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ORIGINAL ESSAYS.

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ART. VI.—*Report on the prevalence of Dengue in the Cantonment of Quilon, during the month of May 1872.* By  
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(Communicated by Inspector General, I. M. D.)

GIVEN the prevalence of Dengue in Cochin for some weeks, and in Alleppey for some days prior to its appearance at Quilon, its introduction into the last-named station could be easily explained. The existing arrangements in small stations do not permit of any deduction being drawn from atmospheric or meteorological causes, for the simple reason that no meteorological observations are registered in the hospital or elsewhere for want of instruments. We can, it is true, sometimes associate certain classes of complaints with ordinary atmospheric phenomena, but in searching for such to be embodied in a report on a form of fever which has never visited this station, the absence of a daily record of the direction and force of the wind, of the thermometrical and barometrical readings immediately prior to this outbreak cannot but be regretted. The rainfall during the early part of the year was below that of the preceding, as will appear from a comparison of the quantities gauged from January to May 1871, which are placed in juxtaposition

with the corresponding months in 1872 in the subjoined table.

	1871	1872
January ...	1·600	0·000
February ...	0·700	2·850
March ...	2·700	0·600
April ...	8·900	5·500
May ...	5·900	5·500
	19·800	13·100

I have no information regarding the first appearance of dengue in Cochin, but an officer of this regiment who reached Quilon on the afternoon of the 23rd April told me (some weeks after its appearance among the sepoys and their families) that he had put up for about 24 hours in the Cochin dawk bungalow, where he saw an European engineer with the complaint. One of this officer's servants contracted fever before leaving, and as he travelled in the same boat as his master, the latter was seized a few hours prior to his arrival at Quilon. Subsequently all this officer's servants suffered, and the man who had been ill at Cochin went to his relatives in the regimental lines. Knowing what I do of Dengue, I think it most likely that this case served as a centre for the dissemination of the disease. It early attacked the Mess-writer and servants, and this could be explained by the likelihood that the servants of the officer above referred to, who had or were getting dengue, were employed in procuring supplies for their master from the Mess-house. I have recently seen an old hanger-on of the mess in the service of this officer, and it is as likely as not that if this man did not actually go to the Mess premises for his meals he had them brought to him by his relatives who reside there. The regimental dhobies next suffered and the possibility of infection from the clothes of the officer and of his servants should be borne in mind, as it is an every-day occurrence for those arriving at a station to send their dirty clothes to be washed. These dhobies being employed by the sepoys it is natural to suppose that during the time they (the dhobies) were stricken with fever, quantities of foul clothing were lying untouched in their huts which on their recovery would be hastily washed and distributed to the owners, carrying more or less of the fever germs or other source of infection to the people in the lines.

Sub-Assistant Surgeon Martin of the Travancore Medical Service to whom I am indebted for particulars of the commencement and progress of dengue at Alleppey (54 miles north of Quilon) writes, "The first case that came under notice occurred on the 21st April last and the subject was a lady resident on the beach, who was suddenly attacked while in church. Her ayah was similarly attacked on the following day. The disease then gradually spread among the native and East Indian population. Meanwhile our resident Minister arrived from Cochin with the disease and so did our Telegraph master," and after the former, several of the servants, teachers and pupils of the Mission sickened and the complaint spread to other parts of the town and the adjacent villages.

With a view to ascertain the order in which cases of Dengue appeared in the Regimental lines, I examined a hundred men, but the information obtained is of that dubious character that it would be a useless waste of time to continue the inquiry. The sepoys could not tax their memories for the required dates, and although it is notorious that the families were first attacked, seventy-five individuals declared without the slightest hesitation that they were the first sufferers in their huts. It seemed singular too that the men just about this time should not have had any communication with people who had been to Alleppey or Cochin; while in point of fact there is daily communication between these stations and Quilon. One private who had been on 3 days' leave to Trevandrum stated that he was taken ill five hours after leaving Nadayara (13 miles south of Quilon) in the transit boat. This boat touches at all stations, and as a cheap and expeditious means of conveyance it is largely used by natives travelling from Trevandrum to Trichoor and *vice versâ*. The possibility of its having been used by cases of dengue is worthy of note.

Having once obtained a footing in the lines the dissemination of dengue became inevitable. In Quilon as at other stations the sepoy huts are placed in rows, adjoin each other and the back of one enclosure abuts on that of another. The huts consist of a frame-work of bamboos covered with cocoanut leaves, the floor is not raised above the surrounding ground and, excepting a door of entrance, there is scarcely any other means of ventilation. The wind may now and then rush in where the cocoanut leaves are not fastened and

where this omission permits of a slight flapping of the leaves. The space per individual in a hut is dependent upon the number of inmates of each. Taking a fair example I give the dimensions of the hut of an old non-commissioned officer with such other particulars as are considered necessary. Length 27 feet  $\times$  12.5 feet breadth = 337.5 feet superficial area,  $\times$  11.75 feet height = 3968.626 feet cubical space. Dividing these figures by 8 the number of inmates we obtain 42.1 of superficial and 496.078 feet of cubical space per occupant. Within 20 feet of this hut lives the son of this non-commissioned officer and the measurements of his hut are 15 feet length  $\times$  12 feet breadth = 180 feet superficial area  $\times$  11.75 feet height = 2115 feet cubical space. Dividing this by 5 the number of inmates the superficial area per individual would be represented by 36 feet and the cubical space by 423 feet. The children of this family sickened one after another, nor did the elders escape for all had Dengue within a short time. The daughter-in-law within a few days of her confinement suffered, as well as her infant when only 3 days old. Neighbours visiting such a family would contract the disease and they in their turn affect others who may share their huts. Isolation would have been beneficial if the character of the ensuing epidemic had been foreseen, but very little experience with a native regiment would show that the ordinary measures resorted to in a British regiment for the repression of out-breaks are almost impracticable in the native army. My application for tents was at once met with a request that I should certify whether the disease was or was not infectious. In the face of all that was seen it was impossible to certify that the disease was not infectious, and here the matter dropped; although one may think it a more serious matter that men should infect one another than that tents should be infected by them, no amount of thought on the subject would help one to tents, the issue of which is hedged in with restrictions of various kinds. Had tents been issued, only such of the effective men as were sick would be accommodated in them, while their families would still remain in the lines. As the sick of a native regiment diet themselves there would be constant communications between the tents and the lines, as the sick sepoy would have his food brought to him from his hut. A cup of broth or congee might, on an emergency, be prepared for him in hospital but with the existing hos-

pital servants (2 sweepers) it would be impossible to feed any number. Simultaneously with the application for tents, I requested that two vacant public buildings, viz., the Staff Sergeant's quarters, and arrack godown should be whitewashed and cleaned. The latter was ready by the 12th May and the former on the 11th May. The dimensions of these buildings will accompany this report. The practice during the outbreak was to place as many new cases as we could in the regimental hospital for a day or two, directly there was any improvement these cases were transferred to the Staff Sergeants' quarters, and they in turn were shifted to the arrack godown, whence they were discharged or allowed sick leave to the lines. Notwithstanding the additional accommodation it was at one time impossible to find room for all effectives who were taken ill and many were allowed to return to the lines, either calling for medicine at the hospital twice a day or having it taken to their huts by the Hospital Assistants sent down temporarily to the regiment. The men who were so allowed to remain in the lines were the native officers, commissioned and non-commissioned, some of the well-conducted buglers and musicians, the older sepoys and such others whose services were required in their huts owing to the illness of their families.

That the disease was infectious will, I think, appear from the following facts. It is impossible at present to ascertain where the Hospital Apprentice could have contracted it, for his statement of symptoms accords with those noticed of dengue; but very shortly after him first one toty and then another suffered, and up to the time of their being taken ill themselves they were in attendance on the sick. Next came Hospital Assistant Thaviah, No. 861 who was taken ill on the 9th of May. Hospital Assistant P. Narrainswamy, No. 623, who arrived from Trichinopoly on 17th of that month was taken ill on the morning of the 22nd, and two days subsequently Hospital Assistant Goolamnubby, No. 649. The Hospital Assistant from Cochin escaped; but he informed me that he had had dengue at his station before coming to Quilon. Five hospital havildars who relieved each other in succession were taken ill. The first man Sheik Davood had dengue on the 15th May, 2 days after he had joined; Swamy Naicken on the 17th, two days after the former. Oodajewan fell ill on the 20th, 12 hours after he had joined; Manuel on the 21st, 8 days after he had joined; and

Iyaswamy on the 26th, after having done duty for 5 days : nor did the hospital orderlies escape, for I have a note of four of these who reported sick on the 18th, 20th, 22nd and 24th May. Of patients who were in hospital with other complaints two were taken ill on the 7th and 9th May, and the last might be amplified but that enough has been said to demonstrate the position advanced. On the evening of the 10th May the Adjutant who had been all day in his office (but who had like the other officers visited the hospital on various occasions since this outbreak) was attacked, and he attributed it to having occupied the same room as his writer who had suffered from dengue a few days before. On the following evening this officer's wife was seized and it has since attacked their ayahs, the children happily escaping. The Adjutant of the regiment would naturally see more of the sepoys and others from the lines than other officers, and the immunity of the latter may be due to their being better able to resist the advent of disease than the comparatively ill fed and badly housed population of the lines.

The data for forming an opinion regarding the period of incubation are not striking, but the following particulars are merely given for what they are worth. The first Hospital Assistant from Trichinopoly was taken ill within 5 days from his first contact with dengue cases. The second (Goolamnubby) within 7. The Adjutant's daily visits to the hospital deprive the fact of his having been in the same room with a man convalescing from the disease, for some hours previous to his being taken ill, of the significance that might otherwise be attached thereto. I may also mention that on pay-day (the 6th May), as the Adjutant had to see some men in hospital about their accounts, his wife accompanied him into the building, where there were some men suffering from dengue ; and this lady, as noticed in the preceding para., had dengue 5 days later : but as she was in constant attendance on her husband for about 24 hours previously it is more likely that the disease would have been contracted from this source. Havildar Hoossain Khan, who returned to Quilon from the Eye Infirmary at Madras on the 14th, was ill with dengue on 18th May.

It may be necessary to remark on the health of the regiment and sanitary condition of the cantonment generally about the period of this outbreak. An index of the former

is afforded by an abstract of the admissions and discharges of the 23rd Regiment for the month of April which is subjoined.

*Table showing the number admitted and discharged during the month of April 1872.*

Diseases.		Admitted.	Discharged.	Remarks.
Fever.	{ Chicken pox ...	1	...	Admitted 7th April, died on the 8th.
	{ Febricula ...	1	...	
	Cholera ...	1	...	
	Rheumatism ...	1	1	
	Coryza ...	1	1	
	Conjunctivitis ...	4	3	Remained over in March, transferred on S. C.
	Constipation ...	1	...	
	Abscess and ulcers...	3	5	
	Skin diseases ...	4	3	
	Fissures of the heel..	1	...	
	Sprain ...	1	2	
	Typhlitis ...		1	
Total...		19	15	

Fallen leaves, splashes of water in the neighbourhood of wells, and the mud pies with which native (like other) children amuse themselves might here and there be detected by the eager searcher for surface impurities; but in more essential particulars, such as a good and abundant water supply, general cleanliness of the roads and huts, the disposal of filth and the conservancy of the cantonment generally, the existing arrangements are as good as could be expected with the means at our disposal. The civil station may (and probably is) different; but any nuisances in the immediate vicinity of the cantonment are brought to notice and remedied. If the progress of dengue be due to defective sanitary arrangements in the cantonment it is marvellous that the civil station into which no sanitary establish-

ment has as yet been introduced should have escaped with comparative immunity. In much that relates to the essentials of sanitary order the cantonment is a-head of the town beyond military limits; the man who reports the cantonment dirty would consider the native town dirtier still, but as I have just said it is remarkable that dengue should have attacked the sepoys and their families in larger number than the civil population. The cases of dengue among the out-patients of the Sirkar hospital amounted to 60 in the month of May, which is in remarkable contrast with the hundreds who were taken ill in the lines as subsequently shown. According to the usual practice among cultivators, the paddy fields in and about the cantonment were ploughed and manured about the time that dengue broke out, but after due reflection I cannot say that I consider this as influencing the out-break. The same preparations of the soil have occurred year after year, but there has been no epidemic; nor has there been an excess of fever cases in the immediate neighbourhood of these paddy fields over other parts of the cantonment. My residence is surrounded by them, but neither I nor any members of my family have suffered: of my servants the only persons attacked were an ayah who had her food daily brought from the lines, and another female who, I suspect, had her relatives suffering from dengue. One of my orderlies was taken ill after he had been on duty for a few hours at my house, but he lived in the lines and undoubtedly contracted the disease in that locality. With the exception of the officers mentioned in previous paragraphs the remainder and their families have escaped. Assuming for the sake of argument that the epidemic was mainly due to defective sanitation in the cantonment, it would not be easy to show why the same should disappear or be dying out, without any sanitary improvements great or small being carried out in the interim. We all know that epidemics have their period of invasion, maturity and decadence; but it would scarcely be fair to jump at the conclusion that because an epidemic such as this has broken out at any station defective sanitation must be at the root of it.

The progress of the epidemic will be gleaned from the following tables. The first gives all the cases admitted into hospital and returned as "febricula" from the 1st to the 10th of May. No return of sick in the lines was obtained till the 8th, hence the columns showing these cases up till



that date are left blank. By a mistake of the orderly havildars who imagined that no return was required on the 9th the figures for that date are wanting, but from the 10th up to the end of the month returns of all sick from dengue are rendered in the second table. No recoveries of sick in the lines were reported on the 8th, 9th or 10th.

TABLE I.

*Showing admissions from 1st to 10th May 1872  
with the number reported sick in the lines  
on the 8th and 10th May.*

			1	2	3	4	5	6	7	8	9	10	Totals.
			May	"	"	"	"	"	"	"	"	"	
Effective men	...	...	2	2	3	5	5	5	5	11	13	13	64
Cases in the lines.	Males	...	...	...	...	...	...	...	...	10	...	2	12
	Females	...	...	...	...	...	...	...	...	31	...	17	48
	Male Children	...	...	...	...	...	...	...	...	18	...	23	41
	Female do.	...	...	...	...	...	...	...	...	18	...	14	32
Totals...			2	2	3	5	5	5	5	88	13	69	197

TABLE II.

*Showing the admissions from dengue and those reported sick in the lines from 11th to 31st May 1872.*

		May 11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals.
Effective men	...	29	30	30	34	31	39	52	31	16	28	15	12	6	7	8	1	5	...	1	...	...	375
Cases in the lines.	Males	3	1	5	2	2	3	2	2	2	...	...	...	2	...	...	...	...	...	...	...	...	24
	Females	27	15	20	3	25	13	12	15	8	5	1	10	8	2	4	...	2	...	4	1	...	175
	Male Children..	28	10	15	21	19	11	8	9	8	5	1	18	2	1	3	...	1	..	3	...	...	163
	Female do. ...	18	10	9	8	9	5	10	8	4	3	...	11	1	3	3	...	2	...	...	1	...	105
Totals...		105	66	79	68	86	71	84	65	38	41	17	51	19	13	18	1	10	...	8	2	..	842

TABLE III.

*Showing the recoveries from dengue from 11th to 31st  
May 1872.*

		May 11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals.
Effective men ...		8	3	6	11	10	19	52	59	15	48	44	38	35	23	20	12	16	10	5	2		436
Cases in the lines.	Males ...		3	3	3	1	5	2	2	1	1	4	3			1	1		1		1		32
	Females ...	4	14	8	18	4	11	12	8	8	15	22	25	14	11	2	12	8	21	31	19		267
	Male Children...	6	22	5	12	4	4	8	10	7	3	20	26	3	10	4	8	11	9	18	13		203
	Female do. ...	3	15	6	14	3	4	10	1	4	1	9	11	1	5	2	5	4	9	10	16	...	133
Totals...		21	57	28	58	22	43	84	80	35	68	99	103	53	49	29	38	39	50	64	51	..	1,071

In my report of the 10th May I entered into a detail of the symptoms exhibited by the patients who up to that time had been admitted into hospital. That account is substantially correct; but having seen hundreds of cases since I shall now proceed to describe the symptoms with such additions as have been divulged by further observation. The greater number of cases declared that they went to bed apparently well, but woke up about two or three in the morning with a hot skin, and when admitted into hospital a few hours later the temperature in the axilla in the recorded cases ranged from 99° to 103° F. During the prevalence of dengue several sepoy's who took their tour of duty in the morning reported sick during the day. I remember a sentry at the hospital who was on guard at my evening visit being struck down with fever before that visit was concluded. In addition to the heat of skin there would be a pulse varying from 78 to 108 and a countenance indicative of utter helplessness and prostration. After a little experience we could from the appearance of a case, tell at once whether it had been of one, two or three days' standing; on the first day the sick would throw themselves down anywhere, outside the hospital on the verandahs, on cots or on the floor, racked with pain in more than one of the joints, large or small. Hindoo and Mussulman, regardless of caste or creed, jostled one another in the common tortures of dengue, and until the temporary hospitals were ready it was difficult to effect an

entrance into the hospital, much less to take notes of cases for a special report on the epidemic. The fever lasted from one to 3 or 4 days, with occasional remissions during the first or second day and a distinct intermission on the 3rd or 4th. Pain was a concomitant of the pyrexia in all the cases; head, neck, arms, elbows, wrists, chest, back, hips, thighs, legs, ankles, the tips and the extensors of the fingers, the ball of the thumb, the soles of the feet and the extensor tendons of the toes all suffered, but all these joints were not affected at the same time. A patient informed me that she had felt whitlows in all the fingers; and for days after she recovered she had hardly strength to place her feet on the ground and when they were down she had hardly power to move them. The more demonstrative of the natives groaned with their pains. Earache was noticed in 2 cases, headache in nearly all, about the second day of the fever; more especially in those cases whose habits were supposed to be intemperate. Sore throat (tonsillitis) was by no means a constant or a prominent symptom, but pain about the throat existed in 3 per cent. of the cases. On an analysis of 300 cases 2 per cent. had sore eyes (conjunctivitis). A few of the first cases had ordinary catarrhal symptoms. Two men complained of something like ptyalism, one individual returned to hospital a few days after the febrile symptoms had left him with swellings of the glands in the groins. The tongue of patients presented one or more of the following appearances; (1) a thick coating of yellow fur on the dorsum, (2) a slight whitish fur on the dorsum with red tip and edges, (3) glazed and red. Vomiting was present in 12 per cent of the cases; it was readily excited by the diaphoretic mixture used. Nausea was frequently complained of. There was no appetite, as might be expected, in almost every case; and for days afterwards there was no inclination for food among the convalescents. 8 per cent. of the analysed cases complained of epigastric pain. The bowels were occasionally confined, but yielded readily to such aperients as rhubarb, castor oil, jalap or podophyllin. Diarrhoea existed in 17 per cent. of the cases, but a dose or two of an astringent mixture or powder soon arrested it. The urine was examined in 84 cases (several times in the same case); the specific gravity ranged in these from 1004 to 1030, the reaction generally acid. There was no trace of albumen in any one of these.

*The rash.* From the onset of this out-break the cases

were examined for the initial or terminal rash. My instructions to the subordinates were precise on this subject and I have every reason to believe that they were not neglected. It should be remembered that my patients and their families have for years been accustomed, to a constant irritation of the skin from scabies and, the fugitive character of the eruption in dengue being considered, it is in the highest degree probable that the people themselves were unaware of any appearance worth mentioning. On the 11th May I was called to the wife of a bugler, who had fever for some days, and learnt that a rash in irregular patches had appeared on the previous night, on the face, trunk and extremities; and on pressure the patches disappeared for a time; the skin generally was somewhat rough to the touch. Just after leaving this woman, I saw a bugler whom I had discharged from hospital that morning and who had discovered a rash on returning to his hut. It consisted of irregular patches on the right shoulder and arm, left leg, in the palms of both hands (and in this situation in reddish spots) and on the back. In another case, seen either on the same day or a day after, I observed a papular eruption on the back of a Mussulman, looking like prickly heat except that the papules were distinct and not aggregated together as is usual in lichen tropicus. On the evening of the 11th I saw a distinct and copious rash on the chest of a European patient (who had fever during the day and on the night preceding) and, but for the abrupt disappearance of much of it by the following morning, I should have supposed that it was prickly heat. The eruption was papular in all the above cases. In another case the patient showed a reddish flush over the prominent portion of the cheeks. From an analysis of 300 of the cases that passed through hospital it would appear that a rash was present in about 11 per cent., but it is not possible now to state in how many the same was initial or terminal or both.

It would at present be premature to report on the sequelæ of dengue but a supplemental report will, if required, be submitted hereafter.

*Treatment.*—Aperients were administered when required; the sufferings of men compelled to move about for the purposes of nature during the first day or two of dengue are pitiful and, if there be any prospect or likelihood of the bowels acting within a reasonable time, it is better to

wait. The aperients used were rhubarb, castor oil, the infusion of senna and sulphate of magnesia, jalap and any ordinary aperient pill.

Diaphoretics were prescribed during the hot stage, the ordinary diaphoretic mixture containing the solution of acetate of ammonia, nitrate of potash, nitrous æther and camphor water, with or without the addition of a couple of minims of the tincture of aconite to each dose, answered very well. When some of the ingredients required for this mixture were exhausted diuretics were used. Perhaps the cases would have done quite as well without either.

As soon as sweating set in and there was a likelihood of a remission or intermission the sulphate of cinchonidine (of which there was a small quantity in store) or of quinia was given in a mixture with dilute sulphuric acid and this was continued for a day or two. On the 18th

Jalapæ Pulvis.	May the drugs enumerated in the
Podophylli Resina.	margin, which had been promptly sent
Quiniæ Sulph.	down by banghy from Madras by order
Tinct. Warburgh.	of the Inspector General, were received
	and a second supply consisting of Anti-
	monium tartaratum, Calomel, Cinchonæ pallidæ pulvis,
	Cinchonidini sulph., Jalapæ pulvis, Liqr. arsenicalis, Potassæ
	nitras, and Quiniæ sulphas, which came in the usual way
	through the Commissariat, reached this on the 10th June.

From the above sketch of treatment, it will be seen that cases of dengue were treated like ordinary intermittent fever. It is not for me to say whether they would have recovered without any medication at all; at any rate I did not hazard the experiment, seeing that so liberal a supply of drugs of acknowledged utility was within reach. In the earlier cases, and till all the rhubarb, calumba and soda were expended, these were prescribed as alteratives. Chiretta was substituted for calumba when the supply fell short. The most urgent symptom of dengue, pain, we endeavored to meet by liniments till every available liniment was disposed of. Having but a small supply of the tinctura belladonnæ (obtained from the sirkar hospital) we were compelled to use it carefully, with very good results. I would here draw attention to the value of belladonna in the experience of Dr. T. Edmonstone Charles of the Bengal Medical Service given in the Indian Medical Gazette for June 1872. He usually prescribes ten minims of the succus or tincture to be repeated every hour till

relief is obtained, or the third dose has been taken. After an interval of a few hours it may be given in the same way if the suffering again increases, more than two drachms being seldom required in any case. A third or half a grain of the extract, in pill or mixture two or three times a day, answered well; and he found nothing to equal belladonna in relieving not merely pain, but the restlessness, distress and anguish, which quite apart from pain are often very prominent features of the attack. Sinapisms were specially useful in some of the chronic pains complained of by the sepoys, and where they persisted for any length of time we had recourse to dover's powder and nitre, colchicum and magnesia &c. All the adults that came under hospital treatment have recovered and there have been no deaths among grown-up people in the lines; but I regret to add that the disease proved fatal to six children. Three of these were due to convulsions and were reported by the Hospital Assistants; three were not under European treatment; and in one case, seen by Dr. Cook and myself, the child (9 years old) was moribund when our assistance was required. As dengue appears to have shown itself in other parts of the Presidency it may not be amiss to refer to Dr. Charles' remarks on the succus conii in convulsions, which will be found in the number of the Indian Medical Gazette above referred to.

*Summary.*—Dengue was imported into Quilon either from Cochin or Alleppey, at both which stations it had appeared in an epidemic form prior to its manifesting itself in this cantonment. A hundred of the first cases were examined with a view to ascertain how the disease spread in the lines; but the enquiry was unsatisfactory as the sepoys could not tax their memories for the required dates: a large number stated that they were individually the first sufferers though it was currently believed that their families had the disease first. Communication with people from Cochin or Alleppey (though of daily occurrence) could not be traced during the enquiry above mentioned.

Having once obtained a footing in the regimental lines the disease spread. Dissemination was most probably owing to the manner in which the huts are built, to insufficient accommodation in them; which, though comparatively of little consequence when the inmates are in health, would become of graver import during the presence of an infectious disease.

The infectious nature of the disease is supported by facts observed in hospital and elsewhere.

Data for forming an opinion regarding the period of incubation are not conclusive; instances are given for what they are worth.

Health state of regiment and sanitary condition of the cantonment previous to outbreak of dengue are considered.

Progress of the epidemic. Total number of effective men (as per entries in the admission and discharge book)—admitted 430, of which 276 were Hindoos 126 Mussulmans 28 East Indians and Native Christians—all recovered.

Cases reported in the lines—36 men, 223 women, 204 male children, 137 female children. Total 600; all the adults recovered, 6 children died.

Symptoms detailed. Pyrexia, temperature ranging from 99° to 103° F., pulse from 78 to 108, duration of fever 3 to 4 days, pain in one or more of the joints, large and small, invariably present. Ear-ache in two cases, ptyalism in the same number. Headache in nearly all, sore throat not a common or prominent symptom. On an analysis of 300 cases 2 per cent. had conjunctivitis. Vomiting in 12 per cent., diarrhoea in 17 per cent. Urine examined in 84 cases was always free from albumen. Rash present in 11 per cent. of the cases, but it is not practicable at present to distinguish in how many it was initial and in how many final. Average number of days in hospital of a case of dengue, 6.2.

*Treatment.*—Aperients, with caution to avoid inflicting needless pain, diaphoretics during pyrexia, diuretics when the former were exhausted. Quinia, cinchonidine &c. subsequently. Calumba, rhubarb and soda as an alterative. Local applications to seat of pain; nothing to equal internal administration of belladonna, in relieving not merely pain but restlessness, distress and anguish. Reference to experience of Dr. T. Edmonstone Charles on this point, and on the administration of large doses of conium in arresting convulsions arising in the course of dengue.

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*Dimensions of the buildings occupied as temporary hospitals during the prevalence of dengue.*

Number of ward.	Particulars.	Length.		Breadth.		Height m. *		Cubic Space
		Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	
	SERGEANT'S QUARTERS.							
	<i>Ground floor.</i>					m		
1	North East room ...	31	...	13·25	...	12	...	5022
2	East room ...	19·75	...	8·75	...	9·75	..	1684·92
3	South Centre room ...	20	...	17·5	...	9·75	...	3412·5
4	North do. do. ...	20	...	11·75	...	9·75		2291·25
5	West room ...	19·75	...	8·75	...	9·75	...	1684·92
6	North West room ...	13·25	...	8	...	m 12	...	1272
	<i>Second floor.</i>					m		
1	Centre room ...	30·25	...	20·5	...	16	...	9922
2	North West room ...	20	...	9	...	m 10	...	1800
3	Do. East room ...	20	...	9	...	m 10	...	1800
	<i>Arrack Godown.</i>					m		
1	Main Ward ...	130·5	...	28	...	13	...	47508

\* m. denotes mean height.



ART. VII.—*A case of Ascites of three years and five months standing ; treated by the juice of Solanum Nigrum ; Recovery.* By M. JAGANATHUM NAIDU, Palace Honorary Sub-Assistant Surgeon, and teacher of Vernacular Medical Class, Mysore.

Pondurungah, Brahmin, aged 14 years, was brought to the Dispensary in October 1871, by one of the Palace Native Doctors, to have the operation of Paracentesis Abdominis performed.

On enquiry I obtained the following history of the case:—Some time back the boy, it would appear, had intermittent fever of the quotidian type, for which he underwent treatment by a Native Practitioner ; and while under treatment the fever changed in character, the paroxysms becoming irregular and continued so for a period of about 3 months. Emetics, purgatives, diuretics &c., were administered by the Native Doctor, without avail. Four months after the appearance of the fever the abdomen began to enlarge.

After a year, the mother of the lad stated that the distress of the abdominal complication was so urgent that she was obliged to ask another medical man to do something for her son. The medical man was G——l, who is considered to be an able physician among the Palace Native Doctors. This practitioner, having considered the abdominal extension to be caused by a tumour within, cauterized the abdomen in three places over the left hypochondriac and lumbar regions. Under this course of treatment the boy derived no benefit ; on the contrary some symptoms of general dropsy supervened ; the ulcers resulting from the canterization added much to the sufferings of the lad and were three months in healing.

The mother finding her son getting worse placed him under another Palace Doctor B——m Row. This practitioner administered to his young patient purgatives and diuretics and placed him on low diet. The repeated purgation and the free action of the kidneys resulted in some temporary relief to the boy. The abdomen became large again, the symptoms of distress recurred and the Native Doctor fearing a fatal termination brought his young patient to the Dispensary, and requested me to perform the operation above indicated—Paracentesis Abdominis.

Upon examination I found the abdomen greatly and uniformly enlarged; there was distinct fluctuation; in the upper zone there was resonance on percussion; dyspnoea was urgent; the upper part of the body was comparatively wasted; the countenance was anxious; the legs and feet were cedematous and pitted on pressure; urine scanty, bowels regular; the appetite was normal, but patient did not take much food as it distressed his breathing; the pulse was small and weak; the tongue was natural. The patient was free from fever. On exploring the abdomen with a needle serous fluid escaped.

Being perfectly satisfied that this was a well marked case of ascites with partial anasarca, I suggested that the boy should be placed under my care for a few days, before I could yield to his wish, as I meant to try the effects of the common plant, *Solanum Nigrum*, from having met with favorable results in two or three cases of anasarca in my private practice among my countrymen. The Native Doctor gladly accepted my request; but expressed his doubts about the success of my trial; and then I prescribed the following:—

R Extracti Solani Nigri 3i.

To be given twice a day.

On the 2nd or 3rd day the medicine commenced to act freely, both on the bowels and kidneys, without causing any apparent corporeal debility. The vegetable extract after some days' administration failed to act satisfactorily on the patient and consequently the dose was increased gradually up to two drachms two or three times a day according to circumstances.

About two weeks after the commencement of the medicine a decided change for the better was observed; the abdominal tumour commenced gradually to decrease; the respiration became free, the cedema of the legs disappeared and the patient was then able to take more food than before without experiencing any distress. Pleased highly with these changes, the boy's mother begged of me to continue the use of the extract some days longer. The extract was persevered in for upwards of a month and, now that it was found difficult to procure the plant in sufficient quantity for daily use, the concentrated juice was ordered to be given in doses of 2, 3 or 4 ounces daily according to effects manifested on the system. The extract appeared to take better effects in this boy than the concentrated juice of this shrub.

With the internal remedy the boy was allowed to have his daily warm water ablution according to the usual caste custom, and was ordered to wear an abdominal bandage so as to give a support to the relaxed muscles of the belly. The administration of the medicine was continued for upwards of two months with occasional intermission. After the disappearance of all the dropsical symptoms, there remained a sort of puffy swelling in the hypogastric region, evidently resulting from the thickened condition of the greater omentum. The application of Iodine Liniment to the part affected, with pressure and occasional purgatives, was ordered. He passed a great deal of mucus for several days. The omental thickness remained in spite of an active treatment for a considerable period.

On examining the abdomen of the patient, after it had been reduced to its normal size, the spleen was felt to be a little larger than usual; the liver was normal.

The lad has now perfectly recovered from his dangerous malady by the blessings of the Almighty and he has nothing at present to complain of except his voracious appetite and a peculiar desire for table delicacies.

*Remarks on the above case.*

This is a severe form of dropsy of the peritoneum with partial anasarca, evidently caused by affection of the omentum and enlargement of the spleen resulting from an attack of chronic ague. This complaint, under the care of Native practitioners, resisted all available medical treatment, and at last little or no hopes were entertained of the recovery of the boy. To give him the last chance of life, the medical attendant of the patient proposed the operation of Paracentesis Abdominis. Prior to the execution of this a suggestion for the trial of the effects of the common indigenous plant, the Solanum Nigrum, (since the Native medical treatises recommend the plant highly in the management of dropsical complaints) was made. Hakeems and Hindu Doctors alike consider it to be the sovereign remedy for the above complaint. The trial has no doubt proved a decided success and saved the life of the poor Brahmin boy.

Having experienced in practice that almost all the cases of ascites that come under my cognizance, in which the usual course of treatment was pursued, terminated fatally, I have had a desire for some time to depart from the established rules of treatment in European books

for this affection, and to try those which the Hindu medical treatises recommend; but my position was such as to debar me from doing things as I would wish. In one instance I was actually accused of encouraging quackery, although my grounds of action were those above mentioned, and were allowed by other members of the profession to be fair and commendable.

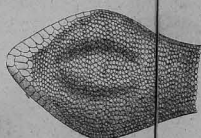
After my liberation from these restrictions, I turned my attention to the careful study of Native medical treatises and of the indigenous medical plants. In my repeated trials I have found some of these plants to possess extraordinary virtues and really valuable therapeutic qualities. I have collected several interesting cases in my private practice and as an example I have brought the above to light, the rest I have reserved for a future occasion. I humbly beg the liberty of stating the fact, that the entire ignorance of the Native Doctors in Pathology brings discredit on their most useful nostrums by their improper application. I am convinced from personal experience that if a proper basis were afforded (as by translations of the Principles of Medical Science into the Vernacular) to the Native Doctors, who are at present held in undisguised disrepute, their accumulated experience and natural ingenuities would soon render them notable and highly useful members of the medical profession. I will however desist from further remarks, as it is my intention to treat the subject at a fuller length hereafter.

In the management of dropsical affections in their earlier stages, diuretics and purgatives are regarded as our sheet anchors and subsequently we rely on tonics so as to counteract vascular relaxation and give to the system generally a healthy tone. To produce these several actions in the human frame simultaneously, practitioners prescribe medicines, so as to obtain their actions conjointly. The one great advantage that the juice of this plant enjoys over other drugs is that it alone produces all the required effects viz., diuretic, purgative and tonic; other cathartics and diuretics produce a certain amount of prostration in the system after their full physiological action has been produced, but no such untoward symptom occurs under the use of this plant, which is an additional advantage to be observed. As the fluid is drained away from the system, the vessels regain their tonicity and the exudation of serous fluid is thereby prevented.

In conclusion I beg to draw attention to the fact, that



EUBLEPHARIS HARDWICKII Gray  
or  
BISH KOPRA OF SCINDE



PLATYDACTYLUS GECKO Linnaeus  
or  
TUCKATOO OF BURMAH

had I not declined the usual course of treatment (after the experience of two or three cases) I would certainly have lost my young patient some months ago. I may venture to add that the marked success in my hands that has invariably followed the exhibition of this drug may warrant its use being adopted in desperate cases of ascites.

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ART. VIII.—*The Tuckatoo and Bish Kopra*. By JOHN SHORTT, M. D., &c., Surgeon, Superintendent General of Vaccination, Madras Presidency.

THE two following lizards have been sent to me for examination from the report that they are poisonous. A distinguished naturalist has already stated that "a venomous lizard is an anomaly, unknown in creation." One is the Tuckatoo of the Burmese and the *Platydictylus gecko*, Linn.; (*Gecko Guttatus*, Syn:) of naturalists; with this specimen I received the following account.

"This is the Tuckatoo of the Burmese, a large species of lizard found in Burmah, inhabiting trees and seldom seen, and heard only at dark and during the night; it is of a dark ash colour spotted with red, but the old ones are much darker in colour, as are also the spots.

Their cry first begins with a croak and then they sing out tuckatoo, tuckatoo, quite slow and then in a quicker time; the same word is repeated for a few seconds and then another croak and all is still. Their voice is quite loud and hoarse and heard at a great distance.

The Burmese as well as other natives dread this reptile, as their bite is poisonous and their hold so tenacious that they can only be cut off the body of the person they fall on. The Burmese say that when any one is bitten their body swells to a great size and they seldom live over a day.

The largest ones are half a yard long and only found in dense jungle, on large trees, where there is a great difficulty in getting at them, as they so nearly resemble the bark of the tree, besides the dread of their falling on one."

This Tuckatoo specimen before me now is of stout form of body and tail, coarsely granular and of a dark grey colour, clouded with grayish white markings, belly of a uniform grey, measuring 10 inches in length from tip to tip and 6 inches across arms and chest from finger ends to finger ends,

length of skull 2 inches, arms 2 inches, legs 2 inches, and that of tail  $4\frac{1}{2}$  inches.

This Gecko according to *Mason* was first described by the Catholic Missionaries in Siam during the reign of Louis XIV and has no doubt been described and depicted by others since, so that I need not enter into details.

2. The *Bish Kopra*, corrupted into *Bis cobra* is common to Scinde, Guzerat, Chittagong and other places. The word *Bish* implying poison, and *Kopra*, snake, or the poison snake. In *Hind.* it is *Ghoor*, in some parts of Upper India, in Bengal *Tuckhut* and *Tuckoo* from its song or cry, but in Bareitch, Oude and Scinde they are termed *Bish Kopra*.\* The scientific name of *Bish Kopra* is *Eublepharis Hardwickii*, Gray. It is described by Dr. Gunther in his catalogue of reptiles. "The fingers and toes are not dilated or depressed, rather short, all clawed and with a single series of simple transverse, narrow scales below. The upper eyelid broad, prominent, the lower well developed. Tail cylindrical, tapering." Of the two specimens now before me and for which I am indebted to the kindness of Captain Lampen of the 17th Regiment N. I. one measures  $9\frac{1}{2}$  and the other  $5\frac{1}{2}$  inches in length. *Gunther* says, "it is a single species of this genus, differs from *Gecko*, evidently a ground lizard."

Some years ago, I saw some articles in the Madras papers about this reptile which made it out to be the most poisonous creature with or without four legs, and one or two of the officers who were in service in Bengal mention that several sentries were found dead on their posts from the bite of some creature, which was afterwards found, and which I took to be the *Bis Cobra* from the description they gave of it.

That neither the *Bish Kopra* nor the *Tuckatoo* is poisonous, but on the contrary a harmless reptile, there is not the slightest doubt. But how or why it is so popularly reported to be not only poisonous but deadly it is impossible to conceive. There is not as far as I am aware any authenticated account of cases bitten by either of these lizards. The common Gecko *Hemidactylus Coctæi* even in Southern India is dreaded, more especially the larger kinds found about rocks and large trees, and by their cry the natives pretend to foretell coming events; the fall of the house Gecko before or on an individual accidentally is considered

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\* Balfour's Cyclopædia.

a misfortune ; and to the urine of the house lizards is attributed a restricted form of *Hæpæs zoster* that sometimes shows itself about the face of individuals, more especially about the lips and mouth. A learned work in Tamil termed the "*Sittar Vedum*" or work of the "seven sages," pretends to give an account of all poisonous animals ; snakes, centipedes, spiders, beetles, lizards, dogs, cats, tigers and monkeys being placed in the same category of venomous animals.

This book is to be readily had in the bazaars for two or three annas and I believe a similar work exists in Ceylon among the Cingalese. The popularity of this work I fear, at least in this part of India, gives rise to such stupid and false notions of animals. It is firmly believed by the natives of Southern India that the Iguana, *Monitor dracæna*, Linn., bites severely and will not cease its hold till a donkey brays ! That the natives believe that most lizards and some species of toads are poisonous there is no doubt. Some years ago, when Zillah Surgeon of Chingleput, I remember on one occasion a native came running to my house, he was almost breathless, streaming with cold perspiration, looking pale, skin cold, pulse small, holding the thumb of his left hand in his right and complaining of being bitten by a Chameleon, *Chameleo vulgaris* on the tip of the left thumb, and requesting with the tears in his eyes that I would do something to save his life, nothing that I could say convinced him that the Chameleon was harmless and the bite not poisonous, but to satisfy the poor fellow I applied some Liquor Ammoniaë to the part said to be bitten and where there was a slight abrasion of the skin and gave him a little brandy and water to drink. He sat down for a while in my verandah and then went away apparently quite well, that the man was in a great *fright* about his life there was no doubt from the state of his pulse, skin and general appearance when he presented himself before me.

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#### ART. IX.—*Lying-in Hospital Reports.*

*Two Cases of Elephantoid Tumors of the Labia under the care of Surgeon R. W. COCKERILL, reported by JOHN LANCASTER, Clinical Clerk, Lying-in Hospital, Madras.*

I. 2nd April 1872.—Ruthnum, aged 19 years. An emaciated dancing girl was admitted into the Hospital this



morning with a large tumor growing from the mons veneris, clitoris and upper part of both labia; the tumor is irregularly globular with flattened sides, the skin covering it is extremely hypertrophied and coarsely nodulated in every direction; it is ulcerated posteriorly from constant irritation and covered with an extremely fetid, thick discharge. A long deep fissure may be seen at the lower and inner part of the tumor in which the vagina and meatus urinarius can be felt; the vagina is twisted towards the right side at almost a right angle, and its walls are extremely thick and cartilaginous; the urethra is pulled downwards and it is with great difficulty that a catheter can be passed into it.

*Dimensions of the tumor.* From mons veneris to the most dependent part ... .. 12 inches.  
 Circumference at the widest part... 21½ "  
 Diameter ... .. 13 "  
 Around the neck ... .. 10½ "

*History.*—She noticed the swelling in the right labium 3 years ago; within the last 2 years it spread and rapidly increased to its present size; rendering her perfectly useless as a "dancing girl."

About 4 years ago she was delivered of a still child.

Her general health is evidently greatly impaired; she menstruates irregularly; she is willing to have the tumor removed, but the operation will not take place till her health is in some degree improved; she is put upon a liberal diet with stimulants and tonics.

9th—As her health is somewhat improved the operation is to be performed to-morrow morning.

10th. *Operation.*—The patient having been put under the influence of chloroform was placed in the lithotomy position, and the tumor supported by an assistant: the diseased structure near the orifice of the vagina was carefully dissected out; an incision marking out the rest of the diseased mass was then made, and the whole of it detached by a circular sweep with a large scalpel; the hæmorrhage was rather considerable: five ligatures were applied to large vessels and several smaller ones were twisted.

The large wound was brought together by strips of plaster and dressed with lint soaked in carbolized oil. The tumor weighed 14 lbs.

23rd May.—The girl's recovery was tolerably rapid: the wound healed completely in 6 weeks, leaving a short broad cicatrix; the orifice of the vagina is slightly contracted and the mons veneris and right labium somewhat puckered up: the structures around are all apparently healthy.

II. Arloye, aged 27 years.—A well-built woman in fair condition was admitted into the Hospital with an enormous tumor growing from the mons veneris and left labium and hanging low down between her knees. It is firm and leathery; pyriform but somewhat flattened antero-posteriorly; the skin covering it is excessively hypertrophied, firmly adherent to the tissue beneath and irregularly and coarsely nodulated: posteriorly, from constant chafing, there is a broad abraded surface covered with a thin and horribly offensive discharge. The vagina and urethra are in their normal position and healthy.

*Measurement of the tumor.*

From mons veneris to the most dependent part.

		16 $\frac{1}{2}$ inches
Circumference at the widest part ...	38 $\frac{1}{2}$	"
Diameter ...	... 15 $\frac{1}{2}$	"
Around the neck ...	... 14	"

*History.*—The swelling was first noticed in the left labium 7 years ago; it increased slowly in the first 5 and rapidly in the last 2 years. While the tumor was still small she became twice pregnant and was safely delivered of living children; her general health is not impaired to any great extent; she menstruates regularly: as she is anxious to have the tumor removed, the operation will be performed as early as possible.

2nd May 1872. *Operation.*—The patient having been put under chloroform was placed in the lithotomy position, the shoulders well raised and the tumor supported by an assistant: As the diseased tissues did not involve the clitoris or ostium vaginæ as in case I. no careful dissection was necessary. A preliminary incision however was made around the neck of the tumor enclosing as far as possible all the diseased structure and then at this site the enormous mass was rapidly cut away with a large scalpel; the hæmorrhage was less than is usual in the removal of tumors of this kind.

Four ligatures were applied, the smaller vessels were twisted. The tumour weighed  $22\frac{1}{4}$  lbs. The wound was dressed with lint and carbolized oil and a catheter kept in the bladder.

The woman made an uninterrupted and tolerably rapid recovery; the wound granulated healthily and healed in about 7 weeks, leaving a long narrow cicatrix, but with no marked contraction of the adjoining parts which are healthy with the exception of the right labium which is slightly hypertrophied.

*On section.*—The tumors were identical in structure with the scrotal tumors so common in this country.

Both the patients left the hospital in good health and highly delighted with their improved and to them novel condition.

ART. X.—*Report of the Medical Committee appointed to investigate the causes of the Epidemic Fever, which has prevailed in the Provinces of Coimbatore, Dindigul, Madura and Tinnevelly, during the years 1809, 1810, and 1811.*

(Continued from page 17.)

TOWARDS the southern and eastern extremity of the Peninsula there are many salt marshes (or Purgas). The chief of these are situated betwixt Coalsairpatnam in the Punjmahal Talook and Veseapetty in Caulead, and are as follows:—Moodoomutta which lies about  $12\frac{1}{2}$  miles south-west of Manapar; Anacoodyerpoo, about 10 miles south-west of Manapar; Pootoor, about  $7\frac{1}{2}$  miles south-west of same place; Cunnoo, 6 miles south-west of Vyravum, about the same distance; Soondencota, nearly 4 miles west of Manapar; and Cootam which is situated a short way from Moodoomutta. These marshes were formerly all distinct from each other but, owing to the late inundations, four of them are now joined together, viz., Pootoor, Cunnoo, Vyravum, and Soondencota, which form one great marsh 10 miles in circumference. They are separated from the sea by high sand hills, have no *natural* communications with it; and lie at unequal distances from it, of from 4 to 13 miles. In common years there is not much water collected in them; but since the heavy monsoon of 1810, and

more especially since the rains which fell out of all season in February and March, they have been filled to a considerable depth (5·7 or 10 feet) and the water, by remaining long in a state of stagnation, has been productive of infinite mischief. In December 1810 the inhabitants of the different villages which are contiguous to these briny swamps, (10 or 12 in number), complained that their houses were rendered uninhabitable, that most of their cultivated lands were flooded and that the water had risen so high on their palmyra trees that they were prevented from drawing toddy. To remedy these evils Mr. Hepburn gave orders that a cut should be made from the four united marshes to the Curnyar river, which rises in the Calcaud hills, with a view of diverting the superfluous water from the deluged country. The cut was made and for a time answered the purpose intended; but the subsequent rains in February and March, unfortunately, by occasioning fresh floods and a new pressure, choked up the opening; since that period and from the time of the weather becoming drier, every exertion has been made to drain the country and relieve the suffering inhabitants.

Towards the extremity of the Peninsula there is another pass into the Travancore country, known by the name of the Arumboolie pass, which till lately was the only one frequented by Europeans; it is about 2 miles in width and not more in length through the hills, which here become very narrow. The eastern opening of this pass lies exactly in the meridian of Cape Comorin and at the distance of 12 miles from it.

There are many large, flourishing, well built towns in the Tinnevelly Province, the chief of which are situated on the fertile banks of the Tambarapoornie; such as Tinnevelly, Alvarthinnevelly, Shermadavy and Culdacourchy.

Tinnevelly is an extensive, handsome and populous city, situated in latitude  $8^{\circ}43'$  N. and about 25 miles east of the great mountains. It is in the Nelumbalum Talook, about 3 miles west of Palamcottah, and is the capital of the Province; it is surrounded on three sides by extensive paddy lands, watered from the river, and on the west by dry rocky high ground.

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Such then as we have described them, or nearly so, are the geographical boundaries and strongest features of the

different Provinces to which our attention has been on this occasion directed ; we shall now proceed to say something of their climate in common years.

Coimbatore,\* as might naturally be expected from its elevation, is colder and drier than some of the neighbouring countries ; we have already remarked that the general plain of it is about 900 feet above the level of the sea ; so that if the theory that has been assumed by Dr. Black† be just, that for every 200 feet of elevation we may reckon one degree of reduced temperature, this district ought to have a great advantage in this respect over all those situations that lie nearer the ocean.

The north-east monsoon commonly commences soon after the calms are over, which take place about the period that the sun crosses‡ the Equator and enters on his southern declination, in other words towards the middle of October ; and first pours its torrents over the Coromandel Coast, in the vicinity of Madras, about the beginning of § November. This monsoon is evidently formed by the junction of the perennial east wind and the cold air from the frozen mountains of Thibet rushing towards the south-west, to supply the place of that which has been rarified and sent upwards by the influence of the sun on the east coast of Africa and the Indian Ocean.

The rainy influence of the north-east monsoon, which almost invariably attends the change of the wind to the north, seems, as far as regards the most southern parts of the Peninsula, to be in great measure confined to the Districts lying east of the Balaghaut mountains, which from their great height and depth attract and arrest many of those clouds which might otherwise have been carried to the Malabar side of India by the strong north-east wind. In such countries as are situated towards the north, as far as Cuttack, this monsoon would appear to be in like manner bounded, in some degree, by the great range of high lands which run south in the Peninsula and at the unequal dis-

\* It is to be kept in remembrance that by the District of Coimbatore is now meant the Divisions of Caroor, Coimbatore, Darampooram and Sattimungalum.

† See Dr. Black's Lectures on Chemistry. Chapter on unequal Temperature. Vol. I., page 103.

‡ The sun crosses the line about the 22nd of September.

§ The rainy influence of this monsoon is observed gradually to extend from the north towards the south. It seldom reaches Tinnevely before the end of November.

tances of 25·28 or 50 miles from the sea. In fact the rainy influence of the north-east monsoon may be said nearly to be confined to such territories as belong to the Madras Establishment.

In Coimbatore the rains at this season (the north-east monsoon) swell the rivers Noel, Bhavanie and Amberabady, as also the Cavary (which, we have already observed, is likewise filled by the south-west monsoon) and at this period also the tanks and low grounds of the District receive their grand annual supply of water.

The end of December, when north-east monsoon rains are over and the sun has gained his most southern declination, may be considered as the coldest season of the year in all those countries situated north of the Equator. In Coimbatore at this period the range of the thermometer in the shade is from 62° to 80° or 81°; the climate is then delightful and the north-east wind proves enlivening and bracing to weakly constitutions. Towards the end of January and in February the dews fall heavily; and the fogs in the morning, especially in situations near the mountains, continue sometimes till 9 o'clock in the forenoon; occasioning simple intermittent fevers, and catarrhs amongst the Native inhabitants.

The north-east wind prevails with little variation till the beginning of March; though it generally becomes weaker the farther the season advances: after this period, as the sun approaches the Vernal\* equinox, the winds are somewhat variable and occasional calms ensue, till he has gained about the seventh† degree of northern declination; when what is called the south-west monsoon may be said to commence; and which appears to be occasioned, according to the notions of the Chevalier‡ *De Coudraye* and others, by the cold air from the continent of Africa and the Indian ocean, (which at this time have felt the absence of the sun) taking its course towards those extensive tracts, lying in the north-east of Asia, over which the air has become heated and displaced by the powerful influence of the solar rays. The early part of the south-west monsoon season is a period of great drought on the Coromandel Coast, though partial rains are

\* The sun crosses the line about the 21st of March on his northern declination.

† Which he does about the 7th of April.

‡ See his "Theory of the Winds."

experienced then in Malabar and amongst the Western Ghauts.

It must here be observed that by the terms south-west and north-east monsoon are not so much to be understood the rains which come from these points as the particular winds which propel these rains; for we know that the north-east monsoon, properly so called, continues long after its torrents have ceased to fall, and that the south-west wind often ensues before the rains commence from the same quarter.

From the time that the sun passes the 7th degree in his northern declination, the southerly and south-east winds begin to blow on the Coromandel Coast; and continue till about the middle of May. In Coimbatore and other inland situations they are weaker and less unpleasant than at places closer to the sea; where, particularly near the period of their cessation, they are often hot\* and to some constitutions extremely enervating. In the month of March† in Coimbatore rain is very uncommon; the wind, though in the morning it still has a gentle flux from the north-east, comes usually round to the south-east in the evening and, towards the end of the month, the north-east wind for the most part dies away altogether; and with it, in regular seasons, those dews in a great measure disappear which had fallen heavily during the three preceding months.

The sky in Coimbatore in the month of April is frequently overcast but rain is not very common, at least not to a greater extent than a few showers from the south and south-west. The weather gets daily hotter, the average range of the thermometer for the month being from 76° to 93°; the wind continues to blow from the same direction as in the end of March but oppressive lulls are often experienced and the dews are but trifling. In May the thermometer rises sometimes as high as 96° and 97° in the shade and seldom falls lower than 79°. The sky is often overcast and there are occasional disagreeable whirlwinds, quickly followed by pelting showers, accompanied with thunder and lightning.

The southerly, or what is called the long-shore wind,

\* We must here except however all situations south of Tanetary or indeed Point Calamyre, where, by the training of the coast towards the west, the southerly wind is rendered less drying and unpleasant than it is further north.

† By a correct Register of the weather kept at Madras, it appears that no rain fell there, during a period of 13 years, in March.

generally terminates about the middle of May; when, owing to this part of the Peninsula having been so powerfully heated by the vertical\* rays of the sun, a change takes place in the direction of the wind, which becomes general nearly all over India; and which brings on, before the rains begin to fall in June, by far the hottest season of the year.

We have observed that the sun crosses the equator about the 21st of March in his northern declination and that, soon after, the wind begins to blow from the south; so that by the end of May he has been vertical over all those districts lying betwixt the southern extremity of the Peninsula and Coimbatore, which have, of course, been much heated. The consequence of this is, that the vast body of air, which takes its direction from the now comparatively cooler regions on the eastern and southern Coast of Africa, rushes towards the tracts where the greatest rarification has taken place; and which, as we have seen, must at this time be the arid plains of the Carnatic. But this wind, passing over a great extent of heated country, will naturally partake of its temperature, and in this way is produced the hot west wind, which usually continues to blow pretty regularly till towards the end of August; when frequent calms ensue and light breezes from different quarters, the evident consequences of the sun's crossing the Equator.

Soon after the setting in of the hot westerly winds on the Coast of Coromandel, the rainy influence of the south-west monsoon is first experienced on the other side of the Peninsula, pouring its floods over Malabar and the Mysore Country and amongst the immense Balaghaut and western mountains; but it is partially felt in the provinces lying east of these high lands. In situations near the hills indeed there are at this time frequent heavy showers, especially in the more western and southern parts of the Tinnevely† and Madura Districts; but, excepting the Valley of Courtalum, no place that we know on the east side of the mountains can be said to be under the regular influence of the south-west monsoon; and even here in certain seasons the expectations of the cultivators are in this respect greatly disappointed.

After the torrents which distinguish this monsoon have

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\* The sun is vertical over Coimbatore about the 10th April.

† What is called the first burst of the south-west monsoon often occasions heavy rains in Tinnevely.



begun to fall in Malabar, the temperature of the west winds on the Coromandel coast is usually a little moderated but, in the Carnatic, by no means to that degree that we might expect. There, heat may be pretty nearly calculated by the distance from the great western Ghauts, as, the nearer to the eastern sea we go, the west wind is invariably found to be hotter and at the same time weaker. In such situations great relief from the extreme heat is almost daily derived from the sea breeze; but we have known 20 successive days at Madras during the land-wind season without an easterly wind, and which produced a state of the atmosphere which was indeed almost insupportable.

After what we have said it can easily be supposed that the west wind in Coimbatore, in the months of May, June, July and August, is by no means so distressingly hot as in situations lying further east; but it is (at least in some parts) fully as unpleasant from another cause, its immoderate strength. In speaking of the general appearance of this District we mentioned the Paulcaudcherry pass into the Travancore country, which is in a direct line with Darampooram and Trichinopoly. This opening is of considerable width and, being shaped like a funnel with its narrowest end towards the east, allows and attracts a free and full passage to the west wind from the time that it begins to prevail. For the first fortnight this is comparatively weak and a little warm; but from the commencement of June till near the end of August, when the rains are falling on the Malabar Coast, it becomes cooler, particularly near the hills, and sweeps over the tracts and in the line we have above mentioned with great violence; so much so indeed at Darampooram as to prove extremely unpleasant to Europeans; who are, during the time it lasts, in a great measure prevented from taking exercise in the open air.

In other parts of this District, out of the strong current of wind, the climate at this time is much more pleasant, such as Coimbatore and Bhavanie, the first of which stands clear of the funnel's mouth, the other is a great way to the eastward and northward of it.

Were the great western mountains as near to the ocean in this Province as they are in that of Tinnevely, we have no doubt but that the rainy influence of the southwest monsoon would prove considerable at the opening of the Paulcaudcherry pass into the Coimbatore country, but, as it is, there are only here experienced frequent

scudding showers which, however, have the effect of making the climate perfectly cool and agreeable.

The west wind, so refreshing near the opening of the pass, by the time that it reaches the eastern boundary of the Coimbatore country, is somewhat warm; and at Trichinopoly, where it blows with great force, it would be almost as hot as Madras were it not for the extensive flooded paddy lands lying towards the west of it, and the swollen river Cavery, over both of which it passes.

A good deal of rain usually falls in the eastern part of Coimbatore in the month of June but in the more western tracts, near the hills, the quantity at that time is much more considerable. There are hardly any dews. The sky is often overcast and the temperature of the air towards the end of the month is somewhat lower than in the preceding one. The nights are pleasant; and the Cavery for the most part fills about the 12th or 13th from the south-west monsoon torrents in the upper countries. In July nearly the same kind of weather prevails as in June, only that in the first mentioned month there is a little less rain than in June. The range of the thermometer is commonly betwixt  $75^{\circ}$  and  $91^{\circ}$ .

About the middle of August in this province the west wind becomes much more moderate and there are frequent heavy showers and occasional thunder-storms: soon after this, most oppressive lulls are experienced, and the evenings and nights become hot and close towards the end of the month, the river almost invariably again fills and gentle airs now and then blow from the southward.

In September the wind is variable but the westerly still predominates. That sultry and close weather, which constantly takes place as the sun draws near to the equator, is now felt. The evenings are most unpleasant and the insects very troublesome; there are occasional showers from different quarters.

The weather in October in Coimbatore is for the most part very similar to that of the month preceding and, though rain occasionally falls, the air is often close and sultry; the winds are light and variable and the insects extremely annoying.

It has already been observed that about the middle of this month the north-east monsoon commences and that at the same time its rainy influence is first felt in the northern tracts of the Coromandel coast; but

the rains do not usually reach Coimbatore sooner than towards the 6th or 8th of November and are generally over by the end of December, about which time the delightful cool weather begins, with heavy dews.

We have said before that this Province was from its nature well suited for dry grain cultivation; the proportion of which over that of rice is so great as to be as 97 to 3. The different grains here produced are the following:—Rice (*Oriza*), Cumboo (*Holcus spicatus*), Cholum (*Holcus sorghum*), Natchenny (*Cynosurus coracanus*), Warroogoo (*Paspalum frumentaceum*), Tennay (*Panicum italicum*), Samay (*Panicum miliaceum*), Wheat (*Triticum*), Ulandoo (*Phaseolus radiatus*), Carp Ulandoo (*Phaseolus max.*), Cooloo (*Glycine tomentosa*), Towaray (*Cytisus cajan*), Caramuny pyre (*Dolichos catiang*), Putchapyre (*Phaseolus radiatus*), Samy pyre (*Phaseolus radiatus var.*), Tattapyre (*Dolichos lablab*), Cadalay (*Cicer arietinum*), Mutchacottay (*Dolichos lablab var.*), and Coodraywalie samay (*Panicum semiverticellatum* (Spec. nov : Rother).

There appears to be great general comfort enjoyed by the Native inhabitants of this District; which was witnessed by us in our visit to it during the months of May and June last. The houses are for the most part well raised and, their roofs being made to slope much, they are little liable to suffer from heavy rains.

We found, as was noticed in our Letter to the Medical Board of date the 17th of May 1811, that the cultivators commonly fed\* well, that most of them slept on cottles (trucklebeds) and had cumblies† to cover them; habits which seem to have existed from the time that the Coimbatore territory was under the dominion of Tippoo, who was extremely particular regarding such matters, owing to the bleak air and dampness of the greater part of the coun-.

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\* As might be supposed from the nature of the cultivation of this Province, the most common food for the labouring people is the dry grains and pulses; the last are much used and are known to be of a most nutritious quality. The affluent of course eat more rice and ghee; and, as in other parts of the world, enjoy those comforts and luxuries in respect to diet which the poorer inhabitants cannot afford; who are sometimes on this account led to prepare for themselves crude and unsalutary mixtures with some of the worst kind of greens, fruits or butter-milk.

† Coarse blankets. The sheep of Coimbatore, unlike those of other parts of lower India, have a kind of wool upon them from which these cumblies are made.

tries over which he reigned having frequently proved prejudicial to his people.

Upon the whole Coimbatore may well be called healthy, though there is no doubt (as there must be in all such provinces as are in any degree bounded by immense mountains) a degree of danger attendant on going amongst the Hills, at certain periods of the year, where fever is known to be constantly endemic.\*

The climate of the Dindigul District in common seasons is reckoned one of the finest in India, so much so indeed, as to have become proverbial.

The temperature during the months of December and January is not in general quite so low as it is in the more northern parts of Coimbatore, the thermometer seldom falling below 64° in the shade. In February the dews are heavy and the morning fogs extremely dense. The southerly and south-east wind, which blows towards the end of March and in April, is here by no means so unpleasant as it is nearer to the coast and is sometimes pretty strong. About the middle of the last mentioned month, by which time the dews are nearly over and the sun vertical† over Dindigul, oppressive lulls‡ are occasionally felt.

It seldom rains in March and April. May may be considered as the hottest month of the year, though the thermometer does not usually rise so high here as in the Coimbatore and Madura Districts and the air is now and then refreshed with showers attended with thunder, by which means the land-winds when they begin to blow are rendered much less scorching than at many other places. But it is in June, July and August, that the superiority of the climate of Dindigul in regular seasons is chiefly experienced, owing to the number of hills which are scattered over and distinguish this province. Much rain falls during these months, the natural consequence of clouds they attract and the frequent and rapid interchange of the electric

\* Such as it is amongst the mountains near Sattimungalum in March and April.

† The sun is vertical at Dindigul about the 17th of April.

‡ These lulls are peculiarly distressing at this season in what is called the Dindigul valley, which from its situation, has a climate much resembling that of the Vallois in Switzerland bounded on one side by the Alps of Savoy and on the other by the most mountainous tracts of the Canton of Berne.

fluid. In this way the sky is often overcast and the temperature of the air rendered cool and pleasant : during the remainder of the year the climate of Dindigul does not materially differ from that of Coimbatore.

Several of the pulses which we have mentioned as growing in Coimbatore we could not find in the Dindigul country, which leads us to think that they are not common ; neither did the Wullawahs (labourers) in this District, who are chiefly Pullars, seem to us to be so comfortable in some respects, chiefly in regard to lodging. Their houses, unless in a few of the largest towns such as Vadasundoor and Pariocolum, are frequently small, badly built, carelessly thatched and but little raised from the level of the ground ; especially those of the villages near the hills, in which there is often an appearance of misery and squalid poverty to be met with, in a great measure perhaps owing to their unhealthiness and the unprofitable nature of their situations. Cottles are less used here than in Coimbatore, indeed they are seldom seen unless in the houses of those in rank above the labourers. such as the Marassidars and principal inhabitants, although timber is by no means scarce.

Cumblies however are here almost in general use ; we believe they are manufactured in some of the more Eastern estates and are certainly a great source of comfort in a hilly country where the dews fall heavily and fogs last long.

The number of cawnies cultivated with punjah or dry grain of all kinds, in the province we now speak of, is Cawnies 123,259, Acres  $5\frac{3}{4}$  ; those under Nunjah or Paddy cultivation amount to Cawnies 28,003, Acres  $14\frac{1}{2}$  ; which gives a difference, in favor of the Punjah, of Cawnies 95,195, Acres  $7\frac{1}{4}$ . The particular food of the inhabitants will of course depend much on the situation of the village, whether under a dry or a wet grain culture ; a part of the produce of which they receive as the price of their labour together with a small sum of money for clothing.

The climate of the Madura Province differs in some respects from that of Dindigul. The country is lower in the Peninsula, is a little farther south and is not so mountainous ; the natural consequence is, that it is hotter in the hot season and not quite so cold in the months of December and January. In April and May the extreme degrees of temperature betwixt the morning and noon are  $79^{\circ}$  and  $98^{\circ}$ . In January the thermometer seldom

falls below 66° at sun-rise. Rain is rarely seen in February, but a few showers occasionally descend towards the end of March, with whirlwinds, clouds of dust and thunderstorms; about which time the north-east wind becomes very faint and there are gentle airs from south and west. In April the same kind of weather prevails that we have mentioned in Coimbatore, with this exception that showers are here a little more common and come from the west\* and south-west.

The south and south-east winds now and then lull† and the most oppressive calms ensue, with frequently a smart thunder-storm in the evening, accompanied with rain from the north-west. This is by far the most unpleasant time of the year in the Province, especially within the Fort of Madura,‡ which lies extremely low, is crowded with houses and choked up with trees. Towards the end of March the inhabitants of Madura are in the habit of visiting the sea-coast at Mootapetty in the Ramnad Zemindary, which from its peculiar situation proves at this season of the year a cool residence.§ By its having the ocean towards the south and west the southerly wind is rendered a sea breeze; and by having the bay of Kilkerry due west of it, the west or land-wind must also become a sea breeze. The sea-port of Daviapatam which is nearly opposite to Mootapetty on the other side of the peninsular neck of land becomes from its position a more desirable retreat during the north-east monsoon.

\* About the full moon of the month of April the river Vyáar, whose bed had previously been dry, is invariably partially filled by rains which have fallen amongst the western mountains from the period that the south-west monsoon winds had begun to blow; and on this circumstance the Natives calculated with certainty for the replenishing of their tanks and enabling them to perform their various ablutions at the festival of the Aligherry god, which is annually held on the banks of the river at this season of the year.

† These oppressive and unhealthy lulls are particularly experienced in that valley in which Towerincourchie stands and which is nearly surrounded with hills covered with trees and jungle and teeming with rank vegetation.

‡ The sun is vertical at Madura about the 16th of April.

§ The second Member of this Committee having been under the necessity of proceeding to Mootapetty from Madura about the end of June, for the recovery of his health, which had suffered much from an attack of the Epidemic Fever caught during his visit through the unhealthy districts, wrote as follows:—

“We have not felt a single hot hour in our tents since our arrival at Mootapetty, where a sea breeze blows night and day. I look upon this as one of the best points on the coast for any person to come to, either for the recovery of his health, or the enjoyment of every thing of, or belonging to, the sea.”

In the beginning of May the west wind in the Madura province, though by no means so hot as in the Carnatic, is somewhat warmer than at Dindigul. In June, July and August there are frequent refreshing showers, particularly in the two first-mentioned months, the consequence as well of these clouds which have been attracted by the Aligherry and Nuttum hills and may be considered as the certain offspring of Coromandel exhalations, as of others which may have been driven by strong west winds from the great Western Ghauts and which are as certainly the produce of the south-west monsoon.

September and October differ but little from the same months in other parts of the eastern coast of the Peninsula, being almost invariably close, sultry and unpleasant.

The north-east monsoon extends to the Madura District in common with other parts of the Coromandel side of India, but in the inland parts the rains fall more gently than they do nearer the sea and are not accompanied by such strong winds. About the middle of November the tanks are full and the Vyāra is impassable at Madura for many days.

Every thing considered, the climate of this District in common seasons cannot by any means be called unhealthy, though the Fort itself has certainly been so for several years past, even before\* the Epidemic prevailed; a misfortune which we conceive entirely to be attributed to those causes and *localities* pointed out by the 3rd member of this Committee (in his paper addressed to the Medical Board) and which are certainly sufficient to produce endemic fever in any quarter of the world, and in the finest seasons.

In the District of Madura, as in every mountainous country in the torrid zone, there are situations where fever never fails at certain seasons to be endemic; but then at *such places* in common years it is purely so and extends not its mal-influence beyond their particular range. An intelligent native at Madura informed the President of this Committee that to his positive knowledge there were villages close to and amongst the hills lying in the most western parts of the Province, in which in the months of

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\* In March 1801 an army at that time under the command of Colonel Agnew, amounting to 5,000 men, were encamped on the glacis of the Fort of Madura, and were remarkably healthy; though the inhabitants within the garrison were then dying at the rate of 15 and 20 daily.

March and April no man could pass a single night without suffering soon after from an attack of fever.

The relative condition of the Native inhabitants does not appear materially to differ from that of the cultivators of the Dindigul District. Along the banks of the Vyāar and in the Shevagunga Zemindary there is a great deal of Paddy land,\* and of course in such tracts rice is generally eaten : in the other quarters the common dry grains are the usual food, especially, Warroogoo, Cumboo, Cholum, Natchenny and Samay. The pulses we found not so much cultivated here as in Coimbatore, indeed several of those we mentioned were not to be seen.

The Marrawas do not seem to be at all conspicuous for neatness or comfort in their dwellings (unless it be in some of the large towns such as Cholvandum and Nuttum). Their houses are but indifferently built, little raised above the ground, and the thatch† is often of a bad kind and carelessly put on. Cumblies, which are a good deal used in Dindigul are in this Province scarcely known; and cottles amongst the lower orders are rarely met with; so that a bleak and moist season here exerts its unsalutary influence most severely, especially on the poor, whose meagre and haggard looks are at such times so many testimonies of the mischief that certainly springs from an exposure to cold and damp; and afford a sad warning of the still more serious evils that would arise under such circumstances from the supervention of an epidemic constitution of the atmosphere.

The climate of the northern part of the Province of Tinnevely has a great resemblance to that of Madura; whilst towards the centre, on the fertile banks of the Tambarapournie, and in its more southern tracts it assumes a somewhat different appearance.

The north-east monsoon seldom reaches those quarters before the end of November and is in general by no means so heavy as in the Carnatic. The rains are over about the

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\* The number of cawnies in the Madura District under Paddy cultivation is cawnies 34,881, acres 11½; the number under that of dry grain is cawnies 102,658, acres 13; which gives a difference, in favor of the dry grain culture, of cawnies 67,777, acres 13½.

† A very bad custom prevails in this as well as in the Dindigul District, which is that of putting new thatch *over* what is old and rotten; by which means, particularly in wet seasons, an unwholesome damp is retained in the dwelling, the bad consequences of which may easily be conceived.



latter end of December but are not succeeded by so cold a state of the atmosphere as is experienced in the Coimbatore and Dindigul territories. The thermometer seldom falling below  $69^{\circ}$  or  $70^{\circ}$  at sun-rise.

The Tinnevely country is peculiar in this respect, that a fall of rain is always looked for late in January in quantity sufficient to bring down the rivers and replenish the tanks.\* Towards the end of February the weather begins to get warm, and in March may be reckoned close and sultry, with a great deal of clear sunshine; rain is seldom known to fall in these months and in the latter the thermometer occasionally rises as high as  $93^{\circ}$  or  $94^{\circ}$ . About the beginning of April (which is also a hot month) the southerly wind commences and continues till late in May, during which period rain is not very common though there is now and then a smart shower attended with thunder. About the end of May or early in June, the south wind ceases and the first burst of the south-west monsoon usually breaks with violence, pouring its torrents amongst and over the great Ghauts, bringing down the rivers and deluging the low country. June is, in consequence of these rains, a cool, cloudy month; in July, August and September, the west wind blows with great force and there are occasional showers from the same quarter; this wind is hot when there are many days together without rain but by no means to so great a degree as in situations lying farther north in the Peninsula; where the land, from sea to sea, is much wider and where of course the west wind must naturally be more heated.

October is almost invariably sultry; it is true, showers now and then fall but they have not the effect of cooling the atmosphere and, towards the end of the month, there are occasional light airs from the north-east, though the rainy influence of the north-east monsoon is seldom felt till towards the end of the succeeding month.

The cool retreats of this Province are Courtallum and Trichindore. Early in June, after the heavy Malabar rains have commenced, is the proper time to visit the former; the climate is then truly delightful to the feelings of Europeans and continues so in a great degree till the middle of October.

Owing to the depth† of the Courtallum valley as already

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\* The tanks in Tinnevely are for the most part small.

† See the geographical description of this recess in a former part of this paper,

described, it approaches so much nearer to the Malabar coast than other situations along the course of the hills that those clouds which under other circumstances would have expended their waters amongst the immense mountains here pour down a great part of their rain; extending, in a considerable degree, to this recess the climate of Malabar; with the favorable exception that it is not at this time by any means so damp\*, notwithstanding the very luxuriant vegetation which is seen in every direction and the showers that fall daily attended with a strong bleak west wind.

The difference of the thermometer betwixt Courtallum and Palamcottah is in general about  $10^{\circ}$ , while in June or July the temperature at the former is  $75^{\circ}$  at seven A.M. and  $79^{\circ}$  at two P.M. It is at Palamcottah at the same hours  $85^{\circ}$  and  $89^{\circ}$ , so that during the hot weather at the latter mentioned station the feeling of comfort experienced on quitting it and visiting this charming retreat is wonderful. Such is the bracing effect of the cool air here that exercise can be taken without doors at any time of the day, and amusements pursued with as much pleasure as in England, as the sky is almost constantly overcast; and if a person does by chance get wet in a shower there is no danger of a cold being caught in consequence, so great is the dryness of the atmosphere.

What conduces much to the restoration of the invalid at this singular abode is the little waterfall, under which most of the European inhabitants daily bathe; this cataract is, by a division in the rock above, separated from the greater one, and is not more than 13 or 14 feet high. The pressure of the water, after the first shock† is over, gives an indescribable feeling of pleasure; by its constant beating it quickens the circulation and produces a fine glow all over the body; and has besides the further good effects of dispelling languor, raising the spirits, exciting appetite and promoting digestion in a superior degree to any other species of bathing that we are acquainted with. It has, in consequence of these virtues, together with the fine cool climate of the valley itself, been

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\* It is a curious and singular fact that in this valley though rains are falling daily there is no feeling of dampness of any kind within doors, as there is in the Carnatic during the north-east monsoon; and iron and steel remain without rusting for a very long period.

† The average temperature of the water of the fall at 8 A. M., during the bathing season is from  $72^{\circ}$  to  $75^{\circ}$ .

the happy means of rapidly restoring many to health and comfort, who previous to their visit to Courtallum appeared to be hastening to their graves.

But it will be necessary here to remark, before taking leave of this recess, that however delightful may be its climate in the months of June, July, August and September, it is far otherwise during those of February, March, April and May. Partaking as it does of both monsoons, there is much luxuriant vegetation in it; but from its singular topographical position, it is altogether, or in a great measure, deprived of the salutary influence of the southerly winds, which alone could purify the air, dis-tempered as it must be by much moisture and unventilated jungle; the consequence of which is that at the last mentioned period it is close, hot and sultry to the greatest degree and never fails on that account to be most unhealthy; indeed endemic fever at such times is as certainly met with here as at Gambia and Senegal.

This peculiarity in the climate of the Valley of Courtalum we particularly beg leave to impress upon the readers of this paper, as it bears an exact resemblance to that which sent its mal-influence over the southern provinces of the Peninsula in the end of 1810 and first five months of 1811; when unusual rains occasioned inordinate moisture and the deficiency of the southerly wind produced stagnation and morbid miasma.

Trichindore is a situation on the sea-side, about 30 miles east of Palamcottah. It is resorted to in the months of March and April for the benefit of the sea-breeze and change of air, but is inferior to Mootapetty in many respects, which may easily be discovered on referring to the singular advantages of that place already noticed.

The District of Tinnevely has certainly many things to recommend it with regard to climate: the north-east monsoon is here mild; in March, April and May (the only unpleasant months of the year) the sea is near to resort to, and for the sick and infirm who may not find Palamcottah suited to their feelings or constitutions in June, July, and August, there is Courtalum at no great distance to fly to for relief.

The Natives in this Province seem in general to enjoy greater comforts than in some others that we have mentioned; their dwellings are for the most part well raised and built, particularly in such towns as lie along the fertile

banks of the Tambarapournie river, where tiled houses are common and where the streets are wide, regular and clean.

In the northern and western tracts of the Streevulputtore Talook however, especially in those estates nearest to the hills, hamlets of a very inferior order, both as to the building and thatching, are often met with. Situated in low and moist bottoms they cannot be otherwise than damp and unhealthy and the houses in such places, being neither built in regular streets nor joined together (so that each might partake of the drying influence of his neighbour's fire) they, like others similarly circumstanced in the Madura Province, are but too often the abode of a gaunt and meagre race.

Cumblies are little known in this part of India, and Cottles are only used by the more affluent. From the rice\* cultivation being so much greater than that of the dry grain in Tinnevely, it follows that the inhabitants eat more of the former than in some other districts, in the rich and beautiful villages situated in many parts of this country. A great variety of valuable fruits, roots and greens is produced, though there are a few of the pulses† common in the Carnatic that do not appear to be much known.

*(To be continued.)*

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\* The revenue annually received from Rice or Nunjah cultivation in the Tinnevely Province is Star-pagodas 285,000. That from dry grain or Punjah cultivation is Star-pagodas 95,000 making a difference, in favor of the Rice culture, of pagodas 190,000.

† Carp Ulandoo, and Malay Towaray, &c.

## THE PUBLIC HEALTH.

Having entered upon the second half of the year 1872, we propose, briefly, to review the circumstances which have already influenced public health during the earlier months of the year, and to note the health prospects of the remaining months.

In the first place we must allude to the sudden and mysterious irruption—not of a new disease, but of a new epidemic of the old “break bone” or dengue fever, familiar to our predecessors in India of 20 years ago, but comparatively unknown to the younger members of the profession in India. This disease so far as its epidemic relation to India is concerned, evidently came to us on the present occasion from Eastern Africa, Zanzibar, and Aden, as already recounted in the pages of this journal. It has already had a wide distribution in India. We have accounts of its ravages in Bengal, Burmah, Madras and Bombay Presidencies. In some stations hardly an individual has escaped attack, while in others the disease seems to have been content with an isolated victim here and there.

It is too early as yet to attempt to compile anything like a history of its progress, but we venture to hope that medical officers who may have had opportunities of witnessing the malady will keep careful notes of the more interesting epidemiological phenomena, so that a full and connected account of the epidemic may hereafter be compiled for the benefit of the next generation, for in all probability when it once departs from Indian shores we shall hear no more of it for many years to come.

Every now and again we have seen newspaper statements to the effect that dengue has been a cause of death, but such statements, in regard to adults at least, must be received with grave caution, for in many cases which have been carefully investigated it has been found that death was due to some other obvious cause, and not to dengue. Probably in a few instances young children may have died of the disease, but these cases are by no means clear. While therefore the victims of dengue are to be commiserated for the horrible and agonising pains peculiar to the disease, they may as a rule be made happy in the assurance that the disease is essentially of a non-fatal character. While we write the malady is extensively prevailing amongst all classes of the community of the town of Madras.

Next to dengue in prevalence, and much more important in regard to loss of life, has been the great epidemic of small pox, general in almost every district in South India, during the earlier months of 1872, but now in most places subsiding. These great small pox epidemics do this amount of good; they serve to remind us from time to time of the weak places in our system of preventive medicine, and if we mistake not, the facts of the present small pox epidemic will serve to show that we have been leaning on a very rotten prop indeed, in depending upon the present system of public vaccination for the insurance of life against small pox.

It has long been known to those who have thought of the subject at all, that public vaccination in this part of India has been nothing better than a gigantic sham, as regards the protection of the people. The total of annual vaccine operations "reported," (and most people know what vaccine reports are worth) has never exceeded from one third to one fourth of the total births of the population, and while three fourths of the people are practically

liable year after year to small pox, it must be clear to everybody that the vaccine department has never succeeded in the smallest degree in controlling or limiting the ravages of small pox. .

A great deal of nonsense has been written and talked about the danger of making vaccination compulsory in this country. It has been said that in making propositions to this end we are interfering with the religious feelings of the people, and that the feeling against vaccination has some religious scruple or prejudice at its bottom. If this be the case, then we can only remark that a Hindu's conscience is easily smoothed, for a recent experiment in the town of Madras has shown that the offer of one anna, or two annas per head for each subject of vaccination will produce any number of parents and children anxious and willing to submit to the operation, and to receive the trumpery bribe.—Curiously enough, the issue of food, which has been tried over and over again, has never done more than bring together just enough of children to keep up a lymph supply at the Presidency depot, and yet the actual value of grain given away per head has been double or treble the money outlay which has brought hundreds and thousands to the depot, who otherwise would not have attended. It seems to us therefore that this Madras experiment may in future be utilized by the Local Funds Boards in spreading vaccination. They have only to notify that the parents of each child brought for vaccination shall receive one anna, or whatever sum may be thought suitable as payment for their time and trouble, and there will in future be no dearth of subjects for vaccination, and if the Local Funds Boards are prepared to spend a little money in this way, there will no longer be any need to trouble the Legislative Council to pass a Bill making vaccination

a compulsory operation. Probably nine-tenths of the population could be reached by the money argument; the remaining one tenth, consisting of the more intelligent and educated classes, might be expected to understand the benefits of vaccination and appreciate it for its own sake.

It is a point of some interest to note here that the death registration reports for the first quarter of 1872 show a diminished prevalence of fever in almost every district in Southern India. In a late number of this Journal we called attention to the fact that mortality had been increasing rapidly from fever, for two or three years past, in very many parts of the country, and that there had been an apparent movement of the great malarial wave from north to south during these years, but it is evident that the intensity of this fever wave had begun to subside during the early months of the present year. We at the same time called attention to the fact that malaria was still active and powerful about the hill ranges of our Southern districts, and our prognostications in this respect have received a melancholy confirmation in the death, from remittent fever, of the Commissioner of the Neilgherries who apparently contracted the malady, while visiting some of the hill slopes of comparatively low elevation. Other cases of severe malarious fever, contracted recently in the hilly districts of Salem and Coimbatore, have come under our notice.

We have left ourselves but little space to touch upon the most important of all public health themes, the advance of a new cholera epidemic. The observer of current newspaper literature must, during the latter part of 1871, have noticed frequent references to the activity of cholera in Oude, and many parts of lower Bengal, and in subsequent months, could hardly have failed to observe, that the disease was steadily extending over the North-west and towards



the Punjab. This same wave of cholera found its way into the northernmost of our districts, Ganjam, in the month of March last. In this district it found a population bordering upon famine, and suffering from great scarcity of water, but up to that time in apparent good health, and free of all epidemic disease. It began in the north of the district and moved slowly through it to the south, appearing in the adjoining district of Vizagapatam in May, and in the one next to it on the south, Godavery, in July. The loss of life already in Ganjam, and Vizagapatam has been very heavy and will probably be still heavier before the rainy season, one of unusual intensity in that part of the country, is over. While the southward advance along the eastern Coast districts has so far been very clearly indicated, the movement of cholera southward through the Central Provinces and Deccan has been by no means so clearly marked. Fitful and irregular outbreaks we hear of, the advanced guards no doubt of the strong cholera force marching more slowly behind, but up to this time it cannot be said that cholera is very general anywhere in the Central Provinces or Deccan, and until it is so, we shall probably find no epidemic movement will appear in the northern districts of the centre of our own Presidency. Up to the end of July, the mofussil stations of Kamptee and Secunderabad had given no evidence of epidemic cholera, although it is right to mention, that outbreaks have occurred on the Hyderabad State Railway, and on the G. I. P. Railway, south of Goolburgha.\* The influence of this through railway communication with infected districts will evidently require to be carefully noted, and we must not be surprised at any time to find that the enemy has advanced and taken up a position on our own rail-

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\* NOTE.—While correcting the proofs of this article cholera is reported to have broken out in the city of Nagpore.

way line south of the Kistna. The main facts we wish to impress upon our readers are that the new cholera invasion has already appeared in force in our northern coast districts, where it is at the present moment steadily moving southward, and that the great body of epidemic cholera, for which our own Presidency and Bombay usually suffer has not made any considerable westward advance during the last few months, but still remains in force in the North-west Provinces and Central India. From all concurrent history we must expect this western and southward advance of cholera, and be prepared for it during the later months of the present year, or the beginning of the next. It will be curious moreover to watch how far the eastern coast cholera will extend south, before it is overtaken by the great advancing wave of Central India and the Deccan. The lines of movement are at present clearly distinct, and the phenomena of the present year may help to settle one or two curious questions regarding the limits of the coast cholera, which yet remain to be defined.

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### DR. SHORTT'S LECTURES ON SNAKES.

During the latter part of the month of June we enjoyed the privilege of listening to three lectures on Snakes, given by Dr. Shortt, Superintendent General of Vaccination, Madras Presidency, at the Medical College.

The lecturer, after introducing the subject to the students of the College who formed the greater portion of the audience, gave a description of the anatomy of the reptile, taking care especially to point out the peculiarities of the skeletons of the ophidia, and the method of articulation which serves so materially in the varied and rapid movements of this class of reptiles. The second lecture was a con

tinuation of the first. Some points in the latter having been reiterated, the lecturer dwelt more especially upon the arrangements of the hard and soft structures of the head and especially upon the position of the poison-sac in venomous snakes and the characters of the fangs which are employed by the reptile in the act of attacking an animal. The fangs were shewn to the audience both in the living reptile, and in specimens preserved in spirit. In some of the latter the poison apparatus had been very carefully dissected out, and the communication between the poison-sac and fang was beautifully demonstrated by the passage of a very fine bristle from the sac along the fang.

The third lecture treated of the mythology of the Snake, after which the lecturer exposed the roguery and imposition that are very commonly practised upon credulous persons by the native jugglers. Certain castes gain their livelihood by catching snakes alone, while other castes (the jugglers) endeavour to tame the cobra and after having extracted the poison fangs perform the tricks which may be daily witnessed in this country. These different castes of jugglers were in turn introduced to the audience, before whom they exhibited their powers. With this the lecturer terminated his short but interesting course, leaving his hearers to regret its brevity.

The interest of the audience was kept up by the exhibition of snakes of various kinds and sizes and especially by that of a very fine specimen of the *Duboisia elegans* or Russell's viper. No experiments with the poison and the application of what is now believed to be its antidote were performed, saving the poisoning of a dog by the bite of a cobra di capello. This was done to demonstrate the virulency of this secretion.

In conclusion we would thank Dr. Shortt for

the interesting lectures given for the benefit of the public, and we hope that at another time a course of lectures more extended than those we have now imperfectly and briefly noticed may be delivered on the subject of the antidote to the poison.

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## THE EUCALYPTUS GLOBULUS.

A tincture of this drug has been extensively tried in Hungary, the Banat and other parts of Austria where paludal fevers are endemic; and apparently the results have been very satisfactory. Dr. Keller treated 432 cases, of which 310 were cured, and recourse to Quinine was necessary in 122. Of the 310, 202 were cured without relapse by a single dose; in the other cases repetition was required. Quinine had already been exhibited without effect in 118 cases, in 91 of which the *Eucalyptus Globulus* was successful. Among the cases which had been previously ineffectually treated with quinine a very large number had been complicated with gastric catarrh, anæmia, splenic and hepatic enlargement, &c. The curation of the disease, under the new treatment was considerably shorter than when quinine is employed. The low price at which the drug is procurable is not its least advantage. Dr. Keller imported the leaves from France and prepared the tincture by macerating them for three months in alcohol in closed vessels. The metric system not having yet been introduced into Austria, we are unable to state proportions intelligibly: we are only told that 30 lbs. of leaves yielded 25 Austrian *mass* of tincture. Of this two or three spoonsful, taken with coffee before the paroxysms, were generally sufficient, larger doses being necessary in obstinate cases. Small quantities were given, morning and evening for some time, to remove mala-

rious cachexia. On the whole, in spite of Mr. Broughton's *ex cathedra* condemnation of the drug it appears to be worthy of at least a trial, in India as well as in Europe. It may be quite true that "Professors Vanquelin and Leiciana" were mistaken when they thought they found something like quinine in the bark of the *Eucalyptus globulus*—even chemists sometimes make mistakes. We can have little doubt that our Quinologist is quite right where he has "the honor to state that neither quinine, quinidine, cinchonidine, nor cinchonine is contained in the plant in any proportion." And yet it is possible that the "much" which "has lately appeared in the papers and *quasi*-scientific journals concerning the valuable qualities of the *Eucalyptus globulus* as a febrifuge" may actually be worth noticing, even though cinchona alkaloids be absent. The value of the medicine must be decided by therapeutical not by chemical experiment; and as we have the tree at hand let us try it in competition with "amorphous quinine."

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## THE GOVERNMENT CENTRAL MUSEUM.

While a successor to the late Major Mitchell is as yet unappointed to the Curatorship of the Museum, it is only right that we should direct the attention of Government to the need that exists for the utilization of the Museum as a school of practical teaching in certain branches of natural science.

Most people who have thought of the subject at all (omitting members of the Senate of the Local University who steadily ignore the whole question) are agreed in thinking that the study of one or more branches of natural science is essential to the educated youth of the present day. Here, whenever the question has been mooted, the educational authorities have

lamented their inability to undertake scientific instruction, and the University has never yet been sufficiently alive to its duty to insist upon a standard of knowledge of one or more branches of science, of the young men who seek its degrees. What we wish to point out is that the Central Museum might be made a school of practical instruction in Botany, Zoology, Geology, and Mineralogy, as well as in many practical applications of science to arts and manufactures, if the Government will only carefully consider the importance of the Institution, and place it upon a proper footing by appointing a thoroughly scientific curator, who shall give his whole time and energies to his duties.

The Museum for years past has been a popular lounge for the holiday loving portion of the native community. They flock to it in thousands to stare at the stuffed animals, the birds and reptiles, and they go away just as wise as they came. As an educational institution it has never been attempted to utilise it in the least degree, and yet there is not the smallest reason why the new Curator should not be expected to afford scientific instruction to classes of native students, illustrating his teaching from the practical examples of the Museum shelves. If the educational advantages of the Museum were thus provided for, the University authorities would have no excuse for further delaying the revision of the curriculum for the B. A. degree, and the insistance on a fair knowledge of one or more branches of natural science by all candidates. We trust these remarks may not come too late.

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### DRESSER'S ENGLISH.

It has been a frequent complaint of the Professors of the local Medical College, that the know-

ledge of the English language by the native pupils of the Institution is so defective, as to interfere very seriously with their ability to understand the tutorial expositions of the Professors. There can be no doubt we think that the complaint is a just one, and that notwithstanding the higher standard of the entrance examination, of late years, many pupils come up to the College so ignorant of English, that scientific instruction by means of that language, must be very difficult, if not impracticable.

A friend in the mofussil has recently brought to our notice a wonderful specimen of composition, in the form of a Medical Certificate given by a Hospital Assistant to a patient who had his teeth loosened by a blow in the mouth. We print it below. (suppressing names only), for the benefit of our readers.

“ I do hereby certify that the Village Moon-siff ——— of ——— aged about 45 was found on my examination suffering from shaking of 2 front upper teeth, and 4 front lower teeth and besides several other teeth also in a slight shaking state. I consider that the shaking appear to have been caused by another individual, or by fall, or by natural of previous administration of cruel mercury. I am of opinion that the hurt is not a mortal.

(Signed) \_\_\_\_\_

*2nd Class Hospl. Asst."*

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## THE METRIC SYSTEM.

The Austro-Hungarian Empire has now adopted the Metric System of weights and measures, a law to this effect having been passed in July 1871. The standard meter is a glass rod, 999·99764 millimeters in length at 0°C. The standard Kilogram, is a crystal glass cube weighing *in vacuo*, 999·9978 milligrams. Both have been made after the platinum

standards in Paris. In all official works the new system will be adopted from the 1st January next. Its use will be compulsory on all from the beginning of 1876. England and (strange to say) the United States will soon be the only countries in the world retaining old and inconvenient systems which are not even identical. In India a step has been taken in the right direction by making the official seer a Kilo-gram. The meter has been adopted also as the width of the State Railways.

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### UNIVERSITY INTELLIGENCE.

We understand that the following are the results of the recent Medical Examinations of the University. Mr. Rockwood has passed, in the First Class, for the degree of M. D. Mr. Matthew John has passed the Second M. B. and C. M. Examination, Second Class. Mr. William O'Hara has passed First M. B. and C. M. in the First Class ; and Mr. James Wilkins in the Second : and Mr. F. H. Pedroza has passed the Preliminary Scientific.

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## REVIEWS.

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*The Science and Practice of Medicine.* By DR. AITKEN.  
Sixth Edition. London. Charles Griffin and Co.

### SECOND NOTICE.

Dengue is a disease with which we have lately been brought into pretty close contact, and the chapter on this subject has naturally come in for a claim on our attention. The characteristics by which the disease is recognized are shortly but explicitly given. We notice that the recurrence of the excruciating pains in the limbs at a period long after the subsidence of the fever is not dwelt upon with sufficient force. This appears to have been one of the most noticeable symptoms in the epidemic which has recently visited this Presidency. This refers more especially to the cases of Europeans; in the native we find neither such degree of pain nor does the eruption always make itself apparent.

The chapter on Cholera interested and pleased us much. Here we find one of the best accounts of the disease, its history, the theories held by various authorities as to its pathology and the treatment advocated by each on the theory propounded by him. To reproduce in succession the views of theorists on such a subject as cholera without some small inaccuracies must be a matter of considerable difficulty. We find our author, however, equal to the task. Dr. George Johnson's theory of "elimination" is not believed in by many, although arguments in its favor are very carefully brought forward by its originator. Pettenkofer's germ theory and the absence of subsoil drainage in helping to propagate cholera germs have been proved, we think, to be of very little value. We are in possession of some facts which would militate strongly against a "zyme" theory. Hallier's doctrine of parasitic origin has lately been overturned by the investigations of one of the officers who have been detailed for this duty under the Government of India. Niemeyer's views on the subject are those which commend themselves to our mind; but we observe that brief notice is taken of the theory enunciated by

this the great pathologist who, we regret, has recently passed away from among us. A coloured lithographic representation of the growth of Hallier's fungi embellishes this part of the work.

In the second volume we find much which interests us as medical men in this country. Here we find Diabetes occupying twenty pages. No allusion is made to the frequency with which the disease is met with in these Eastern climes and the account here given could be well added to by the experiences of medical officers of the Indian service. If we might venture to offer a suggestion to the author, it would be to obtain from a few medical officers in each of the Presidencies their views on this very important subject. Dr. Donkin's treatment by employment of skimmed milk is not referred to by the author, although it has been said to have proved so successful in the mitigation of the symptoms.

Beri-beri, a disease the pathology of which yet remains in the dark, is fully treated. Dr. Evezard's experiences and his views are repeated at some length and the treatment which has been recommended by him stated. We would refer the author to a recent article published in this Journal on the pathology of this affection\* by Assistant Surgeon D. Kearney of the Indian Medical Service of this Presidency. Here the origin of the disease is traced to the consumption of diseased rice at certain seasons of the year. The writer in this article draws an analogy between this affection and that produced by eating diseased rye (ergot of rye) in England. The theory appears to be not merely ingenious but based upon some reasonable grounds. Further experiences of others may confirm the views held by Dr. Kearney.

Sixty-eight pages are devoted to those diseases of the eye which may fall under the care of the physician. The subjects handled are the various ophthalmiæ. Pustular ophthalmia is said to be a lesion which is generally associated with scrofula. The experiences of ophthalmologists in this country agree in ascribing a large number of these cases which are treated in ophthalmic hospitals to the presence of round worms. We have ourselves witnessed the complete disappearance of these so-called pustules twenty-four hours after the expulsion of lumbrici by santonine. Keratitis among the corneal diseases is next treated of; after this

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\* Vide Madras Monthly Journal of Medical Science, Vol., V. p. 103.

the various forms of scleritis and iritis. Choroiditis including a short history of glaucoma follows. All mention of the surgical treatment of these diseases is omitted. Retinitis succeeds, and this chapter terminates with the diseases of the optic nerve, which cause amblyopia and amaurosis. The whole of these subjects receive only a very cursory glance, so that we think they would have been better omitted from this work on medicine. Diseases of the eye more frequently are the study of the surgeon than of the physician and, therefore, we think so brief and incomplete an account of these diseases is next to useless. And in connection with this point we observe a similar mistake being made among the diseases of the digestive system; abscess of the cheek, ranula, abscess of the tongue, vascular tumor of the tongue, tongue-tie are briefly treated of in succession. These subjects we have always regarded as being surgical affections which very frequently have to be treated by means of the knife.

In the section upon Thoracic Diseases, we find a description given of the Sphygmograph and Laryngoscope. The former subject has been revised by Dr. Foster of Birmingham who has employed the instrument largely. Woodcut illustrations are added to these articles. In the former article representations of the pulse-waves in health and disease are given to assist those who may wish to employ the instrument, in arriving at a correct conclusion on the state of the heart-walls or the condition of the valves.

Hepatitis is a subject which has received a short notice from the author; hepatic abscess has gained more of his attention. In the treatment of the former and of simple enlargement (congestion of the liver) little or nothing is said of the advantage which undoubtedly is obtained by the employment of Chloride of Ammonium. That this salt exerts powerful action upon the liver there can be little room for questioning after a perusal of the contribution of Dr. William Stewart, H. M's. 2-21st Fusiliers to the medical papers. Ample proof exists that the initiatory inflammatory stage, prior to abscess formation, in the liver is checked by the exhibition of the salt, so as to warrant a strong opinion in its favor being expressed in any book of medicine. In the surgical treatment of abscess of the liver no mention of Dieulafoy's Pneumatic Aspirator is made. How has the author come to be guilty of such an omission when everybody who has heard of the instrument believes that death

occurring from such a disease can no longer take place while such a weapon is in the hands of any intelligent medical practitioner! From our experience of the instrument in evacuating the contents of an abscess, all the hopes we had at one time entertained have been entirely removed by the repeated exhibition of the failure which attended its employment when put to the test. We, therefore, find no cause to complain that the author has omitted all mention of the instrument. Perhaps his experiences may tally with ours.

Part IV of this work treats of "Medical Geography; or, the Geographical distribution of health and disease over the globe." This is a valuable part of the work. A well executed map illustrates what is written in the text. The work is supplied with a very copious index. With the exception of a few trifling typographical errors the work has been very well reproduced and offered to the profession, and we would recommend this as a valuable addition to the library of every medical practitioner as a work in which may be readily found an abstract of the views of a large number of authors and a record of the most recent methods of medical treatment. In conclusion, we would take the liberty of complimenting the author upon the successful issue of this, the sixth edition of his work.

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*On Spurious, Feigned and Concealed Pregnancy.* By THOMAS  
MORE MADDEN, M. D., M. R. I. A., &c., &c., &c.

Dr. Madden's article on spurious, feigned and concealed pregnancy has been reproduced in pamphlet form. In our Medical Miscellany for June last, we published an abstract of this valuable paper for the information of our readers. Dr. Madden's experience leads him to believe "that spurious pregnancy is most frequently observed about the turn of life." The symptoms, causes and diagnosis of pseudocyesis are briefly but clearly described and then follow several illustrative cases. Dr. Madden expresses great doubt "with regard to the value of auscultation, as a means of diagnosis for even in the 9th month of pregnancy, the placental souffle and the sounds of the foetal heart may not be heard; while, on the other hand, he has come across cases in which medical men have persuaded themselves that they had heard

both placental souffle and the sounds of the foetal heart, when no pregnancy existed.

We conclude this short notice of Dr. Madden's pamphlet by expressing our full concurrence with him, in his condemnation of the legal distinction between "a *quick* child or not." "Nor can anything more at variance with common sense and modern physiological science be conceived than retaining the barbarous distinction between a foetus after the 16th week when *quickenings* was supposed to occur and one before that period, as the veriest tyro in medical study should know that the living embryo at the moment after conception is as certainly living, or quick, as the fully matured man in the prime of his manhood and that the crime is as great to destroy the one as the other."

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## MEDICAL MISCELLANY.

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*On Putrefaction.\** By DR. F. CRACE CALVERT, F.R.S.

THIS paper is intimately connected with those I have already published on protoplasmic life and the influence it effects on putrefaction.

I have already shown that when albumen from a new-laid egg is introduced into *pure distilled water* and communication with the atmosphere prevented, protoplasmic life does not appear. If the same solution, however, be exposed to the atmosphere for fifteen to forty-five minutes, minute globular bodies appear having an independent motion, which I denominate monads. The time required varies according to the time of the year, the amount of moisture present in the atmosphere, and the temperature.

Although M. Pasteur has already noticed the meteorological conditions which influence that life, he has not noticed the extraordinary rapidity with which the fluids are impregnated, and that this impregnation is proportional to the surface exposed.

On the 18th of May, 1871, two portions of albumen, measuring 400 grains, were placed, the one in a test-tube having a diameter of  $\frac{3}{4}$  inch, the other in a test-glass which at the surface of the liquid had a diameter of 2 inches. In the tube vibrios appeared after twelve days, whilst in the glass only five days were required for their development. If in place of pure distilled water the water supplied by the Manchester Corporation (which is one of the purest waters in England) be used, the time required for the development of vibrios in a test-tube was only twenty-four hours.

These experiments prove that the rate of development of vibrio life is influenced by the extent of surface exposed.

M. Pasteur has already demonstrated that oxygen is essential to the life of the Mucedines, but I am not aware, that it has been proved that this gas is necessary to the existence of vibrio life.

In the hope of throwing some light on this subject, the following experiments were made:—

Into each of five glass bulbs equal volumes of a solution of albumen in Manchester water were placed, and the first left in contact with the atmosphere for twenty-four hours, after which the ends of the tube were hermetically sealed about 2 inches on each side of the bulb. After passing oxygen, hydrogen, nitrogen, and carbonic acid over the other four solutions, the tubes were

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\* Abstract of a Paper read before the Royal Society.

also hermetically sealed. These tubes were kept closed for twenty-seven days, during which it was observed that the albumen in the bulb containing oxygen speedily became turbid, then the one containing air, while the other three remained clear. After this period the tubes were broken and the contents examined. A large quantity of vibrio life was found in those containing oxygen and common air, whilst those containing nitrogen, carbonic acid, and hydrogen contained very small quantities, that with hydrogen the least. Thus proving that oxygen is an essential element to the production of putrefactive vibrios.

In further support of this view, I may state that under certain conditions these animalcules produce such an amount of carbonic acid and other gases as to exclude oxygen to such an extent that their own development and life are impaired.

This is easily proved by taking albumen full of animalcules, but not emitting any putrid odour, and placing it in test-tubes, closing some and leaving others open. If these tubes are examined after a few weeks, it will be observed that in those left in the air life has much increased, and they emit a very putrid odour; whilst the life in the closed tubes not only has not increased, but appears to be in a dormant condition; for if the corks are removed and the fluid again comes in contact with the oxygen of the air, its activity returns. The albumen also in the closed tubes does not emit any putrid odour.

M. Pasteur has also found that oxygen was necessary to the vibrios of putrefaction, although the same gas destroyed those produced in butyric fermentation; but he has not made any experiments to show that the products emitted by such vibrios are prejudicial to their development, and even to their power of locomotion.

Having stated above that liquids exposed to the atmosphere become impregnated with monads, I will now try to describe their gradual development into vibrios, and their ultimate transformation into microzyma.

A few hours after the albuminous fluid becomes impregnated, the monads, which have a diameter of about  $\frac{1}{288000}$ th of an inch, appear to form masses. Then some of the monads become elongated into vibrios, which, though attached to the mass, have an independent motion; so that as the force exerted by the vibrios predominates towards one or another direction, so is the mass moved over the field of the microscope. As the development proceeds, the mass is broken up, and ultimately each vibrio has an independent existence, and may be seen swimming or rolling about in the fluid. Their size at this stage is about  $\frac{1}{200000}$ th of an inch. These, which I call ordinary vibrios, gradually grow into long vibrios, which attain a length of  $\frac{1}{3400}$ th of an inch.

These long vibrios gradually become changed into cells, which

I have called microzyms. The first process in the transformation is its division into two independent bodies. One extremely faint line appears across the centre of the animalcule, and increases in distinctness until the vibrio appears like two smaller vibrios joined together. The separation takes place and each part acquires an independent existence. These parts again divide, and the process of subdivision is carried on until they appear to be nothing more than cells, which have a swimming-power so great as to pass over the field of the microscope with rapidity.

After twelve or eighteen months all the vibrios disappear and are replaced by microzyms, either in motion or at rest. If these microzyms are placed in a solution of fresh albumen, vibrios are abundantly developed. The apparent explanation of this fact is that in the fresh albumen they have all the circumstances favourable to their growth and reproduction, while the putrid albumen has become so completely modified as to be incapable of affording them the requisite conditions for reproduction.

I may also notice that at the same time a deposit has taken place which, under the microscope, appears to consist of shoals of small particles of matter which have no life. The solution has now become perfectly clear, possesses considerable refractive power, and has lost the property of becoming coagulated by heat.

The albumen solution does not emit a putrid odour until after the formation of the above-mentioned deposit, and the amount of odour is in direct ratio to the number of vibrios present.

I remarked during the investigation the presence of several other forms of animalcules which contribute to the decomposition and putrefaction of proteine substances, the description of which will be found in the original memoir.—*The Chemical News*.

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### *Spontaneous Combustion.*

In March last, a well-known Detroit druggist, assisted by two seriously inclined and science-loving gentlemen, resolved to make a number of experiments to test the worth of the talk about spontaneous combustion, and their experiments are well worth the attention of every reader.

They first took a piece of cotton cloth, which had once formed part of a sheet, and which had been used until quite threadbare, and smeared it with boiled linseed oil. An old chest was placed in the loft of a store-room back of the drug store, a piece of zinc over it, another piece under it, and then the chest filled with paper and rags, and this particular piece of cloth placed in the centre. Although the room was not a light one, and the weather cold, in eight days there was such a smell of fire about the trunk



and the chances were so good for a conflagration within it, that the contents were emptied.

An examination showed that the fibre of the oil-cloth had untwisted and shrivelled up, and that the rag looked as if it had been held too near a hot blaze. In April, when the rays of the sun were stronger, a pair of painter's overalls, literally covered with paint and oil, were rolled up, a handful of pine shavings placed inside, and these were crowded in next to the roof boards of the loft. The experiment was not a week old when, during one warm afternoon, a smell of smoke alarmed a workman in the next room, and he found the overalls burning, and so tinder-like was the cloth that it had to be crowded into a pail of water to prevent total destruction.

During the hot weather of August, a handful of old cotton rags, in which two matches were placed, but which were not smeared with oil or other matter, were shut up in a tin box and hung up in the loft, a rear window allowing the afternoon sun to shine directly on the box for several hours. Toward the close of the fourth day the druggist took down the box to see how the experiment was progressing, and found the contents to consist of nothing but a puff of black cinders, which flew all over him as the lid was lifted. Having a vacant corner in his brick wood-house at home, the druggist took the trunk up there, where there was no danger of burning a building. He filled the trunk with the contents of the paper rag-bag, and then smeared one with benzine and threw it in last of all. The trunk was shut tight, everything cleared away from its vicinity, and he commenced watching. One day the family came home to find a few ashes marking the place where the trunk stood, while the bricks above and around were badly stained with smoke.—*Scientific Press*.

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### *Small-Pox treated by Xylol, &c.* DR. RUSSELL'S Clinic.\*

DR. RUSSELL has had many cases of small-pox under his care, and his experience as to xylol and other remedies is given in the new number of the *Glasgow Medical Journal*. We propose to give the cases detailed, and extracts of his remarks, for the subject is of great importance, and Dr. Russell's powers of observation are of a high order, so that his clinical work is of great value. Our columns have already contained notices of the new remedy, and its chemical qualities have been reported upon for us by Mr. C. R. C. Tichborne. Dr. Zuelzer, however, appears to have given Dr. Russell a few notes, and we may as well begin by quoting his letter. Dr. Zuelzer, writes—

“Xylol is one of the products of the distillation of coal, and

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\*Glasgow Fever Hospital.

boils between  $138^{\circ}$  and  $140^{\circ}$  C. The boiling point is the best test of the purity of xylol, which is not very good and free from other products, as obtained in the pharmacies of Berlin. It is a member of the Benzol series—Dimethyl-benzol— $C_6H_4(CH_3)_2$ . Introduced into the system, it becomes changed into acid of Toluyll—

$C_6H_4 \begin{Bmatrix} CH_3 + H_2O \\ C \quad O \quad H \end{Bmatrix}$  This product assumes one atom of Glycocoll ( $CH_2(NH_2)COOH$ ), and appears in the urine as acid of Toluene. The latter is an acid of some strength, and its salts are not injurious to the system. Another quality of xylol is, like other similar products, to coagulate albumen.

"I give xylol with good effect in cases of *Variola pustulosa*. Such cases are very much quicker dried than others; the fever is shorter, there is no secondary fever, and the cerebral symptoms are very insignificant. In cases of *V. hæmorrhagica nigra*, I have not remarked any effect. I give it by mouth in doses of 10, 15, 20 drops every hour, or every second or third hour, alone, with wine (claret or sherry), or in *capsulæ gelatinosæ*. It is best to begin as early as possible with xylol." (Dated 12th April, 1872.)

It would appear from these remarks that Dr. Zuelzer believes that by the use of xylol he can modify the normal course of the disease—a breadth of effect which will be difficult to demonstrate even if we allow ourselves to indulge the hope that it exists. Dr. Russell remarks—"Although I have no wish to prejudge the case, still the whole tendency of my experience of diseases such as small-pox, arising from the constitutional effects of a specific poison, as well as my recollections of their therapeutic history, lead me to be sceptical as to specific, aborting or antidotal treatment, and only, in the meantime, to look hopefully on symptomatic treatment. It is to be remarked, however, that small-pox itself furnishes us with a unique illustration of the antidotal treatment of disease, and one which may prove also typical of a large class of true antidotes—I mean the administration of the vaccine virus, so as to modify the variolous virus (the former being the latter modified by the cow). When we vaccinate an infant in a small-pox ward, who has been nursed by a variolous mother, and on the tenth or eleventh day thereafter an eruption of small-pox appears, but is very scanty, and aborts in a day or so, we imitate as closely as possible a laboratory experiment with poisons which are antagonistic, not chemically, but in physiological action.\* There is no doubt that in the infant's body there was a dose of variolous poison which would in due time have sprung into violent activity, but which was, by the intro-

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\* See paper "On the Antagonism between the Actions of Physostigma and Atropia." By Dr. Fraser. "Transactions of the Royal Society of Edinburgh." Vol. xxvi p. 617.

duction of the vaccine poison, completely diverted from its normal course and made comparatively innocent. There is also no doubt that, both poisons being at the same time within the system, the one poison acted somehow either directly on the other poison or on the tissues, so as to modify the physiological action of the other. An infant vaccinated in the usual way, and introduced a fortnight after into a small-pox ward is uninfluenced by the variolous poison; and an infant unvaccinated will be influenced severely. Still, notwithstanding this antagonism between the two poisons, if the variolous poison has already become active in the system, when the vaccine poison is introduced, no such antagonistic effect is observed; the local irritation of the vaccine poison simply assumes an unhealthy action, the contents of the vesicle become rapidly purulent, and the variola goes on uninfluenced. It seems to me that this easily executed and well-known experiment furnishes an *a priori* reason against the efficacy of xylol or any other agent in diverting the variolous poison from its normal course; over and above the well-known failure of all such attempts in the class of diseases which are caused by similar animal poisons."

Dr. Russell remarks—"1. That in the course of small-pox, as seen in *vaccinated* persons, and without any treatment whatever, phenomena are observed which never occur in *small-pox as seen in unvaccinated persons*; that these phenomena are such as we aim at by treatment—short fever, rapid development of the eruption, abortion of the whole process suddenly at any stage, and even when it is of a malignant type. 2. That seeing these phenomena never occur in unvaccinated persons, and frequently occur in vaccinated, it is only the former which we can treat experimentally without risk of fallacy."

The very mildest conclusion which can be drawn from these remarks is that if an experimenter chooses to experiment on vaccinated variolous patients, *the fact is a cardinal one and ought to be stated foremost in the details of his cases.* Without precise information on this point, no reliance whatever can be placed upon inferences as to treatment. Dr. Russell lays great emphasis upon this, because it is remarkable how common it is to publish histories of cases and statistics in which small-pox is treated as a homogeneous disease, a procedure which is worse than publishing as cures cases in which we are told there was a good vaccine mark, as in the latter case *all* the facts are given, and we can form our own opinion. He gives two very marked illustrations, one from home, the other from foreign literature, and criticises them in appropriate terms.

CASE I.—Colin McL., æt. 28, admitted 10th Feb., 1872. *Unvaccinated*, and in 5th day of confluent small-pox.

The xylol was not obtained until the 15th February, 10th of

the disease, from the afternoon of which day the patient got min. xx. in water every three hours. On the 12th day face and scalp presented a uniform surface of pale yellow, soft pus in process of drying; but on limbs and body the pustules were still full, with broad areolæ. The pulse had fallen from 134 (on the 10th day) to 120. In the evening it was 112. On the 13th day it was 104, and there was a subsidence of activity of eruption on limbs and body. On the 14th day the pulse was 100, and pustules burst on all parts of body. On the 17th day the crusts were beginning to separate, pulse 96. The xylol was stopped.

N.B.—This patient had a crop of boils all over body and limbs, and also a large abscess in left arm. The boils produced inert sores, which became fungus-like, and were very long in healing. Patient, who was a vigorous, muscular man at the outset, continued emaciated, and convalesced very slowly.

CASE II.—Thomas B., æt. 28, admitted 9th February, 1872. *One bad v. mark* on the right arm. In 4th day of what proved to be confluent small-pox.

The xylol was not commenced till 15th February, being the 10th day of disease, when from 2.30 p.m., onwards min. xx. were given every three hours. Before that time, however, the rapid breathing and rising pulse showed that the pulmonary congestion, which ended fatally on 16th at 8.15 a.m., had already commenced.

CASE III.—Donald M'L., æt. 24, admitted 27th February, 1872, *unvaccinated*. In 4th day of small-pox, with very copious rash. From the 5th day this patient had thirty drops of xylol every two hours. He died on the 17th day, of gangrene of the lungs. As this is an interesting case, and one in which the drug had a good trial, I shall give full notes of it.

Feb. 28th (5th day).—P. 96. Very copious vesicular eruption, very small, with some lividity intervening. No motion. Slept. Give castor-oil, and begin X., thirty drops every two hours.

Evening.—P. 104. Still no motion. Repeat oil.

29th (6th day).—Commencing pustulation on face. Slept well. Bowels freely moved.

March 1st (7th day).—P. 108. Eruption very pale. Considerable œdema of face, and much lividity surrounding pustules. A few pustules and vesicles show a distinct *hæmorrhagic centre*. Slept none, and passed on the whole a restless night. Motion.

Evening.—P. 120. No sleep; no motion.

2nd (8th day).—P. 106. Pustulation more advanced, and on face the pustules are yellowish, with increase of œdema. No motion; restless.

Evening.—P. 124. Motion; only little sleep.

3rd (9th day).—P. 112. Passed a restless, almost sleepless

night. Here and there on face are points of yellow pus ; otherwise eruption is pale.

4th (10th day).—P. 120. Crustation pretty general on face. Edema and accompanying lividity are decidedly less on trunk. Breathes quietly ; restless, almost sleepless night. Bowels moved.

5th (11th day).—P. 128. Passed a very restless and quite sleepless night. Respirations rather hurried, and pulse soft. Give  $\frac{3}{4}$  iv. whisky.

6th (12th day).—P. 124, improved. Crustation complete on face ; majority of pustules still unburst on trunk, but they are less active. Slept about three hours ; respirations quiet and good ; no motion ; give oil.

7th (13th day).—P. 112. Crustation slowly progressing on body ; still no motion ; repeat oil.

Evening.—P. 128. Bowels freely moved.

8th (14th day) —P. 124, soft and shaky. Slight separation of scabs from face. Some pustules on limbs have coalesced so as to form large blebs. Breathes fairly, feels better, bowels free.

Evening.—P. 132, rather feeble. Passed a restless day, always endeavouring to rise. Bowels free.

9th (15th day).—P. 132, still shaky. Sleepless night ; pustules now burst generally. Left cornea rather cloudy. Breathes fairly. Had a slight rigor at 8 a.m.

Evening.—P. 136, soft. Respirations somewhat hurried and laboured : is very restless. Drinks badly. Give  $\frac{3}{4}$  ss whisky every hour.

10th (16th day). P. soft. Respirations still the same. Cloudiness of cornea less. Has drunk fairly during night. Seems less restless and is still pretty sensible.

Evening.—P. 160. Respirations more rapid and laboured. Evidently sinking.

11th (17th day).—Died at 9. 15 a.m.

*Post mortem* examination showed the immediate cause of death to be gangrene of part of one lung and intense hypostatic congestion of greater part of the other.—*Med. Press and Circ.*

### *Itch ; its easy and rapid cure.*

Carbolic acid in solution, 4 grams in a litre of water ; or, easier still, a pomade of 8 grams of Carbolic acid to 125 grams of ointment. Three or four frictions in twenty-four hours are sufficient for the destruction of the *acarus* ; after which a complete bath, with white soap in solution added, should be taken.—*Jour. des. Conn. Méd.*

*On the Application of Gases as a means of destroying Contagion.* By DR. CAMERON, Analyst to the City of Dublin.\*

There is, he said, no evidence of a satisfactory nature to prove that the ordinary emanations from decomposing animal or vegetable substances are the cause, *per se*, of any contagious disease.

It is more reasonable to believe that zymotic diseases are each of them produced by the introduction of a specific *virus* or *germ* into the animal economy. It is probable that some zymotics are caused by germs which are incapable of multiplication in the body. Such diseases are not, therefore, contagious in the ordinary sense of that word—that is, they are not propagated by matters which are cast forth from the bodies of the sick. In the valuable Report on Yellow Fever, prepared by Dr. J. C. Nott, and published in the Annual Report of the Board of Health of the City of New York, for 1870-71, very strong evidence is adduced to prove that yellow fever is caused by germs, which are not bred within the body. It is, however, shown that those germs may be transported from place to place in the clothes and baggage of men. Dr. Nott brings forward the most convincing proof that decomposing organic matter does not, *per se*, produce yellow fever; and shows that the germs which cause the malady are devitalised by exposure to a temperature of 32° Fahrenheit.

The use of disinfectants is, however, to be commended, because they preserve the atmosphere free from malodorous gases and vapours. Some kinds of so-called disinfectants are also of great utility as a means of preventing the putrefactive decomposition of organic substances. These disinfectants are properly termed antiseptics. They do not altogether prevent animal and vegetable matters from decay; but they greatly retard that process, and then decomposition without sensible putrescence only takes place.

What is it that we try to destroy when we generate chlorine gas in a room which has been tenanted by a small-pox patient? Is it a gas, or a vapour, or an abnormal condition of one or more of the ordinary constituents of the atmosphere? If the cause of the disease lies in an abnormal condition of the atmosphere—in the occurrence of a “pandemic wave” in that fluid, the disinfection of the air of a particular room, would be useless, because, where ordinary ventilation is adopted, the purely gaseous contents of an apartment are wholly renewed many times in an hour. What, therefore, would be the use of disinfecting a room if the atmosphere, on entering it, be already tainted! If cholera, small-

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\* Paper read before Medical Society of the College of Physicians.

pox, rinderpest, and other zymotic and epizöotic diseases are caused by abnormal atmospheric conditions, why is it that they speed along the highways of commerce, that they spread most rapidly as the density of population increases, and that they prevail most in those places where least attention is paid to the removal of organic filth? If the amount of carbonic acid in the atmosphere were increased from its normal proportion of 4 parts in 10,000 parts of atmospheric air to 4 parts in 100, serious disease would be the result; but it would afflict all classes alike, and would ravage the country regions equally with the urban districts.

A careful examination of acknowledged facts relative to nearly all the more important epidemic diseases fully justifies the belief that each is produced by the introduction of a *materies morbi*, or germ, or virus, or some palpable substance from the bodies of the sick into those of the healthy; and by that way alone. This view of the mode of propagation of zymotic diseases is, perhaps, most conclusively proved by admitted facts in relation to two contagious diseases—namely, *scabies*, or common itch, and *syphilis*.

The itch is a good example for the purpose of illustrating the nature of contagion. The *materies morbi* is easily seen; it is an entity, it possesses reproductive powers, begetting its own kind, and it is never found except in the bodies of higher animals. The non-contagionists must admit that at least in the case of this disease the theory of the contagionists is proved to demonstration, and simply because the virus of the disease is so large as to be almost seen by the unassisted eye.

In general the contagious matter appears to be excessively minute. Chauveau (*Comptes Rendus*, October 19th, 1868), diluted the liquid taken from the pustules of sheep-pox with 10,000 parts of water and found that it still retained its power of producing small-pox in the sheep. Vaccine matter from man may be diluted with ten times its weight of water without losing its contagious property to a sensible extent, but if diluted with 500 parts, it becomes perfectly inactive. Hence it is evident that the contagious liquid of sheep-pox is many times more powerful than vaccine, probably because it contains a larger number of the actual particles, or germs that produce disease. These germs have been carefully sought for by eminent pathologists and microscopists. On the whole, the results of the investigations of these inquirers have not been barren. It is shown that vaccine contains, in suspension, minute quantities of two kinds of solid particles—*leucocytes* (which resemble pus corpuscles), and smaller particles not exceeding the 1-20,000th of an inch in diameter. The leucocytes may be easily separated from the other particles and the serum; and they are found to be perfectly inactive. The vaccine property must, therefore, reside either in the small particles or the

clear serum. By means of the diffusion apparatus, Burdon-Sanderson and Chauveau have succeeded in obtaining the serum free from the small particles, but failed to produce vaccinia with it either in man or in the ox. These important and accurately conducted experiments prove that the actual cause of cow-pox, and inferentially of other kinds of small-pox is a minute solid and insoluble body.

It has been strongly urged as an argument against the germ theory of disease that it fails to account for epidemics. Why should small-pox die out in Ireland, and then suddenly re-appear and rage with great violence in many parts during the last twelve months? How is it that cholera periodically invades the west from the east? Why does an epidemic gradually increase in intensity, attain a maximum of virulence, and then gradually die out? It is difficult to answer these questions satisfactorily, because all the factors concerned in the propagation of zymotic diseases are not known.

If it be admitted that small-pox and certain other diseases are sometimes caused by matters thrown off from the sick making an entry into the bodies of healthy persons, then the phenomena of epidemics may be shown to be explicable without abandoning the theory that small-pox (and some other diseases) are only communicable from individual to individual. We can readily understand that the low forms of life which produce epidemic and epizootic disease might, under favourable circumstances, multiply to a greater extent than usual. Under such circumstances the chances of their getting into the bodies of animals would be proportionately increased, and a local epidemic would be the result. Intercommunication between the place where the germs were first developed and other places would soon scatter them over areas more or less considerable.

In some epiphytic diseases we find the analogues of epidemic and epizootic maladies. The "blights" in the cereals and other plants are caused by the ravages of minute parasitical fungi. A common disease of wheat grain is occasioned by the presence of the fungus *Uredo caries*, the seeds, or sporules of which are so minute that, according to Bauer, a single grain of wheat may contain 4,000,000 of them. The fungi which produce the diseases of plants do not originate sporadically, nor are they ever found except as parasites. For years a whole locality may be absolutely or comparatively free from them, when suddenly those pests will appear and destroy whole crops. It is the same with respect to the ravages of plants by insects; suddenly the caterpillars of moths will appear in vast numbers in localities where they had previously been very scarce. A few years ago the extensive plantations at Dunsany Castle, county of Meath, became suddenly the abode of myriads



of caterpillars, which speedily stripped the barks and leaves of a large proportion of the trees.

If species of bacteria or similar objects are the contagia of certain diseases, then we can understand why it is that so many persons who are near small-pox and fever patients escape, whilst persons not in contact with the infected catch the disease. The bacteria thrown off from the bodies of the sick are not equally diffused throughout the air as a gas or vapour would be, but, for the most part, are scattered about on the clothes and on other solid surfaces, from which they may be conveyed to great distances without making their entry into the body of any one. Contagion in general is conveyed by means of clothes or other solid substances, and is rarely directly propagated through the air. In the Report on Yellow Fever, by J. C. Nott, that writer says:—

“No evidence, I think, could be more complete to establish the probability of a disease. All facts being opposed to its contagiousness, I can come to but one conclusion, viz., that the germ may be closed up in trunks or boxes, or be shut up in the baggage car of the railroad, transported from one point to another. I have never seen anybody communicate the disease where luggage was not taken with the patient, and that the disease generally goes everywhere that steamboats go from our infected ports in epidemic years, I see no other conclusion than the one I have before given, viz., that the germ is carried closed up with baggage, and not generated and communicated by personal contagion.”

Before the question of bacteria as a cause of zymotics arose, Haygarth, Murchison, Ryan of Lyons, and others denied that small-pox poison was directly transmitted through any considerable space in the open air. Murchison asserts that the poison was not contagious in the open air at a distance of half a yard. Chauveau states that the contagious matter of small-pox is volatile—that the solid particles float into the air at a temperature of 40 degs. centigrade, but in his experiments the matter was carried away by a current of vapour.

The results of several experiments made by the author show that bacteria and the contagious particles of vaccine lymph resist, when protected by an extremely thin film of solid or semi-solid matters, the action of chlorine and sulphurous acid gases applied to them in larger quantities than are usually employed in disinfection. The filtered meat-juice used in these experiments contained only five grains of solid matter per ounce of 480 grains—less than one per cent. The object glasses were dipped in this liquid, and many of them allowed to drain before being subjected to experiment. We may readily conceive then how extremely thin the film was that separated the bacteria from the gases set free. It is extremely improbable that the actual contagious

particles of small-pox or cholera, or similar diseases, are ever detached from the serum and other matter with which they associated when thrown off from the body. They are, no doubt, invested with some such film as that which protects the contagious granules in vaccine. If ordinary gaseous disinfection sometimes fail to destroy the vitality of vaccine, and has no effect on ordinary microzymes, we cannot rely upon it as a means of destroying the contagium of zymotic diseases which certainly are near akin, if not to bacteria, at least to the virus of vaccine. The recent experiments of Crace Calvert show that bacteria sustain a very high temperature without being killed; and, on the other hand, Melsens in the *Journal de Pharmacie et de Chimie* for September, 1870, shows that vaccine lymph retains its activity when exposed to the intense cold of 80° [sic] centigrade. The low forms of life are often capable of resisting influences which, in the case of the most highly organised animals, would produce fatal results.

No doubt, chlorine, sulphurous acid, and some others of the so-called disinfectants, destroy bacteria and contagia; but in order to do this they must be employed in much larger quantities than they have hitherto been used.

The complete disinfection of a room tainted with the poison of contagious disease can only be accomplished by the most thorough cleansing. The paper should be removed from the walls, and the latter scraped. The ceiling should be washed and whitewashed, the woodwork and floors should be scoured—all these detergent processes remove—probably without destroying them—the contagious particles. The old-fashioned plan of simply whitewashing the walls and ceiling of a room, and washing the woodwork has much to commend it, and it is infinitely more efficacious than gaseous disinfection without liquid applications. If the whitewash does not kill the bacteria, it certainly imprisons them securely.—*Med. Press and Circ.*

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### *Fever and the Sewers.*

AFTER all that was said at the time of the Prince of Wales' illness, the public will be glad to learn, on authority, that the men employed in the sewers are not only not carried off by fever, but appear singularly free from the ravages of that disease. At the instigation of Dr. Brewer, says the *Medical Press*, the Metropolitan Board of Works ordered a return on the subject, which has just been issued, and is quite conclusive.

Out of 5 inspectors employed from 23 to 48 years, there has never been a case of fever. Out of 64 men employed in cleansing and flushing the northern sewers for periods varying up to 34 years, only 2 have had fever, and their cases were typhus. Out

of 47 men engaged in the sewer work in the southern sewers for periods varying from 1 to 24 years, there have only been 2 cases of fever, and these again typhus, and in one of these cases it is shown that the disease was contracted from the man's family. There are 36 penstock and flap-keepers who have been employed from 1 to 50 years. Of all these, only one has had any fever. He has been 16 years at work, and had typhoid in 1862. There are some curious notes about these men. One of them has been at this work 50 years, and has not had one day's illness during the time. One lived 25 years in the sluice house over the King's Scholars pond sewer, but never had any fever. Another lived for 14 years in Penstock House, over outfall sewer at Old Ford. Another lived 32 years in Great St. John's sluice house. Another lived for 35 years in a house over Duffield sluice, and enjoyed good health. Out of 54 men employed at the pumping stations, there has only been one case of fever (typhoid).

At Crossness, out of 54 men engaged during the last 6 years, there has not been one case of typhus or typhoid. There have been 8 cases of ague, but these are of course due to the low marshy district, and they seem to have recovered rapidly. Out of 7 men employed in cleansing ventilators, oiling side entrances, gauges, &c., no case of fever has occurred, though one man has been at the work 23 years. Of 10 surveyors and chainmen in the engineer's office, not one has ever had typhoid fever, although they have been almost daily engaged in the sewers for periods of from 4 to 24 years.—*The Doctor*.

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*Forcible Manual Delivery in Puerperal Convulsions.* BY  
JOHN M. JULIAN, M.D., NEW YORK.

THE small number of reported cases of manual version in puerperal convulsions prompts me to offer a contribution to the subject, with a view of calling the attention of the profession to an efficient means of saving the life of mother and child, which means have not received the attention which, in my opinion, they deserve. This is more particularly the case since anæsthetics have been found to be so useful in the management of the various complications of labor.

I was first led to favor forcible manual delivery by hearing of the death in convulsions of a primipara undelivered, aged 19, eight months advanced, whom I had visited incidentally. In that case I learned that the persistent administration of chloroform had no result whatsoever.

After having seen this case, I determined to try, in a similar case, the effect of forcible delivery. An opportunity for so doing soon presented itself. On the 9th of June, 1864, I was called to

see Mary M., æt. 21. She was six and a half months pregnant, had been eight hours in convulsions, was uræmic, had stertorous breathing, pulse rapid and feeble, pupils insensible to light, and the os barely admitting the end of the index. With much less difficulty than I had previously anticipated, my hand was introduced into the vagina, next the index, and subsequently, one by one, all the other fingers were forced through the os; next the hand was passed into the uterus; one knee was hooked and brought down and the delivery of a male child accomplished, in the course of about twenty minutes. The convulsions did not return after delivery: but she never rallied, and expired the next day.

CASE II.—Reached Mrs. S.'s bedside September 8th, 1864 (town of Guttenberg), æt. 36, primipara, who was in labor, had frightful œdema of body, was insensible, and had stertorous breathing. Had been fifteen hours in convulsions; os admitting the end of the index finger. I administered chloroform at once, and thereby controlled convulsions, so as to enable me to deliver a pair of male twins, the first by version, being still-born; the other, by pedal extraction; alive. There was one slight convulsion three hours after delivery. Consciousness returned the next morning, the albumen disappeared at the end of the sixth day, and mother and child made a rapid recovery.

CASE III.—Saw Mrs. S., æt. 23, in consultation, Nov. 21, 1865; primipara, with the usual uræmic symptoms; had been fourteen and one-half hours in convulsions; insensible and stertorous since first attacked; os undilated, no apparent symptoms of labor present; digital and manual dilatation and version performed in less than thirty minutes, (with sanction of her medical attendants), in the usual way, under chloroform. One slight convulsion three hours after delivery; she remained insensible and afterwards delirious for over forty-eight hours, from which she recovered; but succumbed, one month from date of delivery, to an attack of pleuro-pneumonia. Child ever after subject to occasional epileptic convulsion, died two years after, of cerebral disease.

CASE IV.—Saw, in consultation, on the first of March, 1866, at 11 A.M., Mrs. M. Stage of pregnancy, eight and one-half months, primipara, urine two-thirds albuminous, countenance anæmic, fixed pain in forehead, nausea, pulse rapid and feeble. Counselling induction of labor. At 5 P.M. a convulsion occurred. At 9½ P.M., with the concurrence of her medical attendant, she being fully conscious and about the room at the time, os closed, was placed in the recumbent posture, and fully anæsthetized. I inserted my hand as before (encountering this time a little more rigidity than usual), and delivered twins—the first child by version. Both children lived. The mother made a rapid and uninterrupted recovery, the operation occupying about half an hour's time.

CASE V.—Saw, on August 4, same year, a next-door neighbour to Mrs. M., Mrs. W. Stage of pregnancy said to be eight months. Had been about ten hours in convulsions; primipara, uræmic, deep stertor, pulse rapid and feeble, circulation apparently ceasing. Had been previously to my coming ineffectually anæsthetized during several hours; os undilated. I proceeded at once to deliver in the usual way, which was soon accomplished, this time without anæsthesia. The convulsions ceased after delivery, but she expired the next day.

CASE VI.—Mrs. J., æt. 22, secundipara, who, during her previous pregnancy (sixteen months from date), had suffered from uræmic convulsions, ending, five or six weeks after their occurrence, by the spontaneous expulsion of a decomposed fœtus, whose growth appeared to be of about five months. I was requested to see her on the 5th of March, 1869, at 4 A. M.; said to be in her seventh month; face and lower extremities oedematous; headache, nausea, pulse about 54 had had two convulsions previous to my coming; medical attendant gone home 12½ P.M.; return of convulsions and vomiting, pulse 40; insensible, os closed, no symptom of labor. I at once proceeded to perform version under chloroform, and in the usual and above-described way, which was accomplished in about twenty minutes: child a male one, non-viable. The convulsions never returned, consciousness became gradually restored, and she made a rapid recovery. On the 6th of June 1871, she was again spontaneously delivered at eight months of another male child, but this time without convulsions; child died on the twelfth day, of epileptic convulsions; albumen was again detected in Mrs. J.'s urine.

In conclusion, I will state that my object in publishing the above has been to induce others to give the result of their experience in this matter, and help to establish, by a sufficient number of precedents, the propriety or impropriety of the operation. Inasmuch as a great number of obstetrical authorities look upon the measure as a most desirable one if it can be accomplished without injury or detriment to the patient, I think that on this point the general result of my cases ought to have a tendency to dispose of this objection, and demonstrate that the operation can *à priori* be performed with tolerable safety and celerity. They also suggest the belief that, under full anæsthesia, the question of non-dilatability of the os has not been as yet properly or sufficiently looked into; and that, at least in special cases, this operation ought to take precedence over the safer but more tardy rule of induction.

Therefore, I feel most sanguine in the belief, that should this mode of procedure be more generally followed, in like emergency, the mortality tables of puerperal convulsions would become notably improved, and the lives of fewer women and children sacrificed.

In corroboration of the preceding remarks I beg to observe that in a very extensive search made into the literature of the subject on manual dilatation in puerperal eclampsia, I have found but five cases which, however, fully substantiate my views: one of these will be found by Noeggerath and Jacobi, another by Dr. Paget, one by Dr. J. H. Ross, and two by Dr. Holland, copied from the *Lancet*, and found in Braithwaite's Retrospect Vol. lxiv., the results of all of which were successful, and one equally successful in Milne.

I will further observe that the large sanguineous depletion deemed indispensable, and so firmly relied on, is falling into disfavor. In the Guy's Hospital Reports for 1871 will be found a series of cases, by Dr. Philips, in which bleeding was not resorted to, and chloroform mainly relied upon for the control of convulsions; a practice which has likewise been followed, in the latter part of his life, by our late distinguished fellow-townsmen, Prof. Geo. T. Elliot.—*The Medical Record*.

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# MEDICAL INTELLIGENCE.

*(General Orders by the Governor in Council.)*

## Conveyance.—Hospital Equipments.

27th June 1872.

No. 689 of 1872.—With reference to G. G. O. No. 830 of 1871,\* His Excellency the Governor-General in Council is pleased to publish, for general information and guidance, the following scale of carriage to be allowed for the conveyance of the revised hospital equipment of troops on the line of march.

	No. of maunds.	No. of carts of 2 bullocks.
Regiment of British Cavalry and Infantry... ..	30	3
Wing of British Cavalry with head quarters ... ..	18	1 $\frac{3}{4}$
Do. do. do. ... ..	15	1 $\frac{1}{2}$
Troop of British Cavalry, Company of Royal Engineers, British Infantry or Sappers and Miners... ..	4	1
Battery of Horse or Field Artillery ...	6	1
Do. Garrison do. ... ..	4	1
Regiment of Native Cavalry or Infantry.	22	2 $\frac{1}{4}$
Wing of do. do. ...	12	1 $\frac{1}{4}$
Troop Company do. do. ...	3	$\frac{1}{2}$

This cancels G. G. O. No. 533† of the 14th May 1872.

\* Madras G. O. G. 6th October 1871, No 241.

† Madras, G. O. G. 28th May 1872, No. 139.

## Tents.

5th July 1872.

No. 170 of 1872.—With reference to G. O. C. C., No. 116, dated 11th September 1865, the Right Honorable the Governor in Council notifies that officers of British Regiments on arrival in this country, will be allowed one year to provide themselves with tents, and in the event of their being required to march within that period, tents will be provided for them from the Public Stores.

2. When tents are issued under the foregoing rule, a monthly rent as per margin will

	Cost.	Rent.
	Rs.	Rs.
Tent, Field Officers	... 570	10
" Captains	... 377	7
" Subalterns	... 323	6
" Hill, 11 feet square.	249	5
" Hill, 8 feet square.	219	4
" Staff Serjeants	... 224	4
" European	... 383	7
" Native	... 129	3
" Necessary	... 28	$\frac{1}{2}$

be charged for them, and the officers will be liable to pay for deficiencies, or for damage other than such as may justly be attributable to fair wear and tear.

3. The tents will be obtained by indents "passed" with the words "for payment of the authorized rent monthly." The Ordnance Examiner will take measures for the realization of the rents.

4. When such tents are returned into Stores, the receiving officer will at once report to the Quarter Master General what damage, if any, is chargeable, and the latter officer, on the bill being approved, will notify the same to the Ordnance Examiner, with a view to the amount being recovered from the officers concerned.

## Medical Fund Annuities.

5th July 1872.

No. 172 of 1872.—The Medical Fund Annuities of July 1872 are granted as follows:—

To retired Surgeon-Major J. Peterkin, M. D., a large Annuity, from 1st July 1872, or from date of payment of minimum.

To Surgeon-Major H. T. W. Harper, a large Annuity, from the date of payment of minimum, or from the date of retirement from the service, whichever may be the latest, provided both events take place on or before the 31st August 1872.



**Dooly Bearers.***12th July 1872.*

No. 176 of 1872.—The following is to be substituted for para. 9 of G. O. G. 14th March 1854, No. 59.

9. Whilst in camp, or marching, dooly bearers attached to hospitals will, when not otherwise employed, attend on the sick, provide them with water and give any little aid required. At stations their services will be available in hospitals, for pulling punkahs, removing weeds, dusting furniture, and cleaning windows.

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**Uncovenanted Servants—Appointments.***20th July 1872.*

No. 186 of 1872.—The following General Orders by the Government of India, are re-published :—

No. 726 of 1872.—The following notification, issued by the Financial Department, No. 2620, dated the 10th August 1871, is published for general information :—

No. 2620.—The Governor-General in Council is pleased to rule that no person shall be appointed to the public service in India in a grade eligible to pension without a certificate by a commissioned medical officer, or by a medical officer in charge of a civil station, that he has no disease, constitutional affection, or bodily infirmity, unfitting him, or likely to unfit him, for the public service.

2. The provisions of the above notification are applicable to uncovenanted servants of Government under the Military Department.

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*(General Orders by the Commander-in-Chief.)*

**Passage—Medical Department Sub.**

No. 51.

*2nd July 1872.*

The following extract from a letter, No. 255, dated 6th February 1872, from the Government of India in the Military Department, to the Quarter-master General, relating to the grant of free passages by sea or river for the families of

Hospital Assistants, when proceeding to join their appointments, is published for general information and guidance:—

“ There is no rule which sanctions a free passage by river or sea to the families of Hospital Assistants, neither does the Governor-General in Council consider it expedient to concede the point.

“ But in certain cases when, as in the case of the Eastern Bengal Railway for instance, the steamer passage forms part of the railway journey, that is, when the steamer is connected with the Railway Company, and the through journey forms one fare, the whole journey may be allowed free to the families of Hospital Assistants.”

### Clothing.

No. 54.

An instance having occurred in which certain articles of clothing belonging to attendants on glandered horses were *destroyed* as a precautionary measure, to prevent the spread of infection, His Excellency the Commander-in-Chief, under instructions from Government, desires, to intimate that no necessity whatever exists for the destruction of clothing used on such occasions; it being quite sufficient to subject such articles to the boiling process directed\* by the Government of India in the case of

(a) \*G. O. 17th May 1865. small-pox and cholera-infected clothing.

This course is in future to be followed by Officers Commanding batteries of Artillery and regiments of Cavalry.

### Passage—Troopships.

No. 57.

Under the authority of Government the Commander-in-Chief is pleased to notify, for guidance, the procedure to be observed in the case of officers entitled to a free passage to England overland, who may arrive at Bombay shortly before the commencement of the trooping season.

(a) Vide Madras G. O. C. C., page 215 of 16th December 1865.

2. Officers so entitled, whose leave commences *from and after the 1st September of each year*, are to reach Bombay within the time allowed to officers preparatory to embarkation, and are to be embarked on, or be detained for, the first troopship leaving after their arrival, instead of being provided with passages in the Peninsular and Oriental or other Companies' steamers.

3. In the case of officers who may be ordered to England on medical certificate during the trooping season, local military authorities are directed on each occasion an officer passes a station medical board to give immediate intimation to the Quarter-master General at Bombay.

### Passage—Transport—Railways.

No. 60.

Repeated instances having occurred in which railway warrants have been granted without specifying the nature of the duty on which officers were proceeding, the Right Honourable the Commander-in-Chief, in requiring strictest adherence to G. O. C. C., dated 27th June 1872, and Clause II. of para. 134, "Transport Regulations, Part II." directs the special attention of Staff Officers to an omission of information required by regulation, and productive of much unnecessary inconvenience and delay in the auditing of accounts.

### Leave—Officers.

No. 65.

In modification of the Regulations marginally noted, the Commander-in-Chief is pleased to

\* G. O. 135 of 1870.

direct the discontinuance in future of duplicate papers hitherto submitted with furlough applications of officers of the Indian Army.

\* \* \*  
These documents are now required only in original, except the *statement of service* accompanying furlough applications, which must still be sent in duplicate.

**Neilgherries.***8th July 1872.*

As much inconvenience has occasionally arisen from a neglect of the instructions laid down in para. 307, Army Regulations, the Commander-in-Chief directs the attention of all officers visiting the Neilgherries to that order, which is again re-published.

Para. 307.—Officers proceeding to the Neilgherry Hills on leave, are to report in writing their arrival, place of residence, and intended departure, to the Assistant Adjutant-General, Mysore Division, and to the Staff Officer of the Depôt at Wellington.

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**MADRAS MEDICAL FUND.****Retirement.**

Surgeon J. Macdonald, from 1st August 1872,

FORT ST. GEORGE, }  
30th July 1872. }

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# List of Children.

On account of whom Payments have been notified by the receipt of Paymaster's Statements, &c., from 29th June up to this date for securing the following rates of pensions.

Names of Subscribers.	Children's date of birth.	Sex.	Rates of Pension secured.	To what period.	Payments how made.
S. T. Heard	21st March 1872	Female	Half	To 21 years	By Donation.
A. Sanderson	18th May 1872	Do.	Do.	To D. or M., &c.	
T. Pritchard	11th August 1867	Do.	*Do.	To 21 years	
Do.	Do.	Do.	Full	*From 21 to D. or M. &c.	
Do.	24th October 1869	Male	*Half	To 18 years	
Do.	Do.	Do.	Full	*From 18 to 21 years	
G. Marr	14th April 1872	Do.	Do.	To 21 years	
Do.	13th Dec. 1870	Female	*Half	Do.	
Do.	Do.	Do.	Full	*From 21 to D. or M. &c.	
...	...	...	...	...	

N B.—The rates of Pensions marked thus \* are additional to those previously secured.

MEDICAL FUND OFFICE,  
FORT ST. GEORGE,  
30th July 1872.

**List of Wife**

*On account of whom Payments have been notified by the receipt of Paymaster's Statements, &c., from 29th June up to this date for securing the following rate of Pension.*

Name of Subscriber.	Date of Marriage.	Rate of Pension secured.	Payments how made.
F. Day	... 13th April 1872.	Full ...	By Donation.

MEDICAL FUND OFFICE,  
FORT ST. GEORGE,  
30th July 1872. }

**CORRESPONDENCE.****WATER ANALYSES.**

*To the Editor of the Chemical News.*

SIR,—In your paper of the 15th March I notice a letter from Assistant-Surgeon Nicholson, in which he states that the analyses which have been made during the past four years of the waters of military cantonments in Bengal were made upon a method drawn up in neglect of the peculiarities of Indian waters, and that, in consequence, the results were in most cases erroneous, and, from a chemical point of view, worthless. I might simply meet this assertion by another, namely, that the method which was employed was directed, so far as needful, to the case of Indian waters, and that as, when I drew up the scheme, I had been engaged in analysing Indian waters for over fifteen years, I knew very well what those peculiarities are. I might also add that the reports of the analysts who used this method, which have been included in my reports to the Government of India on the subject of the analysis of potable waters, have gained the marked approval of the Army Sanitary Commission, as well as of Dr. Parkes and Dr. Angus Smith.

The peculiarities to which Dr. Nicholson specially refers are the frequent presence in Indian waters of a large quantity of nitrates in a sample which is free from organic matter, and *per contra* of water contaminated with sewage containing little or no nitric acid. These, however, are facts which have been not only recognised by me, and by analysts who have worked under my guidance, but also by Dr. Angus Smith, who, in a pamphlet which he wrote upon the subject,—one by the way, to which I was much indebted in drawing up a scheme for use in Bengal,—drew attention to these very points, and urged their consideration upon those engaged in water analysis. I should hope that no one would think of condemning a water simply because it contained a large quantity of nitrates or of chlorides, though he would do well to remember that, under some circumstances, if positive, the presence of either in any quantity would be a warning not to be despised.

I willingly allow that the scheme of analysis of potable waters which I drew up six years ago, for the use of our water analysts, needs great modifications; but these have been introduced in the revised scheme which, in communication with Dr. Angus Smith and Dr. Parkes, I compiled under instructions from the India Office, when I was lately on furlough. This more recent scheme includes the admirable methods of water analysis introduced by Messrs. Wanklyn and Chapman. I may, however, say that the old scheme was very much modified by me in communication with the individual analysts, and in particular Messrs. Wanklyn and Chapman's processes were introduced so far back as 1868.

While carrying out the analysis of the potable waters of Bengal and adjacent Presidencies, I had to bear in mind that our analysts were not for the most part trained chemists; and, therefore, to have asked from them complete analyses of the mineral constituents of water would have been, for more reasons than one, a very unwise proceeding. Nor do I think that such analyses are generally needful; and I may conclude by saying that if I were now instructed by Government to do over again the work lately done in Bengal, I should feel much inclined to put into the hands of the analysts Messrs. Wanklyn and Chapman's work on water analysis, with instructions to work by it, supplementing the chemical with a microscopical examination of the waters, and charging them, as I have always done, to bear in mind that by no method of analysis can we with certainty detect all

dangerous matters in a water, while, however, we may with certainty exclude danger by strict attention to the sanitary condition of the water source.

I am, &c.,

F. N. MACNAMARA, M.D.

#### WATER-ANALYSIS.

*To the Editor of the Madras Medical Journal.*

SIR,—If Mr. Nicholson will kindly refer to my reply, he will discover that I did not, as he implies in his letter of the 15th June, say that sulphate of sodium can be WHOLLY converted into chloride by ignition with twice its weight of chloride of ammonium. I simply stated that if the two salts be ignited together in the proportions I have mentioned, abundance of chloride of sodium will be found in the residue; had I meant that the conversion would be a complete one, I should have said so. Mr. Nicholson had stated that any one could convince himself by a simple experiment of the inaccuracy of the scheme on this point, and my wish, therefore, was to indicate an experiment, which could be readily made, and which would convince any one making it, that pure chloride of ammonium ignited with pure sulphate of sodium, does produce chloride of sodium.

One word more—your correspondent “Glycogen” in your May number speaks of me as having been employed for years in nothing but Indian water analysis, so let me say that water analysis constitutes but a very small part of my duties. As Chemical Referee to Government (for the past nineteen years) in all its Departments for this part of India, it would be strange if my laboratory work were not of a most varied character.

CALCUTTA, }  
July 1872. }

I am, &c.,

F. N. MACNAMARA, M.D.

#### HYDROPHOBIA.

*To the Editor of the Madras Medical Journal.*

SIR,—I shall be highly obliged by your kindly inserting this letter in your well esteemed paper for general information.



We have been labouring long to enlighten the hypothetical demonstration on Hydrophobia in one of our vernacular medical paper, but the acquirement of the native doctors by whom the above paper is chiefly patronized, are, we are convinced, not at par to apply their intellect to pervade over the clue of our queries. We shall, therefore, thank your readers to throw some light by explaining the following questions.

What is the true nature of Hydrophobia? How does it produce *de novo*? What structures of the animal body are principally affected by the poison, and how? Why and how spasms of the muscles of the deglutition and respiration are brought on at the contact or even the sight of water? Does the poison of Hydrophobia exist only in saliva or any other fluid or solids of the rabid animal? If it only exists in saliva, what changes occur in the salivary glands? Do the properties and chemical composition of the salivary fluid suffer any change, if so, what are they? Can the poison of Hydrophobia be extracted from the salivary fluid, and will it act in the same manner if taken by the mouth as when bitten by a rabid animal?

I am, &c.,

S. BAHADOOR ALLY,

*Native Doctor.*

RAEPUR, C. P., }  
22nd July 1872. }

### TO CORRESPONDENTS.

MR. STAGGS—MR. NICHOLSON—MR. JUDGE—*In our next.*  
DR. SHORTT—MR. EATE—*Received with thanks.*

### BOOKS, &c., RECEIVED.

Journal des Connaissances Médicales; *May 30th, June 15th,*  
Medical Record; *April 1st, 15th, May 1st.* [30th.  
Gazette Médicale d'Orient; *April and May.*  
Bangalore Spectator; *July 10th.*

Medical Press and Circular; *June.*

Doctor ; *June.*

Dublin Journal ; *May, June.*

\* Do. ; Feb. March.

\* Edinburgh Medical Journal; *Feb. to May.*

\* *Lancet*; 1871 (except *May 20th, July 22nd, Sept. 9th, Oct. 28th, Nov. 4th, 18th, 25th, Dec. 23rd*); *Jan. 6th to May 25th, 1872.*

\* British Medical Journal ; January 1st, 1870 ; Feb. 17th to May 25th, 1872.

\* Pharmaceutical Journal; Feb. 3rd to May 25th.

*The Secretaries* ROYAL MEDICAL BENEVOLENT FUND SOCIETY OF IRELAND, acknowledge with many thanks receipt of the following Donation.

G. W. Walter, Esq. Rs. 25

\* Through Mr. R. Hardwicke.