During the year ending March, 1898, of 7240 females committed to Walton Gaol, 6212 had been in prison previously, and of these 2290 had served upwards of twenty terms of imprisonment (*Report of H.M. Commissioners of Prisons*). Recidivism in local prisons practically implies habitual inebriety.—(5) Magnan, *Leçons Cliniques sur les Mal. Mentales*, Paris, 1897.—(6) This nervous susceptibility which is manifested in sensibly equal degree by all levels—cerebral, bulbar, and spinal—of the nervous system is, of course, in itself no evidence of neuropathic constitution, as is, for instance, the special *cerebral* reaction of the degenerate (*vide* Magnan, *op. cit.*). As a matter of fact, amongst prison drunkards, those whose habit can be attributed to neuropathic disposition are not many.—(7) "Psychology of Criminals," in *Journ. Ment. Sci.*, 1871.—(8) Quoted by Lombroso.—(9) *Dégénérescence Sociale et Alcoolisme*, Paris, 1895.—(10) Quoted in *Grotjahn, der Alkoholismus*, Leipzig, 1898.—(11) Morel, *Les Dégénérescences*, 1857.—(12) Féré, *La Famille Névropathique*, 1894.

A Brief Note on Beri-beri in Asylums. By Conolly Norman, Richmond Asylum, Dublin.

Elsewhere I have dwelt on the occurrence of beri-beri in temperate climates(1) and on the clinical features of that affection as I have seen it.(2) At an early date I hope to be able to publish in detail the clinical records of a number of interesting cases. It is not my intention on the present occasion to dwell, save incidentally, on the symptomatology of the disease, nor to indulge in any speculations upon its origin or essential nature, for these latter points are, unfortunately, still in the region of speculation, and the light which I can throw upon them is scanty and indirect.

My object at present is not to attempt any elucidation of this affection, but merely to call the general attention of those who are engaged in asylum work to the special tendency which there would seem to be to the outbreak of beri-beri in asylums.

Until the last few years the appearance in Europe or in North America of beri-beri, which had not been immediately and directly imported, was a thing [save among the fishermen of the Newfoundland banks](3) unheard of and unthought of. Many people have probably not even yet realised that the researches of observers in Northern Japan and Saghalien have clearly demonstrated that to call beri-beri a tropical disease is a misnomer. Its prevalence in Brazil shows that it is not merely an Eastern disease; while its recrudescence

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in that country, after a long period of quiescence, seems to indicate that it may be in that condition of extending energy which the history of other epidemics shows to occur from time to time without any reason hitherto understood.

Meanwhile, a fact remains which cannot be without interest to any of us, a fact which ought to be known to all asylum physicians, and which should arouse the vigilant attention of those who are responsible for the welfare of the insane in institutions—namely, that within the last five years epidemics of beri-beri have appeared in asylums for the insane in Ireland, England, North America, France, and, probably, Germany. Of these epidemics, the first broke out in the Richmond Asylum, Dublin, in the summer of 1894; another in the Suffolk County Asylum, Melton, Suffolk, in the winter of 1894; another in the Insane Asylum, Tuscaloosa, Alabama, U.S.A., in the spring of 1895; another at Little Rock State Asylum, Arkansas, U.S.A., in the autumn of 1895, and another at the Asylum of Sainte-Gemmes-sur-Loire, in the department of Maine et Loire, in the summer of 1897.

At the Richmond Asylum, Dublin, beri-beri is first known to have appeared in 1894. The exact period at which it began is uncertain, for I am satisfied that I overlooked many mild cases at first, and I misunderstood several of the earlier cases, which were severe enough. On the whole the oncome was extremely insidious. A few isolated cases occurred in the early summer, then there was a gradual increase, then a very great and sudden increase (September), then almost as quick a falling-off, and no fresh cases occurred after October. The average daily population of the asylum for that year was 1503. The number of cases of beri-beri registered was 127 men and 47 women, total 174. The registered deaths from this cause were 18 men and 7 women, total 25. It must be remembered that these figures are, undoubtedly, an under-estimate. In this year only patients were attacked. The disease was remarkably more prevalent among the epileptics than among the other patients. This was attributed at the time to certain local conditions, and these may have contributed; but we shall see presently that the same observation has been made elsewhere, and that there is reason to believe that epileptics are more liable to beri-beri than other inmates of asylums.

It is to be observed that in its relation to season, and in its

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incidence among the sexes, this epidemic followed the ordinary habits of beri-beri.

No cases were observed during the year 1895.

Beri-beri reappeared in July, 1896. In this year the average population was 1686; 114 persons suffered from beri-beri, being 31 male and 76 female patients, and 7 (sane) nurses; 2 male and 6 female patients died. None of the nurses succumbed. The number of new cases decreased in prevalence towards winter, but fresh cases occurred up to and during January, 1897.

In 1897 (average population 1800) 246 cases occurred (including 4 beginning in January, after which there were no fresh cases till June). Of the total, 45 were male patients, 193 female patients, 2 male attendants, and 6 nurses; 3 male and 8 female patients died.

These epidemics differ remarkably from the first in attacking more women than men. The oncome also seemed less distinctly influenced by season.

During the year 1898, 12 cases occurred among women, and 4 women died of this affection. Some of these cases were fresh, some had suffered before. Mostly death occurred from slow decay, and apparently was due to fatty heart, consecutive to the more acute forms of the disease. Meanwhile, a number of cases in the female house linger on—some from 1898, some from 1897, some from 1896—cases which show a quick, irritable, and feeble heart, yet are pretty well when kept at rest, but soon show signs of œdema, feebleness of gait, and sensory troubles if they are allowed to get up.

No satisfactory cause has been assigned for the appearance of beri-beri in the Richmond Asylum. Extreme overcrowding had, of course, existed there for years, and the constant presence of dysentery points, as I have often insisted, to the existence of unfavourable hygienic conditions. Anything more definite than this has not yet been arrived at. In view of overcrowding, it is to be observed that as overcrowding was diminished the disease diminished; when overcrowding again became urgent the disease returned. The water supply is that of the city of Dublin generally. Provisions are procured either in the open market or from contractors who supply many other people besides the occupants of the asylum. Rice is little used, and there is no excess of farinaceous food. The dietary always

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compared favourably with that of the other Irish asylums. Since 1894 it has been better than is usual in this country, and, indeed, bears comparison with the dietary of any public asylum in the United Kingdom.

In Suffolk Asylum the illness appears to have begun in its usual treacherous way towards the close of 1894. In January, 1895, definite paralytic troubles had appeared, and the disease spread rapidly. No fresh cases occurred after June. Only female patients were attacked; 71 cases occurred and 3 deaths. Through the kindness of Dr. Eager, who was then medical superintendent, I saw some of the sufferers in May, 1895. I formed the opinion that the affection was the same as that with which I had had to deal in Dublin the previous summer, but certain differences puzzled me. Chiefly I was struck by the lesser extent of the superficial œdema in the Suffolk cases compared to those occurring in Dublin. Also the character of the œdema was different. It was always demonstrable, but it was of a harder variety than I had seen in 1894, the condition somewhat resembling myxœdema. I now attribute no importance to this difference, because I have found the myxœdematoid form the prevailing one in my own later epidemics, and I have learned that this is a common observation in beri-beri.

In November, 1896, the ailment returned in the Suffolk Asylum. It seems to have appeared in the same insidious way as before. "It was noted that 10 of the women were gradually losing power and co-ordination in the lower extremities." It would seem that some 23 patients were attacked up to March, 1897. As on the previous occasion, the illness was confined to the female division. No cause has ever been ascertained for these outbreaks. A trace of lead was found in the drinking water, and although the disease had but a remote resemblance to lead-poisoning, effectual measures were taken to secure water free from lead. Nevertheless, the second epidemic occurred when the water was pure and had been pure for some time. The asylum had been overcrowded for a considerable period, and there had been other elements of bad hygiene. Dysentery of a severe form had been a constant source of trouble for many years.

The epidemic in Tuscaloosa Asylum, Alabama, developed in February, 1895, and 13 cases occurred during that year. The

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disease recurred in the late summer of 1896, when 58 cases occurred. During the entire period of time covered by both epidemics the approximate number of patients in the asylum was 1200. Seventy-one suffered from beri-beri, 49 men and 22 women, and there were 21 deaths, 16 men and 5 women. The total number of epileptics in the asylum was 80, and of these no less than 32 contracted beri-beri. Dr. Bondurant, who gives an excellent clinical picture of the disease(4), draws attention to its variable mode of onset. "Some cases began suddenly with fever and gastro-intestinal irritation. . . . In other instances the onset was insidious, it being impossible to date the commencement of the attack. In still others the initial symptom was suddenly occurring dyspnœa, with tachycardia and violent pulsation of the vessels of the neck; œdema of the feet and ankles was in others the first indication." It was concluded that the outbreak was due to some form of malarial trouble.

There is little information available about the epidemic of beri-beri at the Arkansas State Asylum, Little Rock. It would appear to have occurred in the late summer and autumn of 1895. The cases numbered between 20 and 30. There was a great preponderance of men. Only one death occurred. The clinical symptoms described leave little doubt as to the nature of the disease. Intermittent malarial fever existed in the asylum at the same time, but here, as at Tuscaloosa, the diseases did not occur in the same individuals.

The epidemic at Sainte-Gemmes-sur-Loire is very interesting, and is as yet little known in this country. (I am glad to acknowledge my indebtedness to my distinguished friend, Dr. Manson, who was so kind as to draw my attention to the earliest published account of this epidemic.) It is, therefore, worth while dwelling upon it for a while. As in Dublin and in Tuscaloosa the oncome of the epidemic was insidious. In Dublin in the first outbreak, and in Tuscaloosa, the epileptics suffered most severely. Similarly in Sainte-Gemmes. The first thing there to attract attention was an unusual mortality among the epileptics, who died apparently in the status, and whose bodies were found to present a considerable degree of œdema. Attention having been drawn to this condition it was found that a number of other patients—epileptics, idiots, and melancholics—suffered from dropsy without presenting the usual causes of that symptom. The œdema had the peculiarity so often noticed

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in beri-beri of being more solid than is usual in the ordinary forms of dropsy. In the great majority of cases œdema was the first morbid phenomenon which was noticeable. It appeared towards evening in the feet and malleolar and pretibial regions. Later on it was liable to spread, attacking the whole body and the serous cavities. Paralysis of the lower extremities appeared, the gait being somewhat similar to that of ataxy, but the feet tending to cling to the ground, the toes dropping and turning in, the inner edge of the foot slightly raised, and the dorsum arched (characteristic posture in neuritis). Paralysis sometimes extended to the superior extremities and also to the diaphragm, producing death by asphyxia. The paralyses were accompanied by extreme muscular atrophy and by remarkable sensory disturbances, tenderness of muscles, formication, cramps, cutaneous hyperæsthesia or anæsthesia. It is stated that the patellar reflexes were always abolished, but it is not quite clear whether that statement refers to cases only of marked paralysis. One third of the total number attacked were paralysed. Paralysis often appeared or increased with singular abruptness. Tachycardia was a prominent condition, the pulse running to 140 to 150, and at the same time becoming so weak as to be scarcely perceptible or imperceptible at the wrist. Sometimes the urine contained albumen. There was generally no fever, except such as was secondary to bedsores, &c., but in some rapid cases slight fever occurred at the onset, soon subsiding. Death was apt to occur under that distressing combination of symptoms which the Japanese call shiyoshin. Vomiting, which was a prominent condition in the beginning, and had usually subsided, reappeared; the pulse became quicker and more wretched; the respirations increased in frequency; the diaphragm became paralysed; mucus accumulated in the bronchi, and the patient was unable to cough or even to swallow. The agony was accompanied by profuse sweating. The picture is that of ordinary beri-beri, but there were certain special features in the epidemic at Sainte-Gemmes. Nausea and vomiting were very common at the commencement of the attack. They were more commonly accompanied by constipation than by diarrhœa. There was no anorexia, rather the reverse. Certain curious trophic changes occurred in the integuments. A considerable number of patients presented over the skin of the hands and face a peculiar brownish discoloration similar to that produced

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by exposure to the sun's rays in field labourers. At the period of muscular atrophy patches of erythema, at first pink then red, appeared on the backs of the hands and wrists. On these patches bullæ appeared, which rapidly dried, leaving large adherent scales which again on desquamation left behind red and white marks like cicatrices. Purpura and ecchymoses were occasionally observed; there was a tendency to bedsores over the sacrum, and three patients suffered from painful effusion into the knee-joints. The cutaneous troubles called up strongly those of pellagra. This interesting circumstance led the recorders of this epidemic (MM. Chantemesse and Ramond, from whose paper in the *Annales de l'Institut Pasteur*(5) I have obtained the facts with reference thereto) to review the history of a singular epidemic which occurred at Saintes-Gemme-sur-Loire, 1855–65, and which has been chronicled by Billod (then director of the asylum) in the *Archives de Médecine.*(6) Billod believed the disease with which he was dealing to be, if not true pellagra, a special variety of that affection, which he proposed to call the pellagra of the insane. That opinion was not accepted generally at the time, nor has it since secured the concurrence of writers on pellagra. Elsewhere I have gone at some length into this question; suffice it here to say that I have read Billod's articles, and making allowance for the fact that peripheral neuritis was not understood at that time, and for the strong prepossession under which Billod wrote, there is a very remarkable similarity, as Chantemesse and Ramond point out, between the epidemic described by him in 1858 and that which occurred forty years later in the same institution.

The mortality in the epidemic at Sainte-Gemmes in 1897 was heavy. It is calculated that about 150 persons were attacked and that about 40 died. None of the staff suffered. Only the free patients (*indigents*) were attacked. "The disease raged as an epidemic in 1897, but it existed in the asylum before that date, for in 1896, and even in 1895, some patients were affected with indications of ascending paralysis quite similar to those which were observed during the epidemic of 1897" (C. and R.).

No satisfactory reason for its appearance has been suggested. It is noteworthy that it only attacked those patients whose dietary was the least nutritious. The possible recurrence after forty years is very remarkable. It is evident that the epidemic

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of 1897 was insidious in its course, and unexpected. There is no account of the condition of the asylum as to accommodation. Sainte-Gemmes-sur-Loire is the public asylum for the department of Maine et Loire, and contained, when the statistical table attached to Dagonet's *Traité des Maladies Mentales* was compiled (1888), 790 patients. (It will be seen how large a proportion were attacked, even making allowance for a great increase in population since that date.) Billod, forty years ago, spoke of the situation of the buildings as rather damp, of the marshy ground in the neighbourhood, and of the occasional occurrence of intermittent fever. Probably these insalubrious conditions have been long rectified. We hear nothing of them now.

Cases are recorded of peripheral neuritis, not called beri-beri, but singularly like that affection, which occurred in 1897 at the asylum at Grafenberg, near Düsseldorf.(7) Similar cases seem to have occurred at Alt-Scherbitz.(7) In both places a malarial infection, connected with excavations for new buildings, was suggested as the cause. In countries where beri-beri prevails, as Pekelharing has shown, excavations seem to act by setting free a miasmatic poison. Excavations for buildings are so constantly going on about almost all asylums, that they may be said to constitute one of the ordinary conditions of asylum life.

I do not think it is reasonable to suppose that the records of so many outbreaks of a similar disease in asylums can be due to mere coincidence, or to any adventitious notoriety which the subject may have acquired. We must take it, I think, that the danger of infective peripheral neuritis (or beri-beri) appearing in an asylum is one of those things which we ought to be on the look-out for. In the last edition of Gowers' *Diseases of the Nervous System*, 1899, it is said: "The diagnosis can only be a matter of difficulty in a very early case, or in a patient who is not known to have been exposed to the infection, or in consequence of ignorance of the disease." It must be admitted that almost all practitioners in European countries suffered largely from ignorance of the disease until comparatively recent times, but it would seem from the above quotation that, even with knowledge of the affection, to know that any particular patient is likely to contract it is an element of importance in the diagnosis. It therefore becomes the more essential to remember its liability to occur in asylums.

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A somewhat different opinion is expressed by another author, whose authority on this subject is so great that it cannot be disputed :

"To the medical man encountering it for the first time, and with only European experience and the ordinary text-books to guide him, case after case may present itself in the out-patient room or in the wards of a native hospital, and yet he may for a long time entertain no suspicion as to the real nature of the disease he is dealing with. Such diagnoses as muscular rheumatism, locomotor ataxia, progressive muscular atrophy, heart disease, Bright's disease, œdema from anæmia, suggest themselves, so varied and apparently unconnected are the elements of the picture. Such, as a matter of fact, are some of the diagnoses the novice in tropical medicine generally, on his first encountering beri-beri, arrives at and registers. By-and-by he is agreeably astonished to find that many of his presumed locomotor ataxia cases rapidly recover, his progressive muscular atrophy cases cease to progress, his Bright's disease cases show no albumen in a fairly dense urine, and his heart cases lose their bruits. On the other hand, he is painfully surprised at the number of sudden deaths occurring among patients who did not seem to be very ill; he cannot account for the frightful attacks of dyspnœa he frequently has to treat, for the anæsthetic patches in the atrophic cases, for the absence of ocular, bladder, and other characteristic symptoms in the apparently ataxic cases. After a time the idea of peripheral neuritis may occur to him, and then, perhaps, on a hint from some one with more experience, or from a book, or by a sort of happy inspiration, he one day concludes that the diseases he is dealing with are but phases of the many-sided complaint, beri-beri. Such I know to be the history of many a medical man's initiation to the diagnosis of this disease."—Manson, in Davidson's *Diseases of Warm Climates.*

Dr. Manson's own works have since contributed very largely to render the British practitioner more familiar with this most interesting disease. Those who are acquainted with the older literature of the subject will remember the old official opinion as to the connection of this affection with *Anchylostomum duodenale*, a superstition which was not quite extinct even in 1894.

But if we must suspend judgment as to the cause, either remote or immediate, of these asylum epidemics, lest we should fall into errors as absurd as our predecessors have made. Why do we venture to name this affection beri-beri? Because, as far as we know at present, the clinical symptoms and the post-mortem appearances are identical with those of beri-beri. The essential cause of beri-beri is unknown. We can, therefore, only apply the name to a certain congeries of symptoms and

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signs and post-mortem appearances, and these appearances correspond in their great variety with the varying but corresponding phenomena of the asylum epidemics. The bacteriological results, not quite complete or satisfactory, go, on the whole, to support the identity of the various affections. It must be remembered that the symptoms of the disease vary somewhat in various localities and in different epidemics,(8) and that the kakké of Japan and the Brazilian disease were for a long while not recognised as identical with the beri-beri of Ceylon and China. It may be that at some future time it will be found that a number of diseases are grouped together under this one name of beri-beri. Many of us expect the same discovery in regard of a disease which we are all more familiar with—general paralysis; but just at present science will be better served by grouping together phenomena which have, at least, much in common, rather than by subdividing where we have no sufficient knowledge to guide us in classification, even though it should hereafter prove that further subdivision is justifiable.

(1) In a paper read at the Tropical Diseases Section of the British Medical Association at the Annual Meeting, 1898; see *Brit. Med. Journ.*, Sept. 24th, 1898. —(2) In a paper read at the Medical Section of the Royal Academy of Medicine in Ireland, Jan. 27th, 1899.—(3) See Putnam's article in *Journal of Nervous and Mental Diseases*, Aug., 1890. Dr. Osler informs me, on the authority of Dr. Birge, that such cases continue to occur among these fishermen.—(4) *New York Medical Journal*, Nov. 20th and 27th, 1897.—(5) *Annales de l'Institut Pasteur*, t. xii, No. 9 (Sept. 25th, 1898).—(6) *Archives générales de Médecine*, 1858, vols. i and ii.—(7) See paper and discussion in *Allgemeine Zeitschrift für Psychiatrie*, Bd. lv, H. 1. (8) The disease is probably both variable and periodic. Dr. Sinclair, Residency Surgeon at Selangor, has noted in his annual report for 1890 the variability which occurs in the Straits Settlements. He says, "The disease, happily, though still very prevalent, seems to have altered its character. In former years the history was an acute one; fever, anæmia, rapidly advancing paralysis and cardiac weakness, dropsy and death, or protracted paralysis in cases of recovery. Now it seems to be more chronic, perhaps endemic. Little or no anæmia with slight cardiac weakness, and subacute or chronic paralysis; death due less frequently to beri-beri itself than to intercurrent disease." Probably this change is analogous to that which distinguished the first from the later Dublin epidemics. As to periodicity some interesting observations made in the Dutch colonies in the Malayan Archipelago have been recorded by Kohlbrugge of Tosari, Java, in the *Therapeutische Monatshefte* (Bd. xxx, H. 1, January, 1899), from which it would appear that the prevalence of beri-beri amongst the European troops rose steadily from 1873 till 1884; and that there was then a sudden increase continuing till 1888, when the disease began to decline and decreased continuously till 1897. Treatment, prophylactic and other, seemed of little service, and disinfection valueless. The disease declined as unaccountably as it rose. Meanwhile Asiatics were more severely affected than Europeans, and the Asiatic curve, as it were, over-rode the European, beginning some years earlier, rising to a much greater height, and declining much more tardily. A similar periodicity, however, is evident in both.

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