Heart hurry : a clinical study / by Edward Blake.

BLAKE
ON
HEART
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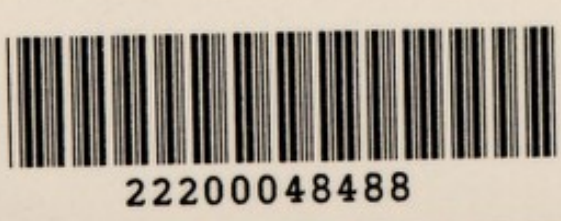

HEART HURRY

A CLINICAL STUDY

BY

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HEART HURRY

BY EDWARD BLAKE, M.D.

THE action of the heart is prone to perturbation as regards *Rhythm*, *Force* and *Rate*.

RHYTHM.

As to the change of rhythm, in a purely practical consideration of the subject the so-called "Cardiac Arhythmia" may be somewhat summarily dismissed. It will suffice here to say that arhythmia occurs in two forms, they are "irregularity and intermittency." Or to adopt another basis of classification, arhythmia may be either nervous or muscular.

Putting aside some secondary morbid conditions as hypertrophy, and aneurysm aortic or basilar, the former, or irregularity, may be accepted generally as evidence that the circulatory apparatus is disordered functionally rather than organically, whilst the latter, *i.e.*, intermittency, appears to confer a positive benefit on its possessor. It may be remembered that irregularity of the heart is normal in certain animals, as the dog. When it occurs in man, as a solitary symptom, it can scarcely be viewed as pathological.

FORCE.

With regard to changes of force, little need be said here; palpitation, its commonest manifestation, will be treated under the heading of "Rate."

Rate.

Quickening and Slowing.

The latter of these disturbances of rate in the heart's action, is by far the more important of the two from a clinical point of view. Nevertheless, for various reasons, the former will chiefly occupy our attention at present.

Heart-hurry.

By acceleration of the heart, or "heart-hurry," is meant a persistent increase of the pulse above 80 in a woman, well above 70 beats per minute in a man, and above 90 in a child.

Heart-hurry is divided into three kinds; they are tachycardia, palpitation and tremor cordis.

Tachycardia.

The term "tachycardia" is not in itself a very beautiful word, neither is it very accurate. Polycardia is better. "Tachycardia" was introduced by Prœbsting, a pupil of Gerhardt, in 1881; it has "caught on" and must now be accepted as a convenient, if not a classic, piece of terminology.

In tachycardia the heart seeks to atone by rapidity, for what it lacks in force. Temporary tachycardia is not in itself a disease. It is caused by exertion in the young and in the aged; in early life too most of the emotions are associated with increased action of the heart.

One most important feature which serves to distinguish between the various forms of cardiac hastening, is that the subject of tachycardia is not conscious of its existence. In this condition, the movements of the heart, in some respects, resemble those of the voluntary muscles of the fœtus, before the stage of quickening. If excited to sudden action during the first four months of intra-uterine life, the movements of the child do not produce any impression on the sensory nerves distributed to the parietes of the mother.

Palpitation.

Palpitation, on the other hand, causes grave discomfort. It therefore resembles the activity with which, after quickening, the babe reminds its mother at one blow both of its own existence and of her possession of sensory filaments in the abdominal wall.

Of palpitation, nearly always combined with irregularity, the patient is perfectly conscious. Again, palpitation is essentially temporary, while tachycardia may persist for months, nay even for years.

Another characteristic of palpitation is that, unlike tachycardia, it does not extend to the smaller arteries.

Tremor Cordis

Is not, like palpitation, related to emotional conditions. Physiologically speaking, tremor is an acute temporary tachycardia.

It has been described as the antithesis of palpitation, for in tremor the heart does not contract enough, whilst in palpitation it contracts too quickly and too forcibly. The heart, instead of wildly throbbing as if it would burst through the chest wall, trembles like a wind-shaken leaf, to quote the graphic description of Balfour, in his well known work on "The Senile Heart."

Though tremor differs so much from palpitation in its mechanism, yet pathologically it is much more nearly allied to palpitation than to tachycardia. The owner of the tremulous heart is painfully conscious of its possession.

The sensation involved in tremor is extremely disconcerting. Sir Walter Scott, who was prone to this disease in earlier life, says of it "I know it is nothing organic and that it is entirely nervous, but the sickening effects of it are dispiriting to a degree." He adds that in his youth it used to throw him into "an involuntary passion of causeless tears."

Tremor is probably toxic as regards its causation. It may either take the form of an auto-toxis, owing origin to

some product of defective katabolism or else it may be hetero-toxic, as when it is induced by tea or by tobacco. I have certainly seen it caused in boys by tea-drinking.

Some support is lent to the toxic view by the fact that, though occasionally seen in the young, *tremor cordis* is much more frequent after middle life and in hearts which are frail and are ready to dilate. It is true that tremor may occur at any age, in any and in every form of heart affection. On the other hand it may attack a heart to all appearances perfectly healthy.

The distinction between the different forms of heart hurry, which, indeed, are often confused together, is not alone a matter of convenience. For these signs differ *toto cælo* as to cause, concomitants, mechanism, time of occurrence, treatment and prognosis. To make this clear it is needful to allude briefly to the chief methods by which the pace of the heart may be modified.

The cardiac muscle may be rendered more or less active, both as regards force and frequency, in two ways; namely, by impulses acting on the circulation

(1) From outside the heart and its appendages.

(2) From the heart itself, its lining membranes or from the pericardium.

The external, eccentric, or peripheral methods of modifying the heart's action, are again divisible into two, which act along different routes.

(1) By the vagal route.

(2) By the sympathetic route.

Speaking generally, the agencies which act through the pneumogastric, when it is in a normal condition, slow the heart, whilst those which affect it by way of the sympathetic both accelerate its pace and augment its vigour. It must be remembered that the existence of excito-motor fibres has never been demonstrated in the human vagus.

It is possible to view heart hurry, either as a stimulated condition of the excito-motor apparatus or as a paresis of the inhibitory fibres. As a matter of fact, nearly all the cases we meet with, certainly all the sustained cases, are examples

of vagal paresis and *not* stimulations of the excito-motor fibres.

The actual number of beats per minute is of considerable service in deciding with which kind of acceleration we may be dealing in any given case. It is useful therefore to store in the memory a few figures as constants or definite standards.

A persistent pulse of 120 is usually a sign of irritated sympathetic.

A sustained pulse ranging between 120 and 180 indicates a suspension of the pneumogastric inhibition.

A pulse above 180 generally points to abolished inhibition, with or without excito-motor irritation, *plus* sympathetic disturbance.

When we have to do with a new case of continued heart-hurry, it is needful to call to our aid every possible assistance, in making an accurate diagnosis. On its accuracy, the success of our treatment must depend; on it, too, must be based those prognostications of the future, which serve either to make or to mar a professional reputation. It is of no use to disguise the fact that here the ground is beset by pitfalls, into one of which the unwary are certain to fall. Our wisdom is then to become well acquainted with all possible sources of error.

It has been asserted that a patient can have a pulse of 300 beats per minute, for weeks together, and yet ultimately recover.

But such a pace is, in itself, quite apart from probable complications, fraught with peril. If it vary not, then a careful search should be instituted for pontine softening; with reflexes, at first exaggerated, and ultimately disappearing altogether.

If this menacing rapidity of action be associated with persistent high temperatures, a dry night-cough, slight nocturnal delirium and tenderness on pressure beneath the left hypochondrium, with the usual physical signs, then endo-, myo- or peri-carditis should be thought of. Acute septic invasions present a somewhat similar group of symptoms, whilst the presence of rigors would suggest

the formation of deep-seated pus, recrudescent ague, or the possible passage of a calculus. It is sometimes stated that no rise of temperature accompanies the passage of a stone. This is quite erroneous.

An exceptionally slow heart, on the other hand, occurring with a high temperature and delirium, suggests involvement of the medulla. The outlook is very gloomy.

Other common causes of heart hurry are :—

A.—*Circulatory Diseases.*

Endo-, peri - myocarditis ; chronic valvular disease ; aneurysm ; aortitis, acute and chronic ; angina pectoris ; arterio-sclerosis.

B.—*Neurocentric.*

Compression, peripheral and central ; bulbar meningitis ; myelitis ; softening ; acute ascending paralysis ; disseminated sclerosis : progressive muscular atrophy; multiple sclerosis of the pyramids, without anterior horn lesion ; tabes.

C.—*Peripheral Diseases of Nerves.*

Peripheral neuritis ; vagal neuritis ; polyneuritis and beri beri ; certain forms of neuritis, usually viewed at present as dermatoses.

D.—*General Diseases.*

1. Acute.
   - Influenza.
   - Enterica.
   - Measles.
   - Scarlatina.
   - Diphtheria.
   - Glycosuria.
   - Peritonitis.
   - Puerperal Fever.
   - Cellulitis.

2. Chronic.
   - Tuberculosis, chronic.
   - Carcinoma.
   - Chlorosis.
   - Syphilis.
   - Malaria.
   - Rheumatism, chronic.
   - Dyspepsia.
   - Diarrhœa.

3. Convalescence from the Exhausting Diseases.

E.—*Toxic.*

1. Aliments.—Tea, coffee, alcohol.

2. Drugs.—Aconite, digitalis, atropin, amylnitrite, tobacco, &c.

3. Reflexes.—From brain, heart, lungs, brachial plexus, stomach, liver, intestines, uterus and adnexa, adrenals, kidney, bladder, prostate, pelvis and abdomen generally.

F.—*Neurotic.*

Graves' disease, rheumatoid arthritis, morbus Addisonii.
Hysteria, the climacterics.
Epilepsy, migraine.

In advanced life, pneumonia, pyelitis and nephritis should never be lost sight of, their onset and advance being so exceedingly insidious.

Such a list could of course be greatly multiplied. It is plainly impossible to consider all the pathological conditions which may be associated with heart hurry, in a brief essay. We must then be content to glance at a few of the more important types. It would be well perhaps to confine ourselves to those forms which we must encounter in daily life, rather than to gratify our curiosity by the contemplation of pathological rarities.

Heart Hurry as a result of Vagal Neuritis.

Some cases of nocturnal palpitation, and also some of those which occur in spinal curvatures and in the subjects

of tight lacing, may be due to the mere physical pressure of a distended stomach or colon, encountering perhaps a temporarily dilated heart. Those instances of true tachycardia, on the other hand, which, occurring once, run a definite course and go, to return no more, are probably due to neuritis of the pneumogastric or of the vagal nucleus in the medulla oblongata. They are not of the nature of vague and transcendental phenomena, known sometimes as "irritation." Whilst they may be at times purely "reflex," they may also be due to definite inflammations of the fibres of the vagus and these are doubtless of toxic origin. There are two well-marked types of vagal neuritis: (*a*) ascending, (*b*) descending.

Ascending Type.—This is associated with three pathological conditions, which may exist either separately or in combination.

1. Myocarditis.
2. Inflammation of the membranes connected with the heart.
3. Aortitis.

Descending Type.—In cases of deep-seated abscess, more especially of pulmonary purulent depôts, as in tuberculosis and pneumonic abscess, we get temporary tachycardia. In these cases it is possible that the inhibitory function of the vagus is suspended by the paralysing action of the toxines of pus on the vagal nuclei. There is a sedative poison acting for a time on the floor of the fourth ventricle.

The actions of tea and of tobacco are probably to be explained in this way.

Some of the cases of menstrual, pregnant and puerperal palpitation have a similar mechanism: whilst others again are a product of dilated stomach.

An excellent example of acute descending neuritis is afforded by diphtheria, when it terminates in death with lung complications. The toxic inflammatory change may descend by the pharyngeal branches of the pneumogastric to the heart, setting up myocarditis, followed by softening and then by dilatation. It may also descend to the pulmonary vagal filaments, causing œdema of the lung bases,

usually diagnosed as pneumonia. A great controversy exists as to whether death during diphtheria comes by way of apnœa or of syncope; as a matter of fact the elements of both may be present, so that it is in the hazard of a die whether one or the other shall lead to a fatal issue.

As to the so-called "gastric crises" which in certain cases come, so like the epileptic seizure, at long but stated intervals and with a distinct periodicity,—these are cases of the extension of the morbid process from the cardiac distribution of the vagus to its gastro-intestinal filaments. It may aid an easier conception of the method, to remember that the causes of tachycardia are the causes of dilated stomach. Amongst the commonest are tea, tobacco, and the toxic innutrition that follows anxiety and traumatism. In point of fact, over action is to the heart what dilatation is to the stomach. Both mean an arrest of nerve control. Both are benefited by nux vomica and by the dry morning meal.

Gastric crises may occur in the course of many diseases, more especially in the toxæmiæ. They have been described by Huchard and Bovet in "Tabes" (see *Le Progrès Médical*, Feb. 15, 1896); by Angel Money, as occurring with transient glycosuria and local sweats in the course of *Rheumatoid Arthritis*.

A very large proportion of the cases of Graves' disease present some deviation from perfect mental and moral balance. The most common and typical psychosis, as pointed out by Maude of Westerham, is exaggerated conscientiousness. My friend, Dr. Williamson of Ventnor, tells me that he has seen mania occur in the course of exophthalmic goitre. Savage says that any disturbance of the mental equilibrium may be and often is present. Gildemeester saw goitre replace epilepsy. Eulenberg witnessed a curious recurring rotation of Graves' disease, migraine and melancholia. As to the tremor, the most invariable member of the group which serves to build up a typical case of Graves' disease, it is common to all the intoxications and this fact is in itself strongly suggestive of the infective origin of goitre. Many of these show the fibrillated finger nail in addition to the curious cutaneous pigment-changes, first

described by the writer in 1881, and afterwards by Dr. Kent Spender, in 1885.

The Neuroses associated with Heart Hurry.

Epilepsy in the aged is usually associated with quick pulse and high tension, the converse of these holds good with the young. Raymond Tripier, of Lyons, long ago noticed the connection of the double heart-beat so suggestive of mitral stenosis, or of digitalis poisoning, with a slow pulse and epilepsy. He gives two cases of remarkable interest in the *Revue de Médecine*, 1883-4. In one, the pulse, habitually 60, fell to 12 beats per minute. This patient died suddenly, yet no change was found in the heart. The second was found to have a pulse of 44, with heart beats 88 during an attack. When free from the fits, her pulse varied from 76 to 100; she died comatose without grave organic disease of the heart.

Thus a very valuable element of prognosis, with regard to epilepsy, is seen to exist in the pulse, which, according to Tripier, is always irregular.

The higher the tension, the more favourable the outlook and for a very definite reason; these high tension subjects are free from organic disease of the brain and of the cord. The increased tension and the cortical nerve discharges are, both of them, temporary and toxic, due doubtless to defects of catabolism or of elimination, they are therefore essentially curable in character. How often have we seen epilepsy in the aged do better under the old fashioned blue pill and black draught than under the best selected "specific remedy" in the world. In epilepsy, the older the patient the more hopeful is the outlook; the reverse is true of neuralgia, in which disease, advanced age is a prominent element of gloom in prognosis. In these cases the possibility of lead poisoning should never be forgotten.

Although there is a progressive tendency to view epilepsy

as usually toxic, still there is certainly an element of tissue innutrition usually present.

The contemplation of the epidemic convulsions in starved districts,* the clonic spasms of animals slowly bled to death and the proneness of underfed children to epileptoid seizures all point in this direction. I will further, in supporting this position, ask my readers to weigh carefully the following points.

The temperature of male adults, having reached its highest point at 6 p.m., falls steadily till 6 a.m. Is it not significant that, with its fall, the frequency of the epileptic seizure rises? In addition to the interesting evidence supplied by the convulsive seizures of animals which are witnessed whilst they slowly bleed to death, there is an imposing array of clinical facts in favour of the view that epilepsy is related to some diminution in the quantity, as well as some deterioration in the quality, of the cerebral supply. In certain kinds of convulsive seizures, as in puerperal eclampsia, it is the quality that is chiefly at fault; in the saturnine form, there is probably a deterioration in the blood as well as the actual presence of poison. This may explain the rarity of lead epilepsy in males. Whatever then causes anæmia, predisposes to epilepsy: however much the fits, in a given case, may seem for a time to improve, the patient is probably the worse ultimately for the free and indiscriminate use of the alkaline salts, so much in vogue in the treatment of epilepsy. This is especially true of the salts of potash, which have been shown by Bouchard, *vide* "Auto-intoxication in Disease," p. 58, to be forty times more poisonous than soda. Again, pregnancy often suspends the course of epilepsy. This no doubt is partly caused by the fact, that the cardiac wall grows thicker, and that arterial tension greatly increases during gestation.

Graves' disease, for the existence of which no perceptible enlargement of the thyroid, even when extending the head and swallowing, is needful, should be first put out of court.

* See "Hecker's Epidemics of the Middle Ages," pp. 87-166.—*Sydenham Society.*

Then we may be helped by remembering that true tachycardia, normal before birth, rare in adolescence, is unknown in early childhood.

The male pulse falls from 140 to 100, in the interval between fœtal life and the second year of extra-uterine existence. Afterwards it ranges between 80 and 75. Now it is curious that, as the tendency to chorea, normal soon after birth, diminishes (for that disease often dies a natural death during the eruption of the second molars), so the tendency to tachycardia increases; it appears indeed to keep pace with the development of the emotional side of woman, whilst in man it corresponds with the tendency to excess in athletic sports, in sexual matters, in the employment of alcohol, of tobacco and of the other nervines. It is curious too, that whilst tachycardia is unknown in very early childhood, yet irregularity of the pulse is exceedingly common, especially during sleep. This is possibly an instance of atavism, for an irregular pulse is normal in dogs. It is well to bear these facts in mind, for they serve to show that irregularity of the pulse *per se* is not a morbid phenomenon.

Treatment of Heart Hurry.

The subject may be conveniently treated in a practical way by taking up heart-hurry as it occurs in adult men, in women and in children, separately. As palpitation and tachycardia sometimes occur in the same subject, it is not possible, in this therapeutic section of the paper, to demarcate the respective limits of palpitation and of true tachycardia, with any approach to accuracy.

Man.

In men a common cause of heart-hurry is acute cardiac hypertrophy. The first indication in its treatment is rest of mind and body. Next comes dieting, small quantities of fluid or semi-fluid food, taken frequently, avoiding as far as possible tea, tobacco, coffee and butcher's meat; whilst alcohol must be rigidly interdicted. Spigelia, cactus, aconite, arnica and the alkaline salts are the safest remedies.

Should the arteries be tightly contracted, then tepid or warm baths 80° to 100° F. are indicated, it being borne in mind that both hot and cold baths shrink the arteries. We should also recollect that pétrissage reduces the arterial calibre, whilst effleurage and tapotement both increase it. We may teach the patient to make forced expirations at stated intervals, followed by deep inspiration.

The presence of a red, dry, glazed throat suggests glycosuria or nicotism, both are associated with thirst and with tachycardia.

The typical smoker's throat is accompanied by a frequent desire to swallow. This, with sleeplessness, nocturnal leg fidgets, and forebodings of evil, is strongly suggestive of nicotism. Now that so many ladies either smoke or sit with smokers, this condition is not confined to the more sinful sex!

We have seen that the passage of a calculus is sometimes associated with severe tachycardia, and as the pain of a passing gallstone may be referred entirely to the cardiac region, it would readily lead to an erroneous diagnosis. Many diseases, common in males, have heart-hurry as an ordinary complication. Amongst them are gout, chronic nephritis, glycosuria, dyspepsia, syphilis and rheumatism. Shock is also a common cause of heart-hurry.

The following case occurred in the practice of Dr. Kenrick Davies, of Llandudno. A man of 45, engaged on the line, suddenly saw an express train approaching him. Having no time to get out of its way, he lay down and the train passed over his body, leaving him, however, quite unhurt. He subsequently had tachycardia for eighteen months, but there was neither goitre nor proptosis.

In cases of heart-hurry, the temperature is an important item; it will serve to aid us in diagnosing between two diseases constantly confused in old tropical subjects, namely, malaria and a recrudescent endocarditis.

It will also assist in eliminating acute cardio-myositis, itself I imagine nearly always toxic. The commonest cause has latterly been the influenza bacillus. This condition of myositis, not always recognised, is much more common

than one might suppose. Most of the acute dilatations of the heart are probably associated with its occurrence. In its treatment, it may be of value to remember that colchicum has the power of inducing it. A case of poisoning by over-doses of this drug has been placed on record by H. M. Moyer, in the *Medical News* of Philadelphia for April 28, 1894. In this case there were hæmorrhagic markings on the right border of the heart, reaching to the apex; with effusions of blood between the muscle bundles. This case is of the greatest possible interest, because we know of scarcely any drug which has been definitely proved to produce primary inflammation of the heart muscle.

Woman.

In women, anæmia is the commonest cause of sustained heart-hurry. It may be of service if we linger to speak more at length on the successful treatment of this rather troublesome disorder. I do not mean the *drug* treatment, that is often the least part of the management of a case of chlorosis.

There is no doubt that anæmia tends to cure itself in time, but unfortunately it takes a very long time, and then too often the heart is left damaged.

A certain number of cases recover rapidly under a favourite routine or orthodox prescription of the combined sulphates of iron and magnesia, or the more modern Blaud's pill. Again a large proportion get well under carefully selected specific remedies; but there is a residue, a kind of "submerged tenth," who have tried the ordinary methods of medical practice, yet all have been found wanting! Then, should the patient be rich, she is taken to a chalybeate spring, and then losing all hope she settles down to despair! There is no royal road to the cure of these cases; and with the present limits set about our knowledge, some of them cannot be cured. We may think that we have done our duty when we have eliminated the possibilities of every local disease known to be capable of producing autotoxis. More especially when we have

hunted in vain for suppuration in the middle ear, in the sinuses and in the antra, seen that the nasopharynx is patulous and removed all carious teeth. When we have forbidden liquids in the morning, more especially tea; when we have removed the nicely-fitting corset, which, by the way, is never "tight," carefully sought for spinal caries or curvature, cured all pelvic and abdominal disease and seen that the feet are in order; when we have examined for dilated stomach by Chomel's "splash sign" and sought for scybala; then we begin to look for heterotoxic factors, as lead in the drinking water, arsenic in the dress, the wall-paper or in the art-fabrics, or else for sewer gas from some waste-pipe imperfectly trapped or not disconnected. When we have done all this, then the far reaching possibilities, involved in the question, will have been considerably narrowed down, but yet the reply may not lie precisely at one's elbow!

I should like to speak here of the very great importance of keeping the highly anæmic subject in a horizontal posture. The mildest case should lie at least one hour in the middle of the day, to prevent the great strain on a badly nourished heart involved in the vertical position.

This danger is shown by the œdema of the feet so often present. The best remedy for the case with leg dropsy is certainly apis mellifica. I use it very largely, I have seen it work wonders.

My chief indications are "symptoms worse in early morning," especially "itching skin" and "deltoid myalgia"; thirst, glazed throat, diarrhœa, scanty urine and albuminuria are additional suggestions for its use.

Sulphur I am very partial to.

Pulsatilla I use when pain over one eye and urticaria suggest the existence of dilated stomach; when of course dry morning meals are insisted on.

Conium maculatum is called for in lymphadenoma, sleeplessness, leg torpor and confusion of mind.

Plumbum is useful in constipation and pain on the left side of the navel, combined with albuminuria, but it must be given with caution and very freely diluted.

Arsenic comes in largely, its indications are so well known that I need not speak of them here.

Iron of course is useful, but usually it has already been well tried before one sees the case. I am much addicted to the use of Flitwick. I order a tablespoonful freely diluted; if in the winter time, then with hot water. Iron should never be taken with food containing tannic or gallic acids; but if constipation be present, it does not necessarily disqualify the patient for the use of iron. I have seen the most severe constipation disappear after sipping a hot solution of steel, in a tablespoonful of glycerine, with a squeeze of lemon in it. The carbonate of iron is the best when gastralgia [neuritis of the sixth dorsal intercostal] is present. A very favourite preparation with Parisian physicians is the protoxalate of iron. If a chalybeate be strongly indicated and the patient is quite unable to take it as crude iron, then it may be remembered that the yelk of an egg owes its colour to an organic form of iron, or Dr. Cooper's favourite *sanguis bovis exsiccata* may be thought of. Dr. Fernie speaks highly of watercress, as containing ferruginous and other valuable salts in an easily assimilable form.

I am still of opinion that anæmia is toxic in origin, the commonest causes in London being sewer gas, the respiration in close rooms of vitiated air, autotoxis from the mouth or pelvis, absorption of peptones from dilated stomach or of ptomaines from retained fæces.

If scybala be present, then the whole colon should be flushed with hot disinfectant, the patient being in the knee-elbow posture: a little borax in mild cases, combined with sulphate of magnesia in severe ones, answers admirably. General light massage, warm voltaic bath, and special lung education, are most valuable. Usually I combine with these measures mild volto-faradic manipulations of the muscles of respiration.

Deep expirations with long inspirations are good, *but without retention of air*, for the arteries are contracted we should remember. I seldom order alcoholic stimulants to my patients, but anæmic girls are often much benefited by a glass of stout at bedtime, which acts in some instances like

a smart purgative. The worry in dieting these cases is that they cannot, or will not, drink milk. It may, however, often be got in by pouring sweetened boiling milk on sliced fruit. Red bone marrow is most useful, and the fresh material is greatly to be preferred to the various artificial preparations now supplied. Very convenient the latter are indeed, but they are most prone to become rancid.

Menstruation. — Next in order of frequency amongst women as a cause of tachycardia is the catamenial function, not only in its commencement, but during its course and at its termination. This we can readily understand when we remember the free supply given by the pneumogastric nerve to the pelvic organs; the keen sympathy too which necessarily exists between the reproductive organs and the circulatory apparatus. The palpitation of girlhood, when it exists alone, rarely demands treatment.

The treatment of the heart hurry of metrorrhagia is necessarily included in uterine therapeutics. Threatened miscarriage, endometritis, polypus and dislocation are the commonest causes. A very remarkable example of the last has been put upon record by Theilhaber, of Bamberg, in the *Bayerisches Aerztliches Intelligenzblatt*, 1884, xxxi. 42, in which a persistent tachycardia instantly disappeared on two different occasions on propping a fallen uterus by means of a pessary.

The climacteric heart-flutterings are best met by lachesis, nux vomica, glonoine, amyl nitrite, erythrol tetranitrate and the other vasomotor paralysing agents, which have been so carefully worked out by Professor Bradbury of Cambridge.

In the *Gazette de Gynécologie* of June, 1896, Kisch has drawn attention to the frequent occurrence of tachycardia after marriage. The remedies should be ignatia or actæa by day and morphia or opium at bedtime.

Constipation, nearly the monopoly of woman, is frequently associated with heart hurry; it is a typical example of toxic tachycardia.

The treatment of this has been detailed at such length heretofore, that I will pass on to mention a condition fre-

quently met with and frequently overlooked. I refer to tapeworm, of which tachycardia may be the only ostensible sign.

Case A.

Tachycardia, Goitre, Urticaria.

Graves' disease.—The heart hurry of one form of goitre is doubtless due to a paralysed condition of the vagal nucleus with or without involvement of the cervical sympathetic ganglia. Roughly speaking, the pale cases are bulbo-vagal in origin, whilst dusky examples are bulbo-sympathetic. The difference between these is well seen in the following typical examples :—

Mrs. ——, aged 31, has had exophthalmic goitre for six years. Four months ago, after some family distress, she developed nettle rash, and she has also well marked gastric crises. The eyes are very prominent, the face is flushed, superficial vessels of the head and neck present the appearance of a person who has been recently hanged. With some local attention to pyorrhœa of mouth and pelvis, and with some general treatment for dyspepsia, dermatitis and rheumatism, she was placed under systematic lung gymnastics. In three months the neck measurement had fallen from fifteen to thirteen inches, the pulse had dropped from 128 to 100, the body weight had increased from 119 to 127 pounds. The proptosis was better, the urticaria gone, she had lost her rheumatism and looked much more calm and placid. I have had a recent report from Dr. C., who sent this case to me, that having been sterile up to the time of the treatment she has now had a healthy child and is improving in all ways.

Case B.

Tachycardia, Goitre and Urticaria.

March 29, 1893. — Miss ——, aged 18, resides in Eastern Canada in a district where goitre is endemic. She is pale and thin. Her hair and skin of the blonde type ; her mother, subject

to rheumatism, was of rather intemperate habits, she died in middle life. The father is alive, he is energetic and gouty. The sisters are of highly strung, nervous temperament. The patient herself, most excitable at all times, is occasionally so extravagant in gesture and utterance, that she appears to be quite irresponsible. She began to menstruate at 12, and soon afterwards she had double pleurisy. The monthly flow had always been profuse but never very painful. Ever since the establishment of the catamenia, she has been prone to temporary attacks of furious over-action of the heart. The attacks are usually preceded by "indigestion," the so-called "atonic dyspepsia," the actual condition being acute gastric dilatation. She has a small goitre and well-marked proptosis. She says that she gets "hives" in the summer. It will be observed that in both these cases heart-hurry and urticaria co-exist. The connection between goitre and nettle rash is not fortuitous. More than ten years ago it was observed, though not explained, by Dr. Duncan Bulkley, of New York, in the *Chicago Journal of Nervous and Mental Diseases*, October, 1875. It is of course possible that one and the same poison, acting in the medulla oblongata, may cause goitre, and yet when it expends its power on the skin, it may produce that form of dermatitis toxica which we call "urticaria." But we know that dilatation of the stomach may induce the formation there, not only of acetic acid but of certain extremely poisonous peptones and albumoses. It is a matter of experience that these can produce an extreme amount of cutaneous irritation. Senator has indeed detected free albumoses in the urine during an attack of dermatitis.

The sleepiness and head dulness which follow a full meal are attributed by Lauder Brunton to the absorption of peptones from the stomach. It is known that when these are injected into the blood stream, they induce lowered arterial pressure: cold hands and feet after a meal are thus explained. But they also destroy the coagulability of the blood.

This patient was supposed to have had "la grippe" in 1892. After this disease, so prone to be followed by tachycardia, strange to say she was much better. She enjoyed a complete immunity from attacks of heart hurry for two months.

August 7, 1893.— I first saw this patient and noted the following symptoms:—

Irritable and difficult to please. Pain in the supra-orbitals and the great occipitals, with tenderness along their trunks.

A symmetrical hypermetropia with paresis of left external

rectus, small goitre and fairly pronounced proptosis. Sleepy after meals with flatulence, and rheumatism of the small joints of the hand, both common symptoms of dilated stomach. Crepitation of both knee-joints.

Some neoplasms were removed from the pharynx. A slight uterine catarrh was cured and this patient was ordered systematic lung gymnastics. Hitherto she had been directed to avoid all exertion and excitement.

This was reversed and the young lady was directed to lead a very ordinary life; merely to lie down for a short time after luncheon till the anæmia was better. Hitherto her life had been rather a dull one, she had been debarred from all the amusements which girls like. She was vastly delighted to be allowed to join her companions, and she reported during the course of the next year that she was always the better the more exertion she took. She remained under my immediate care during twenty-seven days, and then went to Lausanne where she took a good deal of vigorous exercise and always with advantage.

January 25, 1894.—She reported that there had been only one attack of heart-hurry. This had lasted one hour, whilst eighteen hours had been the shortest known attack before the treatment.

This young lady now plays golf, and she plays all day with ease and enjoyment. The heart is sometimes a little irregular, but it no longer goes at its former furious pace.

Case C.

Tachycardia, Amnesia, Exophthalmic Goitre and Pelvic Congestion.

Miss R., aged 25, resides in the north of London. Subject to temporal headache and bronchitis. She has been delicate all her life. Her father is prone to headache, probably due to visual defects. Her mother and one brother are said to have died in a decline. She has been ill for three years. She attributes the swelling of her thyroid gland to drinking impure water whilst living in the States two years ago.

Present state.—She is low, nervous, and apprehensive, her memory is bad, she is often giddy, and for six months has had daily pain in her temples. She has acne of the face, an evident result of scalp seborrhœa. There is eczema covering the distribution of the left musculo-spiral nerve.

Eyes.—Both balls protrude considerably, the left more than the right. Dalrymple's sign is present on the left side, von Graefe's on both to a slight extent. On requesting this patient to close her eyes, the lids show a rima of one millimeter on the right side, two on the left. When requested to make an effort she can quite shut them. There is a fine tremor of the lids, which adhere in the morning; there is epiphora on the left side only. The sclerotic is always visible over both irides. Both sclerotics and conjunctivæ are somewhat injected. She has external asthenopia and mixed astigmatism.

Nose.—The septum deviates to the left and there is the usual hypertrophy of the right inferior turbinate.

Mouth.—The gums bleed and she is always thirsty.

Neck.—The root of the neck, around the most prominent part of the goitre, measures twelve inches. The superior cervical ganglia are both tender on pressure; the middle ones are very tender.

Abdomen.—She complains of sinking at the epigastrium and of fulness and flatulence. There are distinct gastric crises. Persistent pain in the ilio-inguinal nerves. She leaves the bed two or three times every night to void the bladder; the urine is laden with lithates.

Circulation.—The pulse is very irregular. It numbers 108 in the lying posture, 84 when sitting, 120 in the standing position; this acceleration of the pulse on lying down is not uncommon in purely functional tachycardia.

The radial tension, estimated in ounces, is 10 on the right side and 12 on the left.

Respiration.—The breaths are 16 per minute lying and 20 standing.

Trunk.—Persistent loin pains.

Upper extremities.—Fine manual tremors.

Lower extremities.—The leg reflexes are normal on the right side and exaggerated on the left. She suffers from cramp in the sural muscles.

Catamenia had been absent for seven months when she went to the National Hospital for Diseases of the Heart on the first of January, 1894; the monthly flow soon returned under treatment, but without much benefit to the heart hurry. On February 19 the physician in charge transferred her to my care to see what systematic "lung education" would do. The treatment included the removal of the seborrhœa for the cure of the acne; galvanising the extra-ocular muscles for the relief of the proptosis. For

this the patient also wore elastic pads on the lids at night. The stenosis of the right nostril was abolished, and systematic lung education carried out. The pelvic troubles were cured up.

By June 19, after four months of treatment, averaging one consultation per month, the pulse rates had fallen to 80 lying, 96 whilst standing, whilst the sitting pulse remained at 84 as before. The neck had shrunk to eleven inches. At the end of August she reported freedom from all the distressing symptoms and was dismissed with a recommendation to take a little Flitwick daily.

Case D.

Cardiac Disease Simulated by Defective Lung Play and Intestinal Torpor.

Miss G. D., aged 11, is a child in years and a woman in appearance. She was brought to me on January 7, 1896, for attacks of faintness and giddiness, which had lasted during three years. She is not by any means anæmic, but the vessels of the extremities are prone to asphyxia. Her skin itches after exertion. She is physically idle and intellectually heavy; is occasionally somewhat hysterical.

A unilateral squint of five years duration was removed by operation in 1894; accommodation and refraction are now normal. She suffers from recurrent bleeding from the nose, on examination the nasal fossæ proved to be perfectly healthy.

Both tonsils are much enlarged, these were subsequently removed.

Lungs.—Whilst free from actual disease, were found to be very badly developed, the ribs retracted and immobile. The chest measured, just below the mammæ during forced expiration, 23 inches, and after prolonged inspiration 26 inches.

Heart.—Rough systolic murmurs were audible over the pulmonary and the tricuspid areas. Dr. Ewart kindly examined this case for me, and whilst agreeing with me as to the existence of these *bruits*, felt disinclined to hazard an opinion as to whether they were congenital or acquired. If acquired—as to whether they were the product of an early endocarditis or some later infective cause, such as influenza, which this young lady was known to have had.

Abdomen.—The colon was found to be well packed with hard scybala in considerable quantities, the small intestines were also full of fæcal matter.

The Kidneys were normal and urine healthy; no sign of disease in the other viscera.

The Spine was straight and well developed.

The Extremities.—Skin rough and inclined to vaso-motor ataxia. The wrists and the knees were affected with rheumatism.

Treatment began by thoroughly clearing the colon. First by small hot antiseptic enemata and afterwards by flushing the whole colon in the knee-elbow position.

This young lady was afterwards taught to completely expand her lungs and to void them with much more energy, with the result that in a month, the chest measured twenty-two inches on breathing out and twenty-seven on inspiring, a difference of *five* inches instead of *three*.

Various manœuvres were adopted to increase the mobility of the ribs, such as spinal rotation and circumduction, and the feeble muscles of respiration were developed by electro-massage.

At the end of the course, Dr. Ewart was unable to detect in the heart sounds any departure from the normal type. This young lady is now in the enjoyment of vigorous health at one of the well-known Scottish High Schools.

In connection with the remarkable influence exerted by the constipated condition over the heart sounds, the following case may be mentioned:

Case E.

Second Sound of the Heart Temporarily Abolished by Constipation.

A lady, aged 50, having suffered during thirty years from general vaso-motor paresis of the superficial vessels, became prone to the opposite condition of contracted arteries, after the change of life. This induced a tendency to pseudo-angina arising from acute temporary cardiac dilatation. On one occasion, when Sir William Broadbent was seeing this case with me, we found the second sound of the heart was entirely abolished. It re-appeared on clearing out an old accumulation in the colon.

This lady obtained great benefit from systematic lung development, as described above, followed by a course of baths and movements at Nauheim.

Children.

Children are more prone than adults to acute cardiac dilatation, yet that condition is seldom diagnosed. On the other hand so rare is *primary* heart disease of inflammatory type in the young that Professor Pott of Halle, in a paper contributed last year to the *Fortschritte der Med.*, said that in thirty thousand children he never saw one single instance. He had ninety-five cases of cardiac defect in the young, not one was of the nature of primary or idiopathic endocarditis. Scarlatina and articular rheumatism were the chief morbific factors. Pott's experience of fœtal endocarditis agrees with the recognised opinion that the right heart is the one most frequently attacked in utero. He has never seen either mitral stenosis or insufficiency in the fœtus.

Spinal curvature has been known to abolish the memory, so dependent on a vigorous state of the left ventricle. Tachycardia is, too, a common result of spinal curvature. Dr. Motais, in an excellent paper which appeared in *L'Union Médicale* on March 1, 1894, drew attention to "Some derangements of the heart and stomach, produced by the usual position assumed by children in school." This very able paper was originally read before the Paris Academy of Medicine. By the "usual school position," Dr. Motais means that attitude in which the pupil seats himself on the front of the ischial tuberosities, supporting himself by leaning on the left elbow, and stooping forward, so that the front of the body then develops an antero-lateral curvature. The result is, *first*, that by the lateral inclination, the border of the false ribs on the left side descends until it is in contact with the iliac crest. The larger curvature of the stomach is thus pressed upon the spleen and the general mass of the intestines. *Secondly*, by bending the body so much forward, a fold is formed at the upper part of the abdominal wall, and the front of the stomach follows this

curve. Digestion is mechanically interfered with. Respiration is embarrassed by the crowding of the ribs and the descent with fixation of the left half of the diaphragm. The respiratory block reacts on both ventricles; on the left directly, on the right by interfering with the pulmonary reflex. The neck is twisted, the large vessels at its root are submitted to torsion and the vagus is doubtless disturbed. Dr. Motais urges that it is of the last importance that we should insist on a correct posture in the case of cardiac patients.

In view of the preceding observations we may ask—is it any wonder that the underpaid and tea-soaked sempstress should suffer from tachycardia? But posture is not the only factor in causing tachycardia. That the inhalation of confined air will, in some children, cause high-tension pulse and consequent overaction of the heart, is rendered probable by the observations of my friend, Dr. Rayner Batten, in the January number of the *Ophthalmic Review*, 1892. There Dr. Batten describes the remarkable changes of a neuro-vascular character which accompany progressive myopia. It has been asserted that respired air contains a subtle poison which affects the calibre of the arteries. In the number of the *Lancet* for April 6, 1889, p. 710, it was alleged that Du Bois Reymond had succeeded in isolating such a poison, which he named anthropotoxin. As against this, in the *Journal of Pathology and Bacteriology*, at p. 168 of vol. i., October, 1892, Drs. Haldane and Lorrain Smith published a series of experiments on the *Physiological Effects of Air Vitiated by Respiration*. Their paper is full of interest, it contains a very complete bibliography and consists of a series of observations evidently made with scrupulous care to avoid ordinary sources of fallacy.

The chief effect of inspired air is, of course, on the lungs rather than on the heart.

In three experiments the increase of respiration per minute passed from

18 to 30
18 to 34
22 to 35

Distress of breathing was found to be more due to plus of carbonic acid than to minus of oxygen. Excess of carbonic acid dropped the pulses as well as the temperature, the former fell from 90 to 84, the latter from 99 to 96·9: 3 to 4 per cent. of CO_2 caused marked hyperpnœa, 10 per cent. caused hyperpnœa still more severe, whilst 20 per cent. was irrespirable. Haldane and Smith show, too, that the hyperpnœa was probably the result of indirect excitation through the intra-cranial respiratory centres, rather than an effect of direct stimulation of the pulmonic filaments of the vagus by the carbonic acid.

Lack of oxygen, on the other hand, drove up the pulse from 80 to 100, the supply of oxygen being 8·7 per cent.; the pulse rose from 96 to 131. This atmosphere represents the normal tenuity on the summit of a mountain of about 29,000 feet. The conclusions of Haldane and Smith may be thus summed up:

(1) Dangers of breathing vitiated air arise from excess of CO_2 and deficiency of O, not from any subtle poison.

(2) Headache is due to excess of CO_2.

(3) Distress of breathing begins at a point of absence of oxygen that differs in different persons, roughly appreciable at 12 per cent., extreme at 6 per cent.

Another paper on the subject, entitled "The Composition of the Expired Air and its Effects upon Animal Life," was published in the Proceedings of the Smithsonian Institute of Washington in 1895, by T. S. Billings, S. Weir Mitchell and D. H. Gergey. This I have not been able to procure, but I understand that similar results were obtained. The conclusions of Haldane and Smith are not of much value to us in considering the especial effect of vitiated air on children in Government schools, because their experiments were made on healthy male adults of cleanly habits and in sanitary rooms, whereas Araki found that underfed animals suffered from breathing respired air, in an entirely different manner from vigorous ones, see p. 362 of "*Ptomaines and Leucomaines*," Vaughan and Novy.

Of far more importance are the remarkable observations made in Scottish poor schools, by the late Professor Carnelly, who examined the air of 145 class rooms in 59 Board Schools in Aberdeen, Fife and Perthshire. In all cases, determinations were made of the carbonic acid, the micro-organisms and the organic matter contained in the air.

He found that the air of the class-rooms was polluted in direct proportion to the age of the school building and in inverse proportion to the age of the scholars. Those who may be interested in this important topic, would do well to refer to p. 157 of the *Journal of Pathology and Bacteriology*, vol. ii., November, 1893.

I will content myself with saying that among the more common causes of heart-hurry in childhood are :—

Terror, a terribly common cause alas! Probably all nursemaids frighten children, an immense number of infantile neuroses arise from this fruitful source.

Naso-pharyngeal growths with disorders of hearing, tinnitus, &c.

Visual defects.

Vertigo.

Headache.

Constipation, diarrhœa.

Albuminuria from diphtheria, scarlatina, lead poisoning, heart disease, &c.

Epistaxis.

Night sweats.

Rapid general development, over exertion, excitement.

Finally let me say that very little good can be effected by treating Heart Hurry in any case, as constituting a disease in itself : it may not be viewed as a pathological entity, but as a single symptom of some general condition for which there must exist some definite cause. The physician should give himself no rest until he has ascertained the precise etiology in each example.

BLAKE
ON
HEART
HURRY.