if we could look into it, we should find the cavity encroached upon as much as the tissues outside, owing to a villous thickening of the synovial membrane. Pressure gives little pain, and there is no increase of pain at night. Now, if this lad had been allowed to run wild a little longer, he would have limped more and more as the joint became more and more painful. The leg would have become flexed, and by-and-bye abscesses would have formed and opened around the joint. These would, perhaps, dry up after a time, leaving sinuses, with a temporary improvement of the health; then fresh abscesses would form, and the lad, emaciated and reduced by constant pain and discharge, would at length die, death being possibly preceded by an amyloid degeneration of the viscera, a condition not unfrequently superinduced by long-continued suppuration. By treatment, however, we may rationally hope to avert so calamitous a termination. The limb is placed upon a splint, both ankle and knee being immobilised, and after all inflammatory symptoms are reduced by rest and ice-bags, counterirritation will be employed under chloroform in the shape of the actual cautery. Under this treatment, the pain will probably disappear and the swelling subside; in the later stages, pressure will be employed by strapping over Scott's dressing. In the meanwhile, we give cod-liver oil and plenty of milk, two quarts daily, and, above all, exercise much patience; for these cases require a long time, a year perhaps, to effect a perfect cure. It may be indeed that, despite all our efforts, the destructive action progresses. Pyrexia announces the constitutional sympathy; the joint becomes larger, softer, and more tender; abscesses repeatedly form; and the joint becomes filled with pus and broken-down tissue. If such a fate await this poor boy, I shall open the joint on one side of the patella, and hyperdistend the synovial cavity with a one in thirty solution of carbolic acid. Should this plan fail to arrest the mischief, I should at once proceed to amputate the thigh, when, in all probability, you would find that, in a few weeks, the lad would be up and about in a vastly improved condition of general health.

I cannot but warn you against excision in such cases, although the operation is advocated by some surgeons even in the young. I confess to a strong impression that excision of the knee is, under nearly all circumstances, a bad operation, and one which will sooner or later fall into a deserved desuetude; for, after all, what is the end and object of every operation? Surely this: to cure your patient with as little risk as possible, as soon as possible, and with the best results as to utility of parts as possible. Now, how does excision of the knee fulfil these requirements? It seems to fulfil none of them. It is a more risky operation than amputation; it is an infinitely more tedious operation than amputation in the after treatment; and as to results, however pleasant it may sound to save a leg, I would very confidently back the first casual dozen one-legged men against any picked twelve men with excised knee-joints in a walking, or a jumping, or a climbing match. Look at our recent experience of this operation—at least, take my own. Within the last eighteen months, I have excised the knee-joint five times; in two cases, after a long and tedious effort at repair, I was compelled to amputate; the other three have still their legs on, but what are they worth? The best of them cannot go half a mile without pain and trouble; and the worst of them, this poor fellow before you, has been lying convalescing (!) here for the last six months, with the grand result of just being able to lift his leg in one piece off the bed. If things go as merrily as hitherto, he may hope in another six months to make the tour of the infirmary flags, when, if he have the good luck to fall down and break his stiff leg, I shall not hesitate to advise him to allow me to substitute a wooden-peg for his own very indifferent member. Whatever be the ultimate fate of this much bepraised operation of excision of the knee, depend upon it that, in cases of strumous arthritis, the game is at no time worth the candle.

HOLBORN.—Dr. Gibbon commences his report by stating that he had not received from the Registrar-General the usual copies of death-returns, and cannot supply the usual tables. There were in 1875 only 1,165 births registered in the district, and as many as 1,263 deaths: a return which would be the greatest possible censure on Dr. Gibbon if it were not obvious that the returns are erroneous, partly from reasons referred to by Dr. Gibbon himself. He gives the corrected death-rate as being 22.02 per 1,000 population, and the corrected number of deaths as 949, which are too few. Dr. Gibbon refers with satisfaction to the new mortuary. The sanitary work is said to be satisfactory, with which we do not agree, as out of this district, which contains the unhealthy sites reported under the Artisans' Dwellings Act, only 145 houses are reported to have been repaired, cleansed, and whitewashed; 35 accumulations of refuse removed, 89 water-closets cleansed and repaired, and small numbers of different kinds of nuisances abated.

ON THE RELATION BETWEEN ANGINA PECTORIS AND PERIPHERAL ARTERIAL CONTRACTION; AND ON THE *MODUS OPERANDI* OF NITRITE OF AMYL AS A REMEDY FOR THE DISEASE.

By GEORGE JOHNSON, M.D., F.R.S.,

Fellow of the Royal College of Physicians; Professor of Clinical Medicine and Senior Physician to King's College Hospital; etc.

WE are indebted to Dr. Lauder Brunton for a knowledge of the fact that, in some of the most severe and alarming attacks of angina pectoris, the pain and the distress are speedily removed by inhaling the vapour of nitrite of amyl. Dr. Brunton was induced to employ this remedy by a process of reasoning based upon some previously ascertained data. He made repeated sphygmographic observations on a case of angina pectoris, and he noticed that, during the paroxysms of pain, there was evidence of high arterial pressure, the result of excessive contraction of the arterioles. The pain and the high arterial pressure coincided, and the pressure fell with the cessation of the pain. He, therefore, inferred that the increased arterial pressure was the cause of the pain. He says (Goulstonian Lectures, BRITISH MEDICAL JOURNAL, March 31st, 1877, p. 380. See also his paper in the Clinical Society's *Transactions*, vol. iii, p. 191), "The pathology of the disease thus seemed clear; and the next question was, how to treat it. The remedy wanted was one which would dilate the vessels, and this the researches of Richardson and Gamgee supplied. Nitrite of amyl they had shown to possess the very power which I desired, and thus their experiments on the pharmacology of the drug, and my observations on the pathology of the disease united, led to successful therapeutics. I administered the remedy, and the pain disappeared".

The influence of nitrite of amyl in subduing the pain and shortening the paroxysm of angina has been confirmed by a considerable number of observers. In two cases under my own care it has been remarkably successful; but, notwithstanding the success of Dr. Brunton's therapeutics, I doubt the accuracy of his pathology, and I believe that the *modus operandi* of the remedy is different from that which he assumes it to be.

I will first state, as briefly as possible, my objections to his theory, and I will then suggest a different explanation of the phenomena.

There is no proof that arterial contraction is present in all cases of angina pectoris. So far as I know, Dr. Brunton's case is the only one in which the results of sphygmographic observations during the paroxysm have been recorded. Even if it were shown that contraction of the arterioles and high arterial tension are constant phenomena, proof would still be wanting that they are the cause of the angina.

If high arterial tension, with resulting backward pressure of blood upon the heart, were the sole or the main cause of angina pectoris, such symptoms might be expected to occur during the early stage of nitrous oxide inhalation, when before the period of anaesthesia there is unquestionable evidence of high arterial tension. (See my first Lumleian Lecture, BRITISH MEDICAL JOURNAL, April 14th, p. 446.)

In most cases of true angina pectoris, there is organic disease of the walls, or of the valves, or of the coronary vessels of the heart. (See, as to this, Dr. Gairdner's able and exhaustive essay on Angina Pectoris in the fourth volume of Reynolds's *System of Medicine*.) Dr. Brunton's theory suggests no explanation of the arterial contraction, or of the relationship between the central structural changes and the peripheral vascular contraction. It seems more probable that the pain is in some way directly due to these organic changes in the heart itself, than that it is a secondary result of a peripheral arterial contraction occurring without obvious exciting cause.

Dr. Gairdner in his essay (p. 375) refers to a paper by Nothnagel, who had in part anticipated Dr. Brunton by giving particulars of five cases of so-called "angina pectoris vaso-motoria". Dr. Gairdner points out that Nothnagel's cases differ from cases of true angina in some important particulars, especially in the absence of severe pain; in the transient, trivial, and curable character of the attacks; and, in the fact that, the sensations in the extremities supposed to result from vaso-motor spasm (deadness, coldness, formication and pain) were usually present in all the extremities indifferently, and preceded the palpitations and cardiac uneasiness by some minutes. And Dr. Gairdner remarks that, "the lesson taught by Nothnagel's cases is not, properly speaking, that typical, still less that fatal, angina pectoris, is always to be regarded as due to vaso-motor spasm, but rather that, under certain peculiar conditions of the system, a sudden check to the circulation in the extremities determined by vaso-motor spasm may become the cause of an increased action of the heart, palpi-

tation, and pseudo-angina; the disease so induced, however, being devoid of the characteristic pangs, and the more aggravated phenomena of fatal angina*.

I now pass on to my own explanation of the relationship between the pain of true angina pectoris and the arterial contraction; also of the *modus operandi* of the nitrite of amyl in these cases.

I believe that we have as yet no data which will enable us to give a complete explanation of the pain of angina pectoris, whether it be a pure neuralgia with consequent inhibition of the cardiac contractions, or a result of cardiac muscular cramp, or of overdistension of one or more of the heart's cavities, or a combination, in some cases at least, of two or more of these conditions, must remain at present a matter of doubt. It is agreed on all hands, that the pain is often agonising, and that it often radiates into neighbouring sensitive nerves, more especially those of one or both arms. It is a fact ascertained by experiment, that electrical irritation of the central end of a mixed or a sensitive nerve, such as, for instance, the sciatic or the trigeminal, not only causes severe pain, but also excites by a reflex influence through the vaso-motor centre, a general contraction of the arterioles, with resulting high arterial tension. (See Vulpian, *Leçons sur l'Appareil Vaso-Moteur*, tome i, p. 237, etc.) I, therefore, venture to suggest that the high arterial tension, when associated with angina pectoris, is a secondary reflex result, and not the primary cause of the cardiac agony; and, further, that the remedial efficacy of the nitrite of amyl is due to its remarkable influence over some forms of neuralgia, and not to its relaxing effect upon the arterioles, except in so far as its antineuralgic power may depend upon its influence on the arterioles. My contention is that, in addition to the centripetal nervous influence which causes the pain of angina, there is an influence reflected from the nervous centre through the vaso-motor nerves, and thus exciting a more or less general contraction of the arterioles. It is probable that the peripheral arterial resistance, although not the primary or the main cause of the pain, yet adds to the distress and the danger of the paroxysm. We have no evidence to prove that in any case of angina there is a general arterial contraction. It may be that the arterial contraction, like the pain, is limited to one or both arms.

A true theory of the relationship between angina and arterial contraction, and of the manner in which the nitrite of amyl affords the remarkable relief which it often does, is not without practical utility, more especially as a guide in the selection of cases which are suitable for the employment of the drug. One of the most striking examples of great and permanent relief by the use of nitrite of amyl is afforded by the case of Dr. Herries Madden of Torquay, as recorded by himself. (*Practitioner*, 1872, vol. ix, p. 331; quoted also in Dr. Gairdner's essay, before referred to.) Dr. Madden states, that for a considerable time he had hesitated and neglected to employ the nitrite of amyl, in consequence of his belief that it was suitable only in those cases in which the face is pallid during the paroxysms. "As mine was flushed," he says, "I dismissed from my mind all thoughts of trying it, and paid the penalty of hasty conclusions in the shape of a large amount of acute suffering." The result of a first trial of five drops inhaled during a severe paroxysm "was truly wonderful. The spasm was, as it were, strangled in its birth; it certainly did not last two minutes instead of the old weary twenty, and so it continued. The frequency of the paroxysms was not diminished for some time; but then they were mere bagatelles as compared with their predecessors. Under these improved circumstances, strength gradually returned, the attacks became less and less frequent, and finally ceased." Now, in this case, although the relief from pain was associated with the usual evidence of the physiological action of the drug in relaxing the arterioles, the flushing of the face during the paroxysm forbids the conclusion that a general contraction of the arterioles was the cause of the cardiac distress, and that the relief was due to relaxation of the arterioles.

Dr. Talfourd Jones has given some good illustrations of the therapeutic value of the nitrite of amyl, not only in relaxing spasm, but also in rapidly relieving neuralgic pains. (*Practitioner*, 1871, vol. vii, p. 213.) Dr. Jones's experience has been confirmed by other clinical observers.

A few weeks since, I was consulted by a lady who for a fortnight had been suffering from severe facial neuralgia, which had resisted various remedies that had been employed before she came under my care. I advised her to drop five minims of nitrite of amyl on blotting-paper and to inhale the vapour. The pain was rapidly and completely subdued. In a few hours it returned in a milder degree, and it was again promptly removed by the amyl vapour, and, after three or four repetitions of the dose, the cure was complete. It would be interesting, and it might be instructive, to observe, whether during a severe attack of facial neuralgia or sciatica, there is any evidence of contraction of the arterioles, with resulting tension of the arteries.

In conclusion, I repeat the expression of my belief that the relief which is often afforded by nitrite of amyl during a paroxysm of angina pectoris, is due to its antineuralgic power, and not directly to its relaxing influence on the muscular arterioles.

OPHTHALMOLOGY IN ITS RELATION TO PRACTICAL MEDICINE.

By H. MACNAUGHTON JONES, M.D., M.Ch., F.R.C.S.I. & E.,
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WHILE I was perusing the valuable and lucid exposition of Dr. Hughlings Jackson, on the relationship which at times exists between ocular motor disturbance and megrim, or it may be certain psychological phenomena, the following case presented itself to my notice. The man came to the extern department of the Cork South Infirmary and County Hospital. He is a very intelligent man, and the annexed description of his case is principally reported from his own statement of his past history and present symptoms. The interest which just now is taken in such cases, and the bearing of this one on the subject dealt with by Dr. Jackson, must be my excuse for here detailing the particulars.

W. A., smith by trade, aged 48, twenty-four years since, when living in London, fell into the hold of a vessel. He was removed to St. Thomas's Hospital. Mr. Solly, he says, pronounced his case to be one of "concussion of the spinal cord", with "displacement of the vertebrae" in the cervical region. He was insensible for some time after the injury; he had difficulty of feeling and inability to open the mouth; there was apparently no aphasia; he was salivated at the time; he remained in the hospital about eleven weeks. The right side was paralysed, with absence of sensation; the right extremities were useless. He was subsequently subjected to treatment by electricity, and became paraplegic; and both arms and legs were completely paralysed for the space of one year. He then recovered gradually, with a halting in the right leg, which remained ever since, and a difficulty in raising the right arm. He got a rheumatic attack about two years since, when the right eye became affected. At present, he has almost complete ptosis of the right eyelid; the pupil of the right eye is dilated; he has divergent strabismus of the same eye, pointing to paralysis of the third nerve. He can count fingers at any distance with the right eye. Vision $\frac{20}{40}$ (Snellen), with + 60 = $\frac{20}{40}$ nearly; I have not examined with prisms. When he walks with both eyes open, there is a peculiar halting gait and staggering of the right limb; with the sound eyelid closed with adhesive plaster, he gets complete megrim, and cannot walk (would fall); with the affected eyelid closed, he can walk much more steadily. There is ankylosis of the spinous processes of the third and fourth cervical vertebrae, with considerable enlargement of this region at the seat of the old injury.

Ophthalmoscopic Examination.—The fundus of the left eye is in every respect normal. The optic disc of the right eye is hyperæmic; the arteries are small and attenuated; the retina is otherwise normal.

Psychological Phenomena.—When "alone for any time, or violent", he sees visions of "men, women, and children, and animals of all sorts"; these gradually go on multiplying, and, when they "are at their height", he "fancies he sees the devil". He cannot describe all the shapes and forms he sees; they are so numerous. When this state has lasted for some time, he must lie or sit down. A feeling of nausea sometimes comes on, and he gets a sense of faintness; he never has had a fit. When he rubs the right side of the face with his hands, he says he gets a sensation as if he were subjected to an electric shock. The urine is of specific gravity 1015; no cloudiness, no deposit, no albumen.

EXAMINATION OF THE POSTERIOR NARES.

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SINCE the invention, or at least discovery, by Czermak of the art of examining the nasal portion of the pharynx and the nasal fossæ by means of a mirror placed at the back of the throat, the art of rhinoscopy has established for itself a reputation not merely as an aid to diagnosis, but also as a means of facilitating treatment, which its daily employment only serves to enhance.

Experience brings the rhinoscopist into contact with a class of cases in which the relations of the velum palati to the pharynx and tongue necessitate artificial displacement of the former, whilst excessive irritability of the parts with which the "palate-hook" comes into contact