ASTER, NEMORALIS. Ait.

Stem simple or corymbose at the top, leafy, the leaves crowded below the branches, or midway on the simple axis, which is often single-flowered; heads few, branches when present usually single-flowered and naked; stem and branches having short hairs; scales lance linear acute squarrose, margins and tips scarious; rays pale purple or roseate, never white, 15 to 25 in number; leaves narrow, lanceolate, entire sessile; upper surface rugous and scabrous, edges scabrous and revolute, "more revolute in the upper than in the lower leaves; 1′ to 1½′ in some subdentate, lessening from below upwards, an inhabitant of swampy pastures, rather a pretty Aster, generally the first to put forth flowers—July; with a resemblance to the above, it is sufficiently distinct for easy diagnosis from it; they are both included in the div. scariosa or orthomeris, Torr & Gray, differing from Asters proper by their membranous scales.

ART. II.—MORTALITY RATES OF ANCIENT AND MODERN TIMES.

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THE idea of our great recent progress is so generally received, that it may be well to take a retrospective glance and see how much in reality has been accomplished.

To get a fair understanding of our subject, let us revert to the period when natural laws were untrammelled, and we had the best examples of health, which, without doubt, prevailed in a very early period of history. We may conclude that the Pastoral Life furnished every sanitary requirement,—good drainage and ventilation, and temperate and sufficient exercise and diet, without facility for effeminate habits. Under these circumstances, it is safe to conclude that, excepting accidents, death resulted from old age.

We must also premise that every individual is at birth endowed with a prospective length of life under favorable conditions, which is measured by the vigor obtained from the parents, modified by a special individuality (for no two members of the same family are alike.)

This natural life may be prolonged or shortened, owing to the conditions to which it is exposed. One person may naturally die at fifty years, from the wearing out of the mechanisms of life. Another dying at fifty may have prolonged his term five or more years by extra care and judgment; and others dying at sixty or eighty may have brought on death prematurely, by five, ten, or more years, owing to debilitating influences.

To take up individual cases as illustration, would far transcend my limited time, and I must deal in generalities.

Presuming, then, that we have a sufficient knowledge of the most favorable conditions of health, we will compare the present with the past.

We find by historical evidence that partly owing to increase of numbers, as well as to the fertility of certain districts, population become more dense, and a nomadic merged into a fixed population.

Deficient drainage and ventilation can scarcely take place when the tent is shifted at frequent intervals; but it is far different with a stationary house, and the gradual collection of excreta and decomposing material, which, conspiring with war or famine, or both, were sufficient to explain the epidemics which have afflicted humanity from very early dates.

As wealth increased so did the desire for conveniences and luxuries, and in time distant countries were laid under tribute to satisfy the demand. This gave rise to the middlemen or *merchants* that increased in numbers and influence as wealth and ability to pay increased.

Arising from the same cause, *manufactures* began to exercise a similar influence, and at the present these combined have massed very numerous populations about convenient centres or cities, giving conditions the very opposite of what prevailed during the nomadic period.

As a result of this, we would anticipate a great increase of disease and death, and such has been the case in every instance where no special means have been used to ward off the ills resulting from a very large population.

These evils are of two kinds, the social and the physical, and though we do not intend to devote attention to the former, yet it must be alluded to, for there can be no doubt but disease is greatly modified by social conditions at either end of the scale; at the upper end by habits of fashion, ease and effeminacy, and the lower by filth, squalor and poverty.

The physical evils are those induced by an insufficient removal of the gaseous, liquid and solid excreta that are necessarily the result of animal life, and which are the most active agents in producing disease and death in the proportion of their accumulation.

Hence it is not their formation that is prejudicial, but their inadequate removal. By the operation of natural agencies this is easily accomplished in what we may conceive as the natural mode of life—the moveable scattered habitations referred to above.

When artificial customs prevail, so in proportion must artificial means be adopted to carry out the indications of nature, and since we have in latter years gained much knowledge it is to be presumed, if this be turned to account, there should be an amelioration of the general health. Experience has proved the accuracy of this deduction, and the lowered death rate of some cities, notably London, is the best proof, as the very high rate in others shows conversely a deficient attention to sanitary requirements.

One law is thoroughly established, "That the products of animal life are in course of time resolved into inorganic substances which become the pabulum for the growth of vegetable life. But during the transformation above referred to, the compounds that are formed are poisonous to the life of animals unless present in extremely minute quantities. It is necessary that there should be a tolerance of these poisons in the case of animals, or general disease and death would result, and as different species and individuals have different powers of resistance we find that the resulting dis-

ease varies very greatly in its types and results, and also that strong vitality may confer comparative health under very unfavorable conditions.

Another powerful influence that tends to this favorable result is that of *habit*, for we know that so great is the elasticity and endurance of the vital economy that long exposure to a deleterious influence does appear to modify and even arrest its virulence, but in the majority lowered vitality is to be expected with its common result, disease and high death rate.

In comparing the influence of modern civilization on the *General Health* we have two previous eras to consider—the *Ancient* and *Middle ages*.

Our knowledge of ancient times in this particular is very limited, and if what we have received, be correct, they were more favourable than the present. In ancient times, we have three periods—the first when nomadic life prevailed, and we have reason to believe, the best condition were present. Second, that of the Assyrian and Persian Empires.

At these times, we have the gradual accumulation of numerous populations at political centres, with a very high average of health, as a rule, if the Chronicles are to be believed; and this is easily understood, for the great cities of *Nineveh* and *Babylon* were totally unlike those that have succeeded them, for they covered a vast area of territory in comparison with population.

The original founders also devoted great attention to a complete system of drainage and public baths, as well as the perfect cultivation of the soil, with separate location of the domiciles and very wide streets—precisely those conditions that our most recent knowledge would dictate. These methods, no doubt, prevailed then, more from *military* than *sanitary* reasons, but it would be scarcely just to say that their educated men had not accurate powers of observation, and were not guided by the experience of life that they must have had even then, although their theoretical explanation might not be so accurate as we can give to-day. It is only fair to assume that, at a time when the health and energy of every individual was necessary to the formation of armies, whose

success was in proportion to the physical health and endurance of each unit.

(The training of the Persian soldier under Cyrus was perfection as far as our present knowledge teaches.) All reasoning, I repeat, would confirm the idea that the phenomena of health were very closely studied and all arrangements made subservient thereto. Hence it is more than probable that during this long period the standard of general health approached very near perfection, and that our progress at present would be more assured did we very closely copy the methods that prevailed for so many ages long since passed away.

Third, the area of the ancient Roman Empire. Here we had conditions not unlike those that preceded except that there was more crowding with its attendant evils, and we read of plagues that produced great havoc more frequently than in more ancient times. These were generally the accidental results of war, siege, famine and great overcrowding, from the concentration of armies and the inhabitants of the surrounding country, and should not be included in the general health rate which was comparatively high.

The Grecian and Egyptian customs were very similar, and we need not comment on them.

The Middle Ages we may consider as coming down to a late period in the last century, with a health rate comparatively very low in all the great centres of population.

The crowded quarters and ignorance of the most elementary hygienic laws, produced decimating plagues with marked regularity.

The great fire in London in 1666 cut short the epidemic at that time prevailing, by scattering the dense population and perfectly disinfecting the polluted domiciles.

Great wars are always attended by disease, and leave famine and sickness as their result, but in estimating the general health rate this should not be considered, for the unhealthy period just referred to was not very clearly traceable to war but rather to the habits of the times.

During the century just elapsed there are many modifying influences that must be considered in estimating our modern condition.

Commerce and Manufactures, or TRADE, has obtained a pre-eminent position, and controls the massing of populations to a far greater extent than *politics, nationality, or political geography.*

The study of the science of *Hygiene* has made very great progress, and has been able to influence the deliberations of the national as well as the municipal governments, so that the march of improvement is now going on actively, but the course is yet both difficult and long.

Within the past fifty years *trade* has inclined to populate the cities at the expense of the farms, and war has tended so little to diminish numbers, that we have very many centres very thickly inhabited, which, from the vicissitudes of *trade* are alternately in affluence and poverty, and either extreme tends to produce disease.

Hence, we have all that is required to give a very high death rate; and that it is not worse, we must thank the labours of those who, for very many years, have striven to inculcate the requirements of health.

It would be theoretically possible to have most thickly populated and perfectly healthy districts, but since the natural depurating agencies are then insufficient, artificial means must be adopted, proportional to the artificial condition.

Every individual should have abundance at all times of *pure air, pure water, good food, regular exercise,* and no less regular *sleep,* with as far as possible, restriction from indulging the appetite for excesses of every kind.

Sewage, (a convenient term for classing,—the solid liquid and part of the gaseous excreta), cannot be too perfectly attended to, for its influence in poisoning the air and water is supreme.

To accomplish this it is necessary to have perfect removal of dirt of every kind, with such a disposal of the liquids and solids as will enable them to be utilized in nature's way, by vegetable growth, or at least to be disinfected by some means, artificial or natural.

Ventilation is equally as urgent to remove the gaseous excreta of respiration as well as the products of manufactures and sewage decomposition, which must to some extent, obtain, no matter how well their removal may be managed.

As to food, labor, rest and restriction from excesses, they are so mixed up with the conditions of TRADE that at present it is not possible to regulate them by any form of parliamentary legislation. And again they are by no means so prejudicial to the general health rate if perfect cleanliness could be made obligatory.

Zymotic.—Preventable disease, such as Fevers, Dyphtheria, &c., &c., chiefly swells our death rate, and it could be eradicated by cleanliness or perfect ventilation and drainage. While as well those debilitating influences would be avoided that tend so largely to increase the mortality of infant life and those endemic diseases, consumption, malaria and other maladies which are peculiar to certain countries and localities.

To go into the details of these requirements would occupy too much of your time at present, and I will merely refer to the methods sketched by Dr. B. W. Richardson, of London, a most advanced sanitarian, for his model "City of Hygeia," where the most practical indications would be carried out. Its foundation, however, is yet to be commenced.

In conclusion let me say that we have not yet accomplished in any of our cities that which is quite possible, viz., drainage and ventilation, and that our practical sanitary works and general health rate cannot compare with the very ancient and more populous cities of Nineveh, Babylon, or ancient Rome.

It is probable, however, to expect that the vicissitudes of trade will prevent numbers from leaving the pursuit of agriculture and crowding the cities, which vocation alone is practically capable of giving the highest health rate when ordinary common sense and intelligence directs its operation.