Temperature Readings for December 1867 at Cannes and Torquay.

DEC.	CANNES.	TORQUAY.	DEC.	CANNES.	TORQUAY.
2	51	31	17	48	52
3	38*	35	18	51	42
4	36	29	19	44	41
5	37	40	20	34†	42
6	39	37	21	34	52
7	37	34	22	34	51
8	35	35	23	39	49
9	†	35	24	38	51
10	38	41	25	48	49
11	34	50	26	41	41
12	38	50	27	44	40
13	42	43	28	44	37
14	39	43	29	33	32
15	44	54	30	28	39
16	50	53	31	38§	34

NOTE.—From the above table it will be seen that on ten days during the month of December, the temperature of Cannes was higher than that of Torquay; on eighteen days Torquay rose above Cannes in warmth; and on three, including the 9th when no temperature is entered, they were equal.

It is to be regretted that the Cannes correspondent of the JOURNAL has not given the maximum and minimum temperatures of each twenty-four hours; as I think that would probably have brought out, in contrast, one of the most striking advantages of Torquay—its extremely limited range of temperature, and the absence of those rapid ups and downs of the thermometer which characterise so many other places. In illustration, I append the

Extremes of Temperature registered at Torquay, and at the Horticultural Society's Gardens, Chiswick, near London, from December 5th to December 11th, 1867.||

TORQUAY.	CHISWICK.	TORQUAY.	CHISWICK.
5 38—31	47—29	9 39—29	33—13
6 38—30	39—28	10 48—39	42—27
7 36—32	38—29	11 51—46	50—35
8 41—33	35—13		

All places, of course, have not as wide a range as Chiswick; but, that apart, the advantage that Torquay offers to many invalids, in respect to assimilation between its night and day temperatures, is great. I may here be allowed the remark, that a low range of the thermometer is a very different thing, with abundance of English coal and of English comforts, from what it is with expensive wood fires or unwholesome stoves. In Nice, I observe that, according to the latest tariff of the Hotel des Anglais, "wood, per basket," stands at three francs. We often hear grumbling at Torquay at 3s. 6d. per week for coal-fires. Others may draw their conclusion.

I cannot close this paper without alluding to the persistent and malicious reports which were so industriously spread respecting the sanitary condition of Torquay at the commencement of the present season—reports so utterly false and absurd, that it is almost a wonder that they did not carry their own refutation. It cannot be denied that these reports, in some degree, did the work they were intended to do—divert the stream of visitors to other less favoured localities||—as numbers of families and individuals *en route* for Torquay were, unquestionably, deterred coming for health to a place which they heard was decimated by fever. That gastric fever did prevail in the town for some period of autumn was no secret; its extent and fatality may be judged by the fact, that there were but nineteen deaths from that disease registered during the period of three months, out of a population of more than twenty thousand persons.

Doubtless it is a serious matter for a health-resort like Torquay to have an epidemic in it at all, however trivial; but, as yet, can we point to any locality so favoured, or so hygienically perfect, as to be entirely free from the chance of such a visitation? The visitation, slight as it was, has in this case, however, borne its fruit, by rousing the authorities to a still stricter scrutiny of their drainage capabilities, and to efforts for the amendment of their defects, so as, for the future, to put it out of the power of those who are envious of the growing prosperity of this beautiful, and for so many years favoured, health-resort, to find even an excuse on which to found rumours so grossly exaggerated as those of last October, and to save them the trouble and expense of warning visitors. I am happy to state, on good authority, that Torquay is now, and has been for many weeks, free from epidemic disease.

* Snow. † Snow on the Esterelles Mountains (no temperature given).

‡ Snow at night. § Snow on the Esterelles Mountains.

|| This table was the first that came to hand, and was not selected.

¶ In various places in the south, placards were, it is said, posted on the walls, warning visitors against coming to Torquay; and the local papers, both north and south, conveyed similar philanthropic (?) advice.

RESEARCHES ON THE ACTION OF THE HEART.*

By GEORGE PATON, M.D., Bowmanville, Canada West.

THE opinion generally entertained by physiologists respecting the action of the heart, whilst the circulation is vigorously maintained, is, that the diastole of the ventricle is the result of this previous contraction, the fibres relaxing and assuming a state of rest, just as the fibres relax after contraction, when the heart is deprived of blood or placed *in vacuo*; and the act is described as an instantaneous expansive movement, by which the ventricle returns to the same state with regard to form, size, and position, as during the previous period of repose; the blood flowing from the auricles by a suction-power, to fill up a vacuum produced in the interior of the ventricle.

If we examine the action of the heart when it is slow, pulsating at the rate of twelve or fourteen times a minute—in a turtle, for instance—we perceive that, when the auricles contract and expel a portion of blood into the ventricle, it immediately contracts and projects a wave of blood along the aorta; or rather, the contraction of the auricles extends by a sort of vermicular or continuous movement to the ventricle, causing it also to contract. After contraction, the ventricle immediately dilates, its parietes becoming lax and flaccid; and blood passes rapidly from the dilated auricles, without contraction, into the cavity of the ventricle, filling it out to a partial extent.

Properly to understand the manner in which the diastole of the ventricle is effected during this action of the heart, we must remember that at this moment the veins in connexion with the auricles, and the auricles themselves, are filled and almost distended with blood; and a *vis a tergo*, or power by which the blood is impelled towards the heart, is exerted against the internal parietes of the auricles, which, the instant the fibres of the ventricle and of the auriculo-ventricular valve begin to relax, causes the blood to enter the foramen of the ventricle, and quickly dilate its cavity to the previous extent during the pause. But, when the action is more vigorous, the blood passes so quickly from the dilated auricles into the cavity of the ventricle, that the movements seem almost simultaneous; the blood appearing to open up, as it were, the relaxing parietes of the ventricle, or dilate them to their previous extent during the pause.

This constitutes the first stage of dilatation, the pause ensuing, during which the fibres of the auricles and of the ventricle remain relaxed; and, as the auriculo-ventricular foramen continues open, the *vis a tergo* exerted on the blood in the two cavities—the auricle and the ventricle—may be said to be nearly equalised. But, if the force exerted by the blood, as it passed from the auricle into the ventricle, had been greater, it would have dilated the parietes till they reached the point of distension, and contraction would have ensued. But this power, during the natural action of the heart, is only produced by contraction of the auricles; for, as the blood, on its return from the extremities, passes along the *venæ cavae* to the heart, it readily dilates and distends the parietes of the auricle, which, being thinner, are more easily dilated than those of the ventricle; and then the auricle contracts, and projects a portion of blood into the ventricle, completing the second stage of the diastole, and causing the ventricle, as we have stated, to contract.

We have distinctly seen, during this state of the circulation, the blood, as it reached the heart, fill out and distend the auricles, causing them to contract and produce contraction in the ventricle; while no contractions were observed in the *vena cava* or extremities of the venous trunks—showing that, when the action of the heart is slow, the impetus imparted by the blood, as it reaches the auricles, is sufficient to dilate the parietes and produce contraction, independently of any action in the *vena cava* or extremities of the veins; and that one reason why the auricles are destitute of valves is, that the blood may readily reach and distend their parietes, in maintaining the action of the heart.

With regard to the amount of blood that enters the ventricle during each stage of the diastole, we may remark that, when the action of the heart is slow, the ventricle is chiefly dilated during the first stage of the diastole, as the auricles do not contract with vigour, and, in warm-blooded animals, principally in the appendices; the act being apparently or chiefly designed to produce contraction in the ventricle, and consisting of a sort of vermicular movement extending to the ventricle. When the action becomes more rapid, we have, during the second stage of the diastole, seen the ventricle enlarged by one-third of its previous size, the parietes being distinctly stretched out, and the fibres elongated till distension was produced; from which it appears that, in this condition of

* Read before the Physiological Section at the Annual Meeting of the British Medical Association in Dublin, August 1867.

the circulation—that is, when the diastole consists of two stages—the greater proportion of blood enters the ventricle during the first stage of the diastole; and that the auricles only feebly and partially contract.

But, when the action of the heart begins to increase, the auricles contract sooner in point of time and of rhythm. On being dilated, they appear filled with blood; and a portion passes quickly from the auricles into the cavity of the ventricle, as its fibres relax after contraction. But, before the first stage of dilatation is completed, the auricles contract, which annihilates the pause, and renders the diastole one continuous act. In this case, we have distinctly seen and felt, in cold-blooded animals, the fibres of the ventricle, during the contraction of the auricles, continue to be extended and elongated till distension ensued and contraction commenced.

When the action of the heart is still more vigorous, respiration being fully maintained, the contraction of the auricles is synchronous with the diastole of the ventricles. The auricles, on being dilated, do not remain distended with blood, but immediately contract; and the whole of the blood that enters the ventricle is projected by contraction of the auricles. The *vis a tergo* in the veins has now no influence in assisting the dilatation of the ventricle; and the ventricle dilates whilst the auricles contract; and they contract with considerable energy, the diastole of the ventricle being completed by a continuous and uninterrupted movement, without the slightest appearance of a pause.

It is surprising to observe the different opinions that are entertained by physiologists on the action of the heart, according to the phenomena presented to their view. Dr. Hope states (*On the Action of the Heart*, p. 11), "on examining the posterior surface of the heart of a frog when its action was reduced to fifteen or twenty per minute, the whole of the auricle, which had previously been concealed by the ventricle, being now exposed, it was found that, for a short space of time, the ventricle being at rest, partially distended with blood, the auricle then contracted with a smart, brief motion, but only partially contracted; for the sinus venosus was constantly full of blood, both in this experiment and those on the rabbit, and whether the circulation was quick or slow. When the auricle had relaxed again, and not till then, the ventricle (stimulated, I conjecture, by the motion, for it certainly was not by distension) was seen suddenly to rise up on its basis, to shorten its fibres, and to expel its contents, which latter action was slowly performed. After the completion of the systole, which was indicated by the pale colour, the diastole took place, and allowed a partial influx of blood, denoted by the return of the red colour; and in this state the ventricle remained quiescent for a short space, until again stimulated by the auricular contraction. It may be objected to this account, that, as the action of the heart was preternaturally slow, the motions were abnormal. We thought, however, that we could discern the same series of actions when the pulsations were forty (40) per minute." Professor Müller, as the result of his experiments on the action of the heart, states: "In the frog, the contractions of the venous trunk, of the auricle, the ventricle, and the bulbous aorta, appeared to me to follow the order in which I have named the parts, the intervals between the four contractions being nearly equal; so that the same interval of time elapsed from the contraction of the auricles to the contraction of the ventricle, as between the contraction of the ventricle and that of the bulb of the aorta."

The discrepancy of opinion that exists between these two authors respecting the action of the heart undoubtedly arose from the circumstance that Dr. Hope viewed the heart when its action was slow and languid, and Professor Müller when it was quick and vigorous, beating at the rate of sixty or seventy times per minute. And it will be observed that, in the latter case, the auricles contracted and expelled their blood into the ventricle whilst it dilated; and, the movements being alternate, dilated whilst the ventricle contracted; so that nothing like a pause or period of repose occurred during the diastole of the ventricle. And this is what we have repeatedly witnessed in the course of our experiments both in the frog, the fish, and the turtle, when the action of the heart was vigorous, and respiration well sustained.

As the principle that obtains in the action of the heart is the same in warm as in cold-blooded animals, Dr. Hope maintained that a pause always exists between the diastole of the ventricles and the contraction of the auricles; and that this contraction immediately precedes the contraction of the ventricles, or rather, that it passes into it by a sort of vermicular movement. But other physiologists, who have examined the action of the heart when it was vigorous, in living animals, pulsating at the rate of sixty per minute and upwards, respiration being well maintained, are decidedly of opinion that the contraction of the auricles takes place simultaneously with the commencement of the diastole of the ventricles; that no pause or period of repose accrues during the ventricular diastole, but that it consists of one distinct and continuous movement, immediately succeeded by the systole.

[To be continued.]

REPORTS

MEDICAL AND SURGICAL PRACTICE IN THE HOSPITALS OF GREAT BRITAIN.

ST. BARTHOLOMEW'S HOSPITAL.

VILLOUS DISEASE OF SIGMOID FLEXURE; CONSTIPATION; VOMITING; DEATH; RUPTURE OF COLON DISCOVERED POST MORTEM.

(Under the care of Mr. PAGET.)

THE following short but instructive case has been kindly forwarded to us by Mr. William Square, House-Surgeon.

C. K. was admitted into the hospital on December 2nd, 1867. The patient was a sallow ill-nourished woman. On the left side, was a reducible femoral hernia. It was up on admission. There was apparently no other hernia. Her bowels had not been open for ten days. The abdomen was distended, and the colon seemed full of hard faeces. She had been constive lately, but had had no particular trouble with the bowels until the present illness. She felt generally uneasy, but complained of no pain in any particular part. There was constant retching, and vomiting of gastric mucus, but in no very large amount. She was ordered to have a pint of beef-tea; and a draught containing 10 grains of carbonate of magnesia and 2 drachms of sulphate of magnesia immediately; and an enema composed of castor oil 3j, olive oil 5ij, warm water 3iv, to be given in the morning.

On the following day, she had still no motion, and there was no perceptible difference in the other symptoms. Pulse 84. There were no faeces in the rectum. She was ordered ice and soda-water; and to have three calomel and colocynth pills, and the enema repeated.

On the 4th, she was ordered one-twelfth of a minim of croton oil made into a pill with bread; to be taken every two hours. No motion was produced, and there was no difference in the symptoms.

On the 5th, she had an enema of a pint of olive oil and four pints of gruel. This was shortly returned uncoloured.

Next day, at 11.45 A.M., there was still no change; and at 2 P.M. she was worse. The pulse was small, 104. She had great pain. She was ordered half a grain of powdered opium in a pill every two hours. She became worse, and died at 8.30 P.M., without any difference in the symptoms. Collapse seemed to have come on very suddenly at about one P.M.

POST MORTEM EXAMINATION, sixteen hours after death. There were no other herniae. The hernia of the left side was reducible. The abdomen was tense and tympanitic. A large quantity of foul gas escaped on opening the abdomen. There was a decided faecal odour. The transverse colon was bent into a V-shape, with the apex at the hernia retained by adhesions between the mesentery and the hernial sac. The vessels were much injected. There was a large rupture on the free border of the transverse colon, with faecal extravasation. There was plenty of faecal matter in the abdominal cavity. About the rupture the colon was of a dark purple colour. Even beyond the rupture, the gut was full of faeces. To the sigmoid flexure, the left ovary and broad ligament were adherent. On opening this part of the intestine, a villous malignant looking growth appeared, which nearly obstructed the intestinal canal. There was a very small quantity of fluid faeces in the rectum.

THE MIDDLESEX HOSPITAL.

CASE OF FRACTURED PATELLA: TREATMENT BY MALGAIGNE'S HOOKS.

(Under the care of Mr. CAMPBELL DE MORGAN.)

D. C., a healthy man, aged 56, was admitted into the hospital on June 11th, with transverse fracture of the left patella, caused by an attempt to save himself from falling backwards half an hour previously. There was some effusion around the knee-joint, and the fingers could be laid with ease between the fragments. He was laid on a raised bed, and a figure-of-8 bandage applied, bringing the parts into fair apposition. Lint, with evaporating lotion, was laid over the whole joint, and a purgative given. By the fourth day, the effusion had very much subsided, and Mr. De Morgan applied Malgaigne's hooks with steel points. The patient complaining of the inconvenience of the raised bed, he was placed on an ordinary fracture-bed, a back-splint applied, and the foot raised about six inches. The lotion was continued.

He remained easy and doing well; there being on June 16th no inconvenience or pain from the hooks. There was a little areola of in-