June 27th.—Remains well. Has menstruated regularly for six months.

1866, January.—Visited at her home. She appears to have gained in flesh, and states that she is in better health than she has been for years; catamenia regular; appetite normal; she is quite cheerful, and her conversation is intelligent. Neither the eruption nor diarrhœa have threatened to return since she left the asylum. Articulation and gait are normal, but the difference in the size of the pupils remains.

PART II.—REVIEWS.

A Manual of Practical Hygiène, prepared especially for use in the Medical Service of the Army. By Dr. E. A. Parkes, M.D. Lond., F.R.S., Professor of Military Hygiène in the Army Medical School, &c., &c.

This work (says the author in his preface) is an attempt to carry out the wishes of the Commissioners (appointed in 1857 to inquire into the sanitary condition of the army) who recommended that an Army Medical School should be established; and it is intended as a text-book of hygiène for Dr. Parkes's class, as professor in that school.

Though it relates, as Dr. Parkes remarks, mainly to but one sex, and to a particular section of that sex; yet, considering that it treats pretty fully of the general principles of hygiène, it may be entitled to be called a work on general hygiène.

Perhaps there is no part of the curative art which has been so seldom made the subject of a separate treatise in this country as hygiène, although medical opinion has been gradually becoming for many years more convinced of the value of hygiènic means in the treatment of disease, and the faith in the exclusive value of drugs has been as gradually on the wane. The subject of hygiène is of special interest to those who have the care of the insane; hygiènic means are particularly applicable to the treatment of all chronic affections: its resources may be looked upon as so many chronic remedies.

The book is somewhat bulky, containing 612 pages of very closely printed matter; its style is terse and condensed, each passage contains a succinct account of the different opinions of almost innumerable authorities; so that, in fine, the work is more

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of an encyclopædia than a simple treatise. The treatise consists of two books.

Book the first treats of hygiène in general, and book the second of the application of the laws of hygiène to the special wants of the soldier. It is therefore the first book which will prove of the greatest value to the members of the Medico-Psychological Society. The first book treats in separate chapters of water, air, food, habitations. Under the heading of water there are the following sections: the quantity requisite, the quality, mode of examination and purification,—and on many of these points Dr. Parkes makes some very valuable observations, which will be of great interest to every medical practitioner having the superintendence of an asylum.

With respect to the quantity of water requisite, Dr. Parkes estimates that "if baths are largely used—and their use is daily increasing—the amount of water must be practically unlimited; but from forty to fifty gallons per head daily is the least that should be used in a good hospital, and this, as far as imperfect estimates permit me to state it, is expended as follows:

	Gals. per hd. daily.
For cooking, including cleansing of kitchen	2 to 4
For personal washing, baths, &c.	18 „ 20
	Gals. daily.
For laundry washing	5 „ 6
For washing and cleansing hospital and utensils	3 „ 6
For water closets..	— 10 —
	40 „ 46"

But, undoubtedly, for asylum purposes the quantity ought to be, as Dr. Parkes remarks, "practically unlimited."

Many useful hints relative to the sources of water, the quantity of rainfall, the weight of different quantities, are given. These and similar formula will render the work especially valuable as a book of reference: for example, it is almost of daily utility in asylums to be able to estimate the amount of water by weight and bulk. So frequently do such matters come before the medical superintendent as matters of business that it is often useful to know how much a certain bath or cistern will contain. At page 4 this is given in a table, and one cubic foot is said to be equal to 6·23 gallons; so that a bath eighteen inches wide and five feet long would contain, in one foot deep, about forty-seven gallons. There is also given a formula to estimate the contents of a cask, to gauge the quantity a stream will yield per diem, &c.

Then follows a series of condensed remarks on the composition of water from different sources.

The sub-section 3, on the "Sources of Contamination," is especially entitled to quotation. After considering that of lead, Dr. Parkes writes:

"The most common sources of contamination are found, however, in the habitations and trades of men. Shallow wells are extremely apt to be contaminated by surface impurities, and by sewage soaking from cess-pits, and by matters of all kinds thrown out on the ground. To a certain extent the soil through which these substances pass will filter and purify them; but it eventually loses the power, and also, at last, a complete channel may be opened, and a stream of substance might suddenly find its way into a well.

"A well drains an extent of ground around it in the shape of an inverted cone, which is in proportion to its own depth and the hollowness of the soil; in very loose soils a well of sixty or eighty feet will drain a large area—perhaps as much as 280 feet in diameter, or even more.

"Certain trades pour their refuse water into rivers.

* * * * *

"Gases evolved from decomposing substances or thrown out from manufactures are also absorbed.

* * * * *

"As there is now no doubt that typhoid fever, cholera, and dysentery may be caused by water rendered impure by the evacuations passed in those diseases, and as simple diarrhœa seems also to be largely caused by animal organic suspension or solution, it is evident how necessary it is to be quick-sighted in regard to the possible impurity of water from incidental causes of this kind." (P. 18.)

Dr. Parkes does not mention the fermentative or septic condition of the water, though he mentions the subject when speaking of the impurities of the air. He seems to admit that water is decidedly the medium of transmitting certain diseases from person to person, but, as far as we can discover, does not enter upon the subject of how those impurities or deleterious matters act.

The author gives specific directions for the proper examination of the water, dividing his remarks into, *firstly*, the physical examination, as by taste, smell, touch; *secondly*, the microscopical examination, to which is annexed a plate, with the portraits of various long-named little creatures, as Grammatophora marina, Homœocladia filiformis, Ankistrodesmus falcatus, all which and many others, which are lettered from A to B, and one by acci-

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dent omitted—viz., Cyclops quadricornis—were contained in a well at Netley; and another specimen of water from a ditch which rejoices in an equal display of classically hard-named creatures; and *thirdly*, the chemical examination. Dr. Parkes suggests that it would be difficult for the army surgeon to carry out a thorough or minute quantitive examination by chemical means; but he gives directions whereby such an enquiry should be conducted. The medical superintendent's instructions, fortunately, may be more briefly given still, by a recommendation to send such an enquiry at once to an analytical chemist's, who has all the appliances for the practice. Nevertheless the chapter contains many useful suggestions. The quality of water is important to the medical superintendent, not only for the purposes of drinking, but also for cooking and washing. The impurities most to be dreaded are salts, as chlorides and nitrates, as they indicate organic admixtures, as animal excreta, from which they may have been derived.

With respect to the determination of organic matter, Dr. Parkes says (p. 21):

"Determine the presence of organic matter and form a rough guess at the amount by boiling six ounces with a few drops of solution of chloride of gold. In proportion to the amount of organic matter the gold is reduced, and forms a violet or almost black powder. If this is considerable, the amount of organic matter is large.

"Even by these simple qualitative tests a very fair opinion may be formed of the quality of a water, or, at any rate, some guidance is given.

"If water does not deposit carbonate of lime on boiling, and after boiling continues to give a large precipitate with oxalate of ammonia, the presence of sulphate and nitrate of lime or chloride of calcium in large quantities, and not of carbonate of lime, may be inferred.

"If to the qualitative tests the quantity of solids per gallon, and the hardness of the water before and after boiling can be determined, a very safe opinion on the goodness of the water for drinking purposes can be given at the cost of little time or labour.

"If when a small quantity of permanganate of potash be added the discoloration occurs very rapidly, the organic matter is more probably animal than vegetable.

"If a very large quantity of chlorine is present the water is either contaminated with sea water, or with much sewage, or is drawn from strata very rich in salts, as in the case of some sands. A large indication of nitric or nitrous acid shows oxidation of animal matter."

The modes of purification of water are then considered. Firstly, without filtration by exposure in divided currents; this is useful in removing hydro-sulphic acid and offensive organic matters. Secondly, by boiling by addition of alum, six grains to a gallon, by lime water or Condy's fluid; when used for the water of ponds it purifies almost immediately. Carbonate of soda, with boiling, precipitates lime and lead, &c.

"To put these facts in another form," says Dr. Parkes:

"*Organic matter* is got rid of most readily by exposure to air, boiling agitation, charcoal, alum, permanganate of potash, strychnos potalorum, astringents.

"*Carbonate of lime* by boiling and addition of caustic lime.

"*Chloride of sodium* by filtration through a great depth of charcoal and sand.

"*Iron by boiling* and lime-water, and in part by charcoal. Lead and copper are also removed or lessened by pure charcoal.

"*Sulphate and chloride of lime* and magnesia cannot be got rid of, but are perhaps lessened a little by filtration through charcoal.

"It should also be remembered that some water-plants have a purifying effect, apparently from the large quantity of oxygen they give out, and this takes place sometimes though the water itself is green." (P. 37.)

Other directions are given, as the mode of protecting water from lead contamination, various modes of filtration, and the consequences of insufficient supply.

The following general conclusions on the effects of impure water are given at page 63:

"1. An endemic, in a community, is almost always owing either to impure air, impure water, or bad food. If it affects a number of persons suddenly, it is probably owing to one of the two last causes, and, if it extends over many families, almost certainly to water. But as the cause of impurity may be unusual, it is not always easy to find experimental proof.

"2. Diarrhœa or dysentery, constantly affecting a community, or returning periodically at certain times of the year, is far more likely to be produced by bad water than by any other cause.

"3. A very sudden and localized outbreak of either typhoid fever or cholera is almost certainly owing to introduction of the poison by water.

"4. The same fact holds good in cases of malarious fever; and especially if the cases are very grave, a possible introduction by water should be carefully inquired into.

"5. The presence of *Lumbrici*, Guinea worm, or *Bothrio-*

cephalus latus, should always excite suspicion of the drinking and bathing water."

Dr. Parkes further remarks, in a note appended to the above passages, that the effects of bad water are therein considered from the sanitary point of view, but the economical relations of the subject are also worthy of due consideration.

There is much less said about baths and bathing than we were prepared to expect in a work on hygiène, and Dr. Parkes's opinions on the subject would have been of much value. The question is only treated in a short paragraph on ablution; and it would seem that baths are not provided for the soldier even in permanent barracks. The value of bathing as a means of cure, and the necessity for various modes of bathing, seems to be generally acknowledged in all lunatic asylums, English or foreign; that is to say, in every ward of our English establishments we generally find a bath—whether bathing is general and carried out in an efficient manner is another question. Indeed, we do not mind expressing our conviction, that the bathing in the majority of English asylums is very defective, and the arrangements for bathing almost universally bad. It is generally supposed, and there is a kind of tacit assent to the supposition, that every lunatic in our large asylums has an efficient warm bath once a week, and this is what we are disposed to disbelieve entirely. With the means existing in most of the asylums the writer has visited, the arrangements negative such an hypothesis. We have examined a great many; and, as a rule, we have found that the baths are all too large, many containing from 60 to 80 gallons each; and, in the next place, in most instances they are supplied with water through one-inch pipes, very often, too, the waste is no larger. Now, such a bath could not be emptied and refilled under a quarter of an hour or twenty minutes; and, if each patient were allowed ten minutes for the operation of bathing, each must occupy half an hour a week; and thus, for every 100 patients, 50 hours will be employed in bathing only, or 250 hours for 500 patients; or with 10 baths, 25 hours, or more than 4 hours every day of the week. It may also be fairly doubted that every asylum has water sufficient for the purpose. The conclusion to be drawn from which is, either that the patients do not get a bath every week, or they do not have a bath full of water, or several patients must be bathed in the same water. Such a state of things is extremely objectionable, and how is it to be remedied? A suggestion of Dr. Robertson's appears to be worthy of adoption. It must be remembered that the use of the weekly bath is for ablution; the patient, therefore, need not be immersed. If a proper apartment were set aside, properly heated, and supplied with hot and cold water, as in the ordinary Turkish bath rooms, the patient might be seated on a low chair or stool, and thoroughly washed with soap and flannel, and dried in from five to ten minutes each person, with the use of 4 or 6 gallons of water instead of 40 or 60, and the cleanliness secured from the operation would be greater.

The consideration of the subject of sewerage Dr. Parkes defers to the tenth chapter of his first part, but it may be spoken of here, in connection with the water supply, and he treats firstly, of the removal of sewage matters. He says—

"The quantity of excreta to be removed may be assumed, taking all ages into account, to be at least $2\frac{1}{2}$ oz. of fæcal, and 46 oz. of urinary matter. A population of 1000 persons will therefore pass daily 156 lbs. of solids, and 250 gallons of urine; or in a year, 25 tons of solids, and 91·250 gallons, or 14·646 cubic feet of urine. If sewers are used, this is greatly diluted with water." (P. 305.)

He gives, also, every requisite instruction relative to the gradients required for sewage pipes; thus, 4-inch pipes require a fall of an inch in a yard, or 1 in 36; a 6-inch pipe 1 in 65; and an 8-inch pipe, 1 in 87.

Those who have watched the progress of sanitary improvements will remember the fierce controversy of the gauges in the matter of sewers as well as railroads; there was a very strong party advocating the necessity of diminished size of drains, by which several advantages were promised, as increased velocity in the flow, diminished cost in construction, facilities of increasing the fall. There is no doubt that there were great evils connected with the very large drains that existed twenty or thirty years ago; in fact, they soon became long cesspools; but the more they became obstructed the larger they were made. The old builders (they scarcely deserved the name of engineers) insisted, that if the drain was larger it would be yet stopped. The old Board of Health, advised by Mr. Austin, soon reversed this state of things; the subject of the material to be used in making drains was also greatly improved. Brick drains were discouraged, and glazed stoneware introduced. Dr. Parkes discusses at length all these minutiæ, and he leans rather toward a medium size drain-pipe, as the safer under all circumstances. He does not mention any particular construction of the drain-pipe; but undoubtedly the improvement introduced by Jennings, of fitting pipe to pipe by means of a movable socket, is worthy of universal adoption; under the most favorable circumstances, drains will occasionally become obstructed. In asylums, where many obstructing materials are likely to find their way into them, this is particularly the case. To get at the ordinary pipe with immovable sockets the ground must be opened, perhaps a pavement removed for several yards, before the ordinary pipes can be separated; but in the patent pipes any part of the pipes can be opened by a small removal of earth, either for the purpose of examining the contents of the sewer, or making new connections with them.

Dr. Parkes dismisses the subject of water-closets by the short remark, "that little need be said." To this, on the principle that correction will be thereby avoided (?), Dr. Parkes recommends Jennings and McFarlane.

The position of water-closets, or latrines, he considers to be best outside in barracks.

But perhaps the subject of water-closets is of less moment in the barracks and camp than it is even in the asylum; and since the book is large and full, to settle this question in nine lines only shows how condensed the information given is, and how much the work contains. The water-closet question is one which every superintendent has to consider well; the apartment itself ought to be the cleanest place in the establishment, and to make it so it is essential to have a proper apparatus. After having made numerous trials of different kinds of closets, the writer believes he will be conferring a distinct favour on all those who have, as yet, not tried Jennings' syphon pan, to strongly recommend them to do so. He has now used this description of closet for fifteen years, during which time he has had above sixty under his management, both in public buildings and private establishments, and they have invariably proved satisfactory.*

Dr. Parkes has more to say about the dry closet, or the dry method. This mode, of course, is only applicable to out-door places; the dry material used is generally earth. Of course the chief object is to collect the matter for manure.

The subject of irrigation by sewage is one which Dr. Parkes does not specially discuss, and it seems just at present to have particular interest, for the sewage question has been several times spoken of in this Journal, and in many asylums, both public and private, sewage irrigation has been inaugurated. The point of interest connected with the subject at present is, not the good it may do to the grounds or vegetation, but what harm it can do the inhabitants of the soil irrigated. On the subject of soils, Dr. Parkes has the following passage.

"*Passage of air through Soils.*—Some of Pettenkoffer's observations on cholera show that the effluvia from decomposing

* A visit to Jennings' Sanitary Works in London would repay any medical superintendent, more especially if they should happen to meet the intelligent proprietor himself.

cholera evacuations may pass to some distances through very loose soils, and it is by no means impossible that the effluvia from typhoid stools or common fæcal matters may do the same. It is a practical point of importance, especially on the sandy plains of India, to see that there is no chance of transmission of disease in this way."

Another passage which bears on this subject, under the subject of disinfectants, where he says—

"Dried earth, lime, charcoal, and carbonates of magnesia and lime are the principal disinfectants." And further on, in giving the power of each, he writes—"Dried marly earth is much inferior to charcoal, but still it can be employed." This mention of the deodorizing power of the soil refers to its use in small quantities, of course. The question of the power of sewage, distributed over the soil, to produce ill-effects on man, is a matter of much importance, and the subject certainly deserves special and accurate investigation. In our notion, the coincidence of disease in a single asylum, with the employment of sewage irrigation, cannot settle this question, while irrigation works and no such prevalence of disease occur together in such innumerable instances; but the case of the Cumberland Asylum, brought forward by its able medical superintendent, is deserving of very serious consideration, and this chiefly from the logical way in which that single case was inquired into.

We must, however, quit this portion of the author's labours to examine into a subject of equal importance, and on which Dr. Parkes's opinions are of no less value, viz., the subject of ventilation and warming.

The subject of ventilation follows the examination of the air; the subject of warming finds its place after the sewage question. They may, however, be brought together here; the one is closely connected with the other.

We will first examine the chapter relative to air. This is discussed by Dr. Parkes under six sections:—1, quantity necessary; 2, composition; 3, impurities; 4, septic condition of the air; 5, its purification; 6, diseases arising from its impurities.

On the subject of the quantity necessary, this question may, Dr. Parkes says, be answered by calculation and experiment. This chapter is like the rest of the book, full of valuable matter, and the scientific or the theoretical part of it appears to be coming much nearer in its conclusions to the experimental than in our experience we as yet have had the pleasure of finding it.

Time was when fifty feet per hour was the quantity stated to be requisite; as time has advanced, this has been gradually increased, and now it seems to have risen to 4000 feet per hour.

The mode of calculation alluded to to determine this question is, by taking the carbonic acid of respiration as a convenient measure of impurity. Thus, an adult respires 480 cubic inches per minute, or 16·66 cubic feet per hour. In respiration the expired air is charged with CO_2; to reduce this to a normal ratio more than 100 times the volume of expired air must be supplied, or 16·66 cubic feet per hour; but since the air added contains CO_2 and other impurities, at least one fourth more must be added, which brings up the amount to 20·82 cubic feet per hour. The writer found 3720 per head per hour to be insufficient. Dr. Parkes says, in some cases 6000 feet must be given; but the passage which, after all, is the most worthy of extraction is the last passage of the sub-section 1, p. 67:

"*Wherever practicable, we should be contented with nothing short of an almost unlimited supply.*"

From 2000 to 6000 feet is rather a wide range it may be supposed, but what proof is there that either are right; calculations that differ so widely in their results have a suspicious character, besides, it may be boldly denied that the calculation based on the quantity necessary to dilute CO_2 is a correct one. Carbonic acid is only one of the impurities of the air. In our dwellings contamination of air from this source is wholly insignificant compared to that arising from the emanations from innumerable other foul things and places; indeed, the details of the different matters polluting the air occupy several pages of Dr. Parkes's book, which reads like the list of ingredients for the witches' cauldron.

But surely air is cheap, and, when pure, innocent enough. The supply is abundant, and no good reason ever has yet been broached why it is to be stinted. What is the use of expensive apparatus for getting air into a dwelling when, really, the only difficulty is how to keep it from entering too copiously? If we lived below the water or deep in the bowels of the earth, a question might be raised of how much should be supplied of this precious material to paupers or soldiers; but to the ordinary inhabitants of the earth's surface the only point of interest would seem to be the maximum we must stop at, and not the minimum that may suffice. The limit at which to stop is easily arrived at; indeed, each person may readily determine the question for himself, and usually carries about him delicate instruments on a sensitive surface which will aid him.

Tested by such means, the quantity of air which a man may enjoy, and should have even in a workhouse, will, we imagine, be found far above 2000 or 4000 feet per hour.

The truth is that 20,000 feet per hour would not be too much. The points that rule the question are to limit the supply of nature only by the cooling effect produced by the air. If the air is imperceptible to the senses, of course it is exerting no cooling influence. When the air is of temperate heat, and not moving more than $1\frac{1}{3}$ mile per hour, the more a person can have of it the better; the quantity may be then limited only by his own capacity for receiving it. Say the superficies of one side of a man are five square feet—which it of course exceeds—then the air moving through an opening of five square feet would amount to 35,200 cubic feet per hour; in other words, on summer days, with air temperate, that amount might be given without inconvenience, and if the temperature was very great half as much more would be all the more grateful of course. In the winter rather less would be preferable, perhaps. It is essential to have abundant supply, for air is required not only for respiration, but in buildings for other purposes, as lights. A common gas-burner will burn three feet of gas per hour, and will consume ten, or probably twelve, feet in an evening of four hours, and therefore 18,000 to 21,600 cubic feet of air must be introduced for this purpose alone in four hours.

Our space will not permit of our extracting the remarks on the different impurities found in the air, nor of the modes for purifying the atmosphere by various chemical substances. There is no doubt that the chief and best agent is dilution, and therefore a thorough supply of fresh air is essential.

There is a subject, however, on which individually we are much pleased to have the author's opinion—that ever difficult matter of ozone. The author's extreme deference to the opinion of others has to be borne in mind in reading many passages, and it must not be lost sight of here. He says:

" *Ozone.*—Papers covered with a composition of iodide of potassium and starch and exposed to the air are supposed to indicate the amount of ozone present in the atmosphere."

He then describes how the matter is to be carried out, and adds, a little further on:

"The estimation of ozone is still in a very unsatisfactory state. . . . . Indeed, some chemists have doubted whether any proof has ever yet been given of the presence of ozone in the atmosphere (Frankland). . . . . In spite of these difficulties, it seems desirable to continue the ozone observations; they must have a value, and the investigation will perhaps bring its own interpretation. But at present we ought to be cautious in drawing conclusions from any ozonometric experiments."

In connection with the subject of the impurities of the air, the fermentatious theory of propagation of disease is discussed, but again very briefly. Dr. Parkes says it is possible it may be found concerned in some of the so-called zymotic diseases. " On so difficult a subject," he adds, " as the origin of the contagious diseases, it is not safe to make at present any conjectures." Unfortunately at present this is pretty much all that we can do. Certainly the septic theory is as good as any other, and, to our minds, gives the more satisfactory explanations.

The question of the ventilation, or, rather, the means of conducting it, occupies several pages, but is given in a very condensed form—so condensed that the periods read like so many axioms. To those who have given much attention to this subject each passage will be found to be pregnant with learning.

" To keep the air of any habitation at the necessary degree of purity," writes the author, " the change must amount to 2000 feet per head per hour for persons in health, and from 3000 to 4000 feet for the sick."

This is his starting-point, but, since we should be disposed to multiply these figures by ten, it is obvious that we cannot go along with the author in his conclusions.

This, indeed, is the key to the whole question of ventilation—if 3000 or 4000 feet is all that is required, the very well-devised and costly apparatus may effect it; but, as Dr. Parkes says, " *Wherever practicable*"—and that is everywhere—" *we should be contented with nothing short of an almost unlimited supply.*" The means of ventilation may be therefore divided into two kinds—those which will give the unlimited supply and those which will give the limited supply; and the former have the advantage of being the simpler and less costly. This unlimited supply can be obtained by open windows; the movement of the air will ensure the supply constant and unremitting. It is seldom, indeed, the natural movement of the air falls below a velocity of one and a quarter per hour, and if it did the various currents occasioned to it by different temperatures and the law of the diffusion of gases will always effect a proper purification of the air. Artificial movement of the air can only be required in this country in places such as mines or ships' holds, where the air is artificially excluded; where an open window cannot be obtained, &c., the limited supply is the only effectual means of ensuring the proper supply. In hot climates, however, the air is used for the purposes of cooling; in this case an extra movement has to be given to it mechanically, but this is not of interest here.

Dr. Parkes discusses the various modes which have been vaunted from time to time for the purposes of artificial ventilation. Our space is too valuable to be filled with what is not of practical importance; but artificial ventilation may be very briefly shown to be inadequate on scientific grounds, practical grounds and experience having long ago arrived at this conclusion.

If artificial ventilation is to be carried out, in the first place natural ventilation must be stopped. To be efficient, whatever plan is adopted, its action must be constant; not only not liable to temporary derangement, but absolutely free from possibility of stopping. After reviewing all the different modes, that mode which appears to have these essentials to the greatest degree is the "extracting shaft"—one tall ventilating chimney, with a fire constantly burning in it. Even this fire is liable to go out; but it is much less liable to stoppage than any other expedient for moving the air, such as steam jets, pumps, fans, bellows, all of which depend upon machinery.

The ventilating shaft, in fact, we possess in every room with open fireplace, but every one knows that no room, and especially no sick room, can be kept sweet with merely a draught up the chimney; but in a so-called model ventilator there is a grand shaft erected at a distance, generally with flues ramifying, like arteries, to a large aorta.

To show the absolute inefficiency of such means, we will give a calculation of what such a shaft should be to do the work properly, and Dr. Parkes's tables will readily afford us the means.

Let the problem be the following, and which can be answered by a reference to page 128 of our author's work:

Required the height and size of a shaft for the due ventilation of an asylum for 400 patients.

To give 5000 feet only per patient per hour the shaft would have to be fifty feet in height and of one hundred square feet superficial area, and to be kept in a constant temperature of ten degrees above the external air. I have already shown four times this quantity of air can be had gratis through a common sash window, and not be too much, and sometimes not enough, as when in the summer, air is required for the purposes of cooling the body.

In Dr. Parkes's work will be found an enumeration of the different so-called ventilating schemes, faintly praised for their ingenuity, but which we hope in the second edition will be wholly condemned.

We are compelled to quit this topic for the subject of warming, which is also of equal importance, and has also been rendered unnecessarily complicated by persons having no scientific information—men who have endeavoured, ingeniously enough, often to contrive stoves and fire places of an infinity of patterns.

The subject of warming, however, occupies but a very small section of the work. This arises from want of space and the secondary importance of the subject to soldiers and persons in health. There are three modes of communicating heat—viz., by radiation, conduction, and convection. Dr. Parkes glances at those modes, and he justly remarks that heating by radiation is decidedly preferable. He has a certain leaning towards warming

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by convection on the score of its economy. The whole question of warming and the means would require much greater space than our limits will permit; for though barracks do not require the warming to be so nicely adjusted, asylums and hospitals for the insane need much greater attention to this point, and to do justice to so important a subject a separate article of many pages would be requisite.

We have written enough, we trust, to convince our colleagues that this work is one which will be singularly useful to each in their daily duties, and would be a most valuable addition to their library. Every chapter and every line contains most useful information, and if the book has its faults it arises from an extreme deference to the opinions of others, which we cannot help feeling prevents the author from stating boldly his own opinions when they clash with others; but the profession generally has as high an opinion of the author's impartiality as they have of his learning, and, at all events, speaking for ourselves, we should have preferred to have on several occasions had an expression of his own views than the catalogue of opinions broached by others. His own conclusions on any subject connected with the physical sciences or with medicine would be universally received by his professional brethren with the fullest confidence.

On the Brain of a Bushwoman; and on the Brains of two Idiots of European Descent. By JOHN MARSHALL, F.R.S., Surgeon to University College Hospital.

THIS is an elaborate paper, describing the *convolutions* of a Bushwoman's brain, and also those of the two smallest human idiots' brains yet on record. It is one of the most complete and philosophical anatomical memoirs in this or any other language, and is enriched with several admirable lithographs, from photographs of the brains described. Difficult as it is to give a summary of so careful a paper, we shall endeavour to direct attention to certain leading points of interest, referring those who wish to study the subject scientifically to the original description.

The total capacity of the entire cranial cavity of the Bushwoman was 60·64 cubic inches, while the corresponding capacity of the largest skull measured by Morton was 114 cubic inches, and that of the largest skull measured by Wagner 115 cubic inches. Mr. Marshall calculates that the recent brain of this woman would have weighed 30·75 oz.; the weight of the smallest