each other that struck me the moment they entered, and which fascinated me to watch and trace as long as they were in the room together. My cousin, though ten years the junior, seemed the older of the two men. His set, stiff, somewhat hard and dictatorial manner, a tone of half-patronage and condescension towards his "eccentric friend" (which seemed nowise to disturb or even to be perceived by the latter), aided in giving effect to this appearance of relatively-reversed seniority between them; while the frank, easy, almost boyish brightness of the friend himself completed this illusion. I, usually so shy and retiring with strangers, felt at once wholly unafraid and unrestrained with this new guest. He was so entirely unembarrassed, though undergoing the ordeal of undisguised observation from these many country eyes, unaccustomed to see town-dwelling (still less, foreign-traveled) arrivals, that I felt no embarrassment with him.

When my brother took the young men off with him to show them their rooms, a silence ensued which I cared not to break, expecting to hear something said in the way of comment upon the new visitor. But my mother placidly continued her knitting, my sister went on feeding her paroquet with bits of almond from between her lips, and the rustle of my father's newspaper, as he folded it over to begin a fresh column on another page, was the only sound that reached my ear for the ensuing ten minutes.

At last my sister said, "Four-and-thirty! He doesn't look that, certainly. I expected to see quite a middle-aged man, bronzed and lined, and—and—weather-beaten, somehow."

"Weather-beaten!" I exclaimed, laughing.

"Well, travel-worn, sunburnt, you know, as great travellers are apt to be, I've heard. But, on the contrary, he seems quite a fresh-looking, clear-complexioned, ordinary young man."

"Ordinary!" I exclaimed.

"Yes; just a usual, commonplace, everyday sort of person that one might meet anywhere. How the child stares!" she went on, looking at me with my wide-open eyes and my face of amazement.

I laughed outright; I could not help it.

"Really, child," said she, "you are not very polite; echoing one's words and laughing aloud at what one says. I don't know what there is to laugh at in what I said."

"Don't you?" I answered, trying to bring my face into proper seriousness. "To me it seems so very droll to hear you say he strikes you as a 'usual' kind of young man. To me he appears one of the most unusual men I ever saw."

"To be sure, you have seen so very many young men in your long life, child, that you must be an experienced judge," said my sister, smiling indulgently. "I think I have the laugh against you now, eh?"

She seemed so pleased and contented with her own regained advantage that I said no more.

Presently she resumed—

"He's certainly very well-mannered. Gentlemanly—very gentlemanly."

"A true gentleman," I said. "How deferential he was to mother—how courteous to father! He seems to know exactly how to behave to people older than himself—not as some modern young men treat their elders."

"Yes, he's more of the old school, as it's called, than the new-fashioned style; and yet he's not at all fogeyish," said my sister, decisively.

I was just going to echo her words, and to exclaim "fogeyish!" but I recollected in time, and held my peace.

She also remained silent, until, suddenly looking at her watch, she said—

"I declare it's time to dress for dinner. Mind, child, you take a little pains to put on something rather prettier than your eternal white frock. You keep still to those thick plain-made cambric muslins. Very well for a girl in a schoolroom, but horribly unbecoming. Do, for goodness' sake, begin to think a little more about suitable dinner dresses and evening dresses; and put your ruffly curls into more decent and compact condition—more like other people's style of doing their hair—more like what is generally worn."

I felt very much inclined to defend my simple white frocks and my naturally-curling hair, that would take its own way round my head and throat; but I did not care to say any more, as I saw that my sister was eager to get away to attend to her own toilet. Besides, I trusted to my usual good fortune in being allowed to do as I liked in dress, as in most else, if I did but hold my tongue and not attempt to prove myself in the right.

Thus far, however, I deferred to my sister's expressed suggestion on this occasion by choosing a clearer muslin frock that was trimmed round the neck and wrists with some delicate old lace my mother had given me, and by putting a half-blown blush rose among my culpably straying curls, which I tried in vain to bring within seemly bounds.

I was rewarded for my docility upon going downstairs by an approving pinch on the cheek from my father, which told me that in his eyes I looked well, while my sister vouchsafed me a nod and a glance in appreciation of my obedience to her signified wish. During dinner we had some bright and pleasant conversation, our new guest yielding to the evident desire of my father that he should tell us something of the different places of interest that he had visited abroad. But he by no means monopolised the discourse, having the refined art of drawing others to speak on topics with which they themselves were conversant, and which he had the tact to make appear flowing naturally from the subjects already started.

(*To be continued.*)

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

I.—INTRODUCTORY.

IN the controversy which rages perennially about the limitations of the sphere of woman's usefulness, one vocation has been universally admitted as peculiarly and specially adapted to the female temperament. That is the work of nursing the sick. A work calling for much gentleness, great sympathy, and inexhaustible patience appeals specially to those qualities of mind with which nature has gifted women more highly than men; and it is in the exercise of these qualities that the character of women is seen at its best.

In one sense it may be said that nurses, like poets, are born and not made; one must have the innate tendencies without which the good nurse cannot exist; but at the same time the character is capable of great development; and the really high vocation of a trained nurse can only be fulfilled adequately after years of technical training as well as general education.

Fortunately, however, while in the treatment of very serious disease the highest training in nursing is urgently necessary, in the more common and milder forms of illness less scientific nursing may be almost equally useful; and it is with the wish that every girl who reads THE GIRL'S OWN PAPER may be able to render some valuable assistance during illness that this and the following papers are written.

Illnesses, small or great, are so frequent in almost every family of any size that to almost every girl sooner or later must come the opportunity of assisting in the care of some relative during a period of sickness and anxiety; and the possession of some knowledge of the art of nursing will not only add very materially to the comfort and wellbeing of the patient, but will give to the amateur nurse a most delightful sense of usefulness which, like virtue, will bring its own reward.

Real nursing includes much more than simply personal attentions to the sick. It should be understood to cover the control of the sick-room generally, attending to such points as ventilation, warmth, clothing, furniture and diet; and as much as anything it includes accurate watching of the patient, and a general intelligent appreciation of observable symptoms. Medical men in charge of any case of illness are only able to see the patient for a limited period once or twice a day, and must trust to reports either from the patient or the nurse for the remainder of the twenty-four hours; so that the satisfactory treatment of the sick person may depend largely upon the accuracy with which the nurse has observed

any occurrences during the absence of the medical attendant.

There is a general and popular belief that the work of nursing the sick is so easy that fatigue is impossible, a belief which mainly prevails among those who have not taken any opportunity of trying the duty themselves.

I remember once the relative of a patient coming to me to complain very indignantly that the nurse had fallen asleep beside the invalid; and on my inquiring how long she had been on duty, I was told, "only twenty-four hours." Now, as a matter of fact good nursing must necessarily be rather fatiguing, and no one can possibly nurse well for more than twelve or fourteen hours at the outside every day. Very often when men are ill I am assured by their wives that they will do all the nursing required, and that they could not think of allowing anyone else to share such a duty; but in cases of serious illness no human being can bear the strain of continuous nursing for any lengthened period; more especially when combined, as in such cases it is, with deep personal anxiety for the wellbeing of the invalid. To maintain one's health during a period of nursing, two conditions are absolutely necessary: the first is rest for a certain number of consecutive hours every day, and the second is a reasonable amount of out-door exercise. Without these two the strongest person is sure in no long time to diminish much in usefulness, and is not unlikely to break down entirely.

For the satisfactory fulfilment of the duties of a nurse certain mental and physical qualifications are requisite. Among the mental qualifications probably patience holds the most prominent place. Although in some ways illness often tends to develop the better side of human nature, it cannot be denied that many invalids, and more especially perhaps those of more advanced age, are apt to be very fractious and impatient. One finds them not unfrequently misconstruing one's best efforts for their comfort and welfare, intolerant of measures which are intended entirely for their benefit, and reluctant to assist in carrying out the means which it is hoped will promote their ultimate recovery. A good nurse must meet these trials and difficulties with constant patience, trying to persuade rather than to order, and keeping such guard over her temper that not even strong provocation will tempt to a hasty word. After training and experience, one generally can regard such ebullitions of temper as simply symptoms of disease, to be watched and studied, and no more to be found fault with than the development of any physical symptom. As a rule I am quite sure that it is undesirable for a nurse to attempt the part of a mentor to the invalid; any remonstrance about undue irritability or display of temper should come from some relative or other friend, and not from the nurse.

Another qualification in a good nurse of almost equal importance is cheerfulness. Among the many influences which, small in themselves, in the aggregate affect so materially the progress and ultimate result of disease, the constant presence of a cheerful and bright disposition is prominent. Not that undue levity is demanded or desired; but the mental attitude which always looks, as far as possible, on the brighter sides of things, reflects a fund of moral sunshine on the sick-room, which is as valuable in its way as the physical rays of the sun which enter by the window. Such an attribute is not only extremely useful to the patient, but undoubtedly it enables the nurse herself to bear the fatigues of her duties much more easily than if they are undertaken under a distressing sense of mental depression.

Strict truthfulness and accuracy of language are also essential qualifications of a nurse. The faculty of observing properly, and describing exactly what one sees and hears, can be cultivated with care and attention, but exists naturally in most people only to a very limited extent. A well-known historian remarks in one of his works that writing history would be comparatively easy if only eye-witnesses of events agreed as to what they actually saw and heard; and nothing in daily experience is more common than contradictory descriptions of the same occurrence by different witnesses. A nurse must strive to report accurately all that she may have seen or heard regarding the patient, and must avoid most carefully the very common fault of mistaking her own views or interpretation for the actual facts. It is the business of the nurse to observe the facts, and the duty of the doctor to arrive at conclusions from what is observed.

It is unnecessary to illustrate the advantages of such other mental characteristics as general intelligence, courage, and presence of mind, as experience in nursing cannot fail to develop these traits of character.

A good nurse should be also fairly strong physically, and should be free from any disagreeable deformities, or any defects of the organs of sight and hearing. The slightest degree of deafness is a very great drawback to any nurse, invalids being often very irritable when what they say is not understood at once. And it is very necessary in many cases of nursing that the slightest movement of the patient or the faintest sound should attract the nurse, so that acuteness of hearing is really one of the most important qualifications of a good nurse.

Any girl, then, gifted to a moderate extent with the qualities which have been already described, has in her the making of a good nurse; and I hope in the papers which through the kindness of the editor will follow this, to attempt to impart such information as will enable the amateur to utilise her faculties to the greatest advantage, so that acting as sick nurse she may both add to the comfort and promote the rapid recovery of the invalid.

(*To be continued.*)

THE DAYS OF CHIVALRY.

BANNERS AND BADGES.

AGREEABLY to the promise made in our last article on Heraldry, I commence another series on the subject of Flags and Standards; Badges and Devices; Seals, Merchants' Marks, Orders, Knots and Twists, War-cries, Signboards, etc. The reader must not expect to obtain exhaustive information — I only offer as much as might be condensed into a pleasant half-hour's chat with those of our girls who may not have given their attention to these subjects hitherto.

With reference to flags, a greater variety was in use in bygone times than in the present day, and even the names of some are unfamiliar, or at least convey no idea of their character. Their size and form signified the rank of the bearer, and in the case of the improvised banner of the knight-banneret (represented as a "canton" on his escutcheon) it proclaimed to the world some remarkable deed of heroism, and served the purpose of our Victoria Cross. But an important difference exists between them, for, in the first case, the distinction became hereditary, whereas in the second the reward lies by in a box, a forgotten relic in the hero's family, soon after the winner has succumbed before "the last enemy," and laid down his arms for ever.

Some young reader of the chivalrous romances of Sir Walter Scott may remember many allusions made to flags of old-time use, as, for instance, those in "Marmion"—

> "A thousand streamers flaunted fair,
> Various in device and hue;
> Green, sanguine, purple, red, and blue,
> Broad, narrow, swallow-tailed, and square;
> Scroll, Pennon, Pensil, Bandrol—there
> O'er the pavilions flew."

The use of flags is of the most remote antiquity, and they take precedence in point of age of the bearing of charges upon shields.

The banner was somewhat small and nearly square. An idea of them may be formed by seeing a sculptured specimen to be found on the monument of the Standard Bearer of Henry V. in St. Paul's Chapel, Westminster Abbey. It is represented at each corner of the tomb of Lewis Robsart, K.G. A distant view of the old battle-torn, dust-begrimed remains of such trophies may be seen high up in the dusky mysterious light of many cathedral aisles, and afford more food for the imagination than historical information respecting their characteristics of form and emblazonment.

The subject of standards is very interesting, and quite as much so to women as to men, because, in addition to their historic reminiscences, they were the production (perhaps for the most part) of female fingers, those of the loyal and the loving who were, many of them, rendered immortal in the history of their country by their "cunning work" in her service.

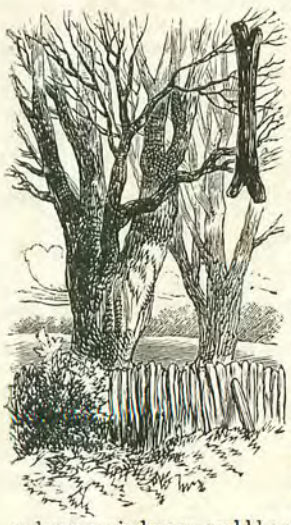
To you who read the Scriptures the term "standard" must be more or less familiar. See the Book of Numbers ii.; and the graphic simile employed by the prophet Isaiah—"and it shall be as when a standard-bearer fainteth"—is indeed most strikingly suggestive, as emblematic of the extreme climax of lost hope, when the very worst of all fears have been realised, and the last glimmerings of waning light are extinguished. Of course, the fall and disappearance of the standard in the hands of the fainting bearer would naturally suffice to turn the tide of the battle, and lead the army to suppose—even were it not probably the fact—that the standard had fallen into the hands of the enemy, and that all was lost.

Of the ancient Roman standards most people have seen engravings. It was first introduced in the country about the middle of the fourteenth century, temp. Edward III. The Red Cross of St. George on a silver shield was usually blazoned next to the staff, and the charges of the owner's escutcheon, or his badge and motto, occupied the rest of the space. But they were specially employed for the display of badges by personages of rank,

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

II.—THE SICK-ROOM.



OFTEN think that if I were building a house for my own occupation, I would arrange specially one room so that, while it should answer as an ordinary bedroom, it should be well adapted for occupation during illness. The largest bedroom available would be selected, and an aspect either south or south-west would be preferred, with as large a window as could be obtained—when possible a window would be placed at each end of the room. The windows would be fitted with double sashes, so as to admit of ventilation between the two, and one would be removable during warm weather. Outside these would be lattice blinds—at least, on the south side—and inside venetian blinds would be hung. The floor of the room would be of polished hard wood; what is known as *parquet* flooring is very suitable. The walls would have a dado of polished wood, above which they would be either painted in oil, or papered with a well-varnished paper, and the ceiling would also be covered with varnished paper. No pictures would hang on the walls, but a few engravings might be pasted on and varnished over so as to relieve the monotony of the colouring. Curtains would be hung in such a manner that they could be removed from the room in a few minutes; and the bareness of the floor would be relieved by a few Persian or Turkish mats.

A room fitted according to this description would be always ready for the reception of any case of illness, even the most infectious, and the patient in it would be under the most favourable conditions for the promotion of recovery.

The selection of a room with a south or south-west aspect for the reception of cases of illness is recommended on account of the great value of sunshine in the treatment of disease. Both in health and illness the rays of the sun are as necessary for the healthy growth and development of human beings as of plants; and, just as many flowers will lose their colour and droop if kept always in the shade, so men and women and, most of all, children become pale, thin, and unhealthy if they live continuously in rooms into which the sun's rays do not penetrate. The advantage of the south-westerly exposure of a room is that the sun will not reach it too early in the morning, when it might disturb the sleep of the invalid, and the rays of the setting sun will be enjoyed before it is time to retire to rest.

External lattice blinds protect a room from the heat of the midsummer sun much more perfectly than any blinds inside the room, as they intercept the rays before they fall on the window glass, which, being a better conductor of heat than wood, does not arrest the heat waves so efficiently. Internal venetian blinds are better than any other kind, on account of the facility with which by their means the amount of light entering can be regulated to suit the wishes of the invalid; and they are useful also in diverting currents of air entering through the open windows in any direction upwards or downwards.

Almost all hospitals built in the present day have the floors made of some variety of hard wood, closely-jointed, and with some kind of polish on it. What is required is the absence of any spaces between the boards in which dust might lie, and a condition of surface which will allow at all times of perfect cleanliness. Any kind of carpet is quite inadmissible, except loose strips which can be lifted and beaten and removed at any time, as all carpets harbour dust, which may be very injurious in some forms of illness. Wall papers have a similar disadvantage, and are only admissible when varnished so that dust will not adhere to them. Ornamental tiles make a very handsome wall for a hospital ward, and are now much used for this purpose.

As, however, comparatively few of us have the opportunity of building and arranging the houses we live in, it will be desirable to consider how to place any ordinary bedroom in the most favourable condition for the reception of an invalid; and how to maintain it during occupation in the most healthy and sanitary condition possible.

In the first place, all superfluous furniture should be removed, so that the most can be made of the size of the room. It is scarcely possible to have a room too large in cases of illness, and every article of furniture occupies some valuable space. Then, except in cases of very slight illness, the less carpet there is in the room the better. While adding to the apparent comfort of a room, carpets absorb dust and other impurities very rapidly, and are exceedingly difficult to keep clean. It is most undesirable that any carpet should be swept in the room where an invalid is lying; and what is best is to have simply a few strips of carpet or a few rugs lying loosely on the floor, which can be removed from the room at any time for the purpose of being shaken or brushed. Heavy curtains to the windows or round the bed are open to the same objections as carpets, and have the additional drawback of generally interfering very considerably with ventilation; they should always be removed. There is no objection, however, to white curtains for the windows, which add much to the appearance and finish of the room; and toilet tables may be covered with white washable covers: all thick stuff material should be removed.

It is much more easy to nurse a patient on a narrow bed than on a wide one, and the bed should be rather low. In most hospitals beds three feet wide are used, and the height from the floor is just sufficient to allow of thorough ventilation underneath. Within late years the different forms of wire spring mattrasses have come into universal use, both because of their comfort and because they admit of thorough ventilation and cleanliness. Neither side of the bed should ever be placed against any of the walls of the room; there should always be a free passage round both sides and the foot of the bed; but there is not much objection to the head of the bed being in contact with one of the walls. In most rooms there are always currents of air in straight lines between the window and door, and between the window and grate, and the door and grate when a fire is burning. So far as can be arranged, the bed should be placed so that the invalid may not be directly in the course of any of these currents of air.

Having the room thus properly arranged, the next question to be considered is the maintenance of efficient ventilation.

However large a room may be, if it is inhabited by living beings, the atmosphere in it will become unhealthy unless some arrangements exist permitting of the escape of impure, and the entrance of fresh air.

For the purposes of ventilation air may be considered as a mixture of three gases, which are known separately as oxygen, nitrogen, and carbonic acid. Other gases exist in it in small quantity, such as vapour of water, but these need not be considered at present. Of every 10,000 cubic feet of fresh air, about 2,100 consists of oxygen, 7,896 of nitrogen, and the remaining 4 of carbonic acid. Although the quantity of carbonic acid is comparatively very small, it is not by any means an unimportant element, as it is chiefly by alterations in its amount relatively to the oxygen that one can judge of the purity or impurity of the air in any room. It is found that when people are living in a room insufficiently ventilated, the quantity of carbonic acid increases while the quantity of oxygen decreases, and as carbonic acid when breathed in a concentrated form is poisonous, while a proper supply of oxygen is essential to health, and even to life, it is obvious that breathing air in which the carbonic acid is increased and the oxygen diminished, must be injurious, if not dangerous. Most people are familiar with the depression and headache produced by remaining long in what is called a "close" room, which means generally a room with an atmosphere deficient in oxygen. It has been found by experiment that this sensation of closeness is usually felt if the carbonic acid in the atmosphere is increased from 4 to about 8 cubic feet in the 10,000 cubic feet of air, and becomes very oppressive if there is as much as 10 cubic feet in the 10,000; and it is generally agreed that any quantity of carbonic acid beyond 6 in the 10,000 should be regarded as injurious. In the process of breathing a grown-up person produces about half a cubic foot of carbonic acid every hour. If then two grown-up people were shut up in an airtight room 20 feet long, 10 feet wide, and 12½ feet high, which would be a room of considerable size, and would hold 2,500 cubic feet of air, in one half-hour the atmosphere of the room would become very impure and oppressive if no fresh air were admitted. For during that half-hour the two occupants would have added 1 cubic foot of carbonic acid to the 2,500 feet of air in the room, which would be the same in effect as adding 4 to 10,000 feet; and as the air at first contained carbonic acid in the proportion of 4 to 10,000 cubic feet, at the end of the first half-hour the proportion would be 8 in the 10,000, which is always perceived as distinctly close. The necessity of a continuous supply of fresh air into even a large room if occupied is thus quite apparent; and in a future paper we hope to show how much is required, and in what way it can be best introduced.

"It's hardly that," said Mary, slowly; "I mean I can't love like you; perhaps it isn't in me. I want to be fair to you; and you are so good to me."

"I can wait," said Jim. "I would rather have your friendship than another woman's love. You have been my one hope all these years. Oh, Mary, come to me at last! This time to-morrow the sea will be rolling between us. Won't you give me a little comfort?"

"I do love you," said Mary, thinking of her desolation after Jim's departure. "Yes, Jim, not as much as I will try to do, some day; but you are very dear to me, and I—I will. Jim, you really want me?"

"Want you!" said Jim, as his arm closed round her. "I have wanted you all my life. And you mean it, Mary? You will be my wife? You will come out to me?"

"Yes," said Mary.

* * * *

Jim sailed on the following day.

From every port he wrote to Mary, and arrived at his destination in India. Each mail brought her a letter. He was counting the months, he said, and urged her starting not later than the beginning of the year, when a home would be awaiting her.

As habit is second nature, the duties calling for her attention had become to a certain degree less wearisome to Mary, while the knowledge that she materially assisted her parents made her unwilling to leave them, and seriously to consider whether or not she should postpone her marriage to an indefinite period.

In the midst of this mental debate came a hurried note from Carry. She wanted to hear more about the mysterious cousin to whom her friend was engaged. She wanted to know when the wedding was to take place, and these wants she could soon satisfy, as her mother's health failing, and complete change of scene advised, they were coming to London for some months; and, best of all, the neighbourhood of Portman Square being preferred, the agents had sent them the address of the very next house to the Wonhams, so that now the long-talked-of delights could come to pass, and the daily companionship begin once more as of old.

Mary felt as though a net were cast about her, shutting out every means of escape. The bells rang, but she heeded them not; her mother's voice reached her, still she sat immovable with Carry's note in her hand, conscious of nothing save an overwhelming sense of humiliation.

Suddenly she sprang to her feet. "Oh, Jim!" she cried aloud, "I will leave it all. I cannot face it. I will come to you. You want me, and soon no one else will. I never meant any wrong when I deceived Carry and the others. I only allowed them to keep the impressions they themselves had created; you understand I never meant it." And then a burst of tears came to her relief. Her father and mother would, she fancied, be spared much trouble if she were gone, for how could Carry's relations with their daughter continue when the truth was known? The inevitable consequences of their mistaken training would bear bitter fruit, and raise a barrier which hitherto the daughter had striven, and successfully, to hide by loving deeds and acquiescence in every phase of her daily work.

Everything pointed to Jim. It did not strike Mary that she was taking an unfair advantage of her cousin, that her feeling for him was mingled with a keen desire to avoid any personal discomfiture. She had avowed the inequality of their affection—she would strive to do her duty as a wife—and Jim wanted her.

She set about her preparations with an eagerness that astonished her mother, and, without further demur, declared herself willing to start, according to Jim's wish, by the first week of the New Year.

(*To be continued.*)

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

III.—VENTILATION OF THE SICK-ROOM.

IN the article in a previous number of this magazine on "The Sick Room," we have considered carbonic acid excreted from the lungs as alone the contaminating agent of the atmosphere of the room. This was done chiefly for the sake of simplicity, and partly because it is usual to judge of the presence of other impurities by the amount of carbonic acid which is always found in association with them; but it is desirable to make distinct mention of other agents which diminish the purity of the air, and which are apt sometimes to be overlooked, in order that the necessity of thorough attention to the ventilation of the sick-room may be impressed on our readers. From the skin, both in health and still more in sickness, some impurities are constantly added to the atmosphere. Carbonic acid, in small quantities, is exhaled from the skin just as from the lungs; but the quantity is so very small compared with that which is evolved in respiration that it may practically be overlooked. The more important secretion from the skin is the perspiration, which, sometimes visibly, but more generally invisibly, is constantly given off in very considerable amounts. It consists chiefly of water, having in solution in it various salts, chiefly common salt, and some organic matter, which exists probably partly as vapour and partly in microscopically minute particles. It is the presence of this organic matter which produces the close smell which is always perceived more or less in crowded rooms and halls which are inefficiently ventilated. It can be separated from the carbonic acid and chemically measured, but as its presence is always accompanied with carbonic acid in excess, and is indicated by that excess, it is usually considered unnecessary to determine how much may be present in the atmosphere without obviously injurious results. From the lungs, also, in addition to carbonic acid, considerable quantities of water in the form of vapour, with organic matter both dissolved and suspended in it, are given off constantly. The presence of the water can always be demonstrated by its deposition when one breathes on any cold surface, such as glass.

In many forms of illness the cutaneous excretion (that is, the perspiration and the carbonic acid) is very much increased, and constitutes a condition to which a nurse must give a good deal of attention. It will be obvious, too, how necessary perfect cleanliness of the whole skin must be to maintain the atmosphere of a room in satisfactory condition, when one considers that any impurity left accidentally in the skin will be dissolved by the perspiration, and distributed through the room by its evaporation.

Other more accidental sources of organic contamination are to be found in the occasional discharges of ulcers, and in cases of disease of the nose or ear, or other parts of the body, accompanied with disagreeable secretions. In a similar manner any unwashed clothes, or soiled bandages or dressings of wounds, constitute a source of impurity to the atmosphere, and should never be allowed to remain in a sick room a moment longer than is necessary.

Another contaminating influence is to be found in the artificial illumination of the sick room by night, whether this is effected by gas, oil lamps, or candles. All these illuminating agents both require a considerable amount of oxygen to enable them to burn properly, and give off a large amount of carbonic acid, as well as some organic impurities in their fumes after combustion; so that they actually steal from the atmosphere the useful and beneficial ingredient, and add to it useless and even injurious products. A common gas burner burns from 5 to 10 cubic feet of gas every hour, and in doing so will destroy about the same quantity of oxygen, and add to the atmosphere from 10 to 20 cubic feet of carbonic acid. So that one gas burner, lighted in our imaginary airtight room of 2,500 cubic feet, would in about ten minutes render the atmosphere unpleasantly overcharged with carbonic acid. Good burning oil does not contaminate the air quite so rapidly as gas, assuming that both are to give the same amount of light. Candles, on the other hand, render the atmosphere impure more rapidly than gas does.

The most perfect light for a sick room is the incandescent electric light; but for most people the possession of this light in their homes can only be a dream of the future.

Probably, after reading this rather long catalogue of injurious influences to which the atmosphere of inhabited rooms is exposed, my readers will be inclined to express surprise that it is possible to remain alive for any lengthened period when shut up within four walls. But they will perhaps have observed that in giving estimates of the amount and rapidity of contamination by various agents, I have always stipulated that the room referred to should be airtight. Now, as a matter of fact, no room in an ordinary house is ever airtight, and cannot be made to approximate to that condition; and as a preliminary to suggesting means of artificial ventilation, it is desirable to inquire what are the natural means by which ordinary rooms both receive a constant supply of fresh air and part with a continuous current of impure air. And in the first place a very short account of one or two elementary principles on which ventilation is based will not be out of place. My readers are probably aware that if two liquids of different weight, such, for instance, as oil and water, are put in a glass, the lighter one, the oil, being above the heavier one, water, they will remain in their relative positions without mixing the one with the other. A similar result will be found to take place with any other two liquids of different weight, provided they are left at rest in their position, and not shaken or mixed up. Gases, on the contrary, act in an entirely opposite manner. If a light gas, such as oxygen, is put in the same vessel with a heavy gas, such as carbonic acid, instead of remaining separate, the lighter one resting on the top of the heavier one, it is found that they always diffuse through each other, until the whole vessel is filled with the gases uniformly mixed with each other. This phenomenon is known as the diffu-

sion of gases, and the intermixing of gases in this way is absolutely essential to the maintenance of life; for if gases, instead of diffusing, acted as liquids do, the accumulation of heavy and impure air on the surface of the earth would very rapidly poison every living being.

Another property of gases which is important in relation to ventilation is its expansion, and consequently decreased weight when influenced by heat. This property is shared by most liquids, although not to anything like the same extent. All my readers are quite familiar with the expansion of the fluid in a thermometer when heated, and they can easily understand how it is that the actual bulk of fluid remaining the same, it must become less in weight as it becomes greater in volume. Atmospheric air expands at about the rate of one per cent. for every five degrees (Fahrenheit) of increased temperature, so that if the temperature inside a house were 67 degrees, which is a comfortable degree of warmth, and the temperature outside were at freezing point, 32 degrees, the air outside would be about one-fourteenth (seven per cent.) weightier than the air inside the room. Such a difference, if utilised properly, is quite sufficient to produce a very strong current of fresh air into a room; and one of the main problems in ventilation is the proper utilisation of the difference of density of the outside and inside air, so as to ensure a constant supply of fresh air, and at the same time to avoid the discomfort and danger of a perceptible current of cold air, which is popularly known by the name of a "draught." When the colder external air is admitted into a room it mixes with the warmer air inside in two different ways. In the first place, being weightier, it falls downwards towards the floor, displacing the warmer air upwards; and in the second place, by its property of diffusion, it tends to mix, in an intimate manner, with all the air previously in the room, the two processes going on simultaneously. But as a room can only contain a certain amount of air at one time, this will only occur satisfactorily when there is a proper exit for the warm air as well as an entrance for the colder air, otherwise only a slow interchange by diffusion will take place at the point of entrance.

In an ordinary room, *i.e.*, one not fitted with any special mechanical means of ventilation, air finds admission mainly through the interstices of the windows and doors. If these interstices are of fair size, as is very common, a very considerable amount of air is admitted, the rapidity of the current entering being often readily apparent when the hand is held against the crevice. A small amount of air diffuses also through the walls, but in the case of walls which are plastered and papered this is insignificant. If no fire is burning in the grate the chimney may act either as an inlet or an outlet for air; generally it acts as an outlet, if sufficient entrances for air exist in the other parts of the room. The practice which prevails in so many houses of closing the chimneys when a fire is not required is a most pernicious one if no other arrangement exists for ventilation. Chimneys ought to be kept clean and left open.

When a fire is burning in the grate, the chimney acts as a most valuable exhauster of the impure air of the room. It is calculated that the current of air up a chimney, below which a fair fire is burning, is at the rate of from three to six feet per second; so that if the chimney were one square foot in section, which means if it measured one foot from back to front, and one foot from side to side, three to six cubic feet of air would pass away up the chimney every second, which is about equal to from 10,000 to 20,000 cubic feet per hour. In a previous paper we saw that to maintain a room in healthy condition 3,000 cubic feet of fresh air should be admitted per hour for every person in the room, so that a good fire, with proper inlets for air, would insure enough fresh air for from three to six persons in the room. If, however, there is not sufficient air admitted to allow of this extraction by the fire, it will be found that occasional down draughts in the chimney occur, filling the room with smoke and impure air.

The great problem in ventilating an ordinary room, in climates where the external temperature is lower than that inside the room, is to admit a sufficient quantity of colder fresh air in such a way that the temperature of the room may be kept equable, and that there may be no "draughts" or cold currents of air. In every room in which there are two openings by which air can be admitted or expelled (and every room has at least two openings in the door and the window, and generally a third in the chimney) there must necessarily be certain currents of air. If the room has no chimney, the general direction of the current will be from the window to the door usually; if there is a chimney, and more especially if there is a fire burning, there will be two currents—one from the window and one from the door towards the chimney. Our object is to admit those currents in such amount and such direction that the rate of their movement will not be sufficient to be perceptible, and that they will be raised in temperature in their progress, so as not to be unpleasantly cold. If a certain quantity of air has to enter in a certain time, it is quite obvious that the smaller the opening it has to pass through the more rapidly it must pass through it, and, conversely, the larger the opening the more slowly need the fresh air pass through it. On the other hand, a large opening admits a mass of air, which is much more difficult to raise in temperature by contact with the air inside the room, so that what is wanted is to find out the largest current which can be admitted without unduly cooling the room, and the best method of admission, so that it may be distributed as well as possible throughout the room. Generally speaking, the higher in the room the opening for admission is, the larger current can be admitted, as it gets heated in its descent towards the floor, so that an opening at the top of the window, as a rule, acts well as an inlet for air. Another very satisfactory method is to have an opening in the middle of the window by raising the lower sash a little, and filling up the space left below by a block of wood fitted for the purpose. The opening in the middle being directed upwards, the air entering first ascends towards the ceiling by the force of the entering current, and then descends by its own weight, getting warmer both in the ascent and descent.

Such, then, are the general principles upon which the ventilation of the sick-room must be based, and every nurse must learn to apply these principles as ingeniously as possible to the existing circumstances of the room under her care, remembering always that upon the perfectness of the ventilation depends, in some measure—in many illnesses in great measure—the recovery of the patient.

ONE LITTLE VEIN OF DROSS.

By RUTH LAMB, Author of "Her Own Choice," etc.

CHAPTER IX.

MY aunt examined and approved of the gown which Miss Martin submitted for her inspection, and madame, having seen it tried on, agreed that with a very slight alteration nothing could be better.

"You will arrange that this shall be at once completed," she said, addressing her assistant. "The robe is required for immediate wear by this lady, who is the relative of young Madame Beauchamp. We deplore her indisposition, you and I, Ellen. Is it not so?"

Miss Martin answered that she had been sorry to hear of my continued illness. "I was afraid from her appearance, when she left the hotel at Longminster, that the attack of fainting might precede something more serious," she added.

The girl looked and spoke like the lady she undoubtedly was. She raised her fine, honest eyes to my aunt's face and made a further inquiry after me, with such evident interest and sympathy, that it was impossible to associate her with a thought of wrong-doing. Then she alluded frankly and naturally to her attendance on me at the hotel—the last thing she would have been likely to do had she been troubled with false pride or a guilty memory.

Miss Martin left the room, carrying with her the gown, as my aunt decided to wait until the slight alteration was completed.

"I have no other business in Longminster," she said, "and should prefer going straight from here to the station."

Madame again became effusive, and suggested that her sitting-room would be more private than the show-room, if my aunt would do her the honour to enter it.

This invitation was exactly in accordance with my aunt's wish, so she accepted it with thanks, only stipulating that Madame Leeson should accompany her thither. "You must not let me turn you out of your private room," she said, "if you are sufficiently at liberty to share it with me."

Whereupon Madame Leeson, who dearly loved a talk with a customer, and whose tongue could be set running at any time by a very simple question, prepared to enjoy herself. She began upon the very subject my aunt was longing to open, but knew not how.

Had madame by chance noticed the girl who brought down the robe?

My aunt replied in the affirmative,

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

IV.—SANITATION OF THE SICK-ROOM.

HOWEVER perfectly the ventilation of the sick-room may be carried out, under some conditions of illness it is impossible to prevent entirely the contamination of the atmosphere with disagreeable odours. The sense of smell is so acute, and the subdivision of odoriferous particles and vapours so exceedingly minute, that odours of different kinds may be painfully apparent even when accurate analysis of the air will not afford any indications of impurity.

Such smells, even when they do not indicate, as they not unfrequently do, the presence of matter in the air which may be the active agents in producing or conveying disease, exercise an injurious influence on the patient by impairing the appetite and sometimes by depressing the nervous system. They may be produced in various ways. In many cases of illness the secretion from the skin becomes very disagreeably odorous; this is more particularly the case in many kinds of fever, especially, perhaps, in rheumatic fever; and physicians with an acute sense of smell have been known to diagnose accurately cases of this nature simply by entering the room and encountering the atmosphere, without any further examination of the patient. Secretions from the lungs also, particularly in long-standing cases of bronchitis, may be very offensive; and among other contaminating agents may be mentioned discharges from abscesses and other sores.

To some extent the prevention and destruction of these smells pertains more to the medical attendant than to the nurse, for to the medical attendant belongs the duty of prescribing certain applications which may beneficially affect such discharges; but this certainly does not relieve the nurse of her responsibility to maintain a sick-room at all times well ventilated and free from smells.

So far as regards the skin of the patient, a great deal can be effected by perfect cleanliness. Unless special orders are given to the contrary, every patient should be carefully sponged all over every day once at least, and oftener when required. To prevent cold, one part of the body only is washed at a time, and successively each part should be carefully dried before another part is commenced. In patients very susceptible to cold, with a little practice a nurse will not find much difficulty in washing the greater part of the patient without removing the bedclothes. In most cases warm water is used, and to this may be added, for the purpose of destroying smells, various so-called disinfectant fluids. The addition of Condy's Fluid, in the proportion of about half a small wineglassful to a pint of water, is very useful for this purpose; it should not, however, be used along with soap, as its action is then neutralised. Carbolic acid in about half the proportion given for Condy's Fluid is most effective, and can be used along with any kind of soap. Its one disadvantage is its own smell, which to many people is disagreeable and prejudicial; but if a very pure preparation of the acid is used the smell is very slight. Another very pleasant purifying agent is Sanitas, which may be used in the same proportion as Condy's Fluid; its own scent is to many pleasant and stimulating, somewhat recalling the scent of freshly-cut pine wood. Some of these disinfectants are incorporated with soaps, which can be used for the same purpose; carbolic acid is perhaps most conveniently used in that form, as in its fluid state, when not very pure, it does not mix so readily with water as the others. These preparations actually exercise a chemical influence over the disagreeable secretions, destroying for a time their noxious character, and for this reason are to be preferred to other fluids more purely scents, which, by their own strong and pleasant odours, overcome the disagreeable but not so penetrating smell of the secretion. As examples of the latter kind may be mentioned eau de Cologne and lavender water.

For neutralising the disagreeable qualities of other discharges, various disinfectants and antiseptics are applied in different ways, in many cases the disinfectant being combined with some curative agency. Thus in cases where poulticing is required, powdered charcoal is often mixed with the meal with which the poultice is made, and forms one of the best deodorisers known; or carbolic acid dissolved in oil may be poured over the surface of the poultice when made. In other cases where lotions have to be applied, some one of the disinfectants already mentioned may be added to the lotion. When there is profuse discharge, various absorbent materials, such as specially prepared cotton wool, gauze, or fine tow, after being impregnated with some antiseptic, such as carbolic acid, iodine, or perchloride of mercury, are used to absorb, and at the same time render innocuous, the effused fluid.

Not unfrequently the breath of the patient may be offensive, and contamination from this source is sometimes obviated by the use of a respirator containing within it gauze or cotton wool impregnated with some harmless and not unpleasant purifying agent, such as Sanitas or a weak solution of oil of thyme.

Notwithstanding all one's efforts, however, to cut off, as it were, at their source the various fountains of impure and disagreeable smells, it will be found occasionally that success in this direction cannot be complete; and the air of the room having become contaminated, other means must be adopted for its purification. Most of the disinfecting agents already named may be used for this purpose; different methods being employed for bringing them into a position to attack effectively the noxious vapours.

Of these methods the most convenient is the hand-spray, charged with some fluid which should be either without odour, or possessed of a pleasant scent.

The appearance and method of use of the hand-spray is probably familiar to all my readers. It consists essentially of a bottle, into the mouth of which a cork is fitted so accurately as to be air-tight. Through the cork two tubes are passed, or one tube divided by a partition into two, one of the tubes having its opening above and the other below the level of the fluid in the bottle. The tube which has its opening above the fluid is connected at its other end with an indiarubber air-ball, by which air is pressed into the bottle; the other tube ends externally in a small opening, out of which the compressed air in the bottle drives the liquid contents in a very fine stream. This stream is divided into minute spray by a current of air introduced through a small communication between the two tubes, and thus mixing with the fine stream of liquid before its exit from the opening.

By means of this small instrument any disinfecting fluid can be made to influence beneficially the entire atmosphere of the sick-room. Just like the rain, which purifies the external atmosphere by carrying down to the ground, and, as it were, washing out the impure particles of matter with which the air in most places is constantly charged, the spray, which is artificial rain, removes from the atmosphere of the sick-room impurities arising from the patient and from other sources; while, much more than ordinary rain, the spray charged with some disinfectant absorbs and purifies any noxious vapours which may be present in the air of the room. Care must be taken that spray is not used in such quantity as to render the atmosphere unpleasantly damp; but used within such limits the nurse will find its use a most valuable aid in maintaining what is often technically called the "sweetness" of the sick-room. Of the disinfectants already mentioned Sanitas is perhaps the most convenient and pleasant to be used as a spray; and it may be used for this purpose without any dilution. If Condy's Fluid is used, considerable dilution is necessary, otherwise any white or light coloured material upon which the spray may fall will be discoloured. If carbolic acid is employed, care should be taken to obtain the acid as pure as possible; if it is then diluted to about the strength of one part of the acid to nine parts of water, and a little scent added, a very useful and not unpleasant spray is obtained.

Another method of purifying the air in the sick-room is by the evolution of some disinfectant or antiseptic gas. If the ordinary commercial chloride of lime is exposed in a saucer or plate to the air, chlorine gas is given off in small quantity; and its presence can be appreciated by the smell, which is not unpleasant if the gas is sufficiently diluted.

The chlorine gas can be produced much more rapidly if desired from the same salt by the addition of a little black oxide of manganese and some sulphuric acid. It is always easy to remove the saucer or plate from the room if the air becomes too much impregnated with the chlorine gas.

Another gas which can be used advantageously is the vapour of iodine; but only in small quantity, as it is very irritating to the throat and lungs when not sufficiently diluted. It is very easily produced by sprinkling the crystals of iodine on a heated shovel or iron plate, when the violet-coloured fumes are given off. If the vapour comes in contact with any white articles, stiffened with starch, it dyes them a blue colour, so that wristbands and collars are apt to suffer considerably during the evolution of the iodine.

Carbolic acid exposed on flat dishes gives off even when cold a considerable amount of vapour, and the quantity can be increased by gently heating the receptacles. It is a very useful deodoriser, but to many patients the smell of carbolic acid is not only unpleasant but also actively injurious; loss of appetite and attacks of sickness being the not infrequent results of injudicious over use of an otherwise valuable disinfectant.

Other methods of producing deodorising and disinfectant vapours are to be found in various patent pastils and ribbons, which are to be had at most chemists; and which have all in common at least the one merit of being very pleasantly scented.

We have dwelt at some length upon the various means of purifying the atmosphere of the sick-room on account of the paramount importance of the subject. The sanitary condition of the sick-room is a matter regarding which the responsibility rests entirely on the nurse; and her efficiency and capacity will not unfrequently be judged mainly from her success in maintaining satisfactorily that condition. The greater the difficulty in doing so in individual cases, the greater the credit arising from success; and of all the ways in which a nurse can contribute to the well-being and recovery of her patient, the thorough sanitation of the sick-room is both the most direct and the most important. One caution alone may perhaps be necessary. It must always be remembered that artificial purification is secondary and subordinate to ventilation; that its aid is properly sought only after the influence of fresh air has been utilised to the fullest extent attainable under the particular circumstances of the case.

"Madam," replied the bishop, "of all people in the world I never expected that question from you, who have built so many castles in the air that you might lie every night at one of your own."

The duchess is seen at her worst in her plays. There are nineteen of them, some of them in two parts and with scenes almost innumerable. No literary appetite nowadays is equal to reading them. Some people said that she stole her plots, but that could hardly be, for her plays have only the ghosts of plots. Her characters are mere abstractions representing certain virtues and vices. The speeches made by them are often scholastic and long-winded, as if they were extracts from her grace's letters and philosophical opinions.

Amongst her grace's short poems those dealing with fairy subjects have been praised. Her verses, however, exhibit marked deficiences in the matter of feet; and as for the rhymes, the duchess's ear, to put it mildly, must have been an odd one. She does not deny that she was weak in the artistic construction of poetry, but this she held to be a trifle—an opinion shared, as we have seen, by her husband. The important thing, according to them both, was the thought, not the way it was expressed.

In her "Poems and Fancies," the duchess has this characteristic request to the reader: "Let me entreat you to consider only the fancies in this my book of poems, and not the language, numbers, nor rhymes, nor false printing, for if you do you will be my condemning judge, which will grieve my muse." In the same volume, she says, "I must entreat my noble reader to read this part of my book very slow, and to observe very strictly every word they read, because in most of these poems every word is a fancy."

"Excuse and pardon me," she writes in another place, "for making all this noise about my own books. I have launched my labours into the world, and am rejoicing at my own handiwork." She was easily pleased. Her thirteen folio volumes merit the description she herself gives of them. "You will find my works," she says, "like infinite nature, that hath neither beginning nor end, and as confused as the chaos wherein is neither method nor order, but all mixed together without separation, like evening light and darkness."

In case anyone should wish to see a specimen of her grace's poetry, we give the following extract from an "Epistle to her brain":—

"I wonder, brain, thou art so dull, when there
Was not a day but wit passed, through the year.
For seven years 'tis since I have married bin,
Which time my brain might be a magazine
To stow up wise discourse naturally sent
In fluent words, which free and easy went.
If thou art not with wit enriched thereby,
Then useless is the art of memory;
But thou, poor brain, hard frozen art with cold—
Words, scales of wit, will neither print nor hold."

Now and then, in her prose works, the duchess says things worth repeating. One can hardly write much without occasionally hitting on something good. Here are some examples:—

"Vanity is so natural to our sex that it were unnatural not to be vain."

"Great memories are like standing ponds that are made with rain; so that the memory is nothing but the showers of other men's wits."

"Surely those who do not delight in poetry or music have no divine souls or harmonious thoughts."

"The reason why women are so apt to talk too much is an overweening opinion of themselves in thinking they speak well; and striving to take off that blemish from themselves of knowing little by speaking much, as thinking that many words have the same weight as much knowledge."

With these sensible sentences we part on good terms with this eccentric woman. Soothed by flattery and firmly believing that she would be famous for ever, the duchess breathed her last on the 7th of January, 1673-4. She was laid in the North Transept of Westminster Abbey, and her husband three years afterwards found a resting place there by her side.

Over them was erected a stately monument, with an inscription which has called forth the admiration of many a visitor to the ancient edifice:—

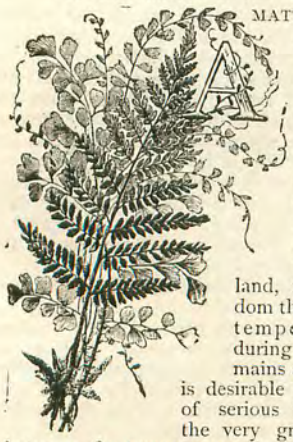
"Here lies the loyal duke of Newcastle and his duchess, his second wife, by whom he had no issue. Her name was Margaret Lucas, youngest sister to Lord Lucas of Colchester, a noble family, for all the brothers were valiant and all the sisters virtuous. This duchess was a wise, witty, and learned lady, which her many books do well testify: she was a most virtuous and loving and careful wife; and was with her lord all the time of his banishment and miseries; and when they came home never parted from him in his solitary retirements."

(*To be continued.*)

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

V.—TEMPERATURE OF THE SICK-ROOM.



A MATTER of considerable importance which claims the attention of a nurse is the maintenance of the proper temperature in the sick-room. In a variable climate like that of England, it is very seldom that the external temperature, even during the day, remains as constant as is desirable in most cases of serious illness; while the very great difference between the temperature of midday and midnight, at almost all seasons of the year, renders it absolutely necessary to resort to means and appliances for artificially modifying the degree of warmth of the patient's chamber. For the purpose of satisfactorily regulating the temperature, it is necessary to have a thermometer placed in some part of the sick-room; and it is generally found desirable to have another outside the window of the room, so that the external temperature may be noted and compared with that of the inside of the room. Fortunately, thermometers are not now an expensive luxury, being bought sufficiently good for ordinary purposes at one shilling, or even less. I have been accustomed to recommend that the one to be placed outside the window should be a spirit one, with the spirit dyed some colour, such as green or red, so that it may be easily seen at any time, even at night. Such a thermometer can be read quite easily by holding a lamp or candle near it inside the window; while for the interior of the room, a mercurial thermometer, which can be used also for registering the temperature of water for baths, etc., is more convenient. In this country thermometers are almost always graduated on what is called the Fahrenheit scale; that is, the degree at which fresh water freezes is marked 32, and the degree at which fresh water boils is marked 212, the space between being divided into 180 equal parts, or, as they are called, degrees Fahrenheit. Occasionally they are graduated in what is called the Centigrade scale, where freezing point is represented as 0 and boiling point as 100, and in this case the hundred parts between 0 and 100 are named degrees Centigrade. This latter scale is the one employed in the greater part of the continent of Europe. When writing a temperature, it is usual to employ the letter F or C after the number of degrees, so as to indicate which scale is intended; and instead of using the word degrees, a symbol is used, such as is represented in the following examples. Thus, in the Fahrenheit scale, boiling point is represented as 212° F., and in the Centigrade as 100° C. In conversation in England, the Fahrenheit scale is always understood, if another is not especially mentioned. Many thermometers are now graduated on the one side with the Fahrenheit scale, and on the other with the Centigrade. A well-made thermometer will register equally accurately the temperature, whether it is placed lying flat or suspended; but it is generally more convenient to hang it on a nail, or to place it upright on a stand. As regards the position in which they should be placed, care must be taken that they are uninfluenced by anything which will interfere with the exact determination of the temperature of the atmosphere, respectively outside and inside the room, which is the information we wish to obtain. The external one should, if possible, be hung in such a position that the rays of the sun will not fall directly upon the thermometer, as if they do they will make the instrument register a much higher temperature than the atmospheric heat, which is what is known as the temperature in the shade. The difference will depend upon the amount of sunshine and the directness with which the rays fall upon the thermometer. In summer, if the sun is shining brightly, and the rays fall full upon the thermometer, there may be as much as 50° F. of difference between the temperature in the sun and that in the shade. If from the position of the window it is impossible to find a place on either side upon which the sun's rays do not beat at some period of the day, such as will be the case in a window looking due south, the difficulty can

be met by fitting to the thermometer a slight shade of darkened wood or other material, to prevent the rays striking directly on the instrument.

In the interior of the room even greater care must be taken to find a proper place for the thermometer, as the influences which may make it register an erroneous temperature are more numerous. In the first place, just as with the external thermometer, the rays of the sun have to be avoided. This of course can always be managed without difficulty inside almost all rooms, as, unless there are windows on three sides, some part of the wall can always be found not exposed directly to the sun's rays. But rays of heat from the fire, and from artificial sources of light, such as gas jets or lamps, are similarly sources of error, although not to nearly so great an extent. It is not an uncommon error to imagine that the heat felt in front of a fire is an indication of the temperature of the atmosphere at that point; but that this is an error is very easily demonstrated by holding a thermometer in a place in front of a fire, first with its surface presented towards the fire, and then afterwards with the back of the wood upon which it rests towards the fire. It will be found that when held with its face towards the fire, the temperature registered is much higher than when it is turned away from it, although the thermometer has not been moved from its place; and it is the lower temperature which accurately indicates the temperature of the air in the room. Another cause of error in accurately ascertaining the temperature of the room is the existence of flues in the walls of rooms which, if fires are burning below them, will often raise the temperature of the wall of the room to a very great amount. Such flues undoubtedly assist in raising the temperature of the room; but at the same time raise the temperature of the wall so much higher, that a thermometer hung against it will register a temperature utterly incorrect as an indication of the condition of the air in the room. On the other hand, when the outside wall of a house is thin, it is so much affected by the external temperature that a thermometer in contact with it is influenced considerably by the external atmosphere. Generally speaking, the best place for a thermometer is on the wall in a line with the fireplace near the corner of the room; or if that happens to be an outside wall, on a table standing near that corner.

There are, of course, two directions in which the temperature of the sick-room may have to be altered. During the greater part of the year in this country, except for a few hours in the middle of the day, the temperature indoors has to be artificially raised by various means; but in the height of summer here, and in warmer climates elsewhere, means have to be sought for the purpose of reducing the temperature. And by a judicious use of the various means of increasing and reducing the temperature of the atmosphere, the nurse has to obtain what is in many illnesses one of the most important of all aids to recovery—the maintenance of a uniform degree of temperature in the sick-room throughout the day and night. The temperature at which a sick-room should be kept varies very considerably with the character of the illness from which the patient may be suffering; and to some extent with the mode of treatment which may be prescribed by the medical attendant, who will usually let the nurse know his views and wishes in the matter. Speaking generally, in inflammatory conditions of the head a rather low temperature is desired, not exceeding 58° F. or 60° F., while in what are known as the essential fevers, such as scarlet fever and typhoid fever, a uniform temperature of from 60° to 64° F. is maintained. In cases of bronchial affections again, in children especially, a constant temperature of 70° F. is often required for many days and nights in succession. A rather higher temperature is required as a general rule when the atmosphere is moist than when it is dry, the moist air abstracting heat more rapidly from the patient, so that, other conditions remaining the same, one would increase the temperature on a foggy or rainy day, and decrease it a little on a dry, bright day. In cases where artificial moisture is introduced into the room for remedial purposes, such as in cases of croup, a very high temperature is usually required, even exceeding 70° F.

Of all the methods of raising the temperature of the sick-room, by far the best is by the free admission of the rays of the sun through the glass of the window, unsheltered by blinds or curtains. In addition to warming the atmosphere of the room, the rays of the sun have a purifying action on the air, and also exercise undoubtedly a beneficial influence on the progress of many diseases; although the exact manner in which this is effected is not ascertained. But the use of this agent is limited in two directions. In the first place, of course, the rays of the sun are not always to be obtained when wanted, and their effect diminishes the less directly they fall upon the window of the apartment; and in the second place many invalids are painfully sensitive to bright light, and are not able to bear with comfort exposure to the full glare of the sun. When, therefore, we are unable to avail ourselves of this means, the alternatives are generally either coal fires, gas fires, oil stoves, or gas jets.

Next in value to the rays of the sun must be placed the heat emanating from a coal fire, burning in an open grate with a chimney which draws well. I have pointed out in a previous article how much such a fire assists in the ventilation of the sick-room. Its one drawback lies in the difficulty of maintaining with it a uniform degree of temperature without disturbing the patient, more especially at night, by the frequent addition of coals, and by the occasional use of the poker. A satisfactory method of avoiding the former difficulty is found in rolling up previously the coals in small paper parcels, each sufficient for one addition, and placing these parcels as required quietly on the top of the fire. If this is done judiciously, and a good burning coal be used, it will be found that the use of the poker may be dispensed with, thus obviating the latter drawback.

Gas fires of various kinds are now much used in bedrooms, and have the advantages over coal fires of being always ready for use, and admitting of easy and accurate regulation of the amount of heat. But, equally with coal fires, they require a chimney which draws well, and in this respect are apt to mislead; as, if there is any down current in the chimney it is not visible smoke, as in coal fires, but invisible, although very impure, gas, which is sent back into the room. As a rule the presence of this will be indicated by a characteristic smell; and it may be laid down as a rule that all gas fires which produce an appreciable smell in the atmosphere are unsuitable for use in a sick-room. A defect of many gas fires is that they dry the atmosphere unduly. All air, as we have seen in a previous paper, contains a certain amount of watery vapour, and the warmer the air the more moisture it is able to retain, without depositing it in the form of drops of water or dew. When the watery vapour is in a comparatively small amount, the air is felt to be dry, and if the deficiency is great, this dryness may become unpleasant and irritating to the throat and lungs; when the watery vapour is in excess, the air is felt to be moist, and may be *even damp. All fires of* every kind decrease relatively the amount of moisture by increasing the temperature of the atmosphere; but gas fires more than others seem to dry the atmosphere so as to make it irritating, especially to invalids whose throats or lungs may be weakened. This excess of dryness can always be prevented by placing near the fire some water in a flat shallow plate or pan, so that a surface of some size is presented from which water can evaporate. An ordinary dinner plate, filled with water and placed just in front of the fire, is usually sufficient for this purpose; in cases where much moisture is required, a steam kettle (what is popularly known as a bronchitis kettle) may be placed on the fire itself and kept boiling. By using the steam kettle a certain amount of heat also is gained which would otherwise be lost in the chimney.

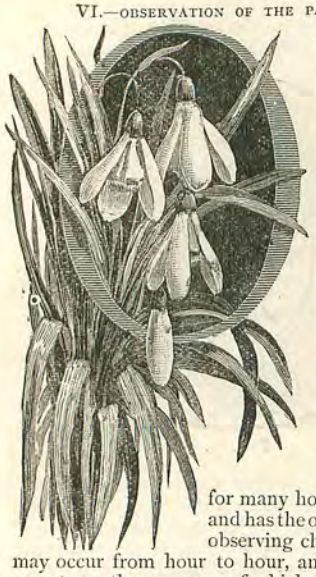
In rooms where there is no flue, or a badly acting one, if it is absolutely necessary to use such a room for an invalid, the temperature may be raised by the use of an oil stove. The products of the combustion of oil are not so injurious as those of gas or coal; and in a fairly ventilated room an oil stove will raise the temperature considerably, without rendering the air unpleasantly impure. Like gas fires, they dry the atmosphere very much, and necessitate the use of evaporating pans. They should only be used when better means of heating are not available.

It does not often happen in this country that much effort has to be made to reduce the temperature of the sick-room. Even in summer the temperature of the atmosphere in the shade rarely exceeds 80° F., and it is found that such a degree of heat is not as a rule injurious, or even very unpleasant, unless it persists for at least several days. The effect of abnormally high temperature is certainly not nearly so immediately apparent as the effect of exceptionally low temperature; and while a change of temperature from 70° to 60° in a case, for instance, of bronchitis may be followed by very serious results, in the same case probably nothing beyond a little discomfort would be experienced by an increase from 70° to 80°. Still it is desirable sometimes to reduce the temperature of the sick-room. The exclusion of the sun's rays by dark coloured blinds is efficient for this purpose, dark coloured materials being found to resist heat best; and where they exist, the use of external lattices and sunblinds is still more effective, as they prevent the rays falling upon the glass of the window, from which much heat is radiated when exposed to the sun. Another means of cooling the atmosphere is by permitting cold water to evaporate freely in the room from shallow dishes presenting large surfaces. The larger the surface the greater the evaporation, and the greater the consequent cooling, as water in the process of evaporation absorbs much heat from the surrounding air. For the same reason the use of cold sprays in the atmosphere is advantageous. Care must be taken that the air does not become too moist by the use of these agents. Another pleasant and efficacious method is the exposure in the room of blocks of ice, which in melting withdraw much heat from the atmosphere; while at the same time moisture is not added to the air to the same extent as it is by the evaporation of water, or by the use of the spray.

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

VI.—OBSERVATION OF THE PATIENT.



ONE of the most important duties of a nurse, and to an enthusiastic nurse one of the most interesting, is the continued intelligent observation of the patient. A nurse has the advantage over the medical attendant of being associated with the invalid for many hours at a time, and has the opportunity of observing changes which may occur from hour to hour, and temporary symptoms the presence of which might escape attention altogether if the patient were not under the care of a watchful and intelligent nurse. It is the duty of the nurse to report conscientiously to the doctor in attendance everything she may have noticed since his previous visit regarding the invalid; even small circumstances which may seem unimportant to the nurse may be of very great value in guiding a medical man to the correct diagnoses and treatment. Such a small matter apparently as occasional squinting in a child may direct the attention to important and serious disease of the brain; and the slight gestures of young children, and of patients who may be unconscious or delirious, may often throw considerable light upon symptoms otherwise obscure.

The amount and the character of the observation required in a nurse vary to some extent in accordance with the age and the intelligence of the invalid. Young children, of course, under all circumstances are unable to describe their own symptoms and sensations, so that all information has to be obtained from observation and examination; older people, on the other hand, unless enfeebled in mind or rendered more or less unconscious by disease, are able to call attention themselves to matters calling for notice, and to describe intelligently and locate accurately sensations of discomfort or pain. But even in the case of the latter there are many facts to be observed by the nurse to which a patient would not think of drawing attention; and such matters as the position and attitude of the invalid during rest and sleep, the expression of the face, or the presence or absence of pallor or flushing, may be important, and ought always to be noted by an observant and painstaking nurse. I propose in this article to give a somewhat general outline of the symptoms of which a nurse is specially expected to take cognisance, and the manner in which some of these observations are to be made and described.

In the first place, then, the nurse ought to be able to give an intelligent description of the general demeanour of the patient, whether he (or she) is irritable, restless, placid, wakeful, drowsy, comfortable or uncomfortable. The expression of the face should be noticed, and especial attention given to any temporary flushing or pallor, the exact position of the flushing being noted if it occurs only on one part of the face. It is not uncommon in inflammation of the lungs to see a circular spot of redness on one cheek and not on the other, the side usually corresponding to the lung which is inflamed. Flushing of the forehead, on the other hand, is more usually associated with diseases of the stomach; while wrinkling of the forehead, in children at least, is very often connected with diseases of the brain. Examples such as these illustrate the value and interest of apparently unimportant details. In children the nurse will sometimes observe that during sleep the eyelids remain half open, showing the white of the eye behind them; and this is generally an indication of considerable weakness. Mention has been made of the interest attached to occasional squinting; of course the value of such a symptom depends on the knowledge that it has never occurred in health.

The nurse during the daily ablutions of the invalid has an early opportunity of detecting the presence of any eruptions. Not a few diseases, both of childhood and adult life, are characterised or accompanied by unusual appearances of the skin; and the attention of the medical attendant should always be directed to these at once. Nurses who have had some experience of disease must guard against the temptation to diagnose the characters of such eruptions for themselves, and to omit mentioning them on the plea that they are quite unimportant; every departure from the normal character of the skin may be important; and in some cases the slighter the eruption is the more valuable may be the significance of its presence.

Another class of symptoms which the nurse has to observe is that connected with the function of respiration or breathing. The rapidity or slowness of the breathing, its regularity or the reverse, any sounds associated with it, such as snoring, wheezing, or coughing; the particular character of the cough, if there is any, whether short, or in long fits, accompanied or not by whoop or expectoration, have all to be noted. The frequency of the breathing, by which is meant the number of breaths taken in a minute, is of considerable importance in many serious illnesses, and ought always to be counted carefully with a watch furnished with a seconds' hand. It is best to count them without allowing the invalid to know that it is being done, as the consciousness of being observed occasionally disturbs the rhythm of the breathing. The movement of the chest can quite easily be observed without any disturbance of the patient, and, standing or sitting beside him with a watch in the hand, the number of respirations can be counted without difficulty for one or two minutes. It is generally best to count two minutes successively, comparing the two, so as to obtain as accurate a result as possible. In some cases where the movement is not very obvious and the breathing very shallow, a hand laid gently on the chest will appreciate the movement better than the eye. Not unfrequently the breathing is so audible that the number of breaths in a minute can be counted simply by listening attentively. In other cases, and more especially with children, the act of breathing is accompanied by slight movements of the nostrils, by which alone the rapidity can be estimated.

The rapidity of breathing is subject to greater variation in children than in adults. Normally in a young child the respirations number from 20 to 25 per minute; in disease as many as 80 per minute may sometimes be counted. In adults the usual rate in health is from 16 to 18 respirations a minute, and in illness the rate may rise to 40 or 45 a minute; or may fall, especially in some forms of brain disease, to 8 or 10 per minute. In all cases where daily observation of the rate of respiration is required, the nurse should make a point of noting the rapidity in writing at the time she counts it; such facts should never be simply retained in the memory. It is customary now with many doctors to supply their nurses with papers specially prepared for the notification of the rate of respiration, along with the observations of the pulse and the temperature, which we are about to describe.

Feeling the pulse has been for many centuries the conventional method by which physicians are supposed to gain an insight into the general condition of their patient's health. It is certainly the oldest of all the physical methods of examining an invalid, and was employed long before the researches of Harvey had made clear the explanation of its occurrence, and its primary cause in the rhythmical beating of the heart. Most of my readers will be aware that the circulation of the blood is carried through the body by a number of blood-vessels which start in one large artery from the left side of the heart. This large artery, by sub-division and by sending off what are called branches from it, which gradually become smaller the further they are from the heart, supplies the whole of the body with blood, which circulates from the end of the small arteries through minute channels, called capillaries, into small veins; and the veins joining with each other and growing larger as they approach the heart, enter the right side reduced to two in number.

The heart, the arteries, and the veins are always full of blood, and this is kept in movement, or, as it is called, in circulation, by the pump-like action of the heart, which contracts and expands alternately, in its contraction sending the blood into the artery, and in its expansion receiving it from the veins. To prevent the blood going the wrong way when the heart contracts, there are valves in it which only open in one direction, exactly similar in action to the valves of a pump. The contraction of the heart sending more blood into arteries already full causes a temporary and limited dilatation of the arteries, which run along them like a wave from the heart to the extremities, where they join the capillaries; and it is to this temporary dilatation and wave-movement that the name pulse is given. My readers will perhaps have already associated the term pulse with a small part of the wrist where it is usual to observe it; but they will learn from the description given that there is really a pulse in every artery throughout the whole body. In explaining the origin of it, I have only described so much of the mechanism of the heart as is necessary to render the pulse intelligible; there are other parts connected with the circulation through the lungs which I think it is better to omit, as not having an immediate bearing on the subject.

Although, however, a pulse exists in every artery throughout the body, it is only in certain places and under certain conditions that it can be conveniently felt and counted. The arteries themselves are soft, and when lying among soft tissues, such as the muscles of the body, it is very difficult to distinguish the pulsation of even an artery of moderate size; so that it is found necessary generally to feel the pulse at some part when an artery passes directly over a bony surface, against which it can be pressed. This condition is found most conveniently on the outside of the front surface of the wrist, where an artery of fair size lies close to the skin upon the flattened surface of one of the bones of the forearm. In most people it is exactly the same both in the right and left wrist; but sometimes the artery will vary a little on one side; and in others, occasionally no artery will be found there at all, and then the pulse must be felt somewhere else.

Occasionally, when it cannot be felt on the outside of the wrist, it may be observed satisfactorily on the inside. Another not inconvenient position where the pulse can usually be counted well is on either temple; in people over middle age the pulsation there is often very apparent to the eye as well as appreciable by the sense of touch. It can be counted also by feeling the beating of the heart against the walls of the chest.

Like the breathing, the frequency of pulse is described by the number of beats or successive impulses occurring in one minute. To be able to judge of the regularity of the beat, it is often desirable to count it for four quarters of a minute successively, noting whether every quarter gives the same number of beats, and then adding the four together to represent the number in one minute. This number, even in health, varies very greatly in different people and with different ages. In babies it sometimes is as much as 160 in a minute, and may be so low as 80 in a minute; while in grown up people one sometimes finds it normally as rapid as 100 in a minute, and as slow as 35 or 40.

These are, however, exceptional extremes, and the average adult's pulse in health is about 75 in men and 80 in women.

In disease the limits are wider still. In extreme illness a pulse may be felt as rapid as 180 in a minute, beyond which, frequently, it becomes very difficult to count; and it may fall as low as 15 per minute. The pulse should always be counted and recorded by a nurse with considerable care; and she should be on her guard against being misled by accidental and unimportant variations. Excitement in people of nervous temperament will often increase temporarily the rapidity of the pulse; the effect of exertion, also, is very marked in causing similar increase; while in invalids suffering from what is known as palpitation of the heart, the character and frequency of the pulse alter entirely during the attack, and are quite valueless as regards any information about the usual state of the patient.

But a nurse of some experience and commonsense will soon learn to recognise and allow for these accidental and temporary conditions.

The most valuable of all the observations which an intelligent nurse is able to record for the information of the physician, is the variation of the temperature of the patient. For this purpose every nurse should be provided with a thermometer of rather peculiar construction, called a clinical thermometer. While ordinary thermometers, such as we described in the article referring to the temperature of the sick-room, rise with an increasing temperature and fall with a decreasing one, the clinical thermometers are so constructed that, while they rise as the temperature increases, they remain stationary when the temperature falls. They thus indicate the highest temperature to which they have been exposed, and remain at that point until, by shaking, or by striking the hand holding them against the other hand, they have been replaced to a lower index.

The temperature of the body is remarkably constant, in health varying scarcely more than one degree Fahrenheit, to whatever vicissitude of external heat or cold it may be exposed. The position in which the thermometer is most frequently placed for the purpose of registering the temperature is in the armpit, the thermometer being held between the arm and the side, and in this position the temperature of health in all human beings old or young is from 98° F. to 99° F.; generally the lower number in the morning and the higher in the afternoon. Sometimes it is taken in the mouth, the thermometer being held between the lips like a cigarette; and in that position the temperature is about one degree higher, varying from 99° F. to 100° F. In ordinary cases of illness the temperature is rarely found higher than 106° F. or lower than 96° F.; but in some extreme and exceptional forms of disease temperatures as high as 115° F. have been registered, and as low as 95° F. These are apparently the extreme limits compatible with the existence of life. Clinical thermometers are accordingly made so as to register only this range, the lowest point being usually 95° F. and the highest 110° F. to 115° F. For convenience of use and portability they are generally made without any background of wood or metal, the degrees being marked directly on the glass tubes containing the mercury which indicates the temperature. They vary in length from 3 to 8 or 10 inches, and in price from about three shillings and sixpence upwards. Very good ones can be obtained for about five shillings, in boxwood or metal cases, from which they are removed when in use.

Before "taking" the temperature of the patient, as it is technically called, the nurse must ascertain that the thermometer has been made ready for use, by having had the mercury shaken downwards until the index is not higher than 95° F.

The end of the thermometer which contains the mercury, and which is known as the "bulb," is then placed under the arm or in the mouth of the patient, and left there for four or five minutes. Thermometers vary in sensitiveness, but most thermometers will register the temperature accurately in five minutes when placed in the arm-pit, and in rather shorter time when in the mouth. The thermometer is then removed, and the height to which the mercury has risen read on the scale imprinted on the thermometer. Almost all clinical thermometers have each degree divided into five sub-divisions, to admit of greater accuracy; and by distinguishing the half of each of these sub-divisions, one is enabled to read the height of the temperature to the exactness of one-tenth of a degree Fahrenheit. In recording the temperature with this amount of accuracy, the decimal notation is used; for example, a temperature of ninety-eight and three-tenths degrees is written 98·3° F., and ninety-eight and a half degrees is written 98·5° F. The height of the temperature, as well as the hour at which it is taken, should always be recorded in writing at once.

THE GIRLS' OWN CONVALESCENT HOME.

THE Editor is most thankful to those whose answers to his appeal have been given with such promptitude and cheerfulness.

In order, however, that his project may become a reality, and the money already given begin to bear fruit, he again calls upon all who desire to join in this good work to send in their subscriptions at once; little or much, no time should be lost.

In his desire to come to the aid of the overworked and weary among his readers, the Editor feels it his bounden duty not to commence the Home until sufficient money has been subscribed to place it upon a firm basis, and to ensure its success in the time to come: and the very least for such a purpose will be a thousand pounds.

The Girls' Own Convalescent Home must be one of which the girls themselves may be proud—one which will do good work now and in the days to come, when those who founded it shall have passed away.

The Editor believes that he has the sympathy and goodwill of all his readers in the work on which he has set his heart, and that their lack of promptitude in sending help arises from the thought that any time will do. This is a mistake. Money given now will be doubly valuable, as it will enable him to commence the work at once.

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(*See page* 426.)

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

VII.—PERSONAL ATTENTIONS TO THE INVALID.

THE personal attentions to the invalid which attach to the position of a nurse may be conveniently arranged under three heads; first, those that are hygienic, or directed towards the general health and well-being of the patient; second, those that are curative, and intended to have a remedial action; and third, those that are palliative, and mainly designed to add to the comfort of the patient.

We have already, in previous articles, dealt with the general hygiene of the sick-room, in which is included the temperature, the ventilation, and the sanitation. Of that personal to the invalid the most important details are those of food, clothing, and cleanliness. The question of food, including both what should be eaten and what should be taken to drink, I propose to leave over to a future article.

Patients when confined to bed are generally clothed in either linen, cotton, flannel, merino, or silk. In whatever material they may be clad, it is always necessary that the dress should be changed with sufficient frequency to prevent it becoming disagreeably charged with the secretions of the skin. We have already explained that these secretions are partly in the form of vapour and partly fluid. Both these forms of secretion are absorbed by the dress, and produce in time a disagreeable and injurious odour. They are absorbed more rapidly and in greater amount by porous materials, such as merino and silk, than by articles of close fibre, such as linen and cotton. If the dress after removal from the patient is suspended in a current of fresh air, or before a fire, the vaporous secretion will be driven off, but the fluid secretion will remain, and must be removed by washing. To allow of the frequent removal of this gaseous impurity, it is always desirable that invalids when confined entirely to bed should have two separate dresses, one for the day and one for the night, and that each should be aired well before being put on. In this way the prejudicial influence of a dress whose pores are closed with impure secretions will be avoided. As the secretions of the skin consist largely of water, it must always be borne in mind that garments which have been removed require to be dried well, as well as ventilated thoroughly. They should always be aired at a fire before being again placed on the patient.

The material in which it is best to dress an invalid must vary to some extent with the age, with the disease from which the patient may be suffering, and with the season of the year. From whatever illness young children may be suffering, it is always best to dress them in flannel, which may be thin or thick, according to circumstances. The skin of children is exceedingly sensitive to cold, which, by arresting temporarily the secretions and deranging the circulation, may cause serious complications of illness; so that the material which is most protective from cold is the most eligible. Children are very apt to be restless during illness, and to become accidentally uncovered; a satisfactory method to prevent this is to make their dress about a foot longer than themselves, and to tie a string round the feet, so as to close it as if it were a sack.

In the case of adults, although merino, silk, or flannel is always the more desirable material of dress, cotton or linen may be allowed when the disease is not one likely to be injuriously affected by changes of temperature of the skin, and when the secretion of the skin is not materially increased. The two objects of clothing are to maintain a sufficient degree of heat in the skin, and to absorb and transmit the cutaneous secretion; and the material which best fulfils both these ends is the most eligible. If the maintenance of uniform temperature alone were considered, a material of very close fibre, and a bad conductor of heat, would be best, such as a very closely woven flannel; but when the latter object is also kept in view, a more porous fabric allows of better transmission of cutaneous vapour; while if the pores are very minute, as in merino or silk gauze, a very uniform temperature is easily maintained.

In all cases of illness where no special reason exists to the contrary, the invalid should be sponged completely twice a day, morning and evening. This can be most conveniently done at the time when the clothing is changed; and great care should be taken that during the process the patient is not unnecessarily exposed to cold. Each part of the body should be taken successively, carefully washed with soap and warm water, and then dried before the succeeding part is commenced. In a few cases complete sponging once a day may suffice, especially where the patient is rather weak, and easily fatigued; but a good nurse is usually able to carry out the washing in such a way as to cause almost no fatigue to the invalid; and very often it will be found that sponging in the evening as well as the morning is the most efficacious way of ensuring quiet sleep during the night. Great care must always be taken that the patient is most thoroughly dried after the sponging; and the towels used for drying should always be slightly warmed. This care is more especially necessary in cases where any tendency to what is known as bed-sores exists; the slightest neglect in such cases may result in a sore which may give the patient very great discomfort, and reflect much discredit on the nurse. To attain a greater degree of dryness, especially with children whose skins are very tender, it is usual after drying carefully with a warm soft towel, to dust the skin with some dry absorbent powder such as powdered starch or fuller's earth. After washing, the hair ought to be brushed and dressed, and the invalid generally made as "tidy" as possible. A general appearance of neatness and comfort in the patient will always reflect credit on the nurse.

Of the various curative measures which the nurse in the course of her duties has to carry out, among the most frequent and important are the external application of heat and cold in various forms. Heat is applied externally to invalids for various objects. Applied in the mildest form, it may be used simply for the purpose of maintaining or restoring the natural temperature of any part of the body. For this purpose it is usual to make use of flannels heated at the fire, or rolled round a hot brick, or round a bottle filled with warm water. Sometimes it will be found more convenient to use small bags filled with sand or with salt, which has been heated in an oven previously to being poured into the bags. These bags can be more closely adjusted to the surface of the skin than bottles or bricks covered with flannel. When heat in any of these forms is applied to patients who are more or less unconscious, or to very young children, great care must be taken that the amount of heat is not sufficient to do any injury. Even good nurses sometimes make mistakes in this way, and I have seen occasionally large ulcers result from applying bricks too much heated to the legs of an unconscious patient. The nurse should always test the temperature with her cheek or with the back of her hand, keeping in mind that the heat takes a little time to penetrate through a few thick folds of flannel. Where there is any doubt the temperature may be exactly estimated with a clinical thermometer placed within the outside fold of flannel for a few minutes; any temperature over 110° F is unsafe, and for a child it should not exceed 100° F.

A second object of the application of heat is to afford relief from pain, by relaxing the blood vessels of the skin, and facilitating consequently the circulation of the blood through them. It is found that when heat is applied to any part of the body, the minute blood-vessels, including the smaller arteries, the smaller veins, and the capillaries which connect these become dilated, and accordingly allow a greater quantity of blood to pass through them, or rather allow the same quantity to pass more quickly. In the process of inflammation there is a tendency of the blood to stagnate in its passage through the small vessels, and the application of heat obviates this tendency, and thus contributes both to recovery and to relief from inflammatory pain.

Heat applied either in a dry or moist form will effect this purpose more or less; but when applied moist an additional result is gained by what is known as transudation of fluid from the blood-vessels. When moisture is applied to the neighbourhood of capillary blood-vessels, some of the fluid of the blood exudes through the microscopically minute pores in their walls, and thus emptying them partially, tends still further to facilitate the flow of blood and to prevent the stagnation which is associated with the process of inflammation. It is probable, also, that the application of heat has a direct sedative effect upon the nerves of the skin, in addition to the indirect effect it exercises upon them through its influence on the circulation. Moist heat intended for this purpose is usually applied by means of flannels which have been immersed in hot water and wrung partially dry, or by poultices of various kinds. If flannel is to be used, a piece large enough to be folded three or four times on itself is taken. After being folded to the size required, it is laid upon a strong towel which has been placed across an empty basin, and boiling water is poured over it until the flannel is saturated, any surplus water running off through the towel into the basin beneath it. Each end of the towel is then taken hold of and twisted so that the flannel is wrung out within the twists of the towel. The towel is then untwisted, and the flannel taken out and applied to the invalid, after the nurse has satisfied herself that it is of proper temperature. The flannel is immediately covered with a piece of waterproof or oiled silk, so as to prevent evaporation and consequent rapid cooling, and to protect the dress of the patient from moisture. When applied efficiently in this manner, flannel often affords great comfort and is preferred by many invalids to poultices, on account of its being cleaner as well as lighter in weight. On the other hand, it does not retain its heat so long, and requires, consequently, to be more frequently

replaced. Speaking generally, moist applications of warm flannel to be thoroughly effective should be renewed every half hour. They ought always to be prepared in the immediate vicinity of the patient, otherwise they are apt to cool rapidly in being carried to them.

The more common method of applying heat with moisture is by means of poultices of different materials. Bread, linseed meal, oatmeal, bran, starch, and rice are all used under different circumstances; by far the most common material, however, used in England is linseed meal, and we shall confine our description to poultices made of this material alone, and in combination with mustard.

To make an ordinary linseed meal poultice well it should be made quickly, and to enable one to do this all the materials must be ready before the actual process of making commences. To begin with, there must be something as a basis on which the poultice is to be spread. In home nursing the material most commonly made use of is old linen or cotton, a piece of which is cut rather larger than the size of the poultice it is intended to receive. Thick brown paper does fairly well for the purpose, but the edges are apt to be felt slightly rough by the patient. In some hospitals ordinary tow is used. A bowl or basin, proportioned in size to the poultice to be made, is also necessary, as well as a wooden or metal spoon for stirring the poultice well. A little hot water in another basin or cup is also desirable, and a kettle filled with absolutely boiling water must be available. Everything being now prepared, a certain quantity of boiling water is poured into the basin, the quantity depending upon the size of poultice required, and being learned only by experience. The nurse then takes the spoon in one hand, and some linseed meal in the other, and lets the meal fall rapidly into the water while she stirs continually with the spoon. Enough meal is added to make the poultice of fair consistency, and the mixing should be completed when the whole of the meal has been added. The mixture thus made is then spread on the linen or cotton prepared for it, and the surface smoothed over by the spoon dipped into the hot water in the other basin or cup. The edges of the linen or cotton are then doubled over so as to cover the edges of the poultice, which is now ready for use. Nurses differ to some extent in the thickness with which they spread the poultice; and one or two considerations have to be kept in view in deciding the matter. The more thickly it is spread the longer it will retain its warmth; but its weight will of course be greater; and if the poultice is at all a large one, and placed on a part where the weight will be felt, as in the front of the chest, the weight may be of some importance. In children especially, if there exists any difficulty of breathing, the pressure of a weighty poultice on the chest may do material injury. As a general rule, about half an inch will be found a convenient thickness in ordinary poultices used for adults; in those of exceptional size, or when to be used for children, a thickness of a quarter of an inch will be sufficient. Linseed poultices should always be applied without anything intervening between the linseed and the skin; and the two best tests of a well-made linseed poultice are that it can be rolled up on itself and unrolled again without any damage to its surface, and that it can be applied to the skin and afterwards removed without any of the poultice remaining adherent to the skin. Sometimes, when the linseed meal is rather dry, a little olive or linseed oil will require to be added to the poultice after it has been thoroughly mixed, in order to attain the degree of perfection indicated.

(*To be continued.*)

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that, borne in a penitent, loving spirit, would have softened and exalted her, served but to harden her the more. Mr. and Mrs. Borrodale died, the brother and sister married, and Charlotte was left comparatively alone; and when Garden Cottage, with an income of two hundred a year, was left her by the old man she had never seen, she at once made up her mind to live at Little Croughton.

One June morning Miss Borrodale put on her garden hat and gloves, and basket in hand went out to attend to her flowers. She could hear Janet in eager consultation with the gardener, who was at work in the orchard, and presently the handmaiden came up to her excitedly, evidently full of news. Janet never would be rebuffed by her mistress's unsympathetic ways, and the latter was not above relishing the little bits of good-natured gossip her servant brought to her.

"Smale's just been telling me, ma'am," said Janet breathlessly, "that someone has took The Mousetrap at last."

"Does Smale know who it is?" Miss Borrodale asked, quite as interested as her maid in the news. The Mousetrap was a tiny five-roomed cottage that had been so named by a former facetious owner; it stood on the opposite side of the way, and could be seen from Garden Cottage. It had been standing empty for a long time, presenting a doleful appearance with its shuttered windows and neglected garden.

"Well, ma'am," Janet answered cautiously, "Smale don't know for certain, but he's heard as it's a gentleman who's lost his wife, and is coming here to be quiet."

Janet had not heard much more, and soon went indoors while her mistress slowly made her way to where the gardener was at work. She made a few remarks as to what he was doing, and then asked in a casual way what he knew of the new-comers to The Mousetrap. Smale was always glad of an excuse for stopping work, and he leaned on his spade while he answered. Miss Borrodale found he did not know much more than Janet had told her, and she turned away rather disappointed, but looked back to ask if he knew whether the widower had any children.

"Not as I heard tell of," the man answered slowly, rubbing some earth off his horny hands. "Mrs. Dace at the shop she says he ain't only been married about six months, and his wife was took off quite sudden when they was in foreign parts, but Mrs. Dace says a deal she ain't sure of," he added virtuously, heaving a sigh as he resumed his work.

Miss Borrodale took a good deal of unexpressed interest in her neighbours' affairs, and she made it her business to walk past The Mousetrap that afternoon. The little house bore signs of having been taken, the windows and door were open, and the village factotum was busy in the passage; but Miss Borrodale was no favourite of his, and he would not see her pause at the garden gate with an evident wish to question him, so she passed on disappointed.

Four days after The Mousetrap had its inmates, and Smale was wrong, for the widower, a tall, sad-looking young man, brought a servant and three little black-clothed girls, the eldest of whom could not have been more than seven years old. The two elder children were at church with their father on Sunday, and were quite objects of interest. Perhaps Little Croughton had got its romance at last; certainly the little ones, whose fairness was enhanced by the mourning garb, sitting so close to their young father with his arms thrown round them while they looked at the preacher with sweet grave eyes, made a very beautiful though sad picture.

Miss Borrodale was not fond of children, and she felt much less interest in Mr. Paton—that was the widower's name—since she heard of his family, though she still listened to all the details Janet could glean of the new neighbours. Janet was intensely fond of children, and it was a great pleasure to her that the little ones lived so near, and she eagerly looked out for opportunities of seeing them. Once when Miss Borrodale was out she called them to the gate as they were passing and gave them a few ripe strawberries, which were shyly but graciously accepted.

The great Newfoundland dog, Victor, would have made friends with them, but his size and good-natured gambols terrified them, and they passed Garden Cottage on the opposite side, looking out fearfully for the huge animal. The children were often out alone, pathetic little figures enough with that look of mother-want about them that is so difficult to describe.

One morning Miss Borrodale, after working for some time in the garden, went indoors to rest and take a little refreshment. She was just cutting a slice of cake in the dining-room, when a loud cry of distress startled her, and she dropped the knife; the cries continued, and she hastened to the front door, from whence the cause of the disturbance was at once apparent. Two of the little girls from The Mousetrap had been intercepted by Victor, who pranced round them with every symptom of delight. The little things were pressed as far as possible into the hedge, dreadfully frightened at the huge creature who was so pleased to see them. Janet came to the rescue before her mistress, and sent Victor back to his own domains, and then tried to soothe the sobbing children. The elder was soon pacified, but the younger one clung to Janet's skirts crying bitterly.

"Bring them in," said Miss Borrodale, who had been watching the little scene; "bring them in, and we will give them some cake."

The little girls came very willingly with Janet; the sobs had ceased at the sound of the strange voice, and once inside the dining-room they looked about interestedly.

"You can leave them here, Janet," Miss Borrodale said. "I will take care of them for a little while."

"Yes, ma'am; but won't their folks wonder where they are?" said Janet, still holding the little hands.

The elder child spoke up quietly, "No, Mercy said we might go and play in Long Meadow; she doesn't expect us back yet."

"And you would like to stay here a bit?" Miss Borrodale asked, a little eagerly.

"Yes, please; and I am sure Lucy would. This is a nice house."

"There then, let me undo your bonnets," and Miss Borrodale's unaccustomed fingers pulled at the strings of Lucy's large bonnet. Two pretty little heads showed when the coverings were removed; short, fair, curly hair clustered round broad, white, blue-veined foreheads. Both children had beautiful eyes—Lucy's that wonderful shaded dark blue that looks at times violet or grey; the elder child's were the rich blue of summer skies. They soon became very friendly over the cake and fruit with which Miss Borrodale supplied them. Their names, they told her, were Milly and Lucy, their little sister was called Chrissie, and Mercy was the servant.

"Does Mercy take care of you?" Miss Borrodale asked.

"Father takes care of us all," Milly answered, opening her blue eyes widely at such a question, "and I take care of the others. Mother told me to."

"Mother's gone away; she used to take care of us," Lucy said. "She coughed, and her breath hurt her, and one day our Saviour took her pain away, and took her to live with Him; but we do want her so sometimes, only father says she loves us and knows all we're doing, so we must be good 'cause she's gone away."

The child was evidently repeating a lesson that had been earnestly impressed upon them, and she looked grave for a few moments, then her mood changed and she got up. "Tell me a 'tory please," she said, trying to climb on Miss Borrodale's lap.

This was not an easy request to comply with, and Miss Borrodale tried to turn the little one's attention to something else; but Lucy had a strong will of her own and was not to be put off thus. She repeated her "Tell me a 'tory, please," with the calm confidence of childhood, and Mildred shook the crumbs carefully from her frock and came to her sister's side expectantly.

(To be continued.)

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

VIII.—PERSONAL ATTENTIONS TO THE INVALID.—*(Continued.)*

It was mentioned incidentally in a previous paper that when any part of the body is inflamed, the bloodvessels become enlarged and overfilled, so that a greater amount of blood is present in the part when inflamed than when healthy. This fact is taken advantage of in the treatment of disease, and more especially in the treatment of inflammation and pain. If the quantity of blood in the whole of the body remains the same, it is obvious that if one part has more than its own share at any particular moment, some other part must have less than its share; and as a matter of fact it is found that to some extent, at least, the excess of blood present in any inflamed part is derived from other tissues in the same part of the body, or in the immediate neighbourhood of that part. Proceeding on this knowledge, it is customary to attempt to reduce the amount of inflammation in internal organs to which direct applications cannot be made, by setting up artificially some degree of inflammation in a neighbouring external part, in the expectation that the inflammation of the external part, which is more immediately under control and observation, may serve to draw away some of the excess of blood in the internal inflamed part, and thus diminish there the intensity of the inflammatory process. This plan of treatment is technically known as treatment by counter-irritation.

The amount of inflammation which it is desirable to excite on the external surface will vary with the extent and character of the internal inflammation it is intended to affect and remedy; and to some degree also with what the patient is able to bear. As a general rule, it may be said that the greater the extent of skin over which it is intended to apply the counter-irritant, that is, to set up some inflammation, the less the amount of inflammation set up must be. For example, in

many cases of bronchitis it is usual to keep up a very slight amount of inflammation by means of mild mustard poultices over the skin of the whole of the chest and back, a very large surface of skin; but no sensible medical man would ever think of applying a blister over such a large surface at one time. If in such a case blistering was considered desirable, a small blister would be applied to one part of the chest; and only when that part had partially recovered would another small one be applied to a different part.

Counter-irritation may be employed either alone, or, as it more commonly is used, in combination with warmth and moisture. Taking the latter method first, as being the milder of the two, the usual means of combining counter-irritation with the soothing and curative effects of warmth and moisture are either by the application of poultices to which some irritant, such as mustard or red pepper, has been added; or by the use of warm moist flannels, on which have been sprinkled turpentine, oil of mustard, or some similar irritating fluid.

Mustard poultices, as they are usually named, are generally made of either linseed-meal or oatmeal, combined with mustard in varying proportions. A common proportion is one-third of mustard to two-thirds of linseed, and a poultice of this strength when made will act as a very efficient counter-irritant, while an adult patient will be able to bear its application for one to two hours at a time. Occasionally they are made of equal quantities of mustard and linseed meal; but few invalids would bear a poultice so made for more than half an hour to an hour. Children's skin is much more sensitive to the irritation of mustard than the skin of adults; and poultices intended for them should never exceed the strength of one-fourth part of mustard to three-fourths of linseed-meal. The most common way of making them is to mix the mustard and linseed-meal first, and then to add the boiling water with constant stirring until the poultice arrives at the proper consistency. This is not, however, the best way, as mustard does not readily yield the essential oil, on which its strength depends, to boiling water. A better method is to mix the mustard well first with cold water, then add the boiling water, and proceed to make the poultice by adding the linseed-meal as was described in making linseed poultices. Or, in accordance with the directions of the British Pharmacopœia, the poultice may be made first as a linseed poultice, and the mustard then added and mixed well with much stirring. The central fact to be kept in view is, that the strength of mustard has to be developed by intimate mixture with water; and that the greater part of the effect of it is lost unless care be taken to extract this. The poultice should be applied like a linseed poultice, directly to the skin of the invalid.

The preparation of warm moist flannels has already been described, and it only remains to give the caution not to allow them to become cool while adding the turpentine or other irritant to the surface. As regards the amount of turpentine to be added, it will generally be found that one to two teaspoonfuls sprinkled carefully over a square foot of flannel will produce decided redness of the skin, and some feeling of heat and irritation. Care must be taken that the turpentine is distributed fairly equally over every part of the surface. Flannels prepared in this way are known as turpentine stupes. They may be applied for some hours in succession, as they do not produce so much irritation as mustard poultices.

Simple counter-irritation is generally produced by: (1st) Friction with some stimulating liniment, such as ammonia or turpentine liniment; (2nd) the application of irritant plasters, such as those made of mustard or capsicum; (3rd) the application of blisters of cantharides or ammonia. These are arranged in the order of their severity, and occasionally even more severe means of counter-irritation are adopted, such as the application of cautery; but remedies of this potency are not usually left in the hands of a nurse, so that it is not necessary for her to be conversant with the method of their application.

Some little skill and practice is required before a nurse can make effective use of liniments which are intended to be applied by friction. Much the most effective means of using them is by the uncovered hand. A little of the liniment is poured into the palm of the hand very slightly hollowed, and being conveyed to the part to which it is to be applied, is rubbed into the skin by gentle but firm and uniform friction. This friction may either be in a circular direction or upwards and downwards, according to the part where the application is made; in some cases only friction in one direction is permissible, and then the hand must be lifted from the skin to return to the starting point. If there is any special direction in which the liniment should be rubbed in, a careful doctor will always remember to indicate to the nurse his wishes. The amount of liniment to be rubbed in, and the length of time which is to be devoted to the rubbing, must vary so much with individual cases that no general rule can be given. As it is usually a pleasant and soothing process to the patient, he is not likely to complain of some time being occupied by it; but unless a nurse is much accustomed to it, she will find the fatigue considerable after some minutes.

Mustard plasters are prepared by spreading on some base, such as brown paper or thick linen or cotton, a thin coat of mustard, which has been mixed with water exactly as mustard is prepared usually for use as a condiment. Care must be taken to elicit its strength by thorough mixing, and it should be spread uniformly to the size required, with the thickness of about one-tenth of an inch. The edges of the base should then be turned over, to prevent the escape of any mustard, and the surface should be covered with thin linen (such as a piece of an old handkerchief) or with tissue paper, before the plaster is applied to the skin. In the case of adults, such a plaster may be applied for half an hour or even more; in the case of children a quarter of an hour will usually be sufficient to obtain the desired result.

The methods which we have already described as available for the production of a counter-irritating inflammation of the skin, have in common the effect of reddening its surface and of producing slight swelling and tenderness, with considerable increased vascularity (that is, fulness of blood) of its deeper layers. When a greater degree of counter-irritation is required, recourse is had to what is called blistering, which consists of setting up an amount of inflammation in the skin sufficient to cause the outer and inner layers of the skin to be separated from each other by the exudation of a watery fluid called serum, exactly as occurs when the skin is scalded by boiling water. The serum is derived from the blood circulating in the vessels of the skin upon which the blistering agent has been applied; and its presence between the two layers of skin serves to protect the inner and sensitive layer from any injury to which otherwise it might be exposed from the proximity of the blistering agent. This agent in medical practice is almost invariably some preparation of cantharides, applied usually in the form of a plaster, but sometimes employed in solution as a liniment. When the plaster of cantharides is used, it is generally spread by the chemist to the size required, on a piece of ordinary adhesive plaster, which is cut rather larger than the blister is desired to be; if it is then slightly warmed and applied to the skin, the adhesive plaster round the cantharides causes it to adhere. Care should be taken that the cantharides plaster is actually *in contact with* the skin at every point on its surface, otherwise the blister will not cover the whole surface required. If there is no adhesive plaster round the cantharides, it may be retained in contact with the skin by placing two strips of ordinary adhesive plaster over it, or by applying a bandage gently with a little cotton wool immediately over the cantharides plaster. Care must be taken not to bandage too tightly over it, as room must be allowed for the blister to rise. A cantharides plaster applied in this way will generally produce a satisfactory blister in from six to twelve hours; and as it exhausts its power when it has separated the outer from the inner layer of skin, there is no objection to leaving it in contact with the skin for some little time after the blister is produced. It is usual to apply them at night, and leave them on until morning, as many invalids have no difficulty in sleeping notwithstanding the discomfort they produce; while during the day the irritation they cause is annoying and unpleasant.

When for any reason it is desired to blister rather more rapidly, cantharides in solution may be painted freely over the surface on which the blister is desired, the painting being repeated if necessary two or three times in an hour, or until the blister rises satisfactorily. For the purpose of preventing the blistering fluid from affecting any part of the skin except the part desired, a little olive oil is usually applied round the edge of the proposed blister before the fluid is employed.

When the blister has risen properly, that is, when the outer layer of skin is elevated by a thick layer of serum, the blistering plaster must be removed with care not to tear the skin or irritate the edges of the blister. If it is desired that the blister should heal as quickly as possible, the fluid contained in it must be allowed to escape by puncturing in a few places the outer skin with a scissors, and pressing gently with a sponge or a piece of soft linen or lint. There is no need to empty it completely; but the openings should be sufficiently large to allow of the free exit of any serum which may not escape at once, or which is secreted while the blister is undergoing the process of repair. The surface is then covered with a piece of lint cut to the size required, and spread with some simple soothing ointment, such as that made of oxide of zinc or of spermaceti. This dressing should be changed at least twice a day, and at first even oftener, as the discharge of serum, which continues during the healing of the blister, saturates unpleasantly the lint covering it, which if left unchanged becomes stiff and irritating. In the case of small blisters where the discharge is inconsiderable, a very convenient and pleasant method of treatment is to simply cover them with some cotton wool, which adheres to their surface, and under which they heal rapidly without any further dressing. When this method is employed, the cotton wool ought to be left undisturbed until the skin is perfectly healed.

Occasionally it is desired to increase and continue the effect of the blister by maintaining it for some little time in the condition of an ulcerated surface. To this end, the whole of the outer layer of skin covering the blister must be carefully removed by cutting round its edges with a scissors; and to the raw surface thus left exposed some irritating ointment, such as sabine or cantharides ointment, must be applied, spread on lint, and renewed once or twice a day. Under this treatment the surface remains as an ulcerating sore, discharging rather thick yellow matter in place of the white serum which originally filled the blister. When desired, such a sore can usually be healed rapidly by the application of some simple unirritating dressing.

"Why have you been so long coming to see me?" asked Mrs. Aspenel, when they were seated.

"I didn't think you really wanted me," returned truthful Fan. "You are a grand lady and I am a born gipsy, in spite of my father and Mr. Aspenel being brothers. And you never spoke to me when we used to meet, so I feared you disliked me very much. You always turned your eyes away when I looked at you in church, and I used to think how different we were, and that you hated all the gipsies as much as Mr. Aspenel did."

"You were mistaken. I am interested in the race; and I only turned my eyes away because yours were so black and piercing that they seemed to wish to read my very thoughts."

"How funny!" exclaimed Fan. "I often wondered what you were thinking of, and never could find out. I knew you weren't thinking of the prayers."

Mrs. Aspenel smiled, and secretly wished she had been more cordial with this strange girl; but she had neither been nor felt cordial with anyone until trouble brought her to her senses. She soon grew interested in Fan, as everyone did who came in contact with her, and the quartette were almost immediately engaged in discussing her wedding, which was to take place in a few weeks. She inquired if Mr. Tom Harton were to be present.

"I think he is going away next week. I heard him tell Sir so, just as we left the house. He had a letter in his hand, and I hope—I mean, I suppose—it was to Lord Thornborough, who wants him. Jack will be sorry, but I shall be glad."

"He should have been best man," put in Edith.

"Yes. But now Mr. Gerard will be," returned blushing, smiling, handsome Fan; and Edith hastily left the room, as she was wont to do when Gerard's name was mentioned.

(To be continued.)

NURSING THE SICK.

By ALBERT WESTLAND, M.A., M.D.

IX.—PERSONAL ATTENTIONS TO THE INVALID.—*(Continued.)*

THE employment of cold applications in the treatment of disease is mainly a development of recent years. In the earlier part of the present century many erroneous ideas were prevalent about the risk incurred by invalids through exposure to fresh air, or to other agents likely to diminish the temperature of the patient; and the prejudice existed frequently to such an extent as to interfere materially with the ordinary requirements of cleanliness. At the present time the beneficial effects of cold applications are fully recognised, and they are used both for the relief of pain and in the treatment of local and general diseases.

When cold in any form is applied to any part of the body, the first effect is to reduce the temperature of the skin with which it is in contact, and to some extent of the tissues lying beneath the skin. This reduction of temperature is accompanied by a diminution in the size of the smaller blood vessels, and a consequent decrease of the quantity of blood circulating in the parts. If the cold be intense enough, and be left in contact with the part for a sufficient length of time, absolute arrest of all circulation will occur, resulting in the condition called frostbite; and as a further stage, if this condition be neglected, gangrene ensues, and the gangrenous part separates from the neighbouring healthy tissue. The depression of the circulation caused by the application of cold is accompanied by a sedative action upon the nerves of the part; and when cold has been used to the extent of arresting the circulation—*i.e.*, when the part has become frozen—the sense of touch and the sensitiveness to pain is entirely lost temporarily, so that in this condition small operations can be performed without any consciousness of even discomfort on the part of the patient. In the treatment of disease the employment of cold is never carried beyond the stage of diminishing the circulation and depressing the sensitiveness of the nerves; but for the purpose of opening abscesses and performing other minor operations, it is common to avail oneself of the local anæsthesia resulting from a complete freezing of the part to be operated on.

The simplest way of applying cold to any part of the body, is by placing upon it thin cloths wetted with cold water, and changed as often as they become either warm or dry. Such applications cool the part on which they are placed in two different ways. In the first place, the water in which they are saturated is cooler than the skin to which they are applied, and when placed in contact with it absorbs some heat from it. In the second place, water exposed to air evaporates rapidly, and this process of evaporation is accompanied by considerable abstraction of heat from surrounding parts, and especially from the part with which the water is in contact. It will be obvious, therefore, that to utilise fully these two methods of cooling the part, the cloth which is saturated with the water must be thin, and must be freely exposed to the air, so as to admit of rapid evaporation.* For ordinary purposes part of a linen handkerchief folded double answers very well; and the changes must be made as frequently as it is found to become warm, and thus to lose its power of abstracting heat directly from the part. It will not unfrequently be found that the changes have to be made so often as to become tedious both to the invalid and to the nurse; and some other device must be employed to attain the same result. The intelligent reader will perceive that the same object would be achieved if a constant supply of fresh cold water could be conveyed to the folded handkerchief, the water as it becomes warmer being removed by evaporation, and replaced by the fresh supply. This is not difficult to arrange by means of a small skein of cotton or worsted, and a small jar or jug to hold the water. If the reader will fill a cup or jar with water, and put into it one end of a skein of worsted, bringing the other end over the edge and allowing it to fall down below the level of the bottom of the cup, it will be found that the contained water will percolate along the fibres of the worsted, and drop off the outer end until the cup is quite emptied. The action is partly analogous to that of a syphon, although the principle is not precisely the same. If, then, a small jar be suspended beside the patient, filled with cold water, and a skein of worsted be carried from it to the folded handkerchief, a constant stream will be conveyed from one to the other, and the handkerchief be maintained always wet. The volume of the stream will depend mainly on the thickness of the skein, and partly on the difference of height between the jar and handkerchief; by altering these one is able to regulate satisfactorily the amount of water supplied, so that the bed of the patient does not become moistened. It is well, however, for a careful nurse always to have a small piece of covered mackintosh sheeting under any part to which cold water is to be thus applied.

When a greater degree of cold is demanded, the water may be artificially cooled by the addition of ice, or of some salt which abstracts heat from the water during solution, such as chloride of ammonium or nitrate of potash. Or the same result may be attained by the addition of some fluid to the water, which will render the process of evaporation more rapid, such as methylated spirit or vinegar.

A still further degree of cold can be produced in any part of the body by the application of melting ice, enclosed in some form of waterproof bag. The freezing point of water is 32° F., and it is found that when ice is melting into water, the water remains at the temperature of 32° F., until every fragment of ice has melted; so that if ice is broken in pieces and placed in a bag, a very uniform low temperature is maintained as long as the process of melting is proceeding. Indiarubber bags for the purpose of containing the ice, and shaped according to the part to which they are intended for application, are to be obtained from surgical instrument makers; but it is not difficult for any intelligent nurse to improvise a bag which will be quite as effective as those sold for the purpose. In some cases an ordinary sponge bag will answer the purpose very well, the mouth of it being carefully tied round a large cork after the ice has been put in it.

Very convenient bags for the purpose can be made by the nurse herself, of any size and shape required, out of the thin guttapercha tissue sold by all chemists, the edges being cemented together by the application of chloroform. The gutta-percha tissue is doubled, and cut to the size and shape wanted; the free edges are then turned over, and are made to adhere by brushing a little pure chloroform quickly along them, and pressing them until they stick firmly together. A very little practice will give the necessary quickness and neatness in making such ice bags, and they will be found exceedingly convenient and useful. The guttapercha tissue used for the purpose should always be good and comparatively new, otherwise there will probably be found in it some minute holes which will leak uncomfortably as the ice melts.

Ice is generally bought in large blocks, and it will fall to the nurse to break these blocks into small lumps, suitable for introduction into the bags. This is best done with a small hammer and some pointed instrument, such as a bradawl or a shoemaker's awl. By pressing the point of the awl on the ice, and giving a smart rap on its head, the block will be found to split quite easily into small fragments. Until the ice is required, it is best left in the original large blocks, melting much more slowly thus than when broken up. The blocks should be rolled up in flannel, and placed in such a position that the water resulting from their melting is able to drain away as quickly as it is formed. A good plan is to tie some flannel, or a piece of blanket, loosely across the top of a pail or deep basin, to place the ice in the hollow of it, and to cover it over with another piece of the same material. At first sight it may appear rather unreasonable to "keep ice warm" in this way; but the explanation becomes apparent when one recalls what has been said about the bad heat-conducting powers of flannel in the remarks upon clothing the invalid. While in the case of the patient the flannel is used to prevent the escape of heat, in the case of ice it is used to prevent the admission of heat; in both cases equally impeding the *transmission* of heat.

In certain cases of essential fever, and more particularly in scarlet fever and typhoid fever, when the temperature tends to become dangerously high, it is usual to attempt its reduction by the application of cold to the whole body of the patient; and it is necessary for the nurse to know how to carry out this treatment when ordered by the physician in attendance. In the febrile illnesses of children, considerable benefit is gained by frequent sponging with cold water, to which is sometimes added advantageously a small quantity of vinegar. If the patient is not dried for two or three minutes after the sponging, the evaporation from the skin is useful in promoting the abstraction of heat. When cold sponging is not sufficient to lower the temperature, a fact to be ascertained by the use of the clinical thermometer before and after its use, recourse is had, both in adults and children, to packing in a sheet wrung out of cold water. To carry out this treatment satisfactorily, the bed of the patient must be specially prepared by having a waterproof sheet and a blanket above it spread over the sheet upon which the invalid usually lies. While the patient lies on this, covered with another blanket, a sheet is taken and soaked in cold water, wrung out gently so as only to press out the excess of water, and then folded round the invalid, underneath the blanket with which he is covered. Reduction of temperature is observed by occasional use of the clinical thermometer; and when the sheet becomes warm by contact with the body, it is replaced by another treated in the same way; and this is continued until the required reduction in temperature is attained. The patient is then dried, and the bed restored to its original condition. It is not usually considered desirable to take advantage of the cooling effects of evaporation in this treatment; the reduction of temperature is effected almost entirely by the actual contact of cold water with the patient. In Germany the same end is attained by placing the patient bodily in a bath of cold water, in which he remains sometimes for from half an hour to an hour; but this latter method is employed only to a very limited extent in England.

(*To be concluded.*)

OUR PRIZE COMPETITION.

CONFESSIONS.

MANY girls may have read the announcement of our last literary competition with surprise, some even with amusement. "What a singular subject—'Confessions'! Why, that is the kind of thing we write in birthday books, confide to a friend, perhaps, describe in a diary maybe; but seriously to write my confessions and have them criticised, scanned through and through by serious examiners, and compared with a host of others—well, that is a novel idea!" Another girl, who had taken part in our previous competitions, may, after hastily glancing at the subject, have decided not to send a paper, and reasoned to herself something in this fashion: "To write an essay on my favourite heroine in Shakespeare is a delightful task, and an instructive one; but this is almost trifling, a kind of joke; besides which, I don't know that I altogether like to tell so much about myself."

Now we commence a new paragraph, with an assurance to our readers that no joke, no trifling task suggested itself for a moment to us—quite the contrary; some time was expended in thinking out the subject, and the papers have been looked forward to with perhaps more interest than in any of the previous contests. The competition, so far from being funny, is a very serious one, and no little of the thoughts, the taste, and even the character of the contributor is shown in these confessions. But it is absurd that a girl should dislike to send a paper on account of the index it is to her character and ideas; nothing could be a better help to her critical faculties than answering these queries; and the reasons given are a test to the examiners, where the choice is really that of the competitor, or merely the echo of a popular sentiment or an universal criticism.

Our readers will see that there is no list of names appended at the end of these lines, and they will therefore guess what is really the case, that this is a notice, not a report. We are going to extend the time allowed for the competition, for we are not contented with the present result. To begin with, there are not sufficient papers, only four hundred in all, though perhaps there is a reason for this, the time allowed having been much shorter than usual. It is our wish that this competition should be a large one, both for the sake of our readers and also for our own sake. For our readers' sake, because so much interest, so much benefit, must accrue to those who take part in it; for our own sake, because the judgment and taste of the girls will help to give us an insight into their characters, and show us, to an extent, how we can still further benefit them and give them seasonable amusement.

This last sentence brings a thought to our minds, which is this. Our magazine and its readers, the editor, the staff of writers, the artists, musical composers, and the vast number of girls who read THE GIRL'S OWN PAPER, are, in a way, all members of one huge family; the shoals of letters sent us during the week show us the thoughts, the difficulties, the ambitions, the goodness, and the frailty of a mighty army of English girls, and in catering for their amusement and instruction we can, and as a matter of fact do, speak to them as a friendly instructor and an old friend. This is a digression, but our readers will see its bearing on the subject we have in hand. All our literary competitions, in a measure, bring our readers, or rather a portion of our readers, before us, and the thoughts and the characters they exemplify are specimens of the thoughts and characters of our great constituency, and consequently these contests are useful to us as well as to our readers. This is true, as we have said, of all the literary competitions, but especially true of this one.

"Your object in life?" can be answered in a general way or in an individual sense. "To do good to my fellow creatures," "to follow Christ's teaching," "to do my duty in the state which God has placed me," any of these would do; or "to be successful in my profession," "to manage my father's, brother's, or husband's household," "to be a good pianoforte player," would also satisfy the query. In answer to "Your favourite qualities in men and women?" it is best to put two or three, not more, traits; otherwise nothing is conveyed by the answer except a preference of good over bad. Perhaps it would have been better to have asked for the one favourite quality, but the question having been set, it of course remains.

With regard to "Your favourite" writer, painter, and musical composer, it must be remembered that the choice is by no means the most important thing: the gist lies in the reasons given for the choice or hearsay; the greatest reputation or the acknowledged position enforce the selection.

To a limited extent this must be the case, even when intelligent reasons are given, for the reasons stated may not be those which appeal to the girl herself, but may be the result of what she has heard or read in textbooks; but examiners can generally tell from the paper whether the girl really feels what she writes, and after all we in some measure educate our taste in matters of art and literature. We hear that such and such works are magnificent conceptions, first of all from experts, then from intellectual amateurs; then we hear the reasons given, the canons of art which are fulfilled, etc.; our interest is awakened, and though art is in one way a mystery, yet the educated mind is often led to like that which has received the approbation of those best qualified to judge. A girl who has seen and studied the works of the great masters would be almost certain to choose Raffaele, Michael Angelo, or one other of the great Italian masters as her favourite; or, if like a contributor aged fifteen, she likes "pictures of the sea and landscapes better than composition pictures and portraits of ugly mediæval people and uninteresting saints," she may choose our own Turner, who is unequalled in his way. But to repeat, we would sooner a girl choose as her favourite even an inferior painter, and give her reasons, intelligent and original reasons for the preference, than write "I like Raffaele best because his works are so natural."