laying bare a condition which, to some extent, exists in our own country; and which paints in strong colors the evils of an attempt to rear a healthy, happy, and prosperous population through an utter disregard of nature's laws:

“By a statement drawn up by Dr. Guy, Physician to King's College Hospital, from the reports of the Registrar-General,

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\*Edinburgh Review for January, 1850; quoted by Shattuck.

it appears that the relative mortality in the town and country districts was as follows :

	Country Dist.	Town Dist.
Population to the square mile, - - -	199.	5,100.
Annual deaths in 1,000,000, - - -	19.300	27.073
Rate of mortality, - - - - -	1 in 52	1 in 37

“The influence of the purer air of the country, and the better hygienic condition generally, of those residing therein, is here shown with much force. Out of the same number of people, the one compressed within a town district into a space at the rate of 5,100 to the square mile, while the advantages of the same space are enjoyed by the other at the rate of 199 only to the square mile, there is a difference in the mortality in favor of the latter, or those reaping the advantages of freer circulation of air of 7,773 souls.”

“The following was Dr. Guy’s statement of diseases which occasion the excessive mortality in large towns :

	No. of deaths in 1,000,000 in Town.	Country.
By small pox, - - - - -	1,000	500
By measles, - - - - -	900	350
By scarlet fever, - - - - -	1,000	500
By typhus fever, - - - - -	1,250	1,000
By epidemic and contagious disease, - - -	6,000	3,400
By infantile diseases—teething, convulsions, water in the head— - - - -	3,500	1,300
By scrofulous diseases and consumption, - -	4,600	3,800

“Total excess of 5,500 in the 1,000,000. So that there is a waste of 22,000 lives in the 4,000,000 inhabiting large towns.”

“Further still, Dr. Lyon Playfair calculates that for one unnecessary death, there are twenty-eight cases of unnecessary sickness ; consequently, in our large towns, above 700,000 cases of unnecessary sickness. The same calculations in the metropolis would save 10,000 deaths and 250,000 cases of unnecessary sickness.”

“Then it may be asked whether all parts of our large towns are equally subjected to these causes of sickness and death? So far from that being the case, I find, from one of the reports of the Registrar-General, that the metropolis is divided into three groups, of ten districts each, under the title of *the*

*healthiest, the medium, and the most unhealthy districts.* The result is as follows: 10 healthiest, with an allowance of 202 square yards to each person, have a mortality of 1 in 49; 10 medium, with an allowance of 102 square yards to each person, have a mortality of 1 in 41; 10 unhealthiest, with an allowance of 32 square yards to each person, have a mortality of 1 in 36."

"But it would be impossible here to give even an analysis of these documents and works. The following are among the many conclusions to which we are led from the information they contain:

"1st. *It is proved*, that there die annually, in each 100 of the population of the whole of England, 2.27;—of the most healthy district, 1.53, and of the most unhealthy district, 3.58; and that the living to one death are in these districts, respectively, 44, 65 and 27.

"2d. *It is proved*, that the various forms of epidemic, contagious and other diseases, caused, or aggravated, or propagated by atmospheric impurities produced by decomposing animal or vegetable substances, by damp and filth, and close and over-crowded dwellings, prevail amongst the population in every part of the kingdom, whether dwelling in separate houses, in rural villages, in small towns, or in the large towns, as they have been found to prevail in the lowest districts of the metropolis.

"3d. *It is proved*, that disease and mortality fall more heavily upon those who live in large towns and populous places, than in the country districts, and particularly upon those who live in narrow streets, confined courts, damp dwellings, close chambers, cellars undrained, unventilated and uncleaned; and affect most severely the infantile portion of the population, and the heads of families between twenty and thirty years of age.

"4th. *It is proved*, that, in such situations, the average duration of life is five to twenty-five years less than it otherwise might be; and that during this curtailed period of existence the working power of those who live, and their capacity for enjoyment, are greatly diminished by a constant depression

of health and spirits, and by the active attacks of fever, cholera, scrofula and consumption.

“5th. *It is proved*, that such diseases, wherever their attacks are frequent, are always found in connection with the physical circumstances above specified; and that, where these circumstances are removed by drainage, proper cleansing, better ventilation, and other means of diminishing atmospheric impurity, the frequency and intensity of such diseases are abated; and where the removal of the noxious agencies, and other causes of disease appears to be complete, such diseases almost entirely disappear.

“6th. *It is proved*, that the annual mortality might be reduced in the whole kingdom from 2.27 per cent., or 1 in 44, to less than 2 per cent., or 1 in 50; and, in all large towns, as low as that general average.

“7th. *It is proved*, that this unnecessary excess of mortality above 2 per cent., occasions an annual loss of more than 50,000 in the United Kingdom,—‘greater than the loss from death or wounds in any wars in which the country has been engaged in modern times;’ and that the causes of these unnecessary deaths occasion at least twenty cases of unnecessary sickness, on the average, to each death, or 1,000,000 cases annually, which might have been prevented.

“8th. *It is proved*, that of the 43,000 cases of widowhood, and 112,000 cases of destitute orphanage, relieved from the poor rates of England and Wales alone, the greater proportion of deaths of the heads of families, occurred from specified removable causes; and that the average of their ages was under forty-five years, or thirteen years below the natural probability of life, as shown by experience.

“9th. *It is proved*, that the preventible causes of disease, and the unnecessary mortality, impose upon the people immense pecuniary burdens, which might be avoided.

“10th. *It is proved*, that the younger population, bred up under noxious physical agencies, is inferior in physical organization and general health to a population preserved from such agencies; and that these adverse circumstances tend to produce an adult population, short-lived, improvident, reckless,

intemperate, immoral, and with excessive desires for sensual gratifications.”

In further illustration of the startling truths which are here presented, may be adduced the following quotations by Shattuck.

The British and Foreign Medico-Cherurgical Review, Vol. II., for October, 1848, in an elaborate article, after giving a tabular statement of the relative mortality of the Bolton Union, sums up in the following words: “Thus the mortality of Great Bolton is greater than that of Sheffield, which hitherto enjoyed a bad eminence in this respect; and out of the population of about 36,000, *near six hundred*, or 1 in 60, die unnecessarily each year. What should we think of an annual sacrifice of one out of every sixty of our population, to satisfy the cravings of some insatiable monster like the Minotaur of old? Should we not put forth every effort, and be ready to sacrifice all our worldly possessions, to avert it? And yet this sacrifice is, in effect, offered up every year in Great Bolton to the Ogre, *Filth*. The fact is too plain to be gainsaid.”

The same journal, in an article on “Cholera and Sanitary Reform,” Vol. 4, Jan., 1850, uses the following vivid words: “Let us endeavor to realize this astonishing fact. A disease has lately crossed over these countries, which, in our metropolis alone, has swept away 15,000 souls. We have lost in all Britain more lives than we have lost in battle since the days of Marlborough. And looking at the matter in a more worldly sense, who can know the incalculable value of many of these lives? Every man instinctively pictures to himself how much misery, and lasting grief and sorrow this great mortality symbolizes. It requires no stretch of imagination to realize a great national calamity, of which the actual deaths are but the smaller items. Behind each death we can trace easily the anguish of the living; the distress of those left fatherless, husbandless, childless; the hopes blighted; the ties broken; the companionship and sympathy forever destroyed. A thousand mental pangs, and among the poor, a thousand bodily hardships are the legacies and sad memorials of every death. Callous and cold-hearted indeed must he be who can

turn aside from such a record, without seeking to probe this national wound, and to demand whether there is no healing force whereby its bleeding surface may be staunched. In the midst of the general distress, a set of men come forward to say that they have found a plan for preventing the recurrence of this frightful slaughter. These men are no enthusiasts, but are the persons of all others, by education and experience, best able to know the truth of their assertions. The whole medical profession announce that they can prevent, if the means are given them, the recurrence of this mortality and suffering. Are these men worthy of credit, or are they not? If they are, then where is the government, where is the nation, that can disregard this assertion—that can blindly shut its ears to those groans of anguish, the echo of which has not yet died from our affrighted air—and careless of the future, can see with indifference the inevitable recurrence of that fearful drama, which, in a few short years, must be again repeated?"

Could appeal be more eloquent than this? Could facts be more forcibly put, or more incontrovertibly maintained?

But the same voice of warning ascends from our own soil, our own physicians: "In 1842, the Hon. Horace Mann, as Secretary of the Massachusetts Board of Education, propounded to several physicians the following question: 'How great a proportion of disease, of suffering, of usefulness and of abridgement of life comes from sheer ignorance, and which we therefore might hope to see averted, if the community had that degree of knowledge which is easily attained by all?' To this question, Dr. Jas. Jackson, of Boston, replies: 'I feel assured that the answer should be, *more than one-half*. When it is brought to mind that the ignorance of parents is included in the terms of the inquiry, the justice of the answer will probably be admitted by all who are conversant with the subject.' Dr. S. B. Woodward, late Superintendent of the State Lunatic Hospital, says: 'I have no doubt that *half* of the evils of life, and *half* the deaths that occur among mankind, arise from sheer ignorance of the laws of health; and that a thorough knowledge of these laws would diminish the suffering incident to our present state of being, in very nearly



the same proportion.' Dr. Edward Jarvis replies: 'From an observation of thirteen years, I have been led to believe that *three-fourths, perhaps more*, of the ailments of men come from a want of sufficient knowledge of their frame, or a disregard for it.' "

Such statements, coming from sources so reliable and trustworthy, cannot be disregarded or made light of; and the conclusion to be adduced therefrom is inevitable—that *fully one-half of those who die at the present day, do so prematurely, and through causes which it is in the power of man himself to prevent*. The instance of the city of Geneva, before cited, whereby the average term of life has been doubled in two centuries through the agency of those very means which it is the object of this report to urge upon the attention of the people of Kansas, is but a solitary example of the beneficial results flowing from the measures proposed. These pages could be filled to undue length with illustrations of the improved condition of health under proper hygienic arrangements; illustrations from the country, the town, the city; the public charity; the penitentiary; from armies and navies, and all sorts of places and institutions where man is found and makes the effort to live.

The following quotation is from Dr. Shattuck's Massachusetts report, and is here given, not only as the sentiment of the writer of this report upon the subject, but as expressing, in a few words fitly chosen, the settled conviction of those who have given it serious consideration:

*"We believe the conditions of perfect health, either public or personal, are seldom or never attained, though attainable; that the average length of human life may be very much extended, and its physical power greatly augmented; that in every year, within this Commonwealth, thousands of lives are lost which might have been saved; that tens of thousands of cases of sickness occur which might have been prevented; that a vast amount of unnecessarily impaired health and physical debility exists among those not actually confined by sickness; that these preventible evils require an enormous expenditure and loss of money, and impose upon the people unnumbered and immeasurable calamities, pecuniary, social, physical, mental and*

*moral, which might be avoided; that means exist within our reach for their mitigation or removal; and that measures for prevention will effect infinitely more than remedies for the cure of disease."*

#### THE SUBJECT AS APPLIED TO KANSAS.

What has now been said is a mere outline of the results which have been developed within the past fifty years, in relation to the life and health of man. Did the occasion permit of detail, statistics could be furnished, so convincing that the truth of what is here endeavored to be pictured, would be made patent to all.

The State of Kansas, considered in reference to its age, is as yet in its very infancy. That density of population belonging to older States, which is so destructive to life and health, is an evil as yet not entailed upon it, though year by year great additions are being made, and it is apparent that in due time the State will be a most thickly populated one. In its present elemental condition, it were far easier to give proper shape and direction to its domestic and social institutions than after the lapse of years, when cities have been built, public works erected, and individual rights have been acquired. Thus far, absolutely nothing has been done looking toward securing to the people of the State the enjoyment of health, with all its attendant blessings. No law has been passed, (with the single exception of a registration law last winter, and which thus far has been a dead letter,) or officers appointed, to give to the inhabitants that which is of more importance to them than all other laws upon the statute books.

This is as much due, perhaps, to the fact that public attention has not been called to the necessities for such legislation, nor the public mind enlightened upon the laws of life, as to any existing recklessness or disregard for health.

A painful example of the lack of any health-considering laws, exists in Leavenworth, the largest city of the State. Located naturally upon a most eligible situation for salubrity, there existed, until recently, a general surface pitch, which, by the intelligent and skilful adjunct of art, could have been converted into a simple system of drainage of the most per-

fect and efficient kind, and projected at a wonderfully small expense. Through a mistaken official policy, the advantages given by nature to this favored situation, have been greatly perverted. Streets have been made to pitch within a few squares in as many different ways, while others have been reduced to a dead level. Thus the opportunities for a uniform system of drainage have been much lessened, save by a radical change of grade, and it is safe to say that the health of the city suffers to a greater extent than it otherwise would through the agency of miasma, generated from the stagnant puddles with their decomposing remains, which are to be found in many parts of the city proper.

In illustrating the necessity for stringent sanitary laws in our State, it will be necessary thus to refer, at times, to local conditions in connection with the more important towns; for, as will elsewhere appear, (see sanitary sketch of the State,) the topographical features of the State at large warrant the assumption that it now possesses a high degree of salubrity, which, under the proper management, may be greatly augmented; and, therefore, it is particularly in the larger towns that the blessings bestowed by nature are apt to be perverted, and an unnecessary mortality entailed. And, further, as in accomplishing the purposes of truth, candor of statement and fairness of criticism are of the first importance, in the pages of this report an impartial freedom of language has been adopted, and there has been no hesitation in characterizing evils where they exist, in the proper terms.

Happily for the people of Kansas, as before remarked, the newness of the State has prevented that accumulated flood of numbers, which builds great cities and makes them the catacombs of their inhabitants. As yet there are no narrow courts and alleys, with their thousands of poverty-stricken inmates, breathing an air laden with the exhalations from innumerable sources of filth; as yet no tenement houses, with their hundreds of miserable occupants, dragging out a sickly existence above ground, and in dark, mephitic vapors below.

But while all this and much more may be said in favor of the State, there exists, even now, a condition of things in some of the larger towns, highly prejudicial to public health,

and which is growing in extent year by year, in a direct ratio with the size of each town. Perhaps this remark is more applicable to Leavenworth than to any other of the young cities of Kansas, being probably three or four times as large as any of her sisters. In the case of Leavenworth, there is this great disadvantage, that being in a transition stage between a large sized town and a flourishing city, she possesses many of the elements of the insalubrity of a city, with but few of the requisites to counteract them. The lack of pecuniary means for rapid and stable improvements, and a deficient supply of water, are here more particularly alluded to.

A few of those general measures, which are necessary to be adopted by all cities aspiring to the enjoyment of even a fair percentage of health, will now be briefly considered and conclude this portion of the subject.

*Drainage.*—To insure any prospect of healthfulness in a city, one of the first essentials is a thorough and complete system of house and street drainage. To procure such a system, it is suicidal to wait until a town shall have grown to the proportions of a city before establishing the grades of the streets, and then only as has been done in Leavenworth, to establish the grade of each street as it is opened up for occupancy. Every village, with any prospect of becoming large enough to disturb the natural site, should be surveyed by a competent engineer; a general plan of drainage should be established; a public map should be drawn, with the elevations of the street-crossings, and their descent to their outlets marked down. After such a plan had once been established it should be rigidly enforced under every authority, no change of political administration or pandering to private interests being allowed to interfere with it. Thus every individual would have a guide in erecting his building, and be enabled to make provision for his house drains, while the city itself would be put in the most favorable condition to construct all necessary sewers, &c., in the simplest and most economical manner.

The drainage of cities is accomplished by the means either of *surface drains* or *underground sewers*. The former, for some localities, answer a tolerably good purpose, but, as a

general thing, are not to be compared with a well-devised plan of underground sewerage, for the reason that half-fluid mud, stagnant water and various sorts of filth are almost sure to collect in places, and poison the air with their emanations.

The idea of underground sewers had its origin at a very early period, and those constructed by the Romans, the remains of which are still to be found, were of immense proportions. In all of the large cities of Europe and America, they are now relied upon, almost entirely, for the purposes of drainage, and for carrying off the putrefactive debris of a crowded population.

When their functions are confined to liquid excreta, there can be no two opinions as to their utility, provided they are properly constructed as to their architecture, their descent and their outfall. The modern world, with its innovating propensities, has, however, enlarged their uses; and it is now common to find, in all large cities in England and America, (though the Continental cities have not yet generally adopted the practice,) direct communications, from all the upper and even middling class of houses with the sewers, through which the contents of the water-closet, the kitchen, and every sort of house refuse are discharged into them. This semi-solid mass accumulates in the sewers, and there is no agency by which it can be thoroughly removed, except the labor of the hands. The pestiferous gases which arise from the putrefaction of these remains, diffuse themselves through the air and destroy its purity, inciting to, if not absolutely provoking epidemic visitations; at all events, greatly lowering the health-rate in the vicinity.

These, with other considerations, render still a mooted point the most effectual and least deleterious means of carrying away the immense amount of excreta discharged by the daily life of a large city; but there can be no doubt that the sewer, when confined to its legitimate office of conveying only liquid refuse, is at present the most available method of getting rid of a large portion of it, as well as of draining away the surplus water.

Each city, then, should have a well devised system of sewerage marked out to correspond with the established grade.

In this manner, the grade of the whole city having been so arranged as to shed the water in a few general directions, the main sewers could be constructed as the city became able, and the accessory sewers of smaller dimensions afterward. This would be the ideal of a city drained upon the most perfect principles of expediency and economy. It is entirely practicable for all of our new States to possess themselves of such a system. The older cities of the Union and of the world have realized the fact here stated, only after they had acquired a dense population, and with them it was consequently impracticable; but profiting by their experience, there is no reason why every new city that is hereafter to become a metropolis, should not, by a wise and comprehensive course of action, enjoy a system of drainage fully corresponding to the knowledge of the times.

Let the young cities of Kansas consider well this matter. But one of them, as yet, has extensively disturbed its natural site. The one alluded to, as before intimated, has heretofore pursued, to some degree, a suicidal course. Much of the grading has been done from street to street, and in some instances, it is believed, has been made to conform to private interests. The legitimate results of this must inevitably be that to establish a thorough drainage hereafter, the city will be put to an expense difficult to estimate, in order to construct the greatly increased number of sewers, necessitated by the irregularity of grade.

Before leaving the subject of sewers, it may not be amiss to state a few general facts relative to their construction. The whole subject of sewerage is so replete with practical detail, that a small volume could be written upon it. It will answer the purposes of this report to say that their *dimensions*, their *descent* and their *outfall* should receive particular attention.

They should be amply *large* to enable them to carry off any amount of fluid which might, in any possible contingency, be poured into them. Their *descent* should be sufficiently great to convey the stream in as rapid a manner as possible. Thus a greater amount of solid material could be carried off than if the current were sluggish, allowing the solid portions

to be deposited, filling up the bottoms of the sewer, and emitting noxious gases when undergoing putrefaction.

The *outfall* of a sewer requires attention in its construction. In those localities where the sewers empty their contents into a tidal river, the subject is of more importance, perhaps, than in other cases. When the tide recedes, the filth poured out is left to pollute the air in the vicinity until the rising tide again covers it up. But in either case, the matter is one of much moment. The extremity of the sewer should be so arranged that the river could not back it up and arrest its flow, nor should the vent be situated so far above the water that a portion of the contents of the sewer would be left upon the ground to putrefy under a reeking sun. Perhaps a good plan would be to allow the level of the sewer to be above the water-surface, and then, when sufficiently near the margin, to cause it to bend down at a right angle, which latter might be reflected obliquely off from the right line, thus discharging the contents into the stream, in a direction *with* the current.

*Paving*.—Closely related to the subject of sewers is that of paving. If sewers are important as a means to carry off surplus fluids, pavements are equally important, that the fluids may be carried into them. A good pavement, such an one as will fully answer its purposes, is expensive, and as a consequence, young cities just beginning to adopt a system of street paving, seek that which is cheapest. The first effort usually consists in *plank sidewalks* and *macadamized* streets. This is the only plan as yet generally adopted in Kansas. It is not a good one for the public health. The plank sidewalks not only allow a complete passage of all fluids through them, so that the subsoil, if a retentive one, is kept filled with moisture, giving out deleterious vapors, but they likewise add to these the products of the decaying wood. Upon the same principle, the macadam is a poor paving for the street. It is so porous that the water, instead of flowing off by the gutters, percolates into the earth, which, being protected from the drying influence of the sun, remains in a wet state and renders damp and unwholesome the adjoining cellars. Within the past year, quite an improvement has been made in the con-

struction of gutters in Leavenworth. This consists in a fine, high curb, with a wide flag of limestone for the gutter, closely joined to its fellow. If the joints were cemented, nothing could be better than this. The water that finds its way into the gutter flows off with a rapid current; but little of it percolates into the ground, and none remains in pits or hollows to be evaporated by the sun.

In concluding these few general remarks on the importance of a well-regulated system of drainage to every city, it will not be inappropriate to quote some paragraphs from a "Report on the importance and economy of sanitary measures to cities," by Dr. John Bell: "Your reporter will content himself with introducing at this time some statements taken from a mass of evidence which he had previously collected for other purposes. To begin with *paving*, it might be sufficient to say that the evils from neglect of it are pointed out in most of the reports on the health of towns, but we cannot forbear from again adverting to the effects witnessed in London. Before the streets of that metropolis were paved, the inhabitants were as great sufferers from periodical fevers as those of the worst situated rural districts in our own country; and until underground drainage had been adopted to some extent, dysentery was common and largely fatal. Drawing on home experience, it has been found that in Philadelphia, the exemption of the inhabitants from intermitten and bilious remittent fevers has, with great uniformity, followed the paving of the streets. The space now called Dock street was, in the early days of the history of Philadelphia, a miry swamp, traversed by the sluggish stream Dock creek, on either side of which, periodical fevers of all grades prevailed with a violence equal to those met with in the most sickly districts in distant States. The exposed surface having been paved, and the creek partly filled up and covered over and made the line of a great culvert, no person residing there now has any apprehension of fevers such as those that afflicted the former dwellers there." \* \* \* \*

"One of the most remarkable examples of the beneficial change in the health of a city produced by paving its streets, is furnished in the history of Louisville, Kentucky, which,



from being called the graveyard of the West, is now regarded as one of the most healthy cities of that extensive region. Intermittent fever was, as we learn from Dr. L. P. Yandell, a regular annual visitor, and occasionally a form of bilious fever prevailed, rivalling yellow fever in malignity, and threatening to depopulate the town. The citizens awakened, after the fever of 1822, to a sense of their condition, and to the means of mending it, set about a system of improvement, the chief feature of which was paving of the streets, and filling up the ponds. The change in the sanitary character is the more noticeable, as it was brought about without the aid of subsoil drainage by sewers."

*Ventilation.*—No discourse upon the best means of preserving health would be complete, did it not dwell with emphasis upon ventilation.

The great scavenger of the human system is the principle called oxygen. This gas existing in proper quantity in pure atmospheric air, is taken into the lungs at each inspiration, and being there brought into contact with the blood loaded with the effete or carbonaceous matters of the system, produces a result in the animal economy that is no less wonderful than necessary. A certain quantity of the oxygen of the *inspired* air combines with the waste material of the blood, and, being *expired*, is given back to the atmosphere in a form which unfits it for the further purpose of respiration. While the air is pure, this function is performed with great regularity, and the well-being of the system is maintained. But if the air be impure,—if that great pabulum without which we could not exist for a moment, be habitually furnished in insufficient quantities,—results ensue which sooner or later destroy the integrity of the various functions, and establish diseased action in the system. These facts, though sufficiently dwelt upon to be known by all, seem to be regarded by the fewest number. The accountant, the seamstress, the artizan, —all who are confined to a close room, breathing over and over again the same air, and who suffer, as a consequence, with headaches, and feelings of prostration and debility, never once consider that they suffer thus because they are violating

one of nature's first laws, which demands a full supply of pure air for the system.

The causes of imperfect ventilation are two-fold: first, the illy-constructed houses in which we live; and, second, the badly built streets and badly managed health regulations of cities. Like all other subjects connected with sanitary science, the proper ventilation of houses is replete with detail, and, therefore, its full discussion would be improper in a brief report like this. The evils of bad ventilation increase in a direct proportion as the ventilation becomes more imperfect, and are represented by every shade of ill, from the slight headache of the clerk in a close room, to the terrible diseases of those living in the dark, underground cellars of a large city.

In remarking upon the blind courts and alleys of London, Dr. Simon says: "The diseases of these localities are well marked. Scrofula more or less completely blights all that are born, often extinguishing life prematurely; in childhood, by hydrocephalus; in youth, by pulmonary and renal affections, which you read of as consumption and dropsy, often scarring and maiming where it does not kill, and rendering life miserable by blindness, decrepitude or deformity; often prolonging life as an hereditary curse in the misbegotten offspring of those who, under such unnatural conditions, attain to maturity and procreation. Typhus fever, too, prevails there, not as an occasional visitor, but as a habitual pestilence."

While it is of vital importance that our houses, our stores, our shops, our schools and our churches should be so constructed as to insure the most perfect ventilation, it is also important that the city should be so laid out and built, and so managed by its municipal regulations, as to furnish the purest air possible to the inhabitants. "Cities," remarks Dr. Shattuck, "are not necessarily unhealthy, but circumstances are permitted to exist which make them so."

The great fault of a large majority of the cities of the world in respect of ventilation, is their narrow and crooked streets. That insatiable greed for money in the human character is directly responsible for this. All cities should be laid out with straight, wide streets, and the more there are of them

the better for the general health. They are the arteries of the town, conveying the life-giving principle to its people.

There should be no narrow streets, lined with overtowering houses, completely preventing the access of those two greatest of God's blessings, sun and air. Neither should there be any of those filthy little recesses called alleys and courts, out of which, invariably, the various pestilences emerge and scour the community.

As before remarked, there are no cities of Kansas, as yet, where these excessive evils of an overcrowded population are felt to any great extent. *If the people were wise, it could be arranged, so that they never would exist!* Let them, as they value their own lives, and the gratitude of their posterity, lay the strong hand of the law upon that mercenary spirit, which would sacrifice life and happiness at the shrine of the money-king.

*Water.*—Second only in importance to a liberal supply of pure air, is an abundance of *pure water*. Water is essential to the requirements of life. One not acquainted with the fact, would scarcely realize the amount of disease engendered by drinking impure water. Water is the great diluent of nature, and the most noxious substances, through its agency, may be introduced into the human body. These cause various derangements, according to the nature of the toxic agents. A strange relationship has been proved, upon more than one occasion, to exist between the prevalence and malignancy of *cholera* and the drinking of bad water. The whole country is now in a state of anxious suspense, trembling lest the opening of warm weather shall let loose that terrible disease once more among us. With the view of putting the masses in possession of facts, which if properly acted upon would greatly ameliorate its ravages, the following brief account of a "gigantic experiment," made in the southern districts of London, during the prevalence of two epidemics, by Dr. Simon, and quoted by Dr. Bell, is considered appropriate in this place:

"These districts (comprising nearly a fifth of the population of the metropolis,) have been notorious for the great severity with which cholera has visited them. Throughout

these districts, during the epidemics of 1853-4, there were distributed two different qualities of water; so that one population was drinking a tolerably good water, another large population an exceedingly foul water, while in all other respects these two populations (being intermixed in the same districts, and even in the same streets of these districts,) were living under precisely similar social and sanitary circumstances. And when, at the end of the epidemic period, the death-rates of these populations were compared, it was found that the cholera mortality in the houses supplied by the bad water had been *three and a half times as great* as in the houses supplied by the better water."

From this extract, it will be seen what a potent influence in subverting the normal functions is exerted by unwholesome water.

It is, however, a matter of some difficulty to obtain water in the requisite degree of purity, and particularly in new cities, where no effort has been made to supply the people from a common source. It may be stated, as a general proposition, that the waters of a navigable stream, particularly those whose banks are dotted with towns of all sizes, are not well adapted to drinking. The amount of effete matters, animal, vegetable and gaseous, which such streams hold in solution, is enormous, and though efforts are made at purification by water companies, they are but partially successful.

The question of pure water is one that has occupied the minds of men in all periods of the world, since they began to aggregate and dwell in masses. The immense aqueducts which supplied ancient Rome with an abundance of pure water, prove conclusively the importance attached to it, even at that early day. The larger cities of our own country have been, at different stages of their progress, compelled to solve, in some shape, this knotty question. Boston, with an enterprise and regard for her citizens which is truly commendable, stretches out her arms and brings the pure water of Lake Cochituate, a distance of twenty miles, into their houses. New York slakes her thirst with the Croton water, which is brought by a most costly structure a distance of forty miles. That young western giant, Chicago, keenly alive to the well-being

of her people, not only sent a commission to Europe to investigate the best methods for sewerage, but is now parting the waters of Lake Michigan with a view to supplying the city with water brought from the lake at a distance of two miles from the shore. The subject of pure water is just now occupying the attention of Cincinnati and St. Louis. Both derive their supply from the rivers on whose banks they are located. That the unnecessary waste of life in these cities from this cause is large, all having any experience in the matter will unhesitatingly admit.

The question is hardly a serious one in Kansas, as yet, her people deriving their supplies from springs, wells, cisterns, &c. But as large cities spring into existence, it will present itself in a very perplexing shape. The water of the Missouri river is no more potable than that of the Mississippi or Ohio. Whence, then, shall the cities upon its banks get their supply? Time, undoubtedly, will present a satisfactory solution to the question.

But even for those localities receiving all their water from wells or cisterns, it is still a matter for very grave reflection. If a well is sunk in the vicinity of a vault, or a sewer, its water may be poisoned by gases which infiltrate into it. Or if the well be a shallow one, or situated in proximity to manure piles, pigsties, &c., the surface drainage will be apt to contaminate the well, and render its water highly impure and unfit for human consumption. How often are our farmers and their families stricken with sickness, induced by drinking the water of a well sunk in a low place, and which is little more than the percolation from the surrounding ditches? These things, which affect our daily well-being so deeply, are but seldom thought of, and too little heeded even when brought to our attention.

The water from cisterns may be equally bad, if they are not properly constructed and filled. A good cistern should be walled up with brick or stone, and well cemented, and covered so as to be secure against the ingress of vermin; it should be located a safe distance from stables and vaults, and particularly out of the line of descent from them. It is well to have the cistern of sufficient dimensions to enable the fam-

ily to shut off the water at a certain season. This season should be the beginning of spring. The cistern, being allowed to fill through the winter, at the earliest approach to spring weather, the water should be promptly turned off.

During the warm weather, the evaporation from sluggish streams and stagnant waters, fills the atmosphere with various organic matters both gaseous and solid. Amongst the latter may be mentioned the million forms of parasitic life, as algæ, confervæ, fungi, infusoria, &c., &c. These matters are washed down plentifully by the summer rains, and no expedient of filtering, however well devised, can insure fully against their ingress into the cistern. The experience of every observing physician teaches him that it is during the seasons when these conditions of the atmosphere exist to their fullest extent, that severe bowel complaints, manifesting themselves in the shape of dysentery, and even cholera itself, are most rife.

In view, then, of the general apprehension of an epidemic visitation from cholera the coming year, let every family in Kansas see that they are supplied with good, pure water to drink.

The foregoing remarks on the uses of water have been confined to the consideration of its potable qualities; its uses for purposes of cleanliness are also of the highest importance. For the farmer, or the small town, the well and cistern properly managed, will supply an abundance for both purposes; but for the large city, it is absolutely essential to be possessed of a prodigal supply. The bath, the wash, the flushing of sewers and drains, the cleaning of streets, the extinguishment of fires, &c., &c., all require an unlimited amount of this common but most invaluable article. That Kansas city which shall first supply a pure water for the drink of its people, and an abundance of it, for the purposes of their health and comfort, will outstrip all others in the race for greatness and prosperity.

*Parks and Trees.*—A measure greatly conducive not only to the general health of large communities, but to their happiness likewise, is the wise plan of supplying a city with parks or public squares. It has been said, not inaptly, that

they are the lungs of a city. It is here that the tired man of business, the man of toil, the valetudinarian, the house-tired female, the school-bound child, may all breathe the pure air of heaven, and bask for awhile beneath the cool shade of the trees. It is a most narrow policy which induces the founders of our cities to neglect this great adjunct to health, to comfort and to the beauty of a city. It is not too late for the cities of Kansas to make provision for a liberal number of parks. No investment will return to them with larger profits than money spent in this way.

#### THE DUTIES OF THE PEOPLE OF KANSAS IN RELATION TO THE SUBJECT.

As stated in the commencement of this report, it was no part of the design to enter into details. In order to illustrate, however, with force and clearness, the extensive field in which the sanitary reform works, it was necessary to depart so far as has been done from this design.

No State was ever situated more favorably than Kansas, to enjoy the largest share of vitality, of health, and of life, which it is possible to be reaped by man. Topographically and climatologically free from all causes which necessarily depreciate the normal health-rate, it needs but a wise, prudent and vigorous administration of public health-laws, to shape her embryotic institutions into a channel that will redound to the happiness and longevity of her people. There is this great advantage over older communities,—that they have learned the lessons which are now before us, through an experience purchased by the sacrifice of millions of lives, and after many of the evils were so fixed that it was impossible to remove them, save through the slow lapse of time and the expenditure of mines of wealth. It is far easier to build one's house to one's liking, than to alter it to his liking after it has been built.

Large cities are destined to spring into life within the boundaries of Kansas. Her beautiful prairies will ere long teem with a profusion of those staples which bring peace and plenty to an industrious population. The cabin of the pioneer will be exchanged for the comfortable dwellings and surround-

ings belonging to the successful farmer. The little town, with its one store and post office, where the lazy stage was wont to get a change of horses, and the hungry passengers a backwoods dinner, will resound to the din of the workman's hammer and forge, and the impatient champing of the iron-horse, as he stops for a moment to gather the stores which Kansas will ship from Galveston and San Francisco to the country beyond the seas.

When the tide of immigration which steadily flows in upon us, shall have built cities counting their population by thousands and tens of thousands; when great piles of brick and mortar loom up a barrier to God's fresh air, while weary men and women pant for its invigorating power below; when the conditions of life and health are so perverted that the allotted three score and ten is frightfully reduced; when public institutions are filled with the puny offspring of indigence and crime; when the filthy abodes of poverty and sloth shall warm into life a hundred pestilences to sweep off the bone and sinew of the State, then will the cry of alarm, which has startled the older communities of the world, find vent, and millions will be expended in the effort at a reform, which a wise and comprehensive legislation at this time might have rendered entirely unnecessary.

This picture is not fanciful or overdrawn; its counterpart may be found, to-day, in some of the great cities of the world. What an immense saving, then, of life, and in a sordid view, of money, might be accomplished if the builders of new States and cities, guided by those well-established laws of life which have been worked out at an appalling sacrifice to the human race, would erect the fabrics of their industry that they might redound to the happiness of their fellow-men.

In the olden time, before the laws which govern the economy of life were as well understood as they are now, the mortality of hospitals, prisons, military barracks, &c., was excessive. Placed under the most unfavorable hygienic conditions, the simplest ailments sometimes assumed the most serious forms, and filled an incalculable number of unnecessary graves. Under an enlightened comprehension of those laws, however, such institutions are now made to enjoy a fair



amount of the health resource, and the dreadful types which diseases were wont to assume in them, principally as a consequence of non-ventilation, uncleanness, over-crowding, &c., are now almost entirely banished. Upon the same principle, it is entirely within the range of possibility to so build a city that the usual penalties attendant upon an aggregation of men shall be completely escaped. It is just as possible to build a *model* city as it is to build a *model* hospital, or a *model* dwelling-house; it is but a difference of extent in plan.

An impartial analysis of these views will reveal to any mind that there is nothing in them bordering on the Utopian or enthusiastic. They are eminently plain and practical, and if rightly acted upon will build up a State which has never yet been surpassed for the general intelligence, the happiness, the vigor and the prosperity of its people.

In consummating so desirable an end, the first step belongs to the Executive of the State. A sanitary commission should be appointed, which commission should be charged with the duty of making a complete sanitary survey of the State. Such a survey should have for its prime object the ascertainment of the natural health-resource of the State at large and in detail, and the causes which depreciate it; with a view, of course, to their removal so far as practicable. In accomplishing this work, the general physical features of the State should first be carefully investigated, and then the inquiry could be perfected by a consideration of the various counties, towns and cities. The points sought to be settled might be classified as follows:

1. *Location*.—Boundaries of the county, and its situation in the State. Its proximity to the water-courses and hills of the State.

2. *Hydrography, or Drainage*.—Size and direction of the water-courses, and of the dividing ridges, or water-sheds. Extent of river bottom. Power and rapidity of streams, and danger and frequency of inundation. Quantity of marshy or springy soil. Artificial water-channels.

3. *Topography*.—Area and mean altitude of each county. Location and size of principal towns. General character of surface, with principal valleys and eminences. Nature and

extent of surface destitute of vegetation; tilled, covered with forest, or grass. Agricultural products; kinds of timber; effects of clearing and of drainage upon climate.

4. *Geology* of different counties. Position, dip, direction and extent of different formations, as determined by State Geologist. Character of soil and subsoil. Source and nature of water used for domestic purposes.

5. *Meteorology*.—Latitude and longitude. Statistics, so far as accessible, of barometric, thermometric and hygrometric states of the atmosphere, indicating the annual and monthly amount of rain, hail and snow. Statistics of wind, so far as accessible.

6. *Particular survey of each town* in the State, of more than 1,000 people. The location, surroundings and number of inhabitants. The general plan upon which the town is built. Streets wide and at right angles, or narrow and crooked. What is the probability of a uniform system of drainage? Where is the refuse of houses, stables, &c., kept, and how disposed of? How is the town supplied with water? What is the material of the houses; how constructed; are there any crowded neighborhoods; how many families in a house? &c. How are the school houses, churches, &c., built and ventilated? How are houses warmed—by fireplace or stove? Are there any hospitals, and how built? Are there any provisions for public parks? What public nuisances, in the shape of slaughter-houses, unwholesome manufactories, and the like, exist? &c., &c.

7. *Prevalent diseases* in each county and city, so far as can be learned. 1. The endemics, and epidemics to which the locality has been subject—how affected by race, age, temperament, avocation, circumfusa, ingesta and density of population? 2. Fevers. Intermittent and remittent—their frequency as compared with former years, and with other months of the same year. Typho-malarial fevers—small pox, measles, diphtheria, scarlatina. 3. Other diseases.

8. *Mortuary Statistics*.—Owing to the newness of the State, but little could be accomplished in learning, with any accuracy, the death-rate of any particular locality; but the means for a beginning in this direction might be instituted at

once, which before long would furnish valuable information.

It is not presumed that the aims of the commission should be confined to the programme here laid down. While this would serve as a basis for action, perhaps, other useful data and information might be appropriately collated.

The materials collected should be embodied in a report by the commission and presented to the Executive with such recommendations for a complete code of sanitary laws as they might deem expedient, embracing prominently among other necessary things the effective taking of the census as often at least as once in ten years; *a law for the efficient registration of marriages, births and deaths*; a law requiring the *compulsory periodical vaccination of every man, woman and child in the State*; also, one forbidding peremptorily, intra-mural interments, or burials within the limits of towns and cities.

Profiting by the advanced state of the science of health in our day, a sanitary code could be perfected which would inure in the highest degree to the health, happiness and prosperity of our people. It is not pretended that, by any health regulations which would be likely to be adopted, humanity could be shorn of all its ills, disease be entirely conquered, and individuals die only of accident or old age. But it is proven beyond the possibility of successful contradiction, that if communities were compelled so to live as to avoid creating all of those unnecessary causes of disease which it is entirely within their power to prevent, the average term of life might be extended at least one-half its present duration, while the increased benefits to be derived from rearing a more vigorous, happy and intelligent people, are utterly beyond calculation. It has been the effort of this report to present the salient points of the subject, in as concise a manner possible. Though a mere sketch of a subject upon which volumes have been written, it is hoped that the strong features have been presented in such a light as will induce the Executive of the State to realize the importance of moving at once in a matter so closely interwoven with every material interest, and so nearly touching the happiness of every fireside in Kansas.

## SANITARY SKETCH OF THE STATE OF KANSAS.

*Boundaries.*—The political boundaries of the State place it between the 94th and the 102d degrees of longitude west from Greenwich, and the 37th and 40th degrees of north latitude. It is situated in the Great Interior Valley of North America, and while possessing, to a certain extent, the general characteristic features of the great Valley, it enjoys that healthful modification which accrues to each locality, as it advances sufficiently near to the western boundary of the Valley, (the Rocky Mountains,) to reap the advantages of the greater elevation above its synclinal line, without losing the general characteristics of the Valley itself.

*Aspect.*—There are no mountain chains within the limits of the State of Kansas, but its face is diversified by a succession of gently undulating hills, stretching off into ridges and intervening valleys. There is a gradual ascent of the surface from its eastern boundary, which, indeed, marks the whole country west of the Mississippi river to the Rocky Mountains.

There is perhaps, no fixed direction for the eminences, though the general inclination may be said to be from northwest to south east, thus forming innumerable water tables, which shed their waters into the streams pursuing an easterly course to reach the Mississippi.

*Hydrography.*—The great hydrographical axis of the region west of the Mississippi, so far north as the 50th degree of north latitude, is the Rocky mountains. The Missouri river, which traverses the eastern border of the State for nearly half its length; the Kansas, with its large feeders; the Big Blue, the Republican, the Solomon, the Saline and the Smoky Hill; and the Arkansas—which flows through a portion of the southwestern corner of the State—are the channels through which a considerable part of the waters of the eastern base of those mountains find an exit, at first into the Mississippi, and from thence into the Gulf of Mexico.

Though this great axis gives a general direction of the waters from west to east, yet there are innumerable smaller axes existing which give rise to streams of greater or less magnitude; these traverse the State in all directions, and

finally disemboque themselves into the principal channels. In Northern Kansas, such minor axes, (in common parlance called "divides,") so arrange themselves as to throw the water into streams which either meander to the south and empty into the Kansas, or to the east to find outlet in the Missouri. The latter, upon the whole, are much the smaller. In Southern Kansas the inclination of pitch is more distinctly from west to east, making divides which either throw the water to the north into the Kansas, or to the south, forming streams which either flow in an easterly direction to join the Missouri, as the Osage, or southeasterly to join the Arkansas, as the Verdigris and Neosho. Through the means of lesser divides again, the streams find accessions through multitudes of smaller ones. Thus the whole State is traversed by a network of water-courses, some larger, some smaller, but amply sufficient for every purpose.

The waters of the smaller streams are pure and potable, but those stretching out their head toward the mountains, as the Missouri and Kansas, bring down in their bosoms the *debris* of the long region of country traversed. The former river is marked for its turbidity, having received the name more expressive than polite, "Big Muddy."

The amount of matter, organic and inorganic, held in suspension by this remarkable river, is indeed enormous. Of the inorganic materials, the chief are alumina, or clay, (mostly blue and yellow,) and silicious and calcareous sand, very finely comminuted. These are derived from the formations over which it flows. From its remote sources in the Rocky mountains, it is said to flow over an inclined plane, the upper layers of which have but little compactness, and are, therefore easily disintegrated. These are, without doubt, in part a tertiary deposit, and in part cretaceous. The Yellowstone and Platte, tributaries to the Missouri, surcharged with much the same debres, assist in the density of its solid constituents. Laden with this immense amount of foreign material, not even the rapid current, (the fall of the river averaging, perhaps, one foot per mile,) prevents its constant deposition. Accordingly, on the subsidence of its waters,

the surface over which it has flowed is covered with a deposition of silt or sand, varying from a few to many inches.

Beside its inorganic constituents, the Missouri is laden with organic elements; of these, in addition to the vegetable remains swept along its bosom, there were found by Prof. Bailey, of the United States Military Academy, countless numbers of microscopic infusoria. In one specimen of water examined, there were detected twenty different species, all alive and active. Notwithstanding impurities, and those arising from the refuse of towns upon its banks, and of the different craft upon its surface, there is a traditional impression that its water is healthy.

Though as before stated, nothing approaching a mountain elevation is to be found in the State, yet the elevations are sufficiently great to give it a fine "rolling" appearance. In consequence of this, the breadth of river bottom proper, within the State, is comparatively very limited. All of the streams flow within rather narrow beds, surmounted on either side by steep banks, generally varying in height according to the size of the stream.

Kansas is, in respect of its natural drainage, unsurpassed by any State in the Union, and equalled by few having the same amount of arable land. There is but little marshy or springy soil in the whole State; the surplus water coursing down to the natural conduits, leaves no opportunity for that saturation of the ground which is observable in some of the other States, and particularly the prairie States east of the Mississippi river. The effect of this upon the general salubrity will be mentioned further on.

*Timber.*—The timber of Kansas being mostly confined to the margins of the water-courses, it is proper to speak of it here.

The State is not heavily timbered naturally, but when it is considered that coal of the best quality underlies the most of the State, supplying all of the requirements for fuel, and that as prairie fires become less frequent, the timber increases rapidly year by year, it must be admitted that for the useful purposes of life, the State will not suffer from a deficiency.

It is an interesting question in sanitary science, as yet un-

determined fully, what are the relative differences in salubrity between two regions, situated in other respects alike, the one moderately timbered, and the other densely so. That trees fulfill an important office in the economy of life, is well known; that they modify climatic conditions, is also well known. This they do by modifying the temperature through their action as conductors of heat, by their absorbing and emitting surfaces, and by their chemical influence.

It is probable that experience will demonstrate that while the beautiful prairies of the State are disencumbered of that surplus of wood, requiring the labor of years to prepare land for the plow, and therefore stand ready to yield bountiful harvests at once, there is a sufficiency of timber in Kansas to fill all the requirements pertaining to the economic and physical uses of the forest.

The following is not a complete list of the trees and shrubs of the State, but it embraces, perhaps, the principal varieties:

## TREES.

Black Jack Oak.....	<i>Quercus Nigra.</i>
White Oak.....	<i>Quercus Alba.</i>
Red Oak.....	<i>Quercus Rubra.</i>
Burr Oak.....	<i>Macrocarpa.</i>
Black Oak.....	<i>Tinctoria.</i>
Water Oak.....	<i>Aquatica.</i>
White or American Elm.....	<i>Ulmus Americana.</i>
Red or Slippery Elm.....	<i>Ulmus Rubra.</i>
Black Walnut.....	<i>Juglans Nigra.</i>
White Walnut.....	<i>Juglans Cathartica.</i>
Cottonwood.....	<i>Populus Canadensis.</i>
Box Elder.....	<i>Negundo Aceroids.</i>
Hackberry.....	<i>Celtis Occidentalis.</i>
Honey Locust.....	<i>Gleditechia Triacanthos.</i>
Willow.....	<i>Salix.</i>
Shellbark Hickory.....	<i>Carya Squamosa.</i>
Pignut Hickory.....	<i>Carya Porcina.</i>
Pecannut Hickory.....	<i>Carya Olivæformis.</i>
Sycamore.....	<i>Platanus Occidentalis.</i>

White Ash.....	<i>Fraxinus Americana.</i>
Sugar Maple.....	<i>Acer Nigrum.</i>
Red Mulberry.....	<i>Morus Rubra.</i>
Linden.....	<i>Tilia Americana.</i>
Crab Apple.....	<i>Malus Coronaria.</i>
Wild Cherry.....	<i>Cerasus Serotina.</i>
Coffee Tree.....	<i>Gynocladus Canadensis.</i>

## SHRUBS AND VINES, (UNDERGROWTH.)

Elder.....	<i>Sambucus Canadensis.</i>
Shoemaker.....	<i>Sumach</i> , several varieties.
Green Brier.....	<i>Smilax Rotundifolia.</i>
Gooseberry.....	<i>Ribes.</i>
Hazel.....	<i>Corylus Americana.</i>
Pawpaw.....	<i>Anona Triloba.</i>
Prickly Ash.....	<i>Zanthoxylum Americana.</i>
Raspberry.....	<i>Rubus Strigosus.</i>
Blackberry.....	<i>Rubus Villosus.</i>
Prairie Rose.....	<i>Rosa Setigera.</i>
Grape, (two or three varieties,).....	<i>Vitis.</i>

*Geology.*—Reference is made to the exceedingly interesting report of Prof. Swallow, for the geological details of the different formations, with the character of the soils, &c. It will be found that these indicate rare conditions for general salubrity. The soil of Kansas, consisting of an argillaceous or clay basis, is so tempered by an admixture of silicious and calcareous sand as to make it light and porous, yet not sufficiently so to impair its capacity for retaining a due amount of moisture. This constitution not only renders it highly available for farming purposes, but prevents that long continued saturation of the ground, observed in soils composed in great part of clay. This peculiarity also renders the surface entirely free from those collections of water in puddles and ditches, ensuing during the rainy season in localities where the subsoil is so strong and stiff from its clayish nature as to retain the water and prevent its drainage, leaving its removal to be accomplished through the process of evaporation. Hence, the soil of Kansas is not only adapted to large yields of every farming product requiring a light, rich and warm



soil, but it is better adapted to withstand the effects of dry seasons than the clay soils before referred to. The clay soil, during a protracted drought, bakes to a strong hardness, and kills vegetation, whereas, the light, pulverulent soil of Kansas permits the vegetation to strike root deeper into the soil, and imbibe moisture through the increased facilities for capillary attraction.

These remarks are made, as having a very close relationship to the subject of health, through the modifications of the atmosphere resulting therefrom. The influence exerted upon the general health by this constitution of the soil, will be illustrated further on.

*Meteorology.*—The very valuable and carefully prepared report of Dr. Sinks's upon this subject, will furnish abundant material compiled from reliable statistics, not only illustrative of the climatology of the State as bearing upon its agricultural resources, but furnishing the necessary data, to determine the atmospheric influences upon health. The tables of the report will be referred to again.

*Prevalent Diseases.*—The settlement of the State being so recent, (dating from the year 1855) no public measures have as yet been taken to collate statistics, showing the classes of disease, if any, which are engendered purely by the climatic and physical features of the State. The only sources from which any such information can be obtained at this time, or until a sanitary survey shall have been made, are, first, the individual experience and records of medical men, and surgeons of posts, situated within the State, to the Surgeon General, and published in the statistics of the United States army. The information to be derived from the latter is of little value for this purpose, for two reasons: first, because such reports consist of mere topographical sketches of particular posts, together with observations made upon the diseases and mortality of soldiers congregated in barracks, often under the worst hygienic influences—at all events, situated totally different from the civilian—soldiers who are ever upon the move, and who may have contracted the reported disease in some other locality; and, second, because the United States statistics are not the tabulated health statis-

tics of each individual post, but represent the diseases and mortality of a number of Forts aggregated together, though situated hundreds of miles apart, and under the most diverse features of climate and physical conditions. For instance, Kansas is classed in the middle interior region, west, and in this division are embraced, the Jefferson Barracks below St. Louis, the St. Louis Arsenal, and Forts Leavenworth, Scott, Riley and Atkinson in Kansas. Jefferson Barracks is situated in north latitude 38 deg. 28 min., and has an altitude of only 472 feet above the sea; while Fort Atkinson is in north latitude 37 deg. 47 min., and has an altitude of 2,330 feet above the sea level. The former is situated in the alluvial valley of the Mississippi, with its profuseness of rich vegetable decay, and the latter upon the sandy soil of the "great plains," with its sparse vegetation, almost entire absence of timber, and complete freedom from boggy marshes. The former has an elevation of 472 feet, the latter of 2,330 feet, a difference of 1,858 feet. The former is subject to the hot and humid winds, which sweep up from that great basin of tropical water, the Gulf of Mexico, while the latter enjoys the cooler and dryer winds which come from the regions west of the Gulf, and the Rocky Mountains. The utter dissimilarity in climatic and physical condition between these two posts, entail as wide a difference in the prevailing types of disease. The reflecting mind will see at once, that for the purpose of ascertaining the prevailing diseases of any particular region, the United States army statistics have no definite value.

In the following brief remarks concerning some of the more prominent diseases, supposed to be influenced by climate, individual observation and experience will be solely relied upon; owing to the discursive nature and purposes of this report, no effort will be made at any systematized nosological arrangement.

*Fevers.*—The class of fevers called malarious, periodical, autumnal, &c., prevail with different degrees of intensity in the great interior valley of North America. The nature of the specific cause producing these fevers, is still undetermined, but experience seems to unite upon the fact, that the cause

or causes are set into operation through the combined agencies of heat, moisture and vegetation, and (that within certain limits) the more fully these agencies exist, the more active is the causative principle and the more intense is its effect upon the system. Taking this fact as a basis, it would not be difficult, other things being equal, for the physician thoroughly acquainted with the physical geography of every portion of the great valley, its climatology, &c., to trace with a pencil the general line of development, and the relative degrees of intensity of the autumnal or periodical diseases.

In those sections of the valley, where from the nature of the soil, or the aspect and elevation of the surface, a thorough natural drainage is precluded, these fevers prevail (temperature also being favorable) with the greatest intensity. A wet soil is productive of a rank vegetation with its proneness to rapid decay; thus furnishing in profuseness one of the most essential elements of fever.

In addition to this influence of a wet soil in favoring vegetable growth and decay, the meteorological condition is most decidedly and insalubriously affected thereby. This is brought about by the excess of moisture with which the air is charged, whereby the secretions of the skin are impeded in direct proportion to the degree of saturation, and the internal organs are burdened to a greater or lesser extent, with the office of removing effete materials, which in health it is the function of the skin to eliminate. The damaging effects of a humid atmosphere upon the secretions, is much greater when combined with the influence of heat. The agency of the hot, wet atmosphere of the tropical regions, in producing in great intensity those diseases consequent upon a derangement of the secretory diseases, seem to decline in violence, in direct ratio to the subsidence of those conditions.

But upon the other hand, a moist atmosphere, if it be a *cool* one, as occurs in some of the higher latitudes, is equally productive of disease, though of a different nature, assuming more generally the shape of rheumatism, and pulmonary disorders, the latter being quite as fatal in their effects, as the diseases called into existence by heat and a high dew-point.

From these hasty observations, it will be seen that too great

moisture of soil is an important element in the causation of disease, and, in the valley, it gives origin to malarious fevers of a more or less benignant type, (the consideration of temperature being included,) as the facilities for its retention are present to a less or greater extent. Kansas, as said before, by reason of its physical aspect, its soil and its winds, is thoroughly drained. The streams usually have high banks and run in narrow channels, and the water is carried off with great rapidity. There is but little river bottom proper, and that which does exist is as readily drained by the facilities for percolation as the higher lands. Hence, no ponds or sloughs are found, and but rarely any springy soil. In Ohio, Indiana and Illinois, the streams generally flow through wide valleys, and have low banks, whereby the land is subjected to inundation; a subsoil tenacious in the highest degree, being usual to those localities, the water does not drain off with facility, and much of it is left to be evaporated, and assist in the production of malarial fevers. This is especially true in those portions of Indiana and Illinois shelving up to the great lakes. Extensive marshes or sloughs exist there, and the saturation of soil is so great that in seasons not remarkably dry, water is easily had a few feet below the surface. In these regions the fevers are of a very pernicious character at times, the "sinking chills" and "congestive fevers" being regular and dreaded visitants.

Kansas, enjoying such a surface drainage, should be exempt to a great extent from the violent malarious fevers of those regions. This is found to be the case. Intermittents and remittents of a mild character are incident to the vernal and autumnal months, but they yield readily to appropriate treatment, and leave behind but few of those shattering results ensuing from the more violent types. The pure congestive or pernicious variety of fever is a rare visitant in Kansas, except in a few of the most illy-favored localities. This being the case, it will readily be inferred that those forms assuming a typhoid aspect, and now designated typho-malarial, are not frequent.

To sum up, ague and bilious fever are the prevalent fevers of the spring and autumn months, but originally of a very

mild character, they are becoming more so, and less frequent, year by year, as population flows into the State.

All communities are subject to epidemic visitations, but the general salubrity or insalubrity of any particular region determines, to a great degree, the extent to which it shall suffer. In intensely malarious districts, the unwholesome influences keep the general health-rate below par; thus an open hand is extended to the epidemic influence, and large tributes are yielded to it. Such diseases as bad forms of diarrhœa, dysentery, erysipelas, measles, scarlet fever, small-pox, cholera, diphtheria, spotted fever, &c., &c., commit great ravages when attacking the kind of population referred to. It will not be amiss to note the prevalence of these diseases in the order named, so far as they have been observed in Kansas:

*Diarrhœa and Dysentery.*—These have never assumed the epidemic form, and, but rarely, even a grave one. Both occur in June and July, as a consequence of the imprudent eating of unripe fruits and vegetables, and of the disturbing influences of heat upon the secretions. They, therefore, yield promptly to treatment.

*Erysipelas.*—Sporadic cases of a mild type occur. It has never prevailed in the State as an epidemic.

*Measles.*—Is frequent, being quite constantly imported by the immense throng of travelers continually in transit through the State. When occurring in winter, from the variations of temperature and carelessness in providing against them, serious complications sometimes arise in the lungs.

*Scarlet Fever.*—This disease has prevailed to a greater or less extent in the State at various times, but it has usually assumed a mild form, and the death-rate has been comparatively small. But few of the terribly malignant cases have been witnessed, the general tendency being to the benignant forms of the disease.

*Small-Pox.*—This has at various times been imported into the larger communities, but not to any great extent, its attacks being confined, in a great measure, to the habitats of filth.

*Cholera.*—During the years 1850, '51, '54 and '55, this disease prevailed among the troops at Fort Leavenworth, and along the great trail across the plains. In this, it but mani-

fested its usual propensity to attack communities, regardless of climate.

*Diphtheria.*—This disease has been witnessed at varying times in the last few years, and has usually made its appearance in conjunction with a visitation of scarlet fever. There seems to be a strange relationship between these two diseases. In Kansas, they have seemed to occur together, and at times to appear vicariously with each other; their symptoms having been observed occasionally to merge. As was said of scarlatina, diphtheria has only appeared (with a few exceptions) in a very mild and tractable form. Nothing of the terrible ravages of the disease, which have occurred in other communities, have been visited upon Kansas. The fatal cases which have occurred in Leavenworth and elsewhere, could, probably be found to be intimately associated with local or inherent constitutional causes, favoring the violent forms of any depressing disease. No registry law being in force in the State, it is impossible to arrive at the exact death-rate of this or any other disease. The experience of every physician will demonstrate to him, however, that it has been very small.

*Spotted Fever.*—Isolated cases of this disease have been reported. They have been, however, strictly isolated. It has never appeared in an epidemic form, carrying off whole families at a time. Individual cases of a violent type have occurred, and some have proven fatal; but these, when compared to the whole number attacked, prove the mortality to have been not great. The few cases of an unquestionable character, seen by the reporter, have been traced to a co-existence with local sources of insalubrity, or with an impaired constitution.

*Rheumatism.*—This disease may be said to be rare in the eastern part of the State, occurring generally in those with a constitutional tendency to it, called into action by exposure to bad influences.

It is one of those maladies, however, the susceptibility to which grows greater as we go westward to a greater altitude and a more rarefied air, obtaining its maximum intensity as the mountains are reached. This is true of all inflammatory diseases, and Kansas, by reason of her position in the Great

Valley, may be said to stand between those influences which propagate the malarious fevers east of the Missouri, and the inflammatory diseases of the mountain elevation: that is to say, while not exempt from disease, by any means, the energy of the one class is greatly spent upon reaching the eastern boundary, and the intensity of the other is not attained until a much greater western limit is found.

To complete this outline of those maladies which are influenced by climate and location, there yet remains a class of diseases of the first importance to be touched upon, the remarks upon which will close this report. The diseases of the *respiratory organs* is referred to.

It will appear from the tables of temperature prepared by Dr. Sinks, that Kansas is liable to great and sudden vicissitudes of heat and cold. This is true, to a greater or less extent, of the whole Interior Valley of North America. In Kansas, this result is probably due, in great part, to the winds. These, in consequence of the potent influence upon temperature exercised by the great western mountain chains, are liable to great variations in short spaces of time. The warm southwest wind, with its softening influences, may quickly veer round to the northwest, and come down in chilling blasts. There being no elevated objects to interpose and break the force of the winds, Kansas experiences them in all their force. Thus it is, that during the winter months, in a period of twenty-four hours, perhaps, the seasons are run into each other; the change being made from the warmth of a spring day to the biting cold of mid-winter.

It would appear from this, that people exposed to such influences would suffer greatly from diseases of the respiratory organs, such as inflammations of the larynx, the trachea, the bronchial apparatus, of the lungs, pleura, &c., &c.; and yet experience will demonstrate that although these diseases are of common occurrence in the winter months, that they do not mount up to a greater ratio than is usual in other portions of the Valley. The reason for this probably is, that the northwest wind is essentially a *dry* wind. When blowing, it feels pure, light and invigorating; oxydation of the blood is accomplished rapidly in the respiratory act, and the bad effects

which might otherwise ensue in consequence of the great reduction of temperature, are thus counterbalanced by the increased activity in the lungs.

*Phthisis Pulmonalis, or Consumption.*—The direction of the medical mind, in seeking for the causes of consumption, has, within a few years, been turned into a new channel. In the facts which have been accumulated concerning this dread disease, it has become apparent that *moisture*, either in the soil or atmosphere, has some occult influence in developing the malady. The limits of this sketch will only permit a bare allusion to the fact. It has been known for years that certain localities were remarkably exempt from consumption, and prominent among these are the regions in the far north, and the elevated regions of the Rocky Mountains. The inference is, that a dry, cold atmosphere is preventive of the disease. Kansas has a pure, dry atmosphere, and in this respect is more favorably circumstanced for preventing the development of consumption than any other portion of the Great Valley, east of the 94th meridian and south of the 45th parallel of north latitude.

These conditions of great dryness of atmosphere, however, increase as the mountains are approached, and hence the inference is, and experience confirms it, that the regions west of us are more fitted for preventing the development of the tubercular disease, than the region directly west of the Missouri river. Cases of consumption do occur in Kansas, but it is believed that they are among those exclusively with an hereditary predisposition to it; and even with these, the percentage of cases is much smaller than in the portions of the Valley named.

These hasty remarks complete the task assigned to the reporter. They are, as before said, a mere skeleton of the subject, presented simply for the purpose of leading to fuller action. If they shall accomplish that object, the whole aim of the report will have been consummated.



REPORT

ON THE

SANITARY RELATIONS

OF THE

STATE OF KANSAS,

BY

C. A. LOGAN, M. D.

HOMINES AD DEOS NULLA RE PROPIUS ACCEDUNT QUAM SALUTEM  
HOMINIBUS DANDO — *Cicero.*

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