The Remodelling of an Old Asylum.⁽¹⁾ By ERNEST W. WHITE, M.B.Lond., M.R.C.P., Medical Superintendent, City of London Asylum; Professor of Psychological Medicine, King's College, London.

IT not infrequently happens that the senior assistant medical officer of a modern institution for the insane is elected medical superintendent of an old asylum. Such was my lot when early in 1887 I was chosen by the Court of Aldermen of the City of London to fill the post of chief officer to their asylum at Stone, and I entered upon my duties with no light heart, because it was early apparent that many structural and administrative changes would be necessary to bring this institution abreast the times. The asylum is constructed on the gallery or corridor plan, in linear form, extending from east to west, with projections north and south at several points. This linear form is modified by semi-detached laundry and workshop blocks, which are connected by covered ways to the central administration situated midway between these blocks, and at right angles to the line of the wards, which it intersects as it runs north and south. The style of architecture is Gothic, of white brick with Suffolk quoins, stone mullions, and dressings to the gables; the roof is of Broseley tiles. There is a handsome tower of white brick and stone with embattlements; the central portion of the tower is an iron smoke shaft, the part intervening between this and the outer wall being a heated extraction shaft for removing the foul air from the galleries and single rooms. The buildings are of two stories, except to the south of the central administrative block, where there is a third story for the old chapel (now being converted into a recreation hall), and for some of the staff bedrooms of either side. The estate comprised in 1887 thirty-three acres.

What were the defects of this institution, and how have they been remedied? The chief structural defect was undoubtedly the existence of a dividing wall extending the whole length of the main building from east to west on both ground and first floors, which so split up the space that the wards, which were separated by glass screens, were small, with connecting galleries and through traffic on both floors on the south side, and the

dormitories small and stuffy, and on both floors on the north. Where was the through ventilation which is so necessary? The w.c.'s were all on the south side, and communicated directly with the wards. They were deficient in number (only one third the proper proportion), often offensive, especially when the sun was upon them in the summer-time, and on the male side there were a sufficient number of stall urinals adjoining the w.c.'s for a railway terminus! These were an ever-present nuisance. With two exceptions there were no w.c.'s connected with the dormitories for night use. The nurses' and attendants' rooms were all on the north side, damp and cheerless, never brightened by sunshine. There were no proper ward sculleries; the washing up was done in the lobbies of the w.c.'s, where sinks had been fitted, and on the male side these adjoined the urinals. There were no ward store-rooms. The stock was kept in small wardrobes and in cupboards, suitable for brooms and brushes only, under the stairs. As regards lavatories, three or four single rooms had in a similar number of wards been fitted up with basins, but apart from these the ablutions were carried out in basins in the dormitories, or in the lobbies attached to the w.c.'s, where basins had been fixed. Each ward had a single bath-room, too small for any dressing accommodation. The patients were therefore obliged to undress and dress in the open wards, a very objectionable practice. There were no general bath-rooms for the proper supervision of the bathing and inspection of the patients for bruises or skin eruptions. The walls of the wards, dormitories, single rooms, and staircases throughout the asylum were unplastered, but had been distempered a blue colour with a light drab brown painted dado, a red line intervening. This rough surface harboured dust and germs, and made the surroundings of the patients cold and comfortless. I should add there were no slop sinks, no boot and cloak rooms in any of the wards, and no proper broom and bucket closets. The day-rooms were badly lighted, on one side only—the south,—stuffy and ill-ventilated, with no cross air current. They were, moreover, small and difficult to manage, being on both floors, therefore requiring a large staff. The same objections applied to the dormitories, only more so, as they faced the north, never received any sunshine, and always looked damp and comfortless. The single rooms were nearly all on the north side of the galleries, which on both

floors were used for through traffic and as day space. All the day-rooms were of a size, although they had to accommodate very different classes of cases. There was an excellent system of ventilation, but it was incomplete and partly defective. The inlets were at the floor level of the galleries, the air being warmed on admission by passing in air-ducts over hot-water pipes, part of a circulating system, of which there were three in all, one on the male and two on the female sides, with corresponding stoke-holes and saddle boilers. In the winter those of the female side necessitated the frequent trucking of coals and coke through the female grounds, an undesirable arrangement. The air, after admission into the galleries near the floor level, passed from the south side across the corridors, over the doors of the single rooms near the ceiling, and was extracted from near the floor level on the north side of the single rooms, and taken to the central shaft already described. The day-rooms and dormitories had similar inlets on the south and north sides, but no outlets for vitiated air. These had been overlooked by the architect. In most of the day-rooms additional artificial heat was obtained from hot-water coils in the bays on the south side, which, being encased, harboured dust and the *débris* of food pushed through by patients.

A word next regarding the sewerage system. The w.c.'s were of the old Jennings type with side handles. The bottoms of the pans were frequently broken by the slops being emptied into them, and the water valve was often defective. The soil pipes passed out on the south side and were not ventilated on egress. The sewer pipes were not laid on concrete, and being on gravel and sand, they kinked and leaked at almost every joint. Their course was close to the buildings, along the entire south front, therefore just under the windows of the day-rooms and galleries on the ground-floor, then round the west end to the north of the asylum, where they delivered into a large tank of 120,000 gallons capacity, situated at a distance of only two hundred feet from the administrative centre. There was a short ventilating shaft to this about twenty-five feet high. The sewage was there stored and underwent fermentation. It was pumped from this tank back to the engine-room in the centre of the asylum, and then driven to a higher level beyond the cottage hospital, and delivered on a 9-acre field, distant about 120 yards from the main buildings. The tank was

always a nuisance to the asylum residents, and the 9-acre field, which had become sewage sodden by being irrigated by the fermented sewage, was a constant nuisance to our neighbours. The inner airing courts were like rough playgrounds, devoid of flower-beds or paths, and in them the patients were congregated in large numbers daily for exercise, but few being employed outside, for there was no farm, and but 9 acres (the portion which received the sewage) under cultivation as kitchen-garden, the remaining 24 acres of the estate being covered by the buildings, airing courts, cricket ground, and cemetery. The small extent of the property was therefore a great drawback to the proper treatment of the patients and working of the institution. There were no greenhouses belonging to the asylum, and flowers were not cultivated. The workshops for the tailor, upholsterer, and shoemaker and their patients were small and dark, with windows only on one side, and no supervision from without. The special observation dormitory on the female side was much too small, badly lighted, and badly ventilated; that of the male side was of recent construction and free from objection. The floors of day-rooms, galleries, dormitories, and single rooms were worn and warped, and allowed percolation beneath when scrubbed from day to day. They had become very insanitary from long use and the faulty habits of patients. The buildings generally were very deficient in alternative exits for use in the event of fire. The arrangement of the outside hydrants was satisfactory, but those inside were stowed away in cupboards, round corners, and not readily supervised, therefore the nozzle or hose would often be missing when required. The water-supply of the asylum was from a central well near the engine-room and boiler-house, which were in the centre of the administrative block. The supply had never failed, but in the event of fire involving the engine-room, no water would have been available. The well is 120 feet deep in chalk, with a central boring of 100 feet below this; the quality of the water is excellent, but with 17 grains per 1000 hardness. A rain-water storage system had been arranged originally for collecting the rain water in a 120,000-gallon tank near the laundry, for use there and in the engine-room, but many of the stack pipes were blocked and leaked, and the collecting system of pipes had settled in the gravel and sand, and the pipes were filled with sediment, kinked and leaky,

and even in some instances broken across, so that but a very small portion of the rainfall on the buildings reached the tank ; most of it percolated the ground near the stack pipes to the detriment of the foundations. There were no mess-rooms and no nurses' recreation room. The administrative department was very defective. There were no central ground-floor stores ; the attendants, nurses, and servants had to pass down a common staircase to the basement stores at the centre, and these stores were damp and unsuitable for dry goods. There was no vegetable room connected with the kitchen department, and we had no housemaid's pantry. The laundry was very old-fashioned, all the work in it done by hand, and the hand machines were very out of date. The drying power was glaringly deficient. There were but four horses ! The foul washing was done in an annexe to the general washhouse. There was no staff laundry. The clothes of both divisions were received in the general washhouse, and there was but one small general delivery room. Moreover the male washing had to be brought through the female division, and returned by the same route. There was a central dining and recreation hall, but without a permanent stage. In the winter months a temporary stage was fitted in this hall for dramatic entertainments ; it was made up of the dining-hall tables tied together, and stage fittings ; it took us the best part of a week to erect, and when up filled a third of the hall, therefore greatly curtailed our dining accommodation for the time being. The sick came off very badly as regards their surroundings. There were no hospital wards proper. Small cheerless dormitories on the north side of the terminal day-rooms on the ground-floor were allotted to the sick. These dormitories held from six to eight beds, but the cubic space was very insufficient, and on the male side there were no padded or single rooms off the dormitory ; they were at the north side of the gallery adjoining the day-room. In both divisions the slops and stools had to be taken through the day-rooms—which were also dining-rooms for the sick—to the w.c.'s, a most objectionable arrangement. The mortuary was a very old-fashioned building, and adjoined the laundry, which was most undesirable. The asylum was lighted throughout by gas supplied by the Dartford Gas Company ; the gas was often of inferior quality, and the light bad in the evening from defective pressure.

Such, then, were the chief structural and other defects of this institution. It is now my pleasing duty to record how, by means of the support of the Visiting Committee and the energetic action of that Committee during the past thirteen years, the following remedies have been effected.

(1) *The land question.*—In December, 1887, we purchased by private treaty, at £74 an acre, the adjoining Stone Lodge Farm of 107 acres, which, added to the 33 acres of the original estate, made 140 in all; but we did not get possession of this land until April, 1890. Last year two additional acres were bought to round off the west end of the farm. We therefore have 142 acres of freehold land in all. At the present time no land in the parish of Stone can be purchased under £200 an acre. The advantages of the acquired land are as follows:—eighty-six acres adjoin the original estate to the north and east, and have a gradual fall of 96 feet towards the Thames. This portion was admirably adapted for surface sewage irrigation on the intermittent system by the natural force of gravity. In the marshes to the north are 21 acres of pasturage for cows, and excellent watercress beds which have been long established. The value of this farm for the employment of patients as a remedial agency cannot be over-estimated.

(2) *The alterations of structure.*—These were commenced in 1887, and are now approaching completion. The wall already mentioned, which extended the whole length of the main buildings from east to west, and separated day-rooms from dormitories on both floors, has in every case been removed, the dormitories on the ground-floor have been added to the day-rooms, and upstairs the day-rooms have been added to the dormitories. We now have through ventilation of both wards and dormitories. By night the windows of the former can be kept wide open, and by day those of the latter. The supervision of the patients is also considerably improved by this arrangement. Properly necked cross-ventilated sanitary spurs have been built to all the wards and dormitories thus formed on the north side. These spurs are of white glazed brick with terrasco floors, and have on the ground-floor 4 pedestal w.c.'s (1 to 12 patients) with Doulton's Simplicitas pans and special pulls, also each spur has a slop sink. On the top floor are slop sink, w.c., and a clothes-room for the patients' clothes at night. The old w.c.'s on the south side have been converted

into nurses' and attendants' rooms all along the line. The single bath-rooms in most of the wards have also been fitted as nurses' and attendants' rooms, of which we were very short. Proper sculleries have been made near the north or dining end of those wards in which patients dine, and suitable lavatories have been fitted to all the wards and the dormitories needing them. In some wards single rooms have been converted into store-rooms. Connected to others new store-rooms have been built. Boot-rooms and broom and brush cupboards have been made where necessary. All inside urinals were abolished in 1893, since which time the pedestal closets have supplied their place. General bath-rooms, central for either division, have been erected in white glazed brick, with pale green crystopal dados and terrasco floors. There are six baths, a shower and needle bath, and a large dressing-room on the female side, and seven baths on the male side, with shower and needle bath and dressing-rooms also. The baths are of porcelain of the best Stourbridge pattern (Rufford's), and fill and empty in twenty-five seconds. The wards, dormitories, and single rooms are being plastered, and the floors renovated throughout. Light has been introduced in every direction. All doors have glass panels excepting where contra-indicated! Those of the nurses' and attendants' rooms have also spring blinds inside. This change was largely effected in 1888; much light was thereby borrowed, and better supervision ensured. We have since realised that the more glass you have in an asylum the less you have broken! The system of ventilation has been improved by extracting the impure air from the single rooms near the ceiling line, by withdrawing it also from the wards and dormitories near the ceiling line to the central extraction shaft, and by the introduction of Boyle's mica flap ventilators into all the chimney breasts which are not used for fires. We are also constructing in both divisions ventilating flèches with electric motor fans for removing the impure air by ducts from the dormitories of the main building, where the present arrangements are insufficient. The workshops have been enlarged by throwing a wide passage into them, and their lighting improved by the introduction of intervening glazed screens. The female special observation dormitory now allows of 56 patients, split up into three divisions, being under complete observation by one stationary night nurse. Four additional alternative exits for use in the

event of fire have been added to the upper story on the female side, and three on the male. Those of the laundry and workshop blocks are stone staircases. All inside hydrants are now unencased and kept coupled up. An alternative water-supply from the West Kent Waterworks to the main tanks has been added for use when needed. Mess-rooms on both sides, with sculleries attached, have been erected, and on the female side a suitable nurses' recreation room. Central ground-floor stores with hatchways opening on to the male and female general corridors have been formed over the old engine-room, and a dairy, vegetable room, and housemaids' pantry added to the kitchen department.

Three new laundries (general, officers', and foul) have been constructed, and the old laundry has been rearranged; the finishing room becomes the sewing and mending room, the old sewing-room the laundry day-room, and the dormitories above remain but little changed.

A housekeeper's cutting-out room and laundrymaids' mess-room, with staff bedrooms overhead and cross-ventilated sanitary spur, are added to the old buildings, and the washhouse is absorbed in the new central power station. The three new laundries are of white glazed bricks, with salt glazed dados, and are very complete, with separate receiving and delivery rooms (male and female), washhouses, drying and finishing rooms, etc. Electric motor fans ventilate the various sections. Corridors connect the laundries to each other and to the day-room, sewing, and mending room. The laundry machinery is supplied by Manlove, Alliott and Co., Tullis, and Bradford's, and fitted by the last-named firm. It is worked by electric motors from the subways, therefore free from noise, nuisance of oil, and danger of shafting and belting. It will also be more economical to work, because it can be used in sections. The laundries will appear unnecessarily large to public asylum officials, but one third of our patients are of the private class, which will explain the apparent redundancy of this department. The new general power station, which I have said above adjoins the laundry, consists of a boiler-house, engine-room, accumulator-room, water-softening house, coal-store, etc. These are largely of white glazed bricks. The three boilers are 30 ft. $\times$ 7 ft. 6 in., of the Galloway type, with forced draught added. The flue is connected with the old central

smoke shaft in order to preserve the original ventilating system, which has stood the test of time.

The Atkins modification of the Porter Clark process is the one adopted for water softening. All the stoke-holes of the several heating centres of the buildings and greenhouses are done away with, and the heat supplied as live steam in the form of calorifiers from the central power station. These heat the several hot-water systems in the air ducts. From this station also cables go to the electric motors, which work the well pumps and the machinery of the bakehouse and workshops at a distance of more than 100 yards. The station also supplies the electric motor power for the laundries and the various ventilating fans throughout the asylum. It moreover furnishes the hot-water supply of the institution, and will give the electric light, the fittings for which are almost completed.

The old engine-room and boiler-house will be converted into a central Turkish bath.

A new mortuary has been erected to the north of the laundries, to replace the old one pulled down during these extensions. Its interior is of white glazed bricks throughout. It has male and female divisions, a well-lighted post-mortem room, with white porcelain revolving table and pathological laboratory.

The new detached chapel is built of faced flint and Portland stone, with tiled roof, and is on the north side of the administrative centre and to the east of the new laundries. It is a Gothic building of the early Decorated period, and accommodates about 350 persons. It consists of nave, chancel, and transept for the organ and vestry. The floor of the nave is of wood blocks, that of the chancel of tiles. The roof is of English oak on the hammer-beam principle, and the seating of oak also. The windows are of stained glass. Those east and west were the gift of members of the Corporation. The old chapel over the dining hall is being converted into a recreation hall, and a stage and dressing-rooms are being added to it on the north side over the kitchen.

Male and female hospitals have been erected. The female is new throughout, and attached by corridor to the west end of the female division. It consists of a central day-room and galleries facing the south, with nine single rooms (two padded), six nurses' rooms, lavatories, and sanitary spurs to the north of

the galleries, and other administrative offices beyond. At right angles to the galleries at the east and west ends hospital wards extend to the south, with a good view and cross-ventilation. This hospital accommodates fifty patients.

That of the male side is at the east end of the main building, and very similar to the female, except that only one half is new, the other half being the old male infirmary gutted and rearranged ; part of it is therefore on the first floor. It will also accommodate fifty patients. A view of the Thames has been obtained for those in the sick ward, by removing the boundary wall opposite the hospital and replacing it by railings. We have also an infectious hospital beyond the cricket ground for twelve patients, six of either sex.

(3) *The sewerage system.*—In 1890 it was decided to adopt a new method of sewage disposal, by abolishing all storage and pumping, and by distributing the sewage fresh, before fermentation had set in. A twelve-inch main, 370 yards in length, was laid from opposite the administrative centre where the sewage entered the old tank, to a natural gulley on the new farm land to the north-east, in a perfectly straight line with a fall of one foot in ninety-six. It passes under Cotton Lane at a depth of 10 feet from the surface, and at one spot is 14 feet 6 inches from the ground level. There are four manholes for inspection and flushing, and you can see daylight through its entire length. There is no storage ; the sewage is delivered fresh on the hill-side, where some 25,000 gallons daily can be directed over from thirty to forty acres of land by gravity. The heavier solids are removed every day at the outfall, where there are gratings in a shallow tray-like arrangement for separating them. They are mixed with sifted dry earth and cinders and used as manure. A system of open earthenware channel pipes and moveable galvanised gutter piping, which taps the liquid sewage at various points, ensures its distribution over a different portion of land daily. There is no effluent ; the subsoil is gravel, sand, and chalk, and therefore highly porous. All the soil pipes from the building to the main have been ventilated with full diameter pipes on egress on the north side. They were relaid on concrete in straight lines, and have junctions only at manholes.

The old sewage tank of 120,000 gallons capacity has been cleaned out, and is now used as a second rain-water tank for the engine-room and boiler-house. The rain-water system has

been relaid throughout on concrete, and now collects to two tanks of equal size, the original one supplying the laundry. Friction between the two departments regarding rain water will therefore cease.

As regards the grounds, the inner airing courts have been properly laid out as gardens, and the outer courts planted and developed. Glass houses have also been erected for the propagation and storage of hothouse plants for the wards.

The plans for the new buildings and the remodelling of the old were made by the City Surveyor from my suggestions. The total cost will be about £80,000. The original asylum cost about an equal sum.

The chief advantages claimed for our remodelled asylum are—

(1) The wards are all on the ground-floor, face the south with one exception, and have through ventilation. As they are only separated by glass screens in the main building there is thorough supervision, and they are easily worked.

(2) The upper story consists of dormitories only, and through ventilation can be ensured all day. It is possible, also, by master-locking off the upper story on the male side, for the beds of that division to be made by female patients, who can cross over to it by a gallery through the dining hall.

(3) All w.c.'s and soil pipes have been removed from the south to the north side only, and the w.c.'s are in necked and cross-ventilated spurs. All inside urinals have been abolished.

(4) Most of the nurses' and attendants' rooms are now on the south side.

(5) The necessary offices have been added to the wards and dormitories.

(6) We have hospitals for the sick and infirm, general bath-rooms, new laundries, a separate recreation hall, with stage, etc., a detached chapel, and a new mortuary, all equal to our requirements.

(7) By the centralisation scheme all stoke-holes are abolished, and heat, motor power, light, and the hot and cold water supplies are derived from one general power station.

(8) We have an alternative water-supply from the West Kent Waterworks for emergencies, such as a fire involving the pumping station, well contamination, etc.

(9) The sewage disposal is devoid of all storage (we have not three inches anywhere), therefore fermentation cannot occur, and the farm benefits by the irrigation.

There is one matter I should like to allude to before concluding ; I am strongly in favour of a central dining hall when the wards are handy to it. We find the sexes like to be associated at all meals, and for quite ten years past we have given them music during dinner. It aids digestion, and going to the hall is a pleasant break in the day's monotony. The windows of the wards can moreover be then thrown open, and proper ventilation ensured.

With full knowledge and experience it is comparatively easy to plan a new asylum. To remodel an old one, and have a full and paying house all the time, is a more difficult task. If we have succeeded our reward will be in the approbation of those best qualified to judge, and in the improved surroundings of those committed to our charge.

(¹) Read at the South-Eastern Division of the Medico-Psychological Association at Dartford, 25th April, 1900.

DISCUSSION

At the Spring Meeting of the South-Eastern Division, April 25th, 1900.

Dr. PERCY SMITH, who had taken the Chair owing to the departure of Dr. Beach, expressed the thanks of the meeting to Dr. White for his able paper.

Dr. THOMSON said he understood from personal experience the many difficulties a medical superintendent had to encounter when, after having been trained in a new asylum, he was elected to an old one. He considered Dr. White was entitled to great credit for what he had accomplished.

Dr. BOWER and Dr. RICHARDS drew attention to several matters which specially deserved favourable comment, and they very heartily congratulated Dr. White on the results of his labours.

Dr. WHITE, in reply, thanked members for their criticisms. With regard to the Kent Water Company, he explained that an agreement was made to connect their supply at a cost of £37 10s., and the Asylum then paid £5 per quarter as a minimum rate for a supply not exceeding 120,000 gallons. Above this supply 10d. per 1000 gallons was charged.