

unnaturally contracted. It is smaller than the other; neither does it act so readily. As the disease of the brain advances, then the pupil dilates, till at last the iris becoming quite paralysed, the elastic ciliary ligament obtains the mastery, and the protecting curtain of the eye no longer obeys the nervous system. I do not mean to assert the pupils are never found unequally dilated in epilepsy during the attack, but it is not usual.

With these opinions regarding the atonic condition of the nervous system in epilepsy, I had no difficulty in continuing the same plan of treatment I had commenced for delirium tremens, adding to it that medicine from which I have seen more benefit accrue than any other in the treatment of epilepsy—namely, the oxide of silver.

We will now return to Mr. Sprakeling's report of the case:—

"26th.—Nine P.M.: From half-past twelve to the present time he has had twenty epileptic seizures; they have been much of the same nature and duration; the face becomes rather livid towards the end of each attack. There is no evidence of paralysis during a fit; he lies as if in a sound sleep. His face is flushed, but there is no particular heat of skin of the face or head. The pupils act on the stimulus of light, though sluggishly; pulse rather fuller, about 88, and compressible.

"27th.—Is conscious to-day when spoken to, but his answers are scarcely rational. He jumps out of bed occasionally, and talks a good deal; has had two fits during the day.

"28th.—Improving daily. When questioned he answers rationally at first, but afterwards he talks in a delirious, rambling manner about his occupation; his pulse is 68, small and weak. There is no heat of skin, though his face looks flushed; tongue sore, but not coated; bowels open. Ordered gin, six ounces in the twenty-four hours, and two pints of ale, this having been his usual drink; full diet, with mutton-chop. To repeat the mixture of ammonia and opium previously prescribed. Only one fit during this day.

"30th.—Answers questions more rationally; pulse soft and quiet; not unnatural heat of skin; bowels confined. Compound rhubarb pill every night.

"Feb. 6th.—Improving daily. States that he feels much better. Allowed to leave his bed. He answers questions correctly, but there is still the busy restless manner of the delirium ebriosorum that is not quite satisfactory; bowels regular; appetite good; pulse 84, small and weak.

"12th.—The same diet, stimulants, and medicine have been continued; his manner is more rational and collected. He wishes to leave the hospital, but I advised him to stay a little longer, and he consented.

"19th.—He has been gradually and steadily improving up to the present time. He has had no return of the epilepsy since the 28th of January. His conversation and manner are now quite rational. He states that he is entirely free from pain in his head. Under these circumstances I saw no reason to detain him longer in the hospital. He left it this day quite well. How long he will remain so depends upon himself. If he commences his old intemperate habits, he will very soon be ill again; but if not, I see no reason to apprehend a relapse."

I do not remember a more interesting case, practically, physiologically, and morally. It reminds one of the value of the injunction, "be temperate in all things."

ON THE PROGNOSIS IN APNŒA (OR ASPHYXIA).

By MARSHALL HALL, M.D., F.R.S.;
OF THE INSTITUTE OF FRANCE; ETC., ETC.

To the Editor of THE LANCET.

SIR,—The prognosis in Apnœa (or Asphyxia) depends upon three elements:

First, the physiological *Constitution* of the subject;

Secondly, the *Stage* of the Apnœa (or Asphyxia);

Thirdly, the *Promptitude* with which the chief remedies, Respiration, or Pronation and Rotation, are administered.

The physiological Constitution of the new-born Infant is that of low stimulus and of high irritability. The respiration is, in fact, the respiration, so to speak, of the fish-tribes, the placenta representing the branchiæ; and even of the lowest of these, the extent of surface of that placenta, compared with the magnitude of the animal, being considered,

But the duration of life in Apnœa is in the inverse proportion of the quantity of respiration; that is, the less the degree of respiration, the longer its suppression can be sustained without the extinction of life. The same hibernant animal lives a longer or a shorter time submerged under water, just according to the degree of hibernation, with its low respiration, in which it may be placed, and dies more promptly as that hibernation is exchanged for activity with its high respiration.

The degree of respiration is always linked with proportionate circulation—as effect is linked with its cause—or as supply is linked with demand. The quicker the circulation, the quicker the formation and elimination of carbonic acid or *blood-poison*, but the ordinary *excitant* of respiration, the degree of *necessity* for its elimination being in the same proportion. Hence the destructive tendency of the *warm-bath*, in the ordinary sense of this phrase, for I do not now speak of the *sudden and momentary hot-bath*, (which may prove an excitant of respiration,) but of the ordinary *continued warm-bath*, which, if it accomplish anything, augments the circulation, respiration being still in abeyance; with this augmented circulation, there is augmented formation of the blood-poison, carbonic acid, and this being *retained*, proves a "choke-damp," and, in a word, destroys life. Now the warm-bath, at the Royal Humane Society's Receiving-house, has been a *warm-bath*, and has usually been continued during twenty minutes.

But to return to the *practical* object of this paper, which will be found, as ever, to coincide with *theory* (so commonly and ignorantly decried),—the new-born infant is a creature of the *lowest* degree of respiration. Its life, and the hope of its restoration in Apnœa, is—the *longest*. I believe that, in almost every case of the Apnœa of the still-born, the success of the Ready Method will be complete. For the same reason, the application of this method should be *the most persevering*.

In regard to the *stages* of Apnœa (or Asphyxia,) I may observe that there are most distinctly *four*:

The *first* is that in which the breathing is not quite extinct; The *second*, that in which the respiration has ceased, but may be *excited* by those means which I have so distinctly pointed out on various occasions;

The *third*, that in which respiration has not only ceased, but is *in-excitabile*, and in which therefore our *hope* of resuscitation is in *imitating* or *inducing* the respiratory movements,—that is, in *Pronation* and *Semi-Rotation*;

The *fourth* and last stage is that of true *Asphyxia*,—that in which not only all respiration, but all *pulsation* has ceased, and with it *almost* all hope, or, as Sir B. C. Brodie says, so emphatically, all hope entirely: "If that action of the heart by which the circulation is maintained should cease, as a consequence of the suspension of respiration, it can never be restored. This I positively assert, after having made it the subject of a very careful investigation."*

In the cases of the drowned or the strangulated, the patient may come under our notice in any one of these stages, or in any prior, posterior, or intermediate condition.

The course of *this* Apnœa or Asphyxia is extremely short: *four* or *five* minutes of complete submersion are supposed to be hopelessly fatal. In a given case, the hope is precisely commensurate with the *promptitude* with which this treatment is applied. Certainly the plan, or rules, recently proposed to the Royal Humane Society to be adopted *before* the Ready Method—that is, *the time lost* in these doings—would extinguish all chance, all hope, and therefore *all fair and honest trial of that method*; and I trust that that Society will, for its own honour and credit, reject all such insidious proposals.

The *moment* we see the drowned patient, we should *observe*, for a moment, whether there be respiration, and if so, *wait* and still *observe* carefully; if breathing continue, be careful of interfering, and constantly watching, direct the wet garments to be removed and the limbs to be rubbed, dried, and clothed as promptly as possible, everyone contributing some article of clothing.

But if the breathing has ceased; if there be real apnœa, then, without any delay of any kind, we should enforce, *at once*, the *best measures*, and those are already demonstrated to be—those of the Ready Method, *unpostponed*.

I regard the new Rules lately proposed to the Royal Humane Society as unfair towards the Ready Method, and as fatal to the patient. I believe it to be absolutely *impossible* that any asphyxiated patient should *so survive* the *preliminary* measures proposed in those Rules, as to be subsequently recovered, or *recoverable*, by that method, or any method.

The prognosis, in cases of drowning, &c., is made up of three

* Lectures on Pathology and Surgery; 1846; p. 81.

elements: 1. The *stage* of the affection; 2. The *promptitude* of the treatment; 3. The *adequacy* of the remedies.

In the cases of Apnoea from *Chloroform*, since the *dawn* of the affection will be observed, and the *just* mode of treatment adopted *instantly and on the spot*, I hope for great if not universal success!

It must be remembered, however, that the effects of chloroform are not pure Apnoea or Asphyxia; that there is the poison of chloroform itself to be eliminated from the system.

The same observations apply to this subject, in a minor degree, as to the effects of the narcotic poisons, of which I treated in a recent number of THE LANCET,* and of the success of which an interesting instance has recently appeared in that journal.†

In concluding this paper and series of papers, I wish briefly but distinctly, to notice the chief practical points in regard to the treatment of apnoea (or asphyxia):—

1. It is obvious to all unsophisticated persons that the effects of

Suspended Respiration,

by whatever cause, are only to be removed by the

Restoration of Respiration.

2. It is proved by experiment on the dead subject that respiration is effected by the

Pronation, and

Rotation of the body, with pressure duly applied and removed.

3. The special remedy for apnoea (or asphyxia), then, is this

Postural Respiration.

4. Other subsidiary and supplementary remedies may be added. These are—the means of *exciting* respiration physiologically; as

1. Irritation of the nostrils or fauces;

2. Excitation of the cutaneous excitator nerves of respiration, by dashing

1. Cold water on the face or surface, previously rubbed warm; or

2. Cold and hot water alternately.

And the means of improving the circulation, viz.,—

Rubbing the limbs *upwards* with *energy*, so inducing warmth, and promoting the circulation, respiration existing.

5. Some remedies formerly used are without efficacy, but not without danger.

1. The *first* of these is, the *warm bath*, without respiration;

2. The *second*, all attempts at inducing artificial respiration otherwise than in

The Prone Position.

Warmth shortens life in apnoea; fluids in the throat are apt to be driven or drawn into the *windpipe* in the supine position.

Recapitulation and Conclusions in regard to Artificial Respiration.

1. In the majority of cases it is impossible, by applying and removing pressure to and from the sternum and ribs, to induce expiration and inspiration, the body being in the *supine* position;

2. In some cases the application of the pressure in this position induces a little *gurgling* expiration, *no* inspiration occurring on its removal;

3. In one case, where it seemed impossible to induce expiration by making pressure, respiration became possible after applying pressure with some degree of violence: some obstacle had been removed: was it the tongue, which had fallen backwards, and which had been replaced by the impulse of the expired air?

4. In one case the epiglottis was found, on examination, pressing against the posterior part of the pharynx so as to obstruct the entrance into the windpipe;

5. In numerous cases fluids, either present in the mouth or regurgitated from the stomach, were found to obstruct the entrance into the air-passages;

6. We can, therefore, never be confident of being able to induce respiratory movements in any but the *prone* position, or position approaching the prone;

7. Nay, we never can be assured that in attempting to induce respiration in the *supine* position, we do not force foreign matters into the trachea, and so *destroy the patient*;

8. The same danger attends all other positions, however slightly inclined towards the supine;

9. In the *prone* position, the means recently proposed to accomplish respiration—viz., *alternate pronation with dorsal pressure, and the removal of that pressure and rotation*—HAVE NEVER FAILED, although our experiments have been almost innumerable;

10. It is plain that in the *prone* position the tongue tends to fall forwards, and all fluids flow from the pharynx and mouth, leaving the entrance into the larynx FREE;

11. It is demonstrated by our experiments, that when the subject is laid prone the pressure on the thorax and abdomen induces expiration, the degree of which is augmented by dorsal pressure, and that these phenomena are reversed on removing that double pressure and rotation;

12. Such manœuvres are *equivalent to respiration*, and respiration is the remedy for *Apnoea* (or Asphyxia): the conclusion is obvious.

13. All this can be said of no other mode of proceeding hitherto devised;

14. In the present state of our knowledge, then, *Pronation and Rotation*, as just explained, are *the* Remedy for Apnoea (or Asphyxia).

15. But these measures must be administered *on the instant, on the spot, in the free air*;

16. All *delays*—and *all* other measures hitherto discovered and applied are *delays*: removal, the warm bath, galvanism—are *homicidal!*—a verdict which no authority, nothing short of such indubitable experiment, made by competent persons, as has *not* yet been made, can gainsay.

17. Continued cold, within physiological limits, prolongs life in the circumstances of Apnoea (or Asphyxia); continued warmth shortens it, and is therefore *opposed* to recovery, notwithstanding the place it has so long held amongst the rules for rescuing the drowned, &c.

18. Sudden cold and sudden heat, and especially the two alternately, are, on the contrary, *excitants of respiration*, and therefore remedies in the *first stage of Apnoea*, as, I believe I was the first to demonstrate in regard to the *second* and *third* of those measures.

19. In general, nothing can be of more fatal tendency than the time lost in removal—the warm bath—galvanism;

20. In conclusion, I am compelled to say that I know of nothing in medicine so near *demonstration* as the proofs of the dangers of the former system, and of the simplicity, the safety, and the efficacy of the *Eupnoea* of the Ready Method.

February 18th, 1857.

OBSERVATIONS ON

THE ARCUS SENILIS,*
OR
FATTY DEGENERATION OF THE CORNEA.

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PART VIII.

Of the Hereditariness of the Arcus Senilis.—It has been truly observed by Dr. Barnes,† that “our acquaintance with fatty degeneration is too recent and too little advanced to admit of any extended investigation into the transmission of this disease to successive generations;” and I propose, in the present observations, to adduce a few facts which, whilst they

* “The pulse, the periphery of the skin, the secretions and excretions, cannot be justly appreciated in diseases without taking at the same time into consideration the different symptoms which the eyes present. It is only by submitting the eyes in diseases to the same examination as we use to investigate other parts of the body that our researches will become important and fruitful.”—J. F. D. Lobstein, M.D.: *A Treatise on the Semeiology of the Eye*, p. 41. New York, 1830.

† The arcus or circulus senilis, is often an important visible sign of the tendency to this degenerative change in the system. I have found it present in about nine-tenths of the cases in which I had reason to infer the existence of fatty degeneration of the heart.”—C. J. B. Williams, M.D.: *Principles of Medicine*. Third edition. p. 447. London, 1856.

“It has been too hastily assumed that the arcus senilis so frequently co-exists with fatty degeneration of the heart that the change in the cornea affords presumptive evidence that the more formidable disease is making progress within. We protest against this hasty assumption.”—G. Johnson, M.D.: *British and Foreign Medico-Chirurgical Review*, p. 369. April, 1856.

† *Medico-Chirurgical Transactions*, Vol. xxxiv., p. 192.

* January 17, 1857.

† *Ibid*, Feb. 14, p. 180.