cases, be such as to ensure an equable determination to the skin, and, in bad cases, the rest should be absolute.

Having now to deal with relaxation, with thickening, or with actual ulceration of the mucous surface of the large intestine, our medical appliances must be apportioned accordingly. In illustration of this part of the subject, I would adduce the following cases:—

CASE 1.—December 29th, 1848.—Lieut. —, of the Indian army, aged twenty-one, is stated in the report of the regimental surgeon to have resided but two years in India, and to have been of regular and temperate habits. But, shortly after his arrival in India, in March, 1846, he was seized with acute dysentery; and from that date to February, 1847, he experienced three several attacks of the same disease. The second attack was of a dangerous acute nature, “and he passed a large sphacelus on the seventh day of the disease. During the period between these grave attacks, he has never passed a week without recourse to the aid of medicine, in some shape or another, for uneasiness and derangement of the bowels. His liver is subject to constant great functional irregularities; and I have sometimes observed a fulness of the right hypochondrium; but this organ has never been the subject of the patient’s complaint. He appears to have a constitutional scorbutic tendency; for, when in his best health, his gums and teeth are invariably coated with blood on first waking in the morning.” These details, by the regimental surgeon, extend from the 26th of August, to the 8th of October, 1848. The attacks of dysentery commenced at the former date, with severe griping and cutting pains across the belly; and during the day he voided several offensive frothy stools, with mucus and some blood; “there was likewise frequent vomiting, and much tenesmus.” The treatment consisted of leeches to the abdomen, fomentations, blue pill with ipecacuanha and opium, and occasional doses of castor oil. This course of treatment, varied only by the occasional use of a drastic purgative, was continued up to the 2nd of October, when the bowels are described as “excessively torpid,” the matters voided being tinged with “muco-purulent matter, but otherwise the evacuations are healthy.”

On the 29th of December, 1848, I first saw the patient in London. His manner indicated great nervous excitement; the complexion was dark and muddy, and there was much emaciation; the skin was perspirable; the pulse natural; the tongue clean. The bowels were still lax, the motions numbering from three to five in the twenty-four hours, and were voided principally during the night and early morning. He voided much ropy colourless mucus, but without griping or straining. There was no tenderness on pressure in any part of the abdomen; no enlargement of the liver or spleen. He was ordered to take an ounce three times a day of a mixture of infusion of Simarouba, with dilute nitromuriatic acid and laudanum; while the diet was directed to be very spare, and to consist of farinaceous articles with milk; he was directed to use warm clothing, the warm bath occasionally on going to bed, and to avoid all exercise.

February 5th, 1849.—The lax state of the bowels continues, but there is much less mucus voided. Ordered, a fourth of a grain of sulphate of copper, with half a grain of opium mixed with extract of gentian, in the form of pill, three times a day.

March 9th.—Much improved. Has but two motions in the twenty-four hours. Thinks the pills cause nausea, and I therefore substituted two grains of gallic acid for the sulphate of copper. The complexion and general condition are improved, and he is allowed solid animal food.

May 19th.—He says he feels quite well, with the exception of “a sensation of cold in the bowels, and of a feeling that they would be moved by the use of cold drinks.” Has but one consistent motion in the twenty-four hours. Ordered four grains of powdered nux vomica three times a day in pill, and allowed a tumbler of bitter ale at dinner.

June 5th.—He declares himself now “really well in all respects, and that he has acquired his ordinary condition and weight;” complexion much improved. Ordered a vinous solution of quinine and citrate of iron twice a day; and in the event of the bowels becoming constipated, he was directed to use an enema of cold water; when an aperient became necessary, he was ordered to take a mild dose of magnesia and rhubarb with ipecacuanha.

Remarks.—The case of this young officer had in India been of a dangerous character, for he voided exudation-tube of the croupous character, and frequently also shreds of dark-coloured flakes of dead mucous membrane. The nervous temperament and the scorbutic complication also added greatly to the difficulties of early treatment. But, on arrival in England, the health had somewhat improved. There were but slight traces or

remains of ulceration of the mucous surface of the larger bowel, and there was no hepatic or scorbutic complication. The treatment was therefore simple, and freed from difficulty. I believe that the formula originally prescribed by me would have conducted his case to a successful and safe conclusion; but such were his terrors of what he would designate “dysentery” that I felt constrained to use active mineral and vegetable astringents in order to appease his fears. The powdered nux vomica appeared to act very beneficially, and I generally find it so in the irritable state of the colon, which so frequently follows the ulcerative dysentery of tropical climates.

In the instance of this young officer, as in so large a proportion of all who come home sick from India, the appropriate winding-up to his treatment consisted of chalybeates, given with a view to remove the anæmic condition; but in this completion, as in the curative endeavour, the salutary effect was greatly retarded by the temptations of the London clubs.

(To be continued.)

ON CEREBRAL, SPINAL, AND GANGLIONIC PARALYSIS.

By MARSHALL HALL, M.D., F.R.S.

ONE great result has flowed from the investigation into the varied condition of the irritability of the muscular fibre in paralytic limbs—the fact, that *hemiplegia* is sometimes *cerebral*, sometimes *spinal paralysis*—sometimes *limited* to the exclusion of the influence of the cerebrum, sometimes *extended* to the exclusion of the influence of the spinal marrow.

The distinction which I have established in regard to these two forms of paralysis, to which in this paper I add a third, is anatomical and positive.

When physicians speak of *hemiplegia*, they in reality use a term, the signification of which has reference merely to a *symptom*; and that symptom may have a double or even a triple origin.

If hemiplegia affects and excludes the influence of the cerebrum only, the case is, I repeat it, cerebral paralysis; but if it affects or excludes the influence of the spinal marrow also, as it does in some severe cases, it is spinal paralysis; it will constitute one of those cases which, from our ignorance of their real nature, and from our error in viewing the terms cerebral paralysis and hemiplegia as synonymous and identical, have been regarded as *exceptional* cases.

These exceptional cases are rare amongst the milder cases of private practice; amongst the severer cases consigned to the workhouse, they may amount, as in the subjects of Dr. Reynolds’ inquiries, to three-fourths of the whole number of cases.

If our terms be once well-defined, all ambiguity is removed: cerebral paralysis excludes the influence of the cerebrum only; spinal paralysis that of the spinal marrow also. The characteristics of each of these, when they are themselves distinct, are as fixed as the laws of physics.

To cerebral and spinal paralysis I must add a *third*—viz., *ganglionic* paralysis. This paralysis is excluded in pure cerebral paralysis; it is included in spinal paralysis.

Thus: in cerebral paralysis the muscles become *atrophied*; in spinal, in reality also ganglionic, paralysis, they become *heterotrophied*, if, for distinction, I may use that term. I have long regarded the ganglion on the posterior roots of the spinal nerves as parts of the true ganglionic system.

Thus again: in cerebral paralysis the irritability of the muscular fibre is *augmented*; in spinal paralysis it becomes gradually more and more *diminished*; in ganglionic paralysis, if complete, it may become *extinct*.

In both an anatomical and in a physiological sense, the muscles in cerebral paralysis remain muscles, and their irritability, being unexhausted by the stimulus of volition, is, *pro tanto*, augmented, compared with that of the healthy limbs; whilst in spinal paralysis they gradually lose their muscular power, and in ganglionic paralysis they cease to be muscular, either in structure or in function. In certain cases, as M. Cruveilhier and M. Duchenne have shown, the muscular fibre undergoes the fatty degeneration which has recently attracted so much attention.

After these explanations and definitions, I think our investigations may proceed without any of those apparent exceptions and contradictions which have so much obstructed our progress. We must bear them continually in mind; and we must distinguish between true irritability and mere *force*, and the results will be uniform; (unless, indeed, some other element of compli-

cation exist, still undetected;) and all difference of opinion, so discreditable to physiological and medical science, will cease.

I will now, for the sake of still greater distinctness, throw the subject into a tabular form.

I.—*In Cerebral Paralysis*—

1. *The Reflex Actions,*
2. *The Influence of Emotion, and*
3. *The Influence of Strychnine,*
4. *The Irritability,*

are more noticed in the paralytic than in the healthy limbs;

II.—*In Spinal Paralysis*—

1. *The Reflex Actions,*
2. *The Influence of Emotions,*
3. *The Influence of Strychnine are extinct, and*
4. *The Irritability diminished.*

III.—*In Ganglionic Paralysis*—

1. *The Structure and*
2. *The Functions may be alike destroyed.*

Cerebral paralysis may exist alone. Spinal paralysis of course implies cerebral paralysis. Ganglionic paralysis may exist with or without spinal muscular paralysis. In division or disease of the trifacial nerve we have ganglionic paralysis, and in a case which I formerly published, in which the digital nerve being injured, the nail ceased to grow as formerly. But as spinal paralysis implies cerebral paralysis, it also implies ganglionic paralysis. I have at this moment an interesting patient, who, from inflammation of the sciatic nerve from cold, has lost the power of the limb; the muscles are absolutely unaffected by galvanism, atrophied, heterotrophied, and, I suppose, changed into fat. By restoring the healthy condition of the nerve, will the morbid change of structure undergo restoration? This is a question never yet agitated. It will require much observation and—*experiment*, to determine it satisfactorily; and I propose shortly to add to the present brief sketch some ample details.

I shall first add the enumeration of some other forms still to paralytic affection.

Cambridge-terrace, Hyde-park, Sept. 1855.

Reviews and Notices of Books.

On the Smokeless Fire-place, Chimney-valves, and other Means, Old and New, of obtaining Healthful Warmth and Ventilation. By NEIL ARNOTT, M.D., F.R.S., F.G.S., &c. pp. 231. London: Longmans and Co.

THIS work opens with a graphic account of the ravages committed on London and Londoners—on their houses, their furniture, and their dress, and on all things, animate and inanimate, by the smoke of this immense town, which the author calls “the great nuisance and the opprobrium of the English capital.” As a matter closely connected with the subject, and bearing upon the advantages of smoke-consuming furnaces, and, where possible, of other fireplaces having the like recommendation, a statement is given of the quantity of coals consumed, and of the greater cost for washing, &c. &c., in the domestic establishments of London, than in those of families of the same station in the country. These remarks are introductory to the description of the author’s “Smokeless Fire-place.”

“Various attempts,” he says, “have been made to feed fires always from below; and so to get rid altogether of smoke. One of the first recorded was made by Dr. Franklin. He placed the burning fuel in a cage of iron bars supported on pivots, and when part of the fuel was consumed, leaving the upper part of the cage empty, he filled the vacant space with fresh coal, and immediately turned the cage upside down, so that the new smoking coal was underneath, sending its pitchy vapours upwards through the mass of ignited coke. Another attempt was made, about thirty years ago, by an ingenious manufacturer in London, Mr. Cutler. He placed a box filled with coal under the fire, in which box there was a movable bottom, by raising which the coal was lifted gradually into the grate to be consumed. The apparatus for lifting, however, was complicated, and liable to get out of order, which, with other defects, caused the stove to be little used. The movable bottom rested on a cross-bar of iron, which in rising was

guided by slits in the side of the coal-box, and was lifted by chains at each end, drawn up by a windlass, and this windlass was turned by bevel-wheels, of which one had to be moved by a winch in the hands of an attendant.”

It is by avoiding the rocks on which others have run that final success is achieved; and so important have we always considered the subject, and so strongly are we disposed to encourage and to commend endeavours to accomplish the ends aimed at by Dr. Franklin and by Mr. Cutler, that we restate the results of their ingenious, although not successful, devices.

Dr. Arnott has supplied a very clear description of the improvements introduced by himself into what he has called the “Smokeless Fireplace,” which comprise the adoption of scientific appliances suitable to his object. The description is accompanied by an exceedingly good woodcut representation of the “Smokeless Fireplace,” (which, indeed, is requisite to make the description complete;) and the cheerfulness of the fire, as represented, gives a very favourable impression that the prejudice which prevails in the Englishman’s mind in favour of an open grate and a blaze might be fully gratified, and that, moreover, consistently with the two great objects—cleanliness and economy. The charge of coal for the day is placed in a box immediately beneath the grate, and is borne upwards as wanted by a movable false bottom or piston, raised simply by the poker used as a lever; to the piston is attached a rod with notches to admit the point of the poker. In order to give perfect control over the current of air which passes into the chimney, a throttle-valve is provided.

“In all cases,” says the author, “it is necessary to be able to command and modify, by a moveable plate or hanging-door, called a blower, the size of the front opening of the fire-place, as to command, by the damper-valve, the opening of the chimney-throat above.” And the author is enabled to state, that “by the proper adjustment of the two, the rate of combustion and the desirable brightness of the front of the fire may be constantly maintained.”

A few minor points are described, for which the work itself should be consulted.

The author proceeds to explain certain advantages which would arise from placing fire-grates higher than they are usually placed in this country, and illustrates his views by reference to natural laws, as, for example, to those of light and heat. He says:—

“A fashion has lately been introduced into this country of placing the fire-grates much lower than formerly—in some cases on the very hearth; the reasons usually assigned being, that a low fire burns better, or gives out more heat from the same quantity of fuel, than a higher; and that, because lower and nearer the floor, it must warm the carpet before, and so prevent or lessen to the inhabitants the evil of cold feet. Now, both these suppositions are curious errors or delusions, having their origin in popular misconceptions respecting the nature and laws of heat, and particularly respecting the law of radiation. Radiation is the Latin word for the spoke of a wheel, and anything which diverges or spreads around from a centre, in some degree like spokes, is said to radiate. Light and heat are of this nature. The portion of either which passes in a straight line from the source is called a ray. . . . Most persons are aware that if a good mirror be placed close to a lamp on one side, it not only intercepts all the rays that fall upon it, which means nearly half of the light given out, but that it returns or reflects these rays back in contrary corresponding directions, and nearly doubles the illumination in those directions; but many do not learn by their unaided observation, that if a surface of any substance, like fire-brick, which strongly resists the passage of heat through it, be placed near a fire, it not only intercepts the heat-rays falling on it, but, by absorbing them, and so becoming heated, often to redness, it then reflects and radiates back the greater part of the heat, almost as if it were additional hot fuel in the fire, and thereby nearly doubles the warmth felt in directions away from the surface.

“It has been ascertained that, of the heat produced by combustion in a common fire-place, one part—being somewhat more than half—is diffused, like the light, by radiation into the open space around, and that the remainder is given by contact and conduction to the air which supports the combustion, and to the solid material about the fire-place. Thus, then, with a common open fire-place, it is the radiated heat almost