

would add his firm belief that the different methods of hydro-therapeutics, electro-therapeutics, and even the much discussed suspension in tubes, acted in a like manner. Let us admit, then, concluded the orator, the importance of the role which the mind has in morbid phenomena, and allow that, as we had psychology, so we also had psycho-therapeutics.—*Lancet*.

### THE TREATMENT OF PNEUMONIA BY TEPID BATHS.\*

By GEORGE N. KREIDER, A. B., M. D., Springfield, Ill.

DURING the past few years much has been written about the alarming mortality of pneumonia. Men whose wide experience has extended over a long period of years affirm that the death rate is much higher under the present accepted modes of treatment than it was forty years ago, when the pathology of the disease was almost unknown.

It would hardly seem that our therapeutics of pneumonia is commensurate with our knowledge of its etiology and pathology. Some endeavor to explain this increased death rate by supposing that a change in the character of the disease has occurred in the last half century, while others claim that the statistics are made more unfavorable by the fact that a large number of poorly nourished and dissipated persons are now treated in the large city hospitals where these comparisons have been made. Whatever may be the explanation, it remains true that the mortality rate is extremely, and I believe unnecessarily, high. The high mortality rate of pneumonia and typhoid fever in America is the medical opprobrium of our country. Dr. Osler says death in this disease is most frequently due to high temperature and heart failure, and it is against these very grave symptoms that our present treatment is least effective. The same statement might be made, and with equal truth, concerning typhoid fever.

The newer antipyretics, antipyrin and antifebrin, have their place, and if used with proper precautions may render material assistance; but, used in a routine and indiscriminate manner, they are capable of doing more harm than good. They may enable us to reduce the height of the temperature, but are not lessening to any great extent the mortality of this disease. Too frequently they depress the heart's action and disturb the stomach, and thus cause complications of the gravest nature by preventing the patient's taking a sufficient quantity of nourishment and by impeding the circulation of blood through the lungs. After careful consideration, and influenced by the successful use of the ice coil in my practice, in the treatment of typhoid and puerperal fever, I came to the conclusion some time since that a change in my method of treating pneumonia was desirable.

Relying upon the statements of well-known German authorities, I decided to make a fair and impartial trial of tepid baths in grave cases. The employment of these means is so contrary to all our American teachings and traditions that it is only in the last six months that I have gained sufficient courage to employ them. So great is the fear of cold in the minds of both the laity and the profession that it is doubtful whether I would have been permitted to make the experiment earlier in my professional career. For this reason the number of cases which I am able to relate in support of my views is not as great as would be desirable. However, I believe that a careful clinical study of a few cases is quite as valuable in proving principles as tables embracing an indefinite number can be.

Modern investigation has certainly proved that micro-organisms of some kind, and not colds, are the immediate cause of this disease, and in the light of this discovery all mistaken prejudice against baths and cold applications must fall to the ground. Pneumonia is essentially a fever, which should be treated, as far as its effects on the respiration, temperature, heart, and skin are concerned, like any other fever. I do not pretend to say that every case of pneumonia should be treated by baths.

Strumpell wisely says it is disadvantageous, if not injurious, to give a patient baths if the disease is progressing favorably, for almost every bath has some disagreeable features which should be avoided if possible. All these disagreeable features vanish in a bad case. The possibility of the necessity for baths should be had in mind on assuming charge of every case of pneumonia, and arrangements made accordingly. A portable bath tub should be in storage from which it can be taken at a moment's notice.

The dealer of whom I procure the tubs rents them out at a reasonable figure, and is easy of access day and night. A portable tub can be placed by the bedside and the patient lowered into it without the least physical exertion on his part. The patient should be placed on a single bedstead, with low head and foot pieces, for convenience in handling sponges and towels; dry sheets and blankets should be on hand in abundance for use during and after the bath. After the tub is once properly filled, very little more disturbance is necessary, since the water will retain its heat for a long time and one or two buckets of hot water will bring it to the required temperature. The reasons for resorting to the treatment should be fully explained to the relatives, and their hearty co-operation secured. I have thus far found little opposition where this treatment was proposed, and this was usually volunteered by some officious neighbor whose medical attendant "never did such a thing." The physician himself must superintend and assist in giving the baths. Especially is this the case in children, whose expression of fear will often influence the parents to the detriment of the treatment.

I have used baths in the treatment of six cases. All have not been successful, but in none were any bad symptoms caused by the bath; on the contrary, in every case the patient came out of the tub refreshed and improved, for the time at least. The first case treated was Mrs. F. W. T., aged thirty-five, seen with Dr. Dresser in the second week of puerperal fever, and with strength reduced by that disease. She developed at this time catarrhal pneumonia of the right lung, beginning with a severe chill, pain in the side, and elevation of temperature, pulse and respiration. She was treated with antipyretics, stimulants, and expectorants for six days, without very apparent benefit. Matters had seemingly reached a critical point. The

\* A paper read at the thirty-ninth annual meeting of the Illinois State Medical Society.—*Medical Record*.

pulse and temperature remained elevated, and little or no material was raised from the lung. There was coma, a vigil, muttering delirium, and picking at the bed clothes. I finally urged, as a last resort, the employment of a bath, to which my colleague finally consented.

To give it we were obliged to carry the patient to another room and immerse her in a stationary tub, which was only accessible from one side. This increased the labor of the treatment a great deal, and minimized its benefits. The temperature of the baths was 98° F.; temperature of the patient, 103° F. The bath was given at 9 P. M., and the condition of the patient being alarming, I remained all night an anxious watcher at her bedside. My concern may be better imagined than described. I had, with many mental misgivings, urged a procedure which until then, I believe I may say, was unknown in the community, and severe condemnation certainly awaited its failure. During the night some encouraging symptoms appeared. She was bathed twice the next day, each time with some slight benefit, but it was not until a somewhat more prolonged bath was given, on the following morning, that the rusty-colored sputa began to come away in any quantity. Four baths in all were given. As showing the condition of the patient and the value of baths, I may relate that her husband, an unusually well posted clergyman, had cabled the patient's sister in London the news of her impending death. The patient has fully recovered, a result which I think would scarcely have been possible without the baths. One interesting feature of this case is the comparatively low range of the temperature. It never went above 103.5° F. The fever was not entirely controlled by the baths, as it went to as high a point after we had discontinued them as before; but their effect in loosening the exudation and stimulating expectoration and the heart's action was so marked as to be beyond question.

The second instance in which the baths were employed was in the case of W. K., aged twenty-three, seen with Dr. Walter Ryan, in the fifth day of the disease. The temperature was nearly 105° F.; respirations, 64; and pulse, 144. While on a drunken spree he had been stricken with a severe type of the disease, and had been treated with antipyretics and stimulants *secundum artem* by Dr. Ryan. It was our opinion that death was inevitable in a few hours, but influenced by the brilliant success in my first case, it was decided to give him the benefit of the baths. They failed to rescue him, but not only did they do no harm, but, we believe, sustained life thirty hours longer than would have been possible without them.

The next case to which I successfully applied the treatment by baths was Willie G., aged ten. On the third day of an attack of measles he developed pneumonia, and it was only then that I was called to attend him. I found his respirations 84 per minute, pulse above 160, blueness of the lips, and temperature 104.8° F. I lost no time, after informing the family of the gravity of the case, in preparing to give him a bath. In default of a regular bath tub, and as I deemed an immediate bath imperative, we made use of a large-sized wash tub in which the boy seated himself, while myself and assistants poured the water over him. He came out of the tub improved. Six hours later, finding alarming symptoms again present, I put him in a second bath. This completed the good effects of the first and started him on the highway to recovery. Eighteen hours after the first bath his respirations were 40; pulse, 126; and temperature, 102° F. Rapid convalescence followed.

The fourth case is that of Mr. W. S., aged twenty-five, whom I was called to see at a coal mining station ten miles from the city. Finding pneumonia of the right lung imminent, he was brought to the city by special train and placed in St. John's Hospital, where he soon developed the disease in its most severe type. The temperature reached the unusual figure of 106.2° F., and this despite the employment of antipyretics and the ice coil. When it reached the highest point, the unconscious patient was placed in a bath at a temperature of 95° F., where he was kept for ten minutes. This procedure was repeated in four hours. These two baths were sufficient to break the force of the disease, and steady and rapid improvement was noted from the time of their use. Expectoration, which had ceased with the appearance of the bad symptoms, became again abundant, consciousness was regained, and the heart's action improved. This patient weighed two hundred and eighteen pounds, but the labor of handling him was much less than was anticipated. The small number of baths required was the more remarkable because of his development of adipose.

The fifth case is that of M. J., aged seven, whom I saw early in the disease, when there was probably little more than congestion present. The symptoms of pain in the side, distressing cough, and elevation of temperature and pulse were great enough to call for active treatment. Instead of giving the usual antipyretics I gave two tepid baths, and was thus enabled to change this picture to one of quietude and freedom from pain, and a rapid convalescence.

The sixth case was that of L. D., aged sixty-nine, in which, unfortunately, the bath treatment was not given until after severe symptoms of heart failure had developed. The effect of the bath was good for the time being, and although the patient did not recover, the bath had nothing whatever to do with the fatal result, which was due to heart failure. My only regret is that the treatment was not instituted earlier in the case.

The results of my trial of this treatment, it will be seen, give a mortality rate of thirty-three per cent. This is not a very encouraging argument in its favor, but statistics in so small a number of cases should not be used in that way. As a result of my clinical study of the use of baths, I am prepared to indorse the statement of their good effects made by gentlemen high in authority and with a large experience in their employment. My two patients who died were already *in extremis*, and two of the cases of recovery were calculated to give as severe a test of the treatment as one is likely to encounter. The treatment means work on the part of the medical attendant, and he who prefers to write a prescription to using some physical exertion had better remain an advocate of antipyretic medication.

The conclusions I make in closing this very imperfect presentation of the benefits of baths in pneumonia are:

1. They should only be given in those cases which are not progressing favorably.
2. In severe cases nothing is calculated to give so much relief to all bad symptoms. They shorten the duration of the disease and of convalescence, and reduce the mortality. Liebermeister says it has been reduced in his hands from twenty-five to ten per cent.
3. Rules for selecting cases and administering baths cannot be rigidly given. The thermometer is not always the guide for their administration. Difficulty of respiration and lack of secretion should lead to their employment, regardless of the height of the mercury.
4. The temperature of the bath should be one hundred degrees or less, depending on the severity of the case and the condition of the patient. Baths of extremely low temperature I have not found necessary as yet, but should not hesitate to employ them if occasion should require.
5. Stimulants should be given just before entering and on coming out of the bath tub. The patient should not exert himself in the least.
6. The physician should himself superintend and aid in giving the bath. This rule could only be broken by having trained nurses who are competent to meet the emergencies which might arise.

### THE BROWN-SEQUARD DISCOVERY.

By G. ARCHIE STOCKWELL, M. D., F. Z. S. (Member of New Sydenham Society, London), Detroit, Mich.

THE announcement made by Prof. Chas. Edward Brown-Sequard before the *Societe de Biologie*, of Paris, on the 8th of June last, has been received with emotions of mingled surprise, belief, and skepticism by the medical profession. Some of his academical colleagues, without inquiry as to the facts that are, or might be, embodied, found therein a source for gibes and ridicule as unseemly as they are oftentimes obscene. Certainly it would seem as if the age and previous standing of the eminent physiologist, to whom we owe nearly all that is known of neuro pathology and therapeutics, including the value of the bromides, should entitle him to at least respectful attention.

Again, most unfortunately, the matter has been taken up by the secular press in an almost indecent manner, and spread broadcast as an "Elixir of Life," the venerable professor being compared to Dr. Dee, Ponce de Leon, and the witches in Macbeth; besides, opportunity has been offered a large class of sensational practitioners and pseudo-medical men to advertise themselves and their wares.

But what are the real facts? Simply, that Prof. Brown-Sequard, after nearly a quarter of a century of careful and conscientious experimentation, conducted in part upon himself, announced, he has reason to believe, a remedy of value, with the specific action of a cerebro-spinal stimulant, contained in the secretion of certain glandular structures intimately associated with the reproductive function!

Certainly there is little of the sensational in this, since the therapeutic action upon the economy of various animal substances has long been known, and their employment limited only by reason of the many difficulties attendant upon administration and preservation of such readily decomposable and highly nitrogenized structures. Further, Brown-Sequard's experiments were founded alike on scientific precedent and tradition, for those most conversant with the earlier history of civilization, and who have delved among the records of extinct and prehistoric nations, are well aware of the probability that, in many things pertaining to the phenomena and mysteries of life, the ancient philosophers were immensely our superiors. To-day we have returned practically to the theory of conception enunciated by Aristotle. The records of ancient Chaldaea and Egypt, and the older books of Holy Writ, exhibit a familiarity with the physiology, pathology, and hygiene of reproduction, and of the generative apparatus, including functions, that are scarcely at all understood by moderns; while is also observed a veneration for specific glandular products that is not susceptible of explanation by any modern sanitary or philosophic hypothesis.

Turning to the history of Phallic worship, we find ourselves at the root of all science, as well as religion, in the veneration of the source of life and the creative principle. It was for an insult to Phallic doctrines that Onan was cursed, and we now know also that the crime that brought the fatal draught to Socrates was Phallic heresy.

It is a trite assertion of science that "no myth or tradition is without a basis of fact," and accordingly we find in Hebrew and Egyptian records evidence that the same product employed by Brown-Sequard was in vogue as a therapeutic measure in the earliest times. In the days of imperial Rome it entered into the "witch potions" dispensed to the libertine patrician youth and the elixirs employed by Nero and Caligula to sustain their prolonged and sensuous debauches. In the middle ages the repute of such preparations had no way lessened, but rather increased; and we find Phillipus Aureolus Theophrastus von Hornheim, better known, perhaps, as Paracelsus (1493-1541), who in many respects was four centuries in advance of his time, dispensing the same as the chief ingredient of potions that obtained a world-wide celebrity. That these were not original with him, but obtained from study in the Arabic and Saracenic schools, which until the downfall of the Moorish empire in Andalusia were the only accurate sources of scientific information and progress in Europe, is self-acknowledged.

Skipping now to the seventeenth century, we find the same products strongly lauded in the London Pharmacopoeia of 1676 and Salmon's New Dispensatory of 1684. In the latter part of the next (last) century, however, these were abandoned, not because of any evidence of lack of therapeutic virtue and activity, but, as stated by the Encyclopaedia Britannica, third Scotch edition (1783), "on account of inexpediency, viz. the difficulty of obtaining fresh as demanded, and the still greater difficulty of preserving." To-day, too, in West Britain and portions of Scotland and Ireland, the same are employed by farriers (administered on a fasting stomach), to renew vitality in worn-out and jaded stockgetters, and with a degree of success, as must be admitted, entirely incompatible with the theory of mere coincidence.

Recognizing the possibility, not to say probability, of the correctness of Prof. Brown-Sequard's views, Mr. H. F. Mier, a well known chemist of Detroit, associated

with the scientific department of Parke, Davis & Co., undertook an analytical examination of glandular products such as are employed by Brown-Sequard, and succeeded in isolating a leucomainic alkaloid which under physiological investigation proved to be the active agent. This alkaloid has since been identified by Mr. Mier with *spermine*, announced by Schreiner in 1878, with the chemical formula of  $C_2H_5N$ , as existing not only in specific glandular products, but in the hearts and livers of calves, and upon the surface of morbid specimens that have long been immersed in alcohol. The phosphate of spermine (as it is now known to be) is identical with the so-called Charcot-Neuman's crystals, discovered some ten years earlier.

Further examination developed the fact that spermine exists in considerable proportion in all normal gray nerve matter of the brain and spinal cord: in oysters, eggs, mussels, lampreys, fish muscle, ova and milk: in the products of all atonic mucous membranes that develop excessive and abnormal secretion. Hence it appears also as a waste product in the expectoration of phthisis, senile and acute bronchitis, and emphysema with catarrh, and in the blood, spleen, and liver of anemics, and others afflicted with wasting diseases.

No little material for reflection is afforded in the fact that this product obtains in excess in the wasting diseases, notably leucocythæmia, where the proportion of white blood corpuscles to red is as one to three, against one to three hundred and seventy-three in health. Here spermine is found lacking in the brain, though it may be isolated from the circulation in disproportionately large quantities: and the administration of iron, which decomposes in contact with alkaloid, forming soluble compounds, appears effective in restoring to the nervous system its proper tone, by again imbuing it with this product.

It is a well known physiological fact that most of those suffering from wasting diseases, such as tuberculosis, catarrhal pneumonia, anæmia, phthisis, etc., where mucous membranes are involved, fail mentally and physically in a degree altogether disproportionate to mal-nutrition, also disproportionate to the amount of food ingested, digested, and assimilated; hence we are forced to look for some other agency than mere dynamic waste as physiologically understood. Again, the loss of vital portions of the sexual apparatus so completely transforms the individual mentally and physically, that physiologists have been forced to acknowledge a cause unknown, and inadequate of explanation by mere removal of glandular tissue. Such individuals are rarely long lived, are lacking in general brain activity, and devoid of normal economic tone. Again, it is an indisputable fact that genital affections of all classes are accompanied by wasting, excessive pallor, and general exhaustion of the economy, most manifest, however, in the central nervous system.

In the laboratory experiments of Mr. Mier, it was found that the *hydrochlorate of spermine* ( $C_2H_5N.HCl$ ) is the most convenient and desirable form of the alkaloid, as it is most stable, and freely soluble in water, though scarcely at all in alcohol or ether. It crystallizes in hexagonal prisms united in tufts, and resembles in no small degree the muriate salt of cocaine. It may be administered by the stomach, as well as subcutaneously, if desired, as it is non-toxic, dialyzable (and therefore readily absorbed), though to obtain its best action it should be employed only when the gastric functions are in abeyance, in order to insure its passage untransformed into the duodenum.

It has been supposed by some that the physiological effects observed by Brown-Sequard from the employment of crude glandular secretion might be due to the contained ammonio-phosphate of magnesium, or phosphatic salts, but experiments with spermine hydrochlorate, in which all ammonia and phosphoric acid combinations are eliminated, prove the alkaloid alone is the factor. The latter, employed subcutaneously in doses of  $\frac{1}{10}$  of a grain, in dogs and cats, induced marked physical and mental activity and profound and prolonged stimulation of the genital system. In one aged animal, the vital processes were so far rejuvenated as to cause in three days the healing of an old suppurating, and hitherto intractable, sinus of two years' standing. The effects are not permanent, however, but wear off in from eight to thirty-six hours, according to circumstances, unless the injection is renewed.

These experiments, along with others undertaken in individuals, were performed in the physiological laboratory of Messrs. Parke, Davis & Co., in the presence of the writer, and have been eminently satisfactory from a scientific standpoint, especially as throughout they were governed by careful control investigation precluding coincidence or suggestion. In human beings in doses of  $\frac{1}{2}$  grain, 70 per cent. of the injections were favorable, 10 per cent. indefinite, and the remaining 20 per cent. decidedly negative.

The evidence to be deduced from the foregoing is that in the salts of spermine we probably have a remedy of value, especially as an adjunct to other therapeutic measures: that it is far from being a panacea is patent. Though apparently innocuous, its physiological effects upon the nervous system are such as to indicate its use should be tempered with caution, since the profound exhilaration frequently induced cannot reasonably be continued without a corresponding reaction that must needs be for harm. It is excreted through natural channels.

It is also found that in spite of the general stability of the salt, *per se*, in solution it deteriorates with age, more particularly when glycerine is employed, apparently through oxidation. For this reason it was found necessary to make fresh solutions as required.

Since this product is not upon the market, and not likely to be, for some time to come at least, a few words regarding the mode of isolation may not be amiss.

The *phosphate of spermine* ( $C_2H_5N$ )<sub>2</sub>H<sub>3</sub>PO<sub>4</sub> + 3H<sub>2</sub>O exists in the form of prisms and slender double pyramids, and may be obtained from fresh glandular secretion by adding a trifle of warm water, evaporating to dryness, then boiling with alcohol, permitting the insoluble portion to subside by standing some hours. The precipitate is now filtered off, washed, and dried at 100° F., and the residue, containing the salt, triturated and extracted with warm ammoniacal water, the crystals appearing thereafter on slow evaporation.

If the free base is desired, it is had by decomposing the *phosphate* with baryta and evaporating the liquid, which crystallizes on cooling. The aqueous solution of the base is precipitated by phosphomolybdic and

phosphotungstic acids, by tannin, and by gold and platinum chlorides.

Regarding the irresponsible experiments undertaken, or purported to be undertaken, as reported in the general press, it may be remarked that the majority bear *prima facie* evidence of spuriousness and unreliability. We may also believe that more than one case of dangerous septicæmia has been developed as the result of such irresponsible experimentation, since ignorance of the correct method of preparing the glandular fluid direct, as employed by Brown-Sequard and the measures necessary to segregate effete and dangerous products, are practically self-confessed. The *secretio seminalis* under all circumstances is a fluid of extreme instability, and especially tends to rapid decomposition in the presence of blood serum: and unless obtained immediately upon the death of the animal, and rapidly prepared, filtered, and used, its employment is prone to be attended with disastrous consequences; even then it cannot be deemed positively safe unless the mode of preparation, throughout every stage, has been such as to carefully inculcate sterility and exclusion of all bacterial products. No such objection obtains to the salts, however, as, during isolation, they are submitted to the action of both boiling alcohol and boiling water—ample safeguards against septic infection.

Detroit, Michigan, Sept. 7, 1889.

THE Farmers' Alliance of Georgia is reported to have adopted the following resolutions:

"Whereas, We have been informed that some of our physicians have gone into a combine, or organization equivalent to a combine, that is detrimental to our interests; therefore, be it

"Resolved, That we publicly denounce any such organization, and also any physician who has or may hereafter attach himself to that or any other similar organization; and we will not patronize any physician who belongs to that society when we can do better."

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