

# THE Journal of the American Medical Association.

EDITED UNDER THE DIRECTION OF THE BOARD OF TRUSTEES.

PUBLISHED WEEKLY.

VOL. XIV.

CHICAGO, MARCH 29, 1890.

No. 13.

## ORIGINAL ARTICLES.

### THE INFLUENCE OF SANITATION UPON OBSTETRICAL AND GYNECOL- OGICAL SURGERY.

*Read in the Section of State Medicine at the Fortieth Annual Meeting  
of the American Medical Association, June, 1889.*

BY THOMAS A. ASHBY, M.D.,

OF BALTIMORE,

FELLOW OF THE AMERICAN GYNECOLOGICAL SOCIETY, ETC.

It goes without saying that the age in which we live is one of immense progress. In whichever direction the eye is turned in the scientific field the evidences of an intelligent and untiring labor are presented. Contrast the status of scientific knowledge to-day with that of half a century ago and the immense gain in beneficent information and in useful fact is made apparent. In no department of scientific work is this gain more marked than in the domain of preventive medicine. Not only have the manifold causes of diseases been diligently and assiduously sought for and in numerous instances found, but astonishing progress has been made in the direction of preventing the spread of contagious influences and in modifying the effects of such influences when in actual force. The science of Sanitary Medicine has been revolutionized and reconstructed on a foundation of established principles. To the growth and evolution of these principles the entire practice of medicine and surgery now pays tribute. To the application of the principles of sanitation to professional work can be traced the largest results which have ever flown from a scientific doctrine.

It is not the purpose of this paper to attempt to trace the history of this progress in sanitary science, except in so far as it bears upon the special subject under discussion, viz., "The Influence of Sanitation upon Obstetrical and Gynecological Surgery." The object in view is to show the very important and beneficent effects which have resulted in obstetrical and gynecological surgery from the recognition and adoption of the principles of sanitary science, and how the further acceptance and enforcement of these principles will bring a larger measure of results than have as yet been witnessed. The scope of this

subject will not admit of its brief discussion if the element of statistics is introduced at any length. An attempt will be made to treat the subject in as condensed a form as is possible, and to regard in a large and general way the lesson which may be learned from a philosophic view of the important facts under consideration.

Going back to the earliest history of medicine it will be observed that Hippocrates directed attention to the influence of air, water, diet, and clothing as factors in the causation of disease. From a general standpoint sanitation is as old as the records of the human race. In a more particular and special sense the growth of the important idea of sanitation is of very modern and recent date. The full influence of this idea has been made apparent in its best sense only within the past forty years. The birth of the modern principles of sanitation took place when Semmelweis demonstrated the influence of cadaveric poison upon the lying-in woman. The principle once established that the diseases of the puerperium originated in external influences the entire groundwork of the science of sanitation, as applied to obstetrical surgery, was relaid, and upon this foundation has been built the present superstructure. The results which have followed the recognition and observance of an external influence as an etiological factor have been so wide-reaching that the vast majority of diseased conditions are now referred to specific influences of external origin. The discovery of microorganisms and the establishment of the relation which they sustain to pathological states led the way to the successful study of specific influences. The essential principle in the causation and extension of disease was in this way traced to a specific factor, a *materies morbi* of recognizable aspect, of given demeanor, and of ascertainable character. Before the day of the microbe—when sanitary science was vaguely striking at imaginary etiological influences, at supposable miasms, at contagious principles lurking in the air, in clothing, in water, and in unseen places—the progress of sanitation was made only along lines of indirect observation. However earnestly attempts were made to destroy or intercept the march of the infectious and contagious principle such attempts were often futile in aim and reach in virtue of the

fact that the principle was an undetermined character and quantity, obedient to no established law and controllable by no power then possessed. Is it surprising that sanitary science was so long in rising to its present plane of usefulness to the animal world when one considers the difficulties which hampered its environment? Nor is it less surprising to witness the progress it has made since the time of Semmelweis when a new impetus was given to its growth by the discovery of the principle of septic origin of disease by the direct introduction of a septic process. In order that the influence of sanitation upon obstetric surgery may be shown in its most striking and truthful aspect I shall present the statistics of puerperal mortality of the present day in comparison with those prior to and at the time of Semmelweis.

That the ancients were familiar with the diseases of the puerperium, grouped under the generic term of puerperal fever, there can be little doubt. It is more than probable that the lying-in woman from the earliest period of human society has been subjected to its ravages. References to epidemics of puerperal fever are not frequent until after the latter half of the seventeenth century (about the year 1664). About this time and during the next hundred years it made inroads upon the lying-in hospitals in Europe to an appalling extent. It prevailed in London during the years 1760, 1768 and 1770 to such a degree that nearly every woman confined in lying-in hospitals perished. A similar epidemic occurred in Edinburgh Infirmary in 1773 and it is stated that almost every woman as soon as delivered was seized with the disease and "all of them perished." In a number of different years it prevailed in the *Maison d' Accouchement* of Paris to such an extent that one woman out of three delivered died. In the lying-in hospital of Vienna in 1823, 19 per cent. of the women delivered in the institution perished, and in 1842 the mortality was as high as 16 per cent. The epidemic waves of puerperal fever which swept over Europe are said to have destroyed nearly as many lives as small-pox and cholera. In our own country we have not been without such epidemics, but in consequence of the fact that the lying-in institutions in America are of comparatively recent date statistics have not accumulated to the same extent as in Europe. Lusk estimates the mortality from puerperal fever in New York City from 1868 to 1875 as 1-146. The mortality from child-bed in the same city during the latter year reached the total of 420, from which it is fair to assume a large percentage as a result of diseases of the puerperium. During the year 1872, in the same city, the mortality reached a total of 502, the larger percentage being due to increase in cases of metria, those from ordinary accidents remaining nearly the same as in the previous

year. During this year epidemic influences were notably present and the influence of atmospheric conditions laden most probably with a larger force of organisms may be assumed as a direct etiological factor in the mortality rate. Contrast the foregoing statistics with those of a more recent date which show the influence of sanitation. Goodell has stated that the mortality at the Preston Retreat in 756 cases was only two from septic disease, and Dr. Price, the present physician in charge of this same institution, has shown a still further reduction in this mortality from the enforcement of every known sanitary appliance. Winckel reports the deaths from metria in the lying-in institution in Dresden as 1.8 per cent., having fallen from 5 per cent. the previous year as a result of the enforcement of rigid measures for the prevention of disease. But take a more striking comparison. The mortality in the lying-in hospital of Vienna, which in 1823 reached 19 per cent., has fallen to the present rate of less than the half of 1 per cent. Take now the statistics of puerperal mortality in private practice as compared with that of maternity hospitals and the influence of sanitation is even more marked. In 1858 Tarnier showed that the mortality in the Paris Maternity was one in 19 whilst that in the city at large was only 1 in 322. In 1866 Lefort showed from his studies that in hospitals and in maternities the mortality was 1 in 29 whilst in cities it was one in 212. He adduced these figures to demonstrate the influence of contagion through the effects of greater crowding. The recognition of this fact led to the adoption of such methods of reform that results have flown in direct proportion to the enforcement of precautionary measures. Here the idea of sanitation asserted itself. The reforms instituted aimed first to purify the surroundings of the lying-in woman by a freer supply of pure air and less crowding and, second, to prevent contagious influences from gaining access through the agency of those in attendance on the puerpera. See the results of the enforcement of this idea by the statistics of Lariboisière Hospital. In 1855, 467 labors took place in this institution with a total death from puerperal causes of 39 cases, 8.4 per cent. During the year 1878, 890 cases of labor took place with a mortality of 10 from puerperal causes, or less than .9 per cent. In the Marbourg Obstetric Clinic for the year ending March 31st, 1888, 308 women were confined with no deaths. In Leopold's clinic during the year ending May 1st, 1887, 1,403 women were delivered without a death from sepsis. In our own country Garrigues has shown from the records of the New York Maternity Hospital that from 1875 to 1886 the mortality from puerperal disease had fallen from 2.63 per cent. to .98 per cent. In whichever direction the search is made for statistics it will be observed that the lowering of the death-rate

during the puerperium from septic processes has been in direct ratio to the acceptance and enforcement of the principles of sanitation. So marked has been this fact and so evident are the results of strict sanitation upon the destiny of the lying-in woman that in one or two European countries (Holland and Belgium I believe) the enforcement of strict sanitation upon the part of those engaged in midwifery practice is made a legal enactment with attached penalty for its violation.

The rapid growth of professional and public sentiment in support of thorough sanitation before, during and after confinement has done more to reduce puerperal mortality than all other agencies previously employed. But the influence of sanitation upon the welfare of the lying-in woman, as pronounced as it has been, only expresses half the debt of womankind to the principles which sanitation embodies. Authorities about agree that whilst labor is a physiological process it leaves woman in a pathological state and that she is indirectly exposed by virtue of the traumatism she receives to all the sequelæ of a surgical procedure. There seems then no rule applicable to the details of a surgical operation which should not be enforced in the management of labor. The two procedures—one natural the other induced—occupy analogous positions and respond equally well to the same principles of sanitation. So we find, as in obstetric surgery the sanitary idea has conquered a mission of widest influence and usefulness, so in gynecic surgery the sanitary principle has gained a triumph no less astonishing and beneficent. Through sanitation the abdomen has become the tramping ground for every manner of incursion. The peritoneum, at one time the *bête noir* of the laparotomist, now receives his friendly touches with kindly behavior and complacent composure. Experience has taught that the sanitary principle rigidly enforced is the *sine qua non* to success in abdominal work. The abdominal surgeon who dares to ignore the principles embodied in the teachings of preventive medicine does so in the face of all that is profitable in experience and commanding in authority. Whilst eminent authorities may differ as to the necessity for antisepticism, so-called, none dispute the principles of which asepsis is the central idea and cleanliness the watchword.

The influence of the aseptic idea upon abdominal surgery has been shown in such numerous instances that a statistical statement may seem out of place in this connection. I cannot refrain from calling attention, however, in this paper to the astonishing results presented by the work of Mr. Lawson Tait and of Dr. Bantock, both of whom are noted for the thorough attention given to the details of operative work and to the principles of sanitation. Mr. Tait has been able to record a total of 146 ovariectomies without a single death, whilst Dr. Bantock's

record shows 86 successful cases in consecutive order. It has fallen to Mr. Tait's honor to record a total of 1,000 abdominal sections with the low mortality rate of 5.3 per cent. in contrast with the work of a great predecessor in this field whose first 1,000 laparotomies gave a mortality of 25 per cent. To what special factor can this difference in results be attributed? Apart from any special fitness or training upon the part of the individual operator the knowledge of a sanitary law will assert its influence in the decision reached. If we move faster than those who have preceded us, is it not fair to assume that this progress is largely due to the fact that we have caught hold of progressive ideas and principles and have been ready to accept and enforce such principles as the embodiment of a broad and rational system of scientific development?

Whilst then it will appear from the foregoing considerations that it has been the distinguished mission of sanitary science to reduce puerperal mortality to its present low percentage it is a most striking fact that sanitary science largely owes its present influence to the observations made during the puerperium and to the deductions made from such observations. It may be profitable to inquire how these mutual influences have been brought about. An examination of the status of sanitary science prior to the acceptance of the doctrine of specific infection will show that the laws of sanitation were so general in their application and so indefinite in their aim that general results only followed their enforcement. So long as the causation of disease was involved in obscurity just so long were the means of arresting or destroying causative influences imperfect in design and in effect. An imperfect conception of an etiological factor implied an imperfect application of the methods of combatting causative influences. Our present knowledge of the behavior of contagious and infectious miasms and our knowledge of the means of arresting or of preventing their influence is based upon a knowledge of their individual characteristics, mode of development, manner of action and form of expression. This knowledge of cause and of effect has made more reliable those methods of sanitation which deal with causative influences. The perfection of the principles of sanitary science rests essentially upon such knowledge. The Ancients knew thousands of years ago that foul air and impure water were causes of disease. This knowledge is instinctive in many forms of animal life. Yet whilst this was true human society profited but little by such knowledge until it was further shown that epidemics and pestilential diseases were likewise referable to atmospheric influences. But sanitary science still labored in the dark when it merely dealt with impure air, food and water. Its principles were only in part known, and only partially un-

derstood ; it dealt in the most rudimentary way with the origin and spread of contagion and infection. The evolution of the science of preventive medicine has only moved from this crude domain of general principles to a plane of high art and specialized function since it entered upon the study of the etiology of disease from a standpoint of microbiology. The belief in a poison germ first came and then the methods of preventing the development and spread of this germ followed, but this idea, as great as it was in advance of former ideas, was not sufficient. It was not until the microscope revealed a world of organisms at peace and at war with the animal economy, many rendering important service to animal life, others destroying animal life in manifold ways, that the study, arrangement and classification of microorganisms, the discovery of their influence upon fermentation, putrefaction and as carriers of disease, the recognition of their presence in zymotic and infectious diseases were successfully worked out. These studies in microbiology led to such an understanding of the nature and cause of disease as to bring into successful operation approved methods of arresting and preventing diseased processes. The progress of scientific enquiry has largely, if not conclusively, confirmed the opinion that as all ferments are living organisms so all contagia are allied living organisms. The special organism in its causal relation to a special disease has been determined in too many instances to admit of doubt as to the existence of specific bacteria as a special factor in the causation and extension of diseased processes. From the date of the discovery of certain rodlets in the blood of animals suffering from splenic fever by Pollender in 1849 down to the present time the causal relation between bacteria and disease has been strengthened and confirmed by the most careful investigations. The discovery of the bacterium of relapsing fever by Obermeyer followed in 1873. The discovery of the bacillus tuberculosis by Koch in 1882 was a most important advance in establishing the truth of the germ theory. Next came the important observation of Koch in 1883 on the comma bacillus of cholera. Discovery of one microbe after another has followed until it is now well affirmed that there is a microorganism of syphilis, of gonorrhoea, of malaria, of whooping-cough and pneumonia, of typhoid fever, diphtheria and erysipelas, of septicemia, pyemia and tetanus. The doctrine of spontaneous generation, no longer tenable, gives place to the germ theory that no life is evolved save from a living germ. The importance of this principle—now accepted by the most reliable observers as an established fact—has been affirmed by the statistics of modern medicine and surgery in no mistakable language. Sanitary science aiding with its principles of cleanliness, of disinfection, of asepticism has lifted the practice of

medicine and surgery to their present plane of successful combat with microorganisms. Medicine and surgery on the other hand by the acceptance of the principles of sanitation have strengthened the influence of the sanitary idea until it has been broadened into a science of modern microbiology, preventive medicine and aseptic surgery.

I have now attempted to show that the discovery of an external influence of septic origin was the first step in the direction of arresting pathological states dependent upon contagious and infectious conditions. If diseases originate from disease germs, whether manufactured within or external to the human economy, the prevention and cure of disease must be undertaken from a standpoint which aims to combat such germs. It has been shown that when once the germ has gained access to the human economy its growth is so favored by conditions that a combat with its influence must be waged at a great disadvantage. Those agencies which destroy bacteria also destroy human tissues and it is an unequal contest which science wages with germicides against bacteria safely housed in the fluids and tissues of the body. Science has yet no specific germ destroyer of safe internal administration. Quite evident is it that the great aim of science is in the direction of preventive medicine which seeks to arrest all forms of bacterial development *in embryo* as it were, and thus intercept their disastrous influence as promoters of disease. The conditions under which microorganisms develop and multiply, the modes by which they are carried from place to place, the pernicious influence they are capable of establishing are now pretty well understood. Through the agency of air, water, food and clothing, through moisture, warmth and all uncleanness, through putrefaction, stench and imperfect drainage the various organisms find ready avenues of travel and all the conditions necessary to their culture and activity. Sanitary science has discovered these facts, aseptic medicine and surgery have confirmed them. The general recognition of these facts alone is now needed to secure the immense results which are destined to follow the acceptance and enforcement of the sanitary principles in their integrity. Just so soon as the entire profession of medicine is brought to a position from which all professional work is made to conform to the universal law of sanitation, from that moment will the statistics of mortality from all preventable diseases reach the lowest possible limit. But the general enforcement and acceptance of the laws of sanitation by the profession of medicine are wholly inadequate to the purpose. The public mind must be educated up to the full understanding of the important influence of strict sanitation upon the public health. This can only be done through intelligent and liberal legislation, through

wise and well-trained public officials, through efficient health organizations, and lastly through the intelligent coöperation of the citizen. Is it a utopian scheme to hope for such intelligent action and large acceptance of the principles of sanitation as are here outlined? Let those answer who have witnessed the progress of preventive medicine within the last quarter of a century. So long as human society is cradled in the lap of ignorance and folly, just so long will its growth be hampered by its surroundings, but as society rises in intelligence and into the liberty of a rational and enlightened conception of its wants and necessities we may expect it to accept and adopt those higher principles of social government which will perpetuate its existence in the most perfect form. The conclusions which may be drawn from the foregoing general consideration may be summed up in brief as follows:

1st. The doctrine that diseases of the puerperium and the pathogenic processes following surgical procedures are of bacterial origin is now universally accepted by scientific authorities. This opinion asserts the idea that diseases are of septic origin, that they are introduced from external influences and do not originate *de novo* in a given case. This view annuls the doctrine of spontaneous development of microorganisms and traces their origin to antecedent conditions.

2nd. The acceptance of the doctrine of external origin of microorganisms implies the necessity of preventing their cultivation and propagation before they have gained access to the human economy.

3rd. The science of sanitation has for its mission the destruction of microorganisms and the prevention of all pernicious influences which would arise from their propagation.

4th. The principles of sanitation are entitled to the utmost consideration and enforcement in all methods of medical and surgical work. These principles insist upon the employment of every known means of preventing and of arresting diseased processes dependent upon bacteria by the removal of all conditions which favor the development and conveyance of such bacteria.

5th. The medical profession is now fully cognizant of the various agencies through which diseased germs originate and the numerous channels through which they are introduced into the human economy. It therefore becomes the solemn duty of the medical profession to give full support to the teachings and principles of preventive medicine and to advocate the fullest acceptance of such teachings and principles by the general public through regularly organized channels of public sanitation and through appeals to intelligent citizenship.

## ONE YEAR OF ACETANILIDE IN PEDIATRIC PRACTICE.

*Read in the Section of Diseases of Children at the Fortieth Annual Meeting of the American Medical Association, June, 1889.*

BY I. N. LOVE, M.D.,

PRESIDENT AMERICAN MEDICAL EDITORS' ASSOCIATION; PROFESSOR DISEASES OF CHILDREN; COLLEGE OF PHYSICIANS AND SURGEONS, CONSULTING PHYSICIAN CITY HOSPITAL, ST. LOUIS, MO.

Carbolic acid and its allies, all products of coal-tar, have been demonstrated to be of great value.

Of this class none, in my judgment, are superior to acetanilide. This substance was prepared as early as 1853 by Gerhardt, by the action of aniline upon acetylchloride, or anhydrous acetic acid, but up to a year or so ago it was not known to possess valuable medicinal properties.

The discoverers of the fact—Cohn and Hepp—that the drug possessed excellent therapeutical qualities gave it a new name, supposed to be more appropriate for use in prescribing, namely, "antifebrin," which name is protected by patent laws, and only the authorized makers and agents can use this term.

"Acetanilide" is in every respect identical with antifebrin, but possesses this advantage, that it is cheaper, and in specifying it we do not cater to the patent medicine trade. It forms colorless, shining plates, melting at 233.6° F., boiling at 563° F. It is almost tasteless, but after a time a slight burning sensation is produced upon the tongue. It is somewhat insoluble in cold water, more readily soluble in hot water; very freely so in alcohol or alcoholic solutions.

It possesses neither basic nor acid properties, and is not readily attacked by most reagents.

In general, my experience has convinced me that acetanilide is about three times as effective as antipyrin in promptness, duration, and extent of action, and is certainly less depressing and correspondingly dangerous. I might readily pay tribute to the value of the drug in adult practice for the relief of violent neuralgias, facial and sciatic; high grade fevers, typhoid and malarial; the discomforts of gout and rheumatism—but this is not the object of this paper.

It is my purpose to present the epitome of one year's experience of the use of acetanilide in the treatment of diseases of children. This experience is a complete endorsement of the announcement of Widowitz in favor of its peculiarly safe and steady action in children up to 4 years of age, or twice or thrice the amount in those older.

When the drug is given for its analgesic effect, where the temperature is normal, it requires eight times the amount to secure the fall of one degree of temperature that it does when fever is present.

At the last meeting of the British Medical Association, at Glasgow, Scotland, Dr. J. Theodore Cash made a most elaborate report in the Section of Pharmacology and Therapeutics upon acetanilide and its kindred. He stated that when it is