as in Fig. 1—that is, with the weight of the water in a resting on B.

The observed changes in the normal heart sounds produced by change of posture may therefore be reasonably explained, at least in part, by the different relations of the valves to the weight of blood in contact with them in the different positions.

Fig. 3.—Diagram to illustrate the change in the limits of cardiac dullness with change of position.

Posture also affects the deep cardiac dullness. In the erect position the cardiac dullness drops nearly a rib's breadth (on an average) further from the clavicle than in the recumbent position, and (in the average adult) becomes about $\frac{1}{2}$ in. wider from side to side at the level of the fifth costal cartilage, the increase being greater to the right than to the left, that to the left being about $\frac{1}{2}$ in. The accompanying table, of 36 consecutive unselected cases with normal hearts, illustrates these changes.

Thirty-six Unselected Cases with Normal Hearts.

Sex.	Age.	In Hospital for—	Changes on Rising from Recumbent to Erect Posture in—		
			Width of Dullness.	Height of Dullness.†	Depth of Chest.*
M.	7	Circumcision ...	+ 1 in.	- 1 rib, 1 space	+ 1 in.
F.	7	Accident ...	+ 1 in.	- 1 " 1 "	+ 1 "
M.	10	Accident ...	+ 1 in.	- 1 " 1 "	+ 1 "
M.	13	Accident ...	+ 1 in.	- 1 " 2 "	+ 1 "
M.	13	Hypospadias ...	+ 1 in.	+ 1 "	+ 1 "
F.	14	Flat-foot ...	No change	No change	+ 1 "
M.	15	Accident ...	+ 1 in.	- 1 in.	No change
M.	15	Accident ...	+ 1 in.	- 1 rib, 1 space	+ 1 in.
F.	16	Housemaid's knee...	+ 1 in.	- 1 " 1 "	+ 1 "
F.	16	?	+ 1 in.	- 1 " 1 "	+ 1 "
F.	16	Lateral curvative ...	+ 1 in.	No change	+ 1 "
M.	17	Accident ...	+ 1 in.	No change	+ 1 "
M.	17	Accident ...	+ 1 in.	- 1 rib	+ 1 "
M.	17	Varicocele ...	+ 1 in.	- 1 " 1 "	+ 1 "
M.	17	Hammer-toe ...	+ 1 in.	- 1 " 1 "	+ 1 "
M.	18	Hernia ...	+ 1 in.	- 1 " 1 "	+ 1 "
M.	18	Accident ...	+ 1 in.	- 1 " 1 "	+ 1 "
M.	18	Varicose veins ...	+ 1 in.	No change	+ 1 in.
F.	18	?	+ 1 in.	No change	+ 1 "
F.	19	Synovitis, knee ...	+ 1 in.	- 1 rib, 1 space	+ 1 "
M.	20	Varicose veins ...	+ 1 in.	- 1 " 1 "	+ 1 "
F.	21	Synovitis, knee ...	+ 1 in.	- 1 " 1 "	+ 1 "
F.	22	Phlebitis ...	+ 1 in.	- 1 " 1 "	+ 1 "
F.	23	Hip disease ...	+ 1 in.	+ 1 rib, 1 space	+ 1 "
M.	24	Varicocele ...	+ 1 in.	- 1 " 1 "	+ 1 "
F.	24	Tuberculous glands	+ 1 in.	- 1 " 1 "	+ 1 "
F.	26	? Appendicitis ...	+ 1 in.	- 1 " 1 space	+ 1 "
M.	29	Perineal abscess ...	+ 1 in.	No change	+ 1 "
M.	30	Sebaceous cyst ...	+ 1 in.	- 1 rib	+ 1 "
M.	30	? Carcinoma, penis.	+ 1 in.	- 1 " 1 "	+ 1 "
M.	31	Varicose ulcer ...	+ 1 in.	- 1 " 1 space	No change.
M.	33	Tuberculous knee...	+ 1 in.	- 1 " 1 "	+ 1 in.
M.	34	Talipes ...	+ 1 in.	- 1 " 1 "	+ 1 "
F.	35	Ulcer of leg ...	+ 1 in.	- 1 " 1 space	+ 1 "
F.	36	" Uterine" ...	+ 1 in.	- 1 " 1 "	+ 1 "
M.	43	Tuberculous ankle..	+ 1 in.	- 1 in.	+ 1 "

* Antero-posterior diameter measured at nipple level.

† Nearness of upper limit of dullness to clavicle.

+ Indicates nearer to clavicle.
- Means further from clavicle.

It will be seen that in several cases the upper limit does not alter, and that in three cases it alters in the reverse direction to the usual one. The change, however, in the width of dullness is strikingly constant, so much so that it seems curious that it has not been observed before. [The same change in width of dullness is even more striking in disease. Thus, in

a case of hypertrophy and dilatation due to combined aortic and mitral disease, I have found the dullness on recumbency only 5 in. wide, whilst in the erect position it was actually 8 in. wide.]

How are these changes to be explained? I think in this way: On assuming the erect position the heart tends to fall lower in the chest, and, owing to the forward slant of the anterior part of the diaphragm, to also fall forward against the front wall of the body. Thus the cardiac dullness should tend to sink somewhat lower, and to widen out when the upright position is assumed, which is just what usually happens. [In disease, where the weight of the heart is increased, this drop on change to the erect posture may be very marked, the apex being sometimes found to beat, when the patient stands or sits, in a lower space than when he lies on his back.]

In a much smaller number of cases, however, the upper limit of dullness actually rises instead of falling. If this is due to the heart being anatomically more firmly held up than is usual, and to its upper part coming forward into contact with the chest wall when the person stands, it might be reasonably expected that the dullness in those cases would widen less than usual, and this is actually found to be the case in the very few examples included in my table, in each of which the widening was only $\frac{1}{2}$ in.

Whether the explanations I have offered of these changes in cardiac physical signs produced by change of posture be correct or no, I think that the importance of the changes themselves will be considered sufficient to justify me in bringing them to the notice of the Society.

REFERENCE.

1 BRITISH MEDICAL JOURNAL, March 15th, 1901, Posture and Heart-murmurs.

AN AID TO PROGNOSIS IN TYPHOID FEVER.

By ROBERT M. SIMON, M.D., F.R.C.P.,

Physician, General Hospital, Birmingham.

For a doctor to be able to form an opinion as to the probability of recovery in cases of enteric, must undoubtedly be of service to a patient and an encouragement or reason for extra care to the physician. In forming an opinion as to the chances of recovery or of death, the experience of the last fifteen years has led me to look to the amount of urine passed in the later stages of the disease as a guide of the utmost value.

Polyuria is a well-known symptom at the end of nearly all febrile disorders, but I am not aware that special attention has been paid to it in connexion with typhoid fever, in which, however, it is a very marked and conspicuous condition.

Towards the beginning of the fourth week, seldom earlier, sometimes a little later, the urine increases in quantity from 30 oz. or thereabouts to 60, 80, or even 100 oz. daily. For the last nine years, in order to confirm or disprove my estimate of the importance of this fact, I have had daily observations made of the amount of urine passed by every patient suffering from enteric fever. It was found that polyuria occurred not only in every case that was doing well, but also in many cases of great severity in which no general improvement or amelioration of symptoms could be observed. It was found that even in severe cases, if polyuria occurred, the patients all recovered.

It does not appear to be necessary, in order to estimate the value of polyuria as a means of prognosis, that the patient should be in a state to voluntarily empty his bladder.

I saw recently at Great Malvern a gentleman, aged 58, who had in the fourth and fifth weeks of an attack of typhoid lost control of the bladder sphincter. His general condition was one of extreme prostration. His temperature was continuously high, his tongue dry, his abdomen distended, heart sounds feeble, and pulse dicrotic. Recovery seemed to be out of the question, and my visit had been suggested to satisfy absent relations. I learnt that it was impossible to keep his bed dry on account of the enormous amount of urine voided. On this symptom alone I ventured to give a favourable prognosis, which was justified by his ultimate recovery.

The importance of the absence of polyuria in a case supposed to be doing well, as shown by a normal temperature and a quiet pulse, was well exemplified recently in the case of a boy under my care in the General Hospital. Despite a very real general improvement, I deprecated attaching too much importance to his general well-doing, as it was not associated with an amount of urinary excretion such as was

to be expected in the fourth week of the disease. For this reason his diet was not improved, and he was sedulously watched.

A sharp but short relapse occurred, at the end of which the urine passed increased from 30 to 40 oz. to 80, 90, and even 110 oz., and an uninterrupted convalescence took place.

In no case in which polyuria was noted have I known perforation to occur, and in no case has haemorrhage of any moment ever occurred after polyuria has been established, and, furthermore, the occurrence of relapse is of the most extreme rarity when polyuria has once begun.

If these observations are correct and can be substantiated by others, it seems certain that we have in polyuria a valuable aid to prognosis. In the hope of obtaining the benefit of the experience of others who have the opportunity of seeing many cases of typhoid, I have ventured to publish an opinion which has been to me a great help and safeguard in estimating the chances of recovery of my patients.

A NOTE ON THE PRODUCTION OF DIARRHOEA BY THE BACILLUS PRODIGIOSUS.

By LOUIS C. PARKES, M.D., D.P.H.,

Medical Officer of Health for the Borough of Chelsea, and Consulting Sanitary Adviser to H.M. Office of Works.

At the end of last July I was asked to investigate the cause of an outbreak of diarrhoea in a large country mansion. About three weeks prior to the date of my visit the first attacks commenced, and had been more or less continuous ever since, nearly every one of the eighteen members of the household having suffered, and some having had more than one attack. The attacks appear to have been of a mild nature, like ordinary summer diarrhoea of a mild type. The only child living in the house escaped attack.

An examination of the premises showed that the drainage and sanitary arrangements were quite modern and in very good order. The water was the same as that supplied to the neighbouring town, where there has been no unusual diarrhoea, and the milk from the farm had been examined and found good. The little girl was the chief milk consumer of the household, and she had escaped attack.

About the time that the illness commenced some alterations had been effected with a view to improving the ventilation of the larder, more openings being made to secure ventilation from an adjoining yard enclosed by a high garden wall. The steam escape pipe of a new hot-water cylinder had also been made to discharge into this yard close to the larder door. Since these alterations had been carried out it had been noticed that the cooked meat, and sometimes puddings, kept in the larder were affected with a superficial pinkish growth. This had been sent to London for examination, and was pronounced to be a growth of *Bacillus prodigiosus*, and harmless.

An examination of the yard from which the larder drew its chief supply of air showed that there had been a continually recurring ejection of hot water from the steam escape pipe on to the yard surface, which was defectively paved at this point with old, worn, and soft bricks. Owing to the enclosed nature of the yard a steamy saturated condition of the atmosphere must have been caused by the escape of so much hot water, a good deal of which must have soaked into the ground, and no doubt the recent heat of the weather had accentuated this condition.

Not being satisfied under the circumstances as to the alleged harmlessness of the *Bacillus prodigiosus* and its products in cold meat and cold pudding, and having also regard to the fact that the little girl who escaped attack never ate cold meat, I advised the temporary discontinuance of the larder, and the taking of such measures as would be required to carry off all surface water from the yard and the prevention of any soakage into the ground around the larder. The larder was also to be cleansed and disinfected before being taken again into use.

The family left the house for the summer holidays two or three days after my visit, and I now learn, by the courtesy of the owner, that my instructions were fully carried out in every particular, and that since the return of the family there has been no recurrence either of the pink bacillus or of any illness.

I am not aware of any hitherto recorded instance of illness due to the growth of *Bacillus prodigiosus* on food. It is evident that the growth must have been favoured by the atmospheric conditions prevailing in the adjoining yard; and

possibly the bacillus was originally present in the soil of the yard, and was mechanically raised by the action of the escaping jets of hot water, which were ejected at a height of 7 or 8 ft. above the yard surface from the steam escape pipe.

Although the facts above mentioned are highly suggestive of the *Bacillus prodigiosus* being the cause of the diarrhoea, the chain of evidence is not complete; and I am informed by the medical practitioner who attended the cases that the attacks continued when he had no reason to believe that the patients had partaken of food contaminated by the bacillus. The occurrence, however, seems of sufficient importance to be recorded with a view to further investigation into the alleged harmlessness of the bacillus.

FURTHER OBSERVATIONS ON PARANGI (YAWS).

By A. CASTELLANI, M.D.,

Colombo, Ceylon.

ON June 17th, 1905, I read a paper before the Ceylon Branch of the British Medical Association on the presence of spirochaetes in cases of parangi.¹ A few days before I had sent a note on the first two cases to Sir Patrick Manson, who kindly communicated it to the meeting of the British Medical Association held at Leicester on July 27th. At the meeting of the Ceylon Branch I was able to communicate that I had found spirochaetes in three cases out of six; that in two of the cases two varieties of spirochaetes could be seen, one thicker and with large waves, one thinner, extremely delicate, identical with or resembling greatly the *Spirochaete pallida* of Schaudinn. In the third case, in which the lesions had not yet ulcerated, there were only spirochaetes of a very delicate variety. Besides the spirochaetes, in several preparations a few rare, peculiar, oval bodies containing granules of chromatin could be seen. In the meantime I had sent a specimen taken from the first case to Professor Schaudinn. Professor Schaudinn has been so kind as to examine the preparation, and has written me a letter, dated Hamburg, August 8th, 1905, in which he states that in the preparation I sent he has observed three varieties of spirochaetes, one of which, very delicate, resembled closely the *Spirochaete pallida*.

As in the last two months I have had the opportunity of studying some more cases, and as I have recently had the good fortune of Dr. Daniel passing through Colombo and giving me his advice in the interpretation of several preparations, I think it may be desirable to publish the latest results of the investigation.

Technique.

Films are made in the usual way from scrapings of the eruptions. It is advisable to select lesions in which a secondary pyogenic infection has not yet taken place. Giemsa stain, which I have used only lately, gives good results; Leishman's method, however, gives also good results if the staining is done according to the following instructions:

1. Let the alcoholic solution of Leishman act for five minutes without fixing the films previously.
2. Mix the stain with equal or double amount of distilled water, and let it act for half an hour to several hours.
3. Wash with distilled water, and leave a few drops of it on the films as usual for half to one minute.
4. Blot and examine with very high power.

Description of the Spirochaetes Found.

In the preparations taken from ulcerated lesions, according to Schaudinn and myself, various spirochaetes are present. One form is rather thick and takes up easily the stain; it is morphologically identical with the *S. refringens* of Schaudinn. One form is thin, delicate, with waves varying in size and number, and with blunt extremities; I proposed for this variety the name of *S. tenuis obtusa*. A third form is also thin and delicate, but is tapering at both ends; I named it *S. tenuis acuminata*.

In non-ulcerated lesions there may be found a spirochaete which I believe to be identical with the *S. pallida*. The organism is extremely delicate, thin, and generally tapering at both ends. The length varies from a few microns to 18 and 20 microns. The number of waves varies also, but they are generally numerous, uniform, and of small dimensions. Sometimes two spirochaetes may be seen attached together, or apparently twisted one on the other. Two organisms close together and nearly parallel, but united at one end, as described in *Spirochaete pallida* by Schaudinn and McWeeney, have been seen. With the microscopes at my disposition the