rently the lining membrane of the lateral ventricle had given way, and the fluid had macerated the corpus callosum, and performed the natural dissection above described—a dissection which I at once recognised, from having repeatedly made it in hardened brains. The optic commissure and tracts were embedded in solid yellow exudation, but apparently normal when extracted. The right optic nerve near the eye was expanded into a bulb of considerable size, evidently formed by distension of the outer sheath by fluid; it was quite translucent. The disc was fairly defined, not papillated, not so pale as usual. The retinal vein was extremely large and distinct, issuing from the centre of the disc. The left optic nerve had no bulbous expansion, and no appearance of having been distended. Longitudinal vessels of considerable size were visible on its exterior. The disc was not well defined, but had a sort of halo round it. The retinal veins were rather large; the arteries small, but distinctly visible. Both vessels were concealed in the disc and for a short distance beyond its margin, apparently by exudation. It is noteworthy that, in this case, the distension of the nerve-sheath, usually bilateral, was present on one side only; and this was not due to accidental displacement of the fluid on the other. The difference in this respect coincided also with a marked difference in the degree of change in the intraocular termination of the nerve, the congestive or inflammatory process having gone further in the eye, the nerve-sheath of which was not distended.

It appears to be a disputed point, whether the fluid in the vagina nervi is formed on the spot, or is forced along the lymph-space from the arachnoid cavity. It has been shown that injections can be made to pass from the arachnoid space into the nerve-sheath; and in my opinion it is in this way that the sheath is distended in these cases of meningitis. The fluid and the pressure are present; and it is unnecessary to seek another cause for an effect which they are proved to be competent to produce. On this view, the dropsy of the nerve-sheath is simply another example of intracranial pressure, producing its effects in the direction of least resistance, tending to confirm this hypothesis as to the mode of production of the choked disc, and affording an illustration of the difference in the results of pressure having different sources of origin. According to my experience, while some degree of hyperæmia of the disc is common in tubercular meningitis, well marked choking of the disc is rare; and I have never seen an extreme example, such as I have met with in cases of cerebral tumour. If my experience on this point be borne out by that of other observers, and if, as I expect, hydrops vaginæ nervi be found to be much more common in tubercular meningitis than has been supposed, the occurrence of marked congestion and swelling of the disc in cases of cerebral tumour, and the less frequent and less pronounced occurrence of this condition in tubercular meningitis, in which the general intracranial pressure is apparently as least as great, would be capable of a satisfactory explanation. Tumours are not usually accompanied by much fluid in the arachnoid cavity; and the increased pressure will act in the obstruction of return of blood from the orbit into the cranial cavity, while at the same time the force required to carry the blood through the vessels of the brain when subjected to pressure would tend to distend the capillaries of the disc, on which no adequate counterpressure is brought to bear. On the other hand, in tubercular meningitis the fluid in the arachnoid cavity is, at any rate, one source of pressure; and it is to be expected that it will find its way along the sheath of the nerve, and distend it at its weakest part. This fluid pressure also, though it will obstruct the return of venous blood from the orbit, will compress the arteries carrying blood to the eye; but more particularly it seems to me that the compression exercised along the whole length of the nerve by the fluid within the nerve-sheath would have the effect of neutralising in some degree the transmission of pressure along the minute vessels of the nerve from the cranial cavity, and so tend to diminish the force brought to bear on the vessels of its intraocular termination.

NOTES ON THE ACTION OF MEDICINES, OLD AND NEW.

By JOHN KENT SPENDER, M.D.Lond.,
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Two of the most pleasing and instructive papers which ever came from the pen of the late Dr. Symonds, were on the medicinal treatment of some common diseases of the throat and lungs. These diseases were the text for certain therapeutic lessons: in learning to cure the diseases, we learn at the same time the scope and power of our medicines. The ideas are perfectly distinct. We may study diseases in order to see how they are affected by drugs, or we may study the substances called drugs in order to find out how they can abolish or relieve diseases:

each plan has its merits and its advantages. In the one or two papers which I propose to contribute on the action of medicines, drugs will be the text, and disease will be the comment. We are supposed to be in the possession of certain things—animal, and vegetable, and mineral—alleged to have the power of doing good to man: it is our province to examine and certify that good, determining the conditions which call it forth and regulate its operations.

Our code of therapeutics, extensive and valuable as it is, will never be exhaustively complete. Human anatomy may be pronounced to be perfect, or very nearly so. The knowledge expressed by these words is comprised within defined and visible bounds: there is a finite quality about it, so that it can be explored within a finite time. But until every element and compound in Nature has been scrutinised, which can never be done by any wit or wisdom short of the Infinite, we cannot declare that any phase of human suffering is absolutely irremediable. New elements will always be discovered; new compounds will incessantly be formed; there is no limit to the things which the animal and vegetable kingdoms may reveal, or which mineral chemistry may produce. Any or all of these unknown substances may be endowed with antimorbid virtues, entitling them to a special place in our therapeutic codex. Our privilege and our duty is to welcome every new product of Nature which can be proved to have healing properties for man. Few may have the time or the opportunity to discover these products, but all can help to verify what has been discovered by others; and this may be said without denying the difficulty of training oneself (especially after a certain age) to the use of new medicines. We prefer the old tools, however blunt and imperfect, to the new instruments, apt and ready for their work. We have tested the old medicines in many ways; we have individualised each dose as a separate force in the conflict with disease, and we know its precise value and power. If it fail to produce the usual result, there is an honest search to find out the cause; but when a new medicine glances off its goal, we may be in doubt where the fault is—in our own want of familiarity with the medicine, or in a shortcoming in the medicine itself. The duty, however, is not the less clear and peremptory to try, and master the application of, all new methods of treating disease which science has put into our hands.

A new remedy has sometimes to clamour itself into notice before it is largely used—before it finds a place in the public and private materia medica. The process of becoming known is often slow and difficult. The new remedy is forgotten when it is most wanted; it is prescribed at first with such experimental caution, with such tentative timidity and even fear, that its characteristic medicinal properties are hardly developed. It lies hid under a “bushel” of prudential restraints; and other remedies are probably harnessed with it, as in the event of failure the old tried means may do the duty of both. And it is long before the new power is handled with promptness and precision. It lags behind other things possessing inferior virtues, but which are familiar by long and perhaps conventional use. Possibly, too, the authorised expounders and preachers of the new remedy proclaim its worth with an uncertain and even dissonant note. And so it has to make its way through months and even years of doubt, until its utility is attested by the confederate testimony of many impartial observers. It then assumes its rank with the drugs of historic name and fame; and the remaining functions of the critic are—to formalise the specific virtue of the new medicine, and to describe its so-called “contra-indications.” We may point to chloral as a fine and recent example of all these “phases of faith.”

Now, what we desire about chloral, and about every other new drug, is an honest narrative of what it can do; and that the whole story of its therapeutic action shall be told with the conscientious accuracy of a scientific observer. There is an artistic completeness about the picture, when a fresh medicine is said to unlock an old therapeutic problem, or to relieve a long-felt necessity; and the ardent disciple of the medicine may refuse to listen to any drawbacks and shortcomings alleged against it. We are all apt to be garrulous about our successes, and judiciously reticent about our failures. The fact is, that our failures seem to reflect upon our own competence; to record a non-success looks like confessing that the wrong agency has been chosen, and that more skill might have selected something which would have done the required work better. And so the moral courage deserves praise which tells everything about the good and the ill which a medicine can do; in no other way can a proper history of Therapeutics be written.

Elsewhere* I have tried to show that a drug may fulfil various purposes according to the doses in which it is given, and according to the times at which it is administered. A small quantity may do one sort

* The Administration of Medicines in comparatively Small and Frequent Doses. (*British and Foreign Medico-Chirurgical Review*, January 1872.)

of good, and a large quantity another sort of good; and these two results may be not only quite different, but even of a contrary kind. Thus ipecacuanha is a typical emetic when administered in the quantity of (say) four fluid drachms of the wine; but one or two drop doses of the same preparation, given every hour, have a growing repute for the power of arresting sickness. (*Practitioner*, December 1869.) Small quantities of sulphate of magnesia have an astringent effect, and were recommended by Dr. Billing for the early stage of cholera. (*First Principles of Medicine*, 5th edition (1849), page 251.) And of most of the vegetable narcotics it may be said that comparatively large doses produce results to which no clue is afforded by the administration of small doses. Thus do we make different tools out of the same material, according as we have more or less of it; and, by combining relative quantities of drugs in various ways, we may obtain effects which are often of high therapeutic interest.

Hence it is clear that a serious injury is done to the therapeutic merits of any medicine, and to our therapeutic skill as practitioners, if that medicine be administered in inadequate doses, or in wrong doses. A small and a large quantity of a medicine produce respectively a particular effect; each, within a certain range, has a distinct and different value. Now, when we aim to produce the specific effect belonging to the large dose, what is the use of administering the small one? The large and the small dose respectively ought, for all therapeutic purposes, to be considered as different medicines; and not more interchangeable than medicines of diverse properties. No fact in the history of medicine is more clearly established than this; and it is easy to see how it multiplies our resources, and how it enables us to fight against disease with increased precision and power.

Passing from generals to particulars, I spoke just now about the medicinal history of *Ipecacuanha*. Long ago, Mr. Higginbottom wrote about the successful use of this drug in such different affections as cholera, intermittent fevers, erysipelas, neuralgia, uterine hæmorrhage, and senile syncope (quoted in the *Practitioner*, October 1868). Possibly more by chance than anything else, ipecacuanha was discovered to have anti-emetic properties. This apparent contradiction has a parallel in the subcutaneous injection of morphia; most medical men would testify that sickness is a serious drawback to the use of this method; and yet some forms of obstinate vomiting, notably that which afflicts pregnancy, may be completely controlled by it. (*BRITISH MEDICAL JOURNAL*, 1869.) Dr. Ringer gives a very encouraging list of stomach infirmities which, he says, can be removed or relieved by ipecacuanha (*Handbook of Therapeutics*, 2nd edition, p. 296); but some of these troubles I have been unlucky enough to increase, instead of curing. I have succeeded best with ipecacuanha in the so-called hysterical sickness of young women, in the early "sympathetic" vomiting of other diseases, and in some forms of infantile sickness accompanied by diarrhoea. But in the first of these affections—menstrual sickness, as it might be called—and in certain irritabilities of stomach seemingly unconnected with organic disease, we may usually obtain excellent results by the administration of sulphate of magnesia in very small and frequent doses—say five grains every hour, dissolved in cold spearmint water. Nothing can possibly answer better than this when the symptom is without apparent cause, and when the patient begins to suffer from the non-retention of food.

Ipecacuanha shows itself to most advantage when the element of spasm is mixed up with over-secretion, as in bronchorrhoea with asthma, and in diarrhoea with tenesmus. Hence the value of ipecacuanha not merely as a classical remedy for dysentery, but in many varieties of flux from the bowel; it soothes reflex irritation, and so indirectly acts as an astringent to a mucous surface.

I pass from ipecacuanha to *Iodine*, not because it begins with the same letter, but on account of the unquestionable efficacy which iodine has in checking that kind of vomiting which constitutes what is called pyrosis. Before sulphurous acid was used for this complaint, and when other recognised means had failed, I gave for a short time three to five drops of the tincture of iodine in an ounce of water, and with very conspicuous success. Is any light thrown upon this point by the influence of iodine on the fermentative and putrefactive processes? In spite of many doubts, however, I still regard nitrate of silver as the most trustworthy remedy for pyrosis; it should be mixed into pills, and always administered immediately after food.

From the days of Lugol, iodine has enjoyed a reputation in the treatment of bronchocele and scrofula which has been probably somewhat exaggerated. In most of the cases requiring the internal use of iodine, it was Lugol's custom to employ it in the form of a bath. The early enthusiasm with which the local disease called bronchocele was attacked with iodine soon subsided into doubt and discouragement; and Dr. Copland's favourable experience (recorded in his *Dictionary of Practical Medicine*) was not supported by other observers. Pereira

tried to explain the uncertainty of the medicine by supposing some peculiar condition of the tumour, or of the constitution. (*Elements of Materia Medica*, 3rd edition, i, 392.) I venture to assert that iodine will very rarely fail to reduce a simple or "adenoid" bronchocele to a size which is neither disfiguring nor inconvenient, provided that it be given in combination with iron. A very considerable number of cases of simple bronchocele have fallen under my care in private and dispensary practice; in almost all, there has been anæmia, and in a few the tumour has been of such dimensions as to produce dyspnoea by pressure on the windpipe. I am not going to say a word about the pathology of bronchocele, or whether defective hæmatisis is a cause or an effect of the disease of a blood-gland; but it is certain that an improvement in the quality of the blood is one of the means of curing bronchocele.* Then, admitting that there were such things as "specific" medicines, we may speak of iodine as a "specific" help to the blood-nourishing property of iron. Anyhow, the fact is incontestable; and a swelling of the thyroid gland big enough to be an extreme deformity and to cause stridulous breathing, will almost always gradually disappear under the steady and prolonged administration of the tincture of iodine and of the tincture of sesquichloride of iron. No local application of iodine is necessary, unless it be expedient to amuse the patient, or to convince him more assuredly that something is being done.

There is a striking analogy between iodine and arsenic in their respective combinations with iron. Iron often seems to economise other medicines, so as to enable them to do more than otherwise they would have done. Arsenic will probably cure a given form of skin-disease in a given time; but some part of the disease is merely bad roots and bad soil, and when we improve these, the special element of the disease which only arsenic can cure is much sooner got rid of. And in like manner arsenic is helped also by cod-liver oil; so that whatever food or medicine promotes tissue-nutrition, will assist us to cure any disease which fastens upon that tissue when it is poorly nourished. And, therefore, iron not only causes iodine to cure a simple bronchocele in a much shorter time, but makes a certainty about that cure which cannot be otherwise attained. I lay emphasis on the particular combination of iodine and iron just specified; the *syrupus ferri iodidi* is quite inert for the purpose now under discussion, whatever may be its merits in other ways.

Iodine has almost innumerable good qualities for counterirritation, and for this object it has been always in much repute. Quite in the old days King's College men carried into general practice the tradition of iodine paint, which was largely and successfully used in the out-patient's room of King's College Hospital; and although the formula was frequently published,† the preparation was not introduced into the *Pharmacopœia* until 1864. Practitioners who had been accustomed to apply the feeble tincture of iodine externally, are surprised by the positive and splendid results often obtained from the *linimentum iodi*. Studying the facts related by Mr. Furneaux Jordan about the counterirritating properties of iodine liniment, we feel that abstract discussions on the philosophy of counterirritation are no longer needed; for those facts tell their own tale, and show that we possess a remedy of great and unusual power.

Now, what is Mr. Jordan's plan? Briefly this (*Practitioner*, February 1869): the locality, extent, and intensity of the counterirritant are all carefully defined. If it be applied exactly over a bubo, or abscess, or carbuncle, or boil, the inflammation will be increased; but a circumjacent zone of vesication will remove the inflammation, the completeness and rapidity with which this is done being dependent on the width, locality, and intensity of the vesicating patch or circle. The right principle is announced to be that counterirritation shall be excited over the next artery or next vascular territory. There is no better agent for fulfilling the object just stated than the liniment of iodine (*Ph. B.*). It may belong to the species of superficial counterirritants, if we choose so to term it; but it should be reapplied at first every twenty-four hours, until a girdle of cutaneous inflammation begins to be developed all round. Omit it, then, for a single day, and paint it with equal vigour over the same spot on the day after. Thin scales of dead cuticle will soon peel off; and if the application be continued at intervals for two or three weeks, there will be displayed a more or less purple-red stain in the epidermis, which may remain for some time. The following case is instructive.

A girl, aged 9, the daughter of a prosperous tradesman, had threatening strumous disease of the left shoulder-joint. There were much pain

* The ætiology of bronchocele is discussed in Dr. Aitken's *Science and Practice of Medicine*, second edition, ii, 58.

† For instance, in Mr. Christopher Heath's *Manual of Minor Surgery and Bandaging*, second edition (1862), p. 218.

and swelling; the arm was almost immovably pinned down to the side; the general health was bad, and there was some pyrexia. The febrile movement having been subdued by rest and mild aperient medicines, the local disease (which had lasted several months) was treated by a broad ring of iodine liniment painted over the lower part of the neck, the adjacent portion of the thorax, and the superior third of the upper arm; the whole skin-area of the joint being left intact within the circle of counterirritation. The liniment was carefully applied on alternate days, and the forearm was supported in a sling. The constitutional treatment consisted of the administration of citrate of iron, iodide of potassium, and cod-liver oil. There was no interruption to the favourable progress of the case. All the joint-symptoms gradually disappeared; passive movement of the upper arm soon became possible, and eventually (within three months) the recovery was so complete that the girl could raise the limb aloft by the side of her head. And, *pari passu*, she became ruddy and strong.

Mr. Furneaux Jordan recommends enlarged cervical glands to be treated with a long patch of iodine liniment, out of sight on the lower and back part of the neck; and I have adopted this plan with much benefit. Long ago, scrofulous ophthalmia was treated in a similar way by painting a "saturated solution of iodine in spirit freely round the orbit, making a broad ring upon the forehead and cheek, and repeating the application every two or three days." (Dr. Nevins's *Translation of the New London Pharmacopœia*, 1851, p. 513.) Among the many local remedies enumerated for *tingea circinata*, I find that equal parts of tincture of iodine and iodine liniment make a lotion which is extremely serviceable. And I can only just allude to the inhalation of iodine as supplying a real need in allaying the cough and expectoration of some chronic forms of catarrh, and of fibroid phthisis of the lungs.

It is an easy transition from iodine to *Iodide of Potassium*. Almost everything has been said about this drug which there is to be told, but I wish to speak of four points of interest regarding it—two about its internal use, two about its external. Iodide of potassium has remarkable power over certain forms of uncomplicated bronchial asthma. The caprice of this disease is in no respect more conspicuously shown than in its behaviour to remedies; and a large part of our treatment consists in nothing better than trying shrewd experiments. Success often rewards our efforts when we least deserve it; but as we have always to bear the penalties of failure, we may conscientiously appropriate the praise of even a chance success. Then, in the many phases of scrofula of childhood, especially cutaneous ulceration about joints, enlarged tonsils and sore-throat, and "scrofulous lupus" anywhere, iodide of potassium in union with citrate of iron may be given for a long time with a benefit not to be rivalled by any other medicines. Here, again, we see how we can economise our therapeutic resources by making one drug help out another, so that both do more than double work at the same time.

The ointment of iodide of potassium is valuable in many ways, and has been recommended empirically for the cure of itch. I wish to speak in an emphatic manner of the value of the liniment of iodide of potassium with soap. It should be used with much friction over joints rigid from insufficient use, or from the products of chronic inflammation. It is a capital agent to use friction with; nor need it be wiped off when the friction is finished, but the part may be wrapped with a simple covering of wadding or lint, and so more or less absorption will go on. Joints which are damaged by chronic rheumatoid arthritis, but not quite crippled, may be excellently treated by the systematic application of this liniment, alternating with other treatment by the Bath thermal waters.

Although *Bromide of Potassium* belongs to the same chemical group as potassic iodide, it has very distinctive therapeutic properties. My experience of it in the treatment of epilepsy amounts to this: in a large proportion of cases it relieves (or "cures") only so long as it is administered. As an American writer (whose name I forget) well puts it, bromide of potassium *feeds* nerve-tissue as an antidote to convulsion, and therefore requires to be continuously given like food. Certain it is that, if an epileptic patient insist upon leaving off his medicine because he believes himself to be well, a prognosis ought to be given that the malady will probably return. Further, I am confident that the efficacy of the bromide is enhanced by the addition of strychnia; so that our most advanced therapeutic knowledge about epilepsy is now possibly represented by the union of these two medicines.

In my next paper, I propose to continue the illustrations of bromide of potassium, and show the remarkable efficacy of this salt when combined with chloral.

[To be continued.]

CASE OF EXTREME GRANULAR DEGENERATION OF THE KIDNEYS, WITHOUT HYPERTROPHY OF THE HEART.

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THE following case has an interesting bearing on present questions as to the pathology of granular kidney. (It may, in passing, be remarked that we now are accustomed to use this name in a sense different from that in which Bright used it. He applied the term "granular" to a large kidney which looked to the naked eye minutely conglomerate, so that granules were suggested to the eye by its appearance. He called the small shrivelled kidney, which we now call "granular", by another name—"the contracted kidney". Bright's granular kidney is now recognised as one of the stages of chronic catarrhal nephritis.)

The case is as follows.

Stephen A., aged 72, had been knocked down by a cab, and was admitted under Mr. Birkett's care with severe fracture of the thigh and arm—the former compound, and communicating with the knee-joint. He was sensible throughout the few days that he lived after the accident, and took his food fairly well; but he gradually sank, and died.

Post Mortem Examination.—An aged frame, grey, bald, and toothless. The body was well nourished. The lungs showed senile atrophy, with a good deal of pigment. The heart weighed 11 ounces. There was no hypertrophy or dilatation. There were some milk-patches on the pericardium. The heart was remarkably fat; its right ventricle was covered with fat. The muscular substance was firm and healthy. The liver was healthy, save that a large cavernous angioma was in its right lobe. The kidneys weighed 4½ ounces; and a large part of this weight was due to fat in the hilus. They were very small and shrivelled, looking flabby, pale, granular, with numerous cysts. The cortex was wasted much, both the superficial and the interpyramidal parts. The pyramids were very small. There were no grains of urate of soda in them.

Although the rule is, that we find hypertrophy of the heart in cases of granular kidney, yet there are occasional exceptions. Sometimes these exceptions resolve themselves into differences of degree. I mean that one finds very little hypertrophy, but the kidney is not excessively diseased; and then one falls back for explanation on the relative degrees of the two changes. Often one has to say, "Perhaps this kidney, though considerably diseased, yet did work enough not to call largely on the heart and arteries for supplementary power and consequent hypertrophy." But this, which is at best often an unsatisfactory way of treating the difficulty, fails entirely in many cases, as in the instance before us. We have kidneys here wasted away to the last degree, and yet the heart does not exceed the average weight for the age and size of the man. I have before met with such cases, but have observed that there was a certain relation between the age of the patient and the size of his heart, younger subjects having the heart smaller. Yet there have been striking exceptions to such a rule before the present example.

Evidently we cannot conclude that the renal imperfection causes cardiac hypertrophy as a direct result, through the necessarily consequent impurity of blood, leading to strong efforts of the heart to force this blood onward through the vessels. If the sequence were so direct, such a case as the present could not have arisen. Viewing the present example in its strong differences from the ordinary cases, one cannot but suspect that there is some underlying important difference in their pathology.

When I was observing the cases of granular kidney fatal at very early periods (19 to 24 years), with very little cardiac hypertrophy, I used to suggest to the class that this form of the disease might be due to congenital imperfection of the organ, and to point out certain differences between the contracted gouty kidneys and the kidneys in question. These were more uniformly small. The interpyramidal masses of cortex had not their usual comparative immunity, but had shrunk away as much as the superficial layer; so too the pyramids, which generally are large in granular kidneys, were here shrunken remarkably; and microcysts were plentiful. All this easily suggested an incomplete original foundation of the organs; and I used to consider that such a congenital imperfection probably had led to the premature failure of the glands. Since then I have read a parallel suggestion in Virchow's account of "fœtal cystoid degeneration of the kidneys". He says, in explanation of the cystic degeneration found in adults, "it may, indeed, easily happen that a *partial* fœtal degeneration may continue on into later life" (*Kr. Geschw.*, B. i); and, if this be true for