and ventricles the contraction is so perfect as to force every atom of red blood out of each cavity, a circumstance indicating that all the cavities are of one magnitude. In the contraction and dilatation of these several cavities, the mechanical laws of the pendulum are obeyed. For every cavity contracts from its fundus towards the opening where it expels the blood, and hence has its greatest amount of motion at the most distant part from that opening.* This pendulous mode of action necessarily causes a momentary rest or cessation of motion between every contraction and dilatation, and produces a regular series of harmonic actions.

Perceiving that the actions of the heart owed their existence to the presence of a certain amount of heat, I tried the following experiments:—I carefully removed the yolk and albumen from, and retained the embryo and its membranes hanging in, the shell of the egg; I then placed the shell in cold water until the actions of the heart ceased; I then gradually applied heat, and noticed that when the heat amounted to 98° Fahr. the actions of the heart recommenced, and increased in velocity in exact proportion to the degrees of heat conveyed to it. I afterwards kept the heat steadily at 120° for one hour, and noticed that the great velocity of action in the heart did not lessen, or appear to wear out, its irritability. After this period, I placed the egg-shell again in cold water, and then noticed the actions of the heart to become progressively slower, and at last to cease. I then, for the second time, applied warm water until the heat reached 120° Fahr., and noticed the progressive restoration of the actions of the heart to their former velocity. After this experiment, I poured cold water into the egg-shell until the embryo floated in it, and noticed that the actions of the heart instantly ceased. I then poured out the cold water, and placed the shell in water heated to 98° and 100° Fahr., and restored the actions of the heart to their natural vigour. After this experiment, I removed the shell, and poured into it a little harts-horn heated to 104° Fahr., and noticed that the actions of the heart soon ceased to exist, and could not be again restored.

That heat is the energizing agent to the vital actions, and the only agent capable of restoring these actions when suspended by cold, is proved by the above-mentioned, and likewise by the following experiments:—I removed a number of eggs which had been four days under a clucking hen, and exposed them five days to the influence of the cold air. I then examined them, and saw that all the vital actions had ceased to exist. I then placed them in water heated to 104° Fahr., and in a very short time all the suspended actions were restored. I then placed the eggs into cold water until the restored actions ceased to exist, and afterwards placed them into warm water, and reproduced the vital actions. This reproducing power shows that eggs will not become addled from the temporary absence of the hen from her nest during incubation. It likewise shows that a certain amount of cold has merely the power of arresting, not annihilating, the vital actions of a tender foetus, and that a change in the amount of heat is necessary to the perfect development of these actions. In illustration of this remark, I may adduce the circumstance of canary-birds quitting their eggs occasionally for hours, and very seldom having addled eggs; and of the crocodile having her eggs hatched in the sand by the alternate presence and absence of the sun's rays. In the human subject, heat is not generated to so great an amount during sleep as when awake.

Reiterated experiments show that the actions of the heart are slow at 90° Fahr., very rapid at 110°, and that at 128° they in a few minutes cease to exist, and cannot afterwards be reproduced—a circumstance worthy of much consideration.

Upper Fitzroy-st., Fitzroy-sq.

LIABILITIES OF THE MUSCLE IN DISEASE.— POISONING BY LEAD.

In clinical medicine, how important is the negative evidence—how great the interest that attaches to the missing symptoms of a case! The gains from direct observation in our wards are of acknowledged value, and open to all. To the thoughtful physician, there is often most of suggestion in what he looks for,—yet, looking, fails to find. Lead is known among us, chiefly from its effect of palsy on the muscle. As a poison, it is determined from the common blood to the fleshy self-contracting fibre—to that division of the muscular structure which is under direct influence from the will. Here, in the

Burton Ward, is a young woman, (M. G.—, aged twenty-two,) who, at ten o'clock P.M. of Saturday, December 20, swallowed, intentionally, about sixty grains of the officinal sugar of lead, and who, at this present date, retains the full use of every muscle in her body. Hands, feet, toes, and fingers, are all, as much as ever, under her own control. There is not a muscular symptom in the case; neither cramp, twitching, convulsion, nor dropping of any one limb, or of any part of a limb; and yet, during the sixty hours succeeding one o'clock on Sunday morning, the patient was in the utmost danger from the primary effects of the poison. In the case of self-poisoning by arsenic and verdigris, up stairs in the York Ward, the paraplegia of toes and fingers was observed within forty hours after swallowing the mineral compound. The subject of this case (A. D.—, a young man of twenty-seven) is, and will ever remain, a helpless cripple. For how long a period will the unhappy girl now before us retain the use of her limbs? Will she escape the lead palsy altogether? The cases are parallel, and yet in useful contrast. Beginning from the same agency of a mineral poison, happening at the same time, their circumstances being nearly similar, it is impossible to avoid setting one against the other. And thus, we advance in our clinical studies by the help of comparison,—a principle without limit in its practical application. Let it not be confined by nosologists to disorders the same in class. Of disease, as it really occurs, to those who work upon it, there are no two cases, in appearance however dissimilar, that are not better known, the more they are compared. J. A. W.

St. George's Hospital, Dec. 26th, 1845.

P.S.—Jan. 12th, 1846.—M. G.—, the subject of this case, left the hospital this morning entirely "recovered." Did she escape the lead palsy by dint of her violent and frequent vomitings?

OBSERVATIONS ON LUXATION OF THE JAW.

WITH A SIMPLE CONTRIVANCE FOR PREVENTING A RECURRENCE OF THE ACCIDENT.

By J. L. LEVISON, Esq., Surgeon, Brighton.

A SHORT time since, a toothless old gentleman, of a highly nervo-bilious temperament, consulted me, to use his own phraseology, "to know what he should do to prevent his jaw coming out of its place;" thus rendering it evident that he was subject to a luxation of the jaw. On further inquiry, I ascertained that he was only affected on the left side; for he said, "Sometimes I awake up with my lower jaw pushed on the right side, where it is fixed, and I am rendered incapable of making myself understood, from a difficulty, under the circumstance, to utter articulate sounds." After a great amount of painful suffering, particularly near the left ear,* he continued "to pull his jaw—to press it backwards, when, after about a half hour's work, bang it seemed to go, and all was right again," excepting that the pain in the angle of the jaw would frequently remain for hours afterwards. From his active temperament he was always restless and fidgety, even during the few hours he slept at night, or when taking his afternoon's nap, which were the times that the luxation occurred; usually it was just when in the act of waking, and at other times the annoyance was great, from the dread of its recurrence. Having suggested the following simple contrivance, it is some satisfaction to me to mention that it has answered the purpose contemplated.

In my own experience I have invariably found that when a luxation occurs, whether from an excessive fit of gaping,—from opening the mouth to have a back tooth extracted,—or from the loss of teeth, so that the jaws cannot be properly antagonized, (as in my present case;) in all such instances there is a tendency to a repetition of the annoyance, but which might be obviated by the plan alluded to above, and which I shall now describe. A flat band, composed of four layers of wash-leather, is accurately measured to the under part of the chin, with a cap to fix on the latter exactly, and so shaped as not to press on the trachea; and then it is neatly bound with ribbon. At one extremity there is a neat, small buckle, not sown on the edge of the band, but on the flat side, the corresponding extremity having a neat doeskin strap, by which it is fastened at the top of the head, after being placed on the chin. This contrivance may be worn with security and ease. But as a preventive against the instrument being forced off during sleep, two pieces of ribbon or strong tape are sown on

* Some physiologists deny the possibility of the several cavities of the heart being able to contract independently of each other. (See Hertius' "Manual of Physiology.")

* When the condyle slips out of the glenoid cavity, it springs forward, resting on the edge of the zygomatic arch, and hence the accuracy of this description.

it at each side, exactly under the ears, and then they are tied behind just under the occipital process.

It appeared to me in this case, with an upper jaw so much absorbed as to be considerably within the arch of the lower, the latter is, in consequence, so very much thrown forward, and the cheeks are so hollow, that such an instrument as that proposed by Mr. Fox,* could not be depended on, whilst my own can be worn without any annoyance, and is quite secure.

Nature seems to have furnished a hint for such a contrivance, as may be observed when a severe fit of gaping is experienced after great watchfulness, the hand is placed under the chin with a corresponding force, and an instinctive confidence of its utility, just as if the anatomy and articulation of the jaws had been well understood.

Devonshire-place, Brighton, Jan. 1846.

POISONING BY THE STRONG LIQUOR OF AMMONIA.—RECOVERY.

To the Editor of THE LANCET.

SIR,—From the few cases recorded of poisoning by liquor ammoniæ fortis, I have been induced to furnish you with notes of a case under my care, requesting you to insert them in your journal.—Your obedient servant,

University College, March, 1846.

ERNEST P. WILKINS.

M. C—, aged twenty-four, of a nervo-sanguineous temperament, was attended by me during her accouchement, Jan. 10th, which was perfectly natural. I called to see her on the following day, about four o'clock P.M., when, from her suffering considerably from afterpains, I ordered the following:—Take, liquor of acetate of ammonia, three drachms; tincture of hyoscyamus, fifty minims; camphor water, one ounce. Make a draught, to be taken immediately. If the bowels should not be evacuated before the next morning, to take a dose of castor oil. During the evening her husband came to fetch me to see her, stating that the dispenser had made a mistake in her medicine, which had nearly killed her. I was not at home when he called, but went to see her as soon as I returned. I found a six-ounce mixture, containing a large quantity of strong liquor of ammonia, of which she had measured a wineglassful, and drank half of it. The quantity of liquor of ammonia it contained was doubtful, as no measure had been used in compounding it; suffice it to say, that on tasting a very minute portion, I and others burnt our mouths. There was no label on the bottle, but the husband, who fetched the medicine, said he had verbal direction "to give a dose, and repeat it." As soon as she had drank it, she fell back insensible, apparently (to those with her) as if choked; the husband ran to a chemist, who told him a mistake had been made in dispensing my prescription, and gave him a dose similar to what I had ordered, advising him to come for me directly. She took this about six P.M., I saw her at half-past ten. She had then revived somewhat, but complained of severe burning pain down her throat, in the epigastrium, and left hypochondrium, each of which parts were tender on pressure; pulse 53, small; voice a feeble whisper; great debility; countenance anxious; gruel had been offered to her, but when she attempted to swallow it, a choking sensation prevented. I gave her some diluted vinegar; this she swallowed in small quantity, but with difficulty; pupils widely dilated; breathing difficult; tongue coated with white fur, painful, and tender; two or three patches of its mucous membrane peeled off; she had three convulsive twitches of the right arm at different times during my visit. I directed diluted vinegar to be given occasionally, and ordered citric acid, one drachm; mucilage of acacia, three ounces; pure water, three ounces. Make a mixture, of which take a table-spoonful every hour. Four grains of extract of hyoscyamus to be taken into the mouth, and allowed to dissolve.

Dec. 12th.—Pain less, but still severe, especially the colicky pains; pulse 44, small and feeble; she has expectorated little, flattened, thready substances several times during the night; has had no sleep; tongue coated with a white fur, and very sore; pupils less dilated; lochia absent; breathing easier; on swallowing, a sensation is produced as if the substance was too large for the passage, and seemed to lodge once or twice before deglutition was completed. She said she thought her gullet was swelled.

* The late highly-esteemed Mr. Joseph Fox once contrived an instrument for the same purpose. It consisted of a cap to fit the head, and another cap to fit the chin, with a connecting leather on one side of the face, and a buckle and strap on the other. But this would be annoying to such a restless, irritable patient as mine, and the contrivance has less actual security than the one described in this communication.

13th.—Much better in every respect.

15th.—Still complains of pain and tenderness in the epigastrium and hypochondrium; pain also in the lower part of the abdomen, which was swollen, and a little tender; tongue furred, pulse 56; has had copious perspirations; feels much exhausted and depressed; severe pain across the nose, darting through the head; has passed a restless night; bowels not relieved since the 13th; urine free; milk copious; lochia scanty; thirst; deglutition much easier; no appetite. Take half an ounce of castor-oil at bedtime. Tincture of hyoscyamus, spirit of nitric ether, of each two drachms; liquor of acetate of ammonia, two ounces; antimony wine, half an ounce; camphor mixture sufficient for a six-ounce mixture. Take two table-spoonfuls every four hours. Take of calomel, two grains; Dover's powder, eight grains. Make a powder, to be taken at bedtime. Apply fomentation of poppies to the abdomen.

16th.—Seized, during the night, with severe diarrhoea, which is still present; evacuations pale; pain and tenderness of the epigastrium; urine passed with pain, and high-coloured; pulse 68, weak; pain across the nose gone; tongue coated with a white fur; spirits much depressed. Take of powdered opium, one grain; calomel, two grains. Make a pill, to be taken at bedtime. Take of acacia powder, prepared chalk, of each one drachm; compound chalk and opium powder, half a drachm. Mix them into six powders, one to be taken every four hours.

17th.—Much better; purging ceased.

19th.—Improving.

24th.—Convalescent.

This patient's pulse is unusually slow during health, averaging 48.

ON THE TREATMENT OF CHRONIC DISEASES OF THE SKIN.

By THOMAS HUNT, Esq. M.R.C.S. Eng., Herne Bay.

ORDER VI.—VESICULE.

To this order Willan has allotted seven genera—viz., varicella, vaccinia, herpes, rupia, miliaria, eczema, and aphtha.

Varicella and vaccinia are diseases of limited duration, as well as mild in character. Rupia properly belongs to the order bullæ, and has already been disposed of. Miliaria is probably a disorder of mismanagement, and is, in fact, disappearing before the march of improvement. Aphtha is a disease of the alimentary canal; and herpes, besides being essentially acute and ephemeral, is generally complicated with some obvious disorder of the general health, and requires corresponding treatment. When the health is not materially deranged, it may safely be left to the vis medicatrix nature.

Eczema, the remaining genus in this order, both in its acute and chronic form, is occasionally a disease of magnitude, and is often obstinate as well as severe and tormenting. Dr. Willan appears to have been singularly unfortunate in his description of this disease. He distinguishes it from herpes as an eruption of vesicles, with little or no inflammation round their base; and yet the most important variety (eczema rubrum) is described as attended with local inflammation and general vascular excitement. Before we censure Dr. Willan for this contradiction, and attempt to re-arrange his ingenious and highly-convenient classification, it may be well to consider whether every system of arrangement must not necessarily be open to some objection. Diseases are not developments of Nature, but deviations from Nature's order. Concise and exclusive definitions, the very materials with which the nosologist must frame his tables, are inapplicable to the complicated and ever-varying phenomena of morbid action, which, from their very nature, require elaborate as well as accurate description.

The disease which now claims our attention consists of an irregular eruption of vesicles, surrounded by an inflamed base, and attended by excessive pruritus. The vesicles are evolved, and burst with great rapidity, and may easily escape detection. They pour out an irritating fluid, which excoriates the already inflamed skin. The cutis, deprived of the cuticle by desquamation, appears beset with numerous pores, from which exudes a sero-sanguinolent fluid. This dries into scabs, or laminated incrustations, which take their colour from the discharge, being at first of a greenish-yellow, afterwards becoming yellow and brown, if the discharge becomes purulent; or reddish and dark-brown, if the ichor is tinged with blood. Meanwhile, fresh eruptions appear, and go through similar stages: chaps and fissures succeed, and the subcutaneous cellular tissue often becomes involved in the inflammatory