SEQUEL OF A CASE OF CARDIOLYSIS.

BY

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IN the *BRITISH MEDICAL JOURNAL* of December 14th, 1912, was published a case of cardiolytic.

A boy of 15, who appeared to be at the point of death from cardiac failure, supposed to be secondary to adhesions of the pericardium to the heart muscle and to surrounding tissues and organs, was operated upon by Mr. Barling on June 17th. Every method of treatment had previously been tried but had failed to relieve him.

At the operation about 14 in. of ribs over the praecordial region were removed and adhesions to the sternum and ribs were broken down. Good results were almost instantaneous; four days later the pulse, which had always been from 100 to 120 per minute, fell to 60. Diastolic bruits which had been audible could no longer be heard, and the only systolic murmur audible was over the mitral orifice.

Three weeks later it was noted that, though his pulse was irregular, he was comfortable and much less cyanosed than formerly. His breathlessness had vanished, he was able to walk up and down stairs, oedema had disappeared from his legs, and the marked ascites was no longer existent. The improvement was quite remarkable, and continued until the end of October, when he gradually began to fail.

All the old symptoms reappeared, and, though he was treated continuously either in the General or the Jaffray Hospital, nothing could be done for him. Death occurred at the end of March. A very careful *post-mortem* examination was made for me by Dr. Parsons and Mr. Haycraft, and the result of their examination, for which I am greatly indebted to them, is as follows:

POST-MORTEM NOTES BY LEONARD G. PARSONS, M.D.,
AND J. B. HAYCRAFT, F.R.C.S.

External Appearances.—The body was very thin and wasted. The face was cyanosed. The abdomen was distended and discoloured, and there was some oedema of the legs, chiefly on the left side. Over the praecordium there was a large depression and a semilunar scar where the ribs had been resected by surgical operation.

Thorax: Universal adhesions; many of the adhesions were oedematous, broke down easily, and looked fresh; others were dense and firm. The heart and pericardium were extremely large, measuring 6 by 5½ in., with marked recent and old adhesions to the chest wall, to the operation scar, and to the lungs. The pericardium is universally adherent to the heart, and can be separated in patches only, and that with the greatest difficulty. The heart cavities are considerably dilated. There is a slight thickening of the mitral cusps (some functional regurgitation). The other valves are quite normal in appearance. The heart muscle is quite pale and very flabby, and showed marked hypertrophy. Left ventricular wall ¾ to 1 in. thickness. The pericardium is very adherent to the diaphragm, and there are marked adhesions around the inferior vena cava and round the superior vena cava and the venae innominae. All these veins, together with the jugulars, were very distended with blood. The left internal jugular measured 1 in. in width. These veins were traced along their whole extent, and no constriction or stenosis was found, even where they were enveloped in fibrous tissue.* The left lung was considerably retracted. There was a fair amount of straw-coloured fluid in each pleural sac, and there were many adhesions. Both lungs showed marked oedema, and the lower lobe of the right lung was consolidated. The pulmonary veins throughout the lung seemed distended, and their walls showed up very distinctly; they did not appear to be distended.

Abdomen: On opening the abdomen there was an escape of a large amount of clear, yellowish-coloured fluid. The inferior vena cava was full of blood and markedly distended. The renal veins were in a similar condition. The stomach and duodenum were healthy. The intestines were normal.

Liver: There is some perihepatitis, and on section there is a definite, although small, increase in fibrous tissue. The liver on section shows a well-marked nutmeg character. It is free from adhesions to other organs and to the diaphragm.

Pancreas: Healthy.

Kidneys: Right, 3½ oz.; left, 4 oz. They showed some congestion.

The *spleen* was enlarged, firm in consistence, of a dark red colour, and congested and also showed a mild degree of peri-splenitis.

The *suprarenals* were enlarged and of a purplish colour.

* The inferior vena cava showed the smallest calibre when passing through the diaphragm. There was no stenosis beyond that point, and it opened into the auricle by a very large mouth. The Eustachian valve was very prominent, and the right muscle very dilated.

Microscopical Examination.

Liver: The capsule showed some degree of thickening, and there was a slight increase of fibrous tissue round the portal tracts with some spread into the lobules. In a few places there was some small-celled infiltration, and the liver columns were separated by oedema and congestion.

The *kidneys* showed some degeneration of cells of the convoluted tubules, and some early fibrous change affecting the vessels and glomeruli.

Spleen: Definite fibrosis of capsule, trabeculae, and vessels.

The *suprarenals* showed patches of small-celled infiltration, and the medulla was of more open structure (? oedema) than normal.

So far as I know this is the first time the sequel of a case of cardiolytic has been recorded, and the results are not only very interesting but may have also a very important bearing upon treatment. In addition they do, to a certain extent, justify the opinions I hazarded as to the causation of symptoms when the pericardium is adherent to structures in the mediastinum.

They show, moreover, the accuracy of the observations of Sir Thomas Barlow, who had noted the dilatation of the jugulars in similar cases, and of Professor Keith, who suggested that the symptoms were largely due to the posterior adhesion. To both of these gentlemen I am greatly indebted for their letters and their interest in my case. They justify, I think, my guess that the ascites and the cyanosis might be due to the nipping of the inferior and superior cavae respectively, for though no stenosis of the former was found, it is expressly stated that the smallest calibre of the vein was found in its passage through the diaphragm.

The disappearance of practically all the bruits which had been audible over the whole cardiac area was remarkable, and justified the opinion that they were due not to endocardial changes but to distortion of the relations of the valves and the heart cavities.

What the bearing of the *post-mortem* evidence on future surgical methods may be I cannot say, and perhaps it would be unwise to generalize from a single case, but it is difficult not to think that, if there are evidences of pathological adhesions to the diaphragm, it would be wise to try to divide some of them. It is, I think, material to this point to remark that the operation has been always done in cases in which there is no possibility of improvement by means other than surgical, and that if death results, as, so far as published cases show, it never has resulted, from operation, it will anticipate by only a few days or weeks death with all the distressing symptoms of breathlessness, sleeplessness, and mental misery.

There can be no question that in my case the operation was worth doing, for it gave the patient a good six months of pleasant life and comfort before the recurrence of distressing symptoms began.

**AN ANALYSIS OF A SERIES OF CASES OF
HYPERTENSION AND HYPOTENSION
TREATED AT VITTEL.**

BY

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I LOOK upon the sphygmomanometer as just as important an instrument in the diagnosis and treatment of chronic ailments and diseases as is the thermometer in acute ones. The interpretation of blood-pressure readings, however, is a far more complicated problem than is that of making one's deductions from the varying height of the thermometric column.

My first experiences of the use of instruments for measuring the hydraulic phenomena of circulation were those early investigations of Dr. George Oliver. From that time onwards I employed at irregular spells one or another of the numerous instruments for measuring arterial tension. In 1903 I was driven by a very serious attack of cyclic synovitis for treatment at Vittel, where I entirely recovered, and since 1904 have reversed my condition from patient to physician at that spa. During the last nine seasons, therefore, a large number of patients have passed through my hands.

At about this time—1904—I realized that a large proportion of ailments attributed to varied and multiple causes could be grouped together as due to different forms of chronic toxæmia. The writings of Huchard and others were directing attention to the importance of hypertension as being most frequently the preliminary phenomenon that eventually led up to “heart disease.” They furthermore assigned to most hypertension and eventual arteriosclerosis a toxi-alimentary origin. Their teaching had a marked influence upon our ideas of the whole question, and did much to modify our views of treatment. I was much struck by these writings, and my old interests in blood pressure were again thoroughly revived, all the more so because Huchard had chosen Vittel as being the ideal place for the treatment of hypertension.

Two or three years' experience convinced me, however, that although a toxi-alimentary origin formed a large proportion of predisposing causes, there were also others at work, and that not infrequently several causes were combined. In fact, I now think that there are many conditions which favour this ailment, some of which we do not know, while of others we have but the faintest inkling.

I have chosen at random some 456 cases of all kinds which have resorted to Vittel for treatment, the only conditions I have observed in the selection of them being that I was in possession of full records of each case, consisting of two complete quantitative analyses of the urine made under my supervision in my own laboratory both before and after the cure, and of the determinations of blood pressure, capillary reflux, pulse, weight, etc., taken before, during, and after the cure.

Normal Blood Pressure.

For the moment I do not propose to touch upon the arterial tension of children, of which I know little, but upon which some interesting researches have lately been published. Limiting the discussion, therefore, to adults, we are still met by a number of difficult problems. I have further circumscribed this study to maximum or systolic pressure only. The minimum or so-called diastolic pressure is still too problematical, and, although in most of these cases minimum pressures are recorded, yet I am so dissatisfied with the uncertainties of the readings that I postpone drawing conclusions therefrom to a later date. Most of the pressures here quoted were those recorded by a mercurial manometer. A large proportion were taken by my secretary, who has no medical training, and therefore no theoretical ideas by which to be influenced, but has great technical skill, and a large number were confirmed afterwards by myself.

In giving my experiences with Pachon's oscillogram¹ in a cursory way, I stated in outline only an empirical method which I have adopted, fixing upon average normal blood pressure, but with the desire to limit my letter I did not give collateral details and reservations. I here repeat the method: For every year of age after 15 I allow 1 mm. Hg, and add 100 to the number. Thus a person of 15 years of age should have 115 mm., one of 35 years 135 mm., one of 60 years 160 mm., etc.

The first qualification I would make to this is that these figures represent a *safe maximum*. The second is that for persons over 60 years of age there should not be a uniform rise in the systolic thrust, as somewhere about this time a markedly less strenuous mode of living is followed, and also the heart muscles begin to show the first indications of senile enfeeblement. As a third qualification I would say that, as the general muscles, glands, nerves, etc., vary in different people, so, no doubt, their heart, blood vessels, capillaries, etc., also vary, and even vary amongst themselves. A powerful heart with weak arteries and perhaps inefficient kidneys will give us a normal average blood pressure for such a person very different from that which a reverse condition would register. Many physicians know of people with permanently high blood pressures who have lived for years in good health, whilst others with relatively low blood pressure have died of apoplectic hæmorrhages or failing hearts.

Analysis of Cases.

These 456 patients include persons resorting to the cure for all sorts of ailments, but chiefly those who owed their ill health to some form of chronic toxæmia.

The largest number are those of the “gouty” nature—visceral, articular, and nervous. Next come those with the dominant phenomena of hypertension and heart troubles. After these follow albuminurics and other renal and vesical sufferers, while lastly we may place glycosurics, hepatics, etc. As may be observed, these are mostly ailments in which we expect to find some alterations in blood pressure.

Age.

From this total of 456 persons, then, we get an average age of 53.78 years—which will, no doubt, be inferior to the truth, since a considerable proportion were ladies—and an average blood pressure of 151 mm. Hg, evidently a far higher maximum blood pressure than we should obtain from the same number of persons of the same ages not requiring a cure. The average blood pressure on departure was 138 mm., which affords us a mean diminution indiscriminately for each person of 13 mm. But of the 456 patients there were 75 whose blood pressure rose and 36 with no variation. This leaves us 345, or three-fourths of the total, whose blood pressure went down in consequence of the cure. The calculated average age of these 345 was 54.1, while their blood pressure was 156 mm. before and 136 mm. after the cure, giving an individual mean reduction of 20 mm.—a striking demonstration of the good effects of the Vittel treatment.

The next thing to select was all those whose blood pressure on arrival was over 160 mm., my maximum safe limit for any age. These attained the number of 154, the larger proportion of whom were sent to Vittel for the purpose of reducing their hypertension. The average age of these was 59.75 years, with a mean tension of 182 mm. before and 159 mm., or a reduction of 23 mm., after the cure.

I then proceeded to make a selection of those over 60 years of age. Taking their averages once more I got 66 years, with blood pressure at 161 mm. before and 146 mm. after, or a reduction of 15 mm.—that is a gain of 14 mm. below the maximum safe normal for their ages.

It will be observed that those above 60 years of age had on arrival an average lower tension than the others of all ages who had a blood pressure above 160 mm. This would lead us to infer that in these younger patients we had further special causes for increased arterial degeneration, such as syphilis, nephritis, adrenal excess, capillary spasm, higher blood-viscosity, etc., than in those over 60 years of age, where we have to look more to the true senile wear and tear of the arteries. In the group of those over 60 years no doubt a less strenuous mode of living would keep the heart at a lower level of activity, and our average may be vitiated by a certain number of failing heart muscles.

Passing now to the consideration of the 36 patients whose blood pressure remained unaltered during the cure, we obtain a mean age of 55 years and blood pressure of 144 mm., which, I think, will give us an absolute normal for persons of their age, and therefore it is to be presumed that as no reduction was necessary in such cases the cure did not act in this direction.

Effect of Vittel Treatment on Abnormal Tension.

In the last group of the 456 we have 75 whose blood pressure was raised during the cure, their mean age being 51.6 years and their blood pressure before the cure 131 mm. and after 142 mm., or an augmentation of 11 mm. It may be noticed how very near were the final readings of these hypotensionists to the normal blood pressure of those who remained unaltered during the cure—that is, 142 and 144 mm. Obviously, 131 mm. is a decidedly low blood pressure for people averaging 51.6 years. If, however, we examine individually this group of 75 persons, we find many of them with blood pressure below or near 100 mm. In the statistics, however, the results are marred by a certain number whose blood pressure was fairly high and rose during the cure. Why this increase took place I am unable to say in some cases, but in others, as seen by their history and the analyses of their urine, we have to deal with hypertensionists from chronic nephritis. In these patients their kidneys are just able to perform the ordinary daily work, but when the renal structure has to deal with the large extra amount of fluid,

the actual volume of blood is temporarily increased. If one is able to watch these cases for several days after the cure, one may see that several of them come down finally to below the blood pressure they had on their arrival, and show permanent improvement. One well-known man illustrated this admirably. He had had blackwater fever four times. During the cure his blood pressure went up somewhat, but finally came down with a considerable margin to the good, and marked improvement in health. In these cases we ought to be allowed much longer for the cure, in order that we may push water-drinking so much less in proportion. All practitioners know, however, the meanness of patients in the question of time given to any course of treatment.

If we get a prolonged spell of cold and damp weather such as we had last year (1912) blood pressure often goes up, and then drops when warm weather comes, and the capillary reflux oscillates in accordance, showing that the hypertension is due to capillary spasm. The mechanism of this is, I think, fairly clear. I should like to know if any other physician has observed this fact. At any rate, it points to the great advantage of dry, warm weather for hypertensionists in general. I have frequently observed this favourable influence in such cases that come to me in my winter practice on the Riviera.

I am often asked by my medical colleagues whether, over and above the relief of the symptoms that usually accompany hypertension, the reduction or increase of blood pressure towards normal is permanent. The reply to this question must be qualified. I have no hesitation in saying that in most cases the improvement is not evanescent. On the other hand, if no intermediate care as to mode of living is taken, or no lixiviating treatment followed from time to time, the blood pressure again gradually rises. This rise, however, is far and away more gradual than after treatment by drugs, most of which I have used with very indifferent success, and which, I am convinced, are more dangerous—excepting as a temporary measure—than the hypertension which they are intended to reduce. Drug treatment in such cases is neither more nor less than superposing or replacing one toxæmia by another. In consequence of the length of this study, I propose to postpone to a future paper an investigation on these lines of a number of annual *habitués* to Vittel, who well illustrate this point.

Classification of Patients.

Experience has taught me to classify persons suffering from increased blood pressure into three classes. In the first group are those persons "who are never still"—I mean those who work, worry, play, etc., very hard. Their heart is always in an overstrained and excited condition, and pumps too hard. These may or may not have a minimum arterial-capillary spasm from their vessels carrying and being fed by a toxæmic blood in ratio to the nature of their diet and the efficiency of their excretory organs. In the second group are those where a toxæmic blood, setting up capillary and arterial spasm, has persisted until the arteries have advanced more or less towards permanent reduction in calibre by arterio-sclerotic changes, just as a long restrained limb becomes permanently a rigid one. The earlier these cases are treated, the greater and easier is the fall of blood pressure coincident with an increase in capillary permeability.

If we measure the capillary reflux in these cases we often find it fall during the cure from five to ten or more seconds to three or even less, and simultaneously the systolic blood pressure will diminish 30 to 50 mm., the heart regains its exhausted forces, the aortic clang is no longer audible, and cold extremities are replaced by warm ones. Even in the last stages of arterio-sclerotic disease, with a dilated and failing heart and fallen blood pressure I have seen great improvement; but, of course, here the cure must be very gentle, carefully watched, and prolonged over several weeks.

In taking the averages of our records of capillary reflux we obtained an average of 3.7 seconds before the cure and 3.5 seconds after. Taking 3 seconds as the average normal, it will be observed that all the patients had slow capillary circulation, showing that the average high tension was to no inconsiderable extent due to capillary spasm and high blood viscosity.

It is interesting, though to a less extent, to investigate

the total effect on the pulse, which often increases as blood pressure is reduced in ordinary conditions. This occurs when the pressure descends from normal or above it to below normal, the heart making an effort to keep up circulation, and so equalize nutrition in distant parts of the organism. Our pulse records give us a mean of 75 per minute on arrival and 73 on departure. Although the mean reduction is only two, yet the approach to average normal is marked. But what is of greater interest is that, notwithstanding the marked reduction in the blood pressure of these patients, not only did no increase of pulse-rate occur, but on the contrary a slight reduction, demonstrating that the improvement of the hydraulics of the circulation was a real and substantial one.

In the third group we must place the renal cases. Here great complexity arises. Complete twenty-four hour urine analyses help us a good deal, but are often deceptive as to the amount or advance of the kidney lesion. Many of these cases come year after year to wash their blood and tissues, clear their urine of casts, diminish or get rid of their albumen, if they have any, and to reduce their arterial tension. Some cases get quite well, and remain so for years; others wind up their clock of life for some months; but, year by year, as they return, a morbid, degenerative action, although greatly reduced in the speed of its progress, eventually leads to a fatal termination. In two of the cases recorded a patient and his wife came each winter to Beaulieu and each summer to Vittel. They were both cases of chronic nephritis. The wife, step by step, for three consecutive seasons at Vittel, quite recovered her health, but her husband, though he improved considerably each season, yet each year on his arrival had lost during the eleven months' interval more than he had gained during his previous cure. Eventually, after a number of retinal and other small haemorrhages, he died in London of uræmia. This man, two seasons before his death, arrived at Vittel with the phenomenal blood pressure of 290 mm., which fell during the first five days of the cure to 245 mm., and at the end of it to 215 mm. I have selected these two as illustrations, as they lived inseparably for many years, and therefore were exposed to identical surroundings, and ate the same food, etc.

Another question I am often asked is whether the reduction of hypertension in old people is brought about by a cure at Vittel. The answer to this is already given in the statistics for those over 60 years of age, as also for those with blood pressure over 160 mm. on arrival. Both results—the former showing a reduction after the cure of 17 mm. as the average per head, and the latter one of 23 mm.—are speaking enough. No more striking demonstration could be offered, I think, of the remarkably practical, positive, and fairly permanent results of proper treatment by a non-chloride bearing, slightly hypotonic water, in which we introduce into the organism no substance that does not enter into the composition of the human frame to a greater or less extent, a method of treatment incomparably superior to any employment of drugs.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, January 13th, 1912.

THE Principal Medical Officer (Dr. Sanson), in his annual report for 1911, states that the estimated population of the Federated Malay States was 1,045,947, being an increase of 44,690 over the number for 1910. The birth-rate was 19.41 per 1,000 of the estimated population—a slight decrease on the rate for 1910, which was 21.39. The death-rate for 1911 was 37.03, as against 32.16 for 1910. Malaria caused 45.02 per cent., and dysentery and diarrhoea 19 per cent. of the total deaths. The infantile mortality was 170 per 1,000. There are forty hospitals and nine gaol hospitals, and in these 97,162 in-patients were treated during the year, and 232,506 out-patients. An Advisory Board has been appointed (1) to collect and distribute information regarding malaria; (2) to advise how anti-malarial measures could be most advantageously carried out in each district; (3) to encourage and advise local bodies in their efforts towards extermination of mosquitoes; and (4) draw up appropriate legislative measures. There were 6,042 cases of beri-beri treated in the hospitals, with 695 deaths. The Government has had under consideration several proposals for preventing or limiting the use of an unsafe rice and encouraging the use of a safe rice.