hend from it. Experimental pathology and pharmacology have not given us the remedy, but they have taught us how to use it, what are its dangers, and how they are to be avoided. They are death from failure of the heart and death from failure of the respiration. The researches of Panum, Cyon, and others, have shown us that the heart is stimulated to increased action by warmth, but that a sudden fall in the temperature to which it is exposed may act upon its inhibitory ganglia and suddenly arrest its pulsations. The respiratory centre also is stimulated by warmth to increased action. But, while a high temperature quickens the heart and makes it beat more powerfully, it also exhausts it more rapidly. Supposing, then, that both the heart and the respiratory centre should be weakened by continuance of fever, we can readily see that the withdrawal of the stimulus supplied to them by the high temperature may cause them to act so feebly as to endanger life as well as that a sudden fall in the temperature may cause instant death by stopping the heart through its inhibitory ganglia. A knowledge of the dangers teaches us how to avoid them, and the lessons of experiment coincide with those of clinical observation. The temperature in such cases must not be brought down too quickly; it must not be brought down too low, and stimulants must be administered to prevent the action of the heart and respiratory centre from flagging.*

While experimental pathology and pharmacology have done so much for us already, will they not do more? They have taught us how to use such remedies as cold affusion, which were known before, and they have put new ones, like salicylic acid, into our hands. But collapse still sometimes occurs after a cold bath, and salicylic acid does not always prevent the temperature from rising. Will this always be so? I think we may confidently answer, No. We shall yet discover remedies to prevent the collapse, and to keep the temperature within its proper limits. Every day is enriching medical science with some new discovery, diseases are being traced more precisely to their origin, and the action of remedies is being more exactly defined and localised. Order is beginning to appear amongst the crowd of new acquisitions to our knowledge, and isolated facts begin to range themselves under general laws. Pharmacology is allying itself to chemistry, and the rigid laws of the latter are beginning to extend to the former. We no longer attribute the power of drugs to an inherent energy, and say, with Molière, that opium causes sleep because it possesses a *vis dormitiva*. We are beginning to look upon the sleep as only one link in a chain, the beginning of which is a chemical affinity between opium and certain molecules in the nervous system. We observe that drugs having different chemical affinities differ in their effects on the body, while those belonging to the same chemical groups are nearly allied in their action. By altering the chemical composition of our drugs, we can alter the place of their action and change the nature of their effect. We can counteract the effects of one drug by another, and prevent death from a poisonous dose. We are learning the conditions which cause our drugs to affect one part of the organism rather than another, so that we hope are long to foretell from the chemical constitution of any substance the organ it will attack and the functional changes it will effect. At the same time, pathology is teaching us the parts on which we must act, and the nature of the influence we must exert, in order to prevent or arrest the processes of disease. Thus we may hope to predict that a body having a certain chemical constitution will prove an efficient remedy in a particular disease. Hitherto we have been obliged to trust to the substances we procure from plants for our most powerful agents; and, even if we were to know the constitution of the particular remedy we required, it might be impossible to procure it. But now one alkaloid has been made, another and another have rapidly followed it. We can change the constitution and action of these in the same way as we alter those derived from the vegetable kingdom. It is, therefore, highly probable that we shall be able to produce artificially the substances which will act on the body in any way we desire.

Nor may the time be so very far distant. When the oldest licentiates of this College now living were studying their profession, the discoveries of Lavoisier were novelties; digestion was still regarded as a process of solution; the functions of sensory and motor nerves were unknown, and the doctrine of reflex action was still far in the future. The distinction between the tissues had just been made, and the importance of the cell had not been recognised. Pathology had hardly begun, and scientific pharmacology did not exist. When we think of all this and compare it with our present knowledge, we are astonished. If we compare our practice, as at the beginning of these lectures, with that of the Egyptians and Greeks, we are discouraged; but, if we glance

at the advances made during a single lifetime, we cry, "Slow has been the advance of medicine, because she went astray; now the path she follows is right, swift has been her progress and glorious will be her future."

THE DIAGNOSIS AND TREATMENT OF AUDITORY-NERVE VERTIGO.

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[Continued from p. 289 of number for March 10th.]

A GOOD illustration of the obscurity which gastric symptoms may confer on these cases was afforded by a woman, 50 years of age, who came under my care last spring at University College Hospital. She gave a long history of the symptoms of chronic ulcer of the stomach, for which she had been previously in the hospital. On examination, the stomach was found to be tender and evidently dilated. Vomiting was still frequent, occurring chiefly in the evening, when much of the food taken during the day was rejected. Giddiness was complained of as associated with the vomiting. When she was first seen, the giddiness was thought to be due solely to the gastric disturbance. Subsequent questions as to the character of the vertigo and the time of its occurrence elicited a very definite history of another kind. It appeared that the giddiness very frequently came on when there was no sickness; that it occurred in paroxysms; and that it was produced especially by sudden movements, as lying down, or sitting up, or turning round in any posture. In the attacks, the sensation was always of a definite character, being as if "something went over the top of the head from the right side to the left". If standing, she often fell, and, even if sitting, she would fall from the chair. She always fell to the right. Whether she fell or not, she always had, during these attacks, the sense of falling to the right and backwards, never forwards or to the left. Many attacks were witnessed. In some, she fell to the right; in others, merely backwards, although she felt as if falling to the right. In some, she almost lost consciousness; could be roused with difficulty. She said that she had many times actually lost consciousness for a few minutes. During the attacks there was slight flushing of the face. The eyelids were closed; on opening them, there was no dilatation of the pupils. The eyes were all the time in the median position, never turned either to the right or the left, even when the sense of falling to the right was most intense. The duration of the attacks varied from a quarter of a minute to several minutes. The vertigo commenced suddenly, but ceased gradually.

The definite character of the vertigo led to a careful examination of the state of hearing. It was found that a watch was heard less acutely with the right ear than with the left. (Right at one-third, left at two-thirds the normal distance.) She could hear all the notes of a piano; but, after listening for a little time, the upper and middle notes suddenly ceased to be heard. After a little time, she could hear them again. The upper notes, she said, constantly sounded a "long way off and faint, like the strings of a guitar". She had noticed lately that her daughter's voice, in singing, sounded distant and "squeaky", quite unlike its ordinary character.

Audition through the bones of the skull was tested with the tuning-fork. Placed in contact with the top of the head, she said she could hear it in the left ear only. Placed on the left parietal eminence, she heard it invariably louder when the meatus was closed than when it was open. Placed on the right parietal eminence, she could hear it only faintly, and, when the meatus was closed, she could not hear it at all. Examination with a watch yielded the same result. The meatus was free from obstruction. She had been troubled with occasional singing and whistling noises in the right ear.

Sight was unimpaired, except by presbyopia. The ocular muscles were unaffected. Smell and taste were both diminished. Neither peppermint, assafoetida, nor camphor could be recognised. Neither citric acid, salt, nor sugar could be tasted on either side. Quinine was tasted a little. No pain was referred to the ear, but neuralgic pain and tenderness over the right side of the head were complained of, and, on examination, there was distinctly defective tactile sensibility in the parts supplied by the right fifth nerve. There was a good deal of general weakness and prostration, and she was liable to occasional attacks of great prostration, sense of dyspnoea, surface pallor, without marked failure of pulse. She was disturbed at night by starting in her sleep, accompanied with a sensation of falling: she would wake in a

* A remedy which pharmacology indicates as likely to be successful in cases of impending death from the effects of a cold bath in fever is atropia, which paralyses the inhibitory nerves of the heart and stimulates the respiratory centre.

perspiration. She constantly dreamed of falling, and dreamed that she saw other persons falling from heights.

Many drugs were tried to lessen the attacks of giddiness (bromide of potassium, belladonna, gelseminum, Indian hemp, etc.), but with no permanent benefit. Absolute rest in the hospital (when she was admitted under the care of Dr. Reynolds) was followed by marked improvement, and the attacks of paroxysmal headache were effectually relieved by inhalations of nitrite of amyl, which had, however, no effect on her vertigo. At a later date, she thought that salicylate of soda did her more good than anything else.

The evidence of defective labyrinthine function in this case is clear. The character of the vertigo, its paroxysmal and uniform character, render it probable in the highest degree that it was due to that morbid action of the right auditory nerve, of which there was independent evidence. The distinct affection of other cranial nerves suggests the probability that the impaired function was due to disease of the nerve-trunk or centre rather than to disease of the ear itself.

The more immediate interest of the case is, however, the combination which it presented of chronic gastric symptoms and auditory-nerve vertigo. The association was here conspicuously accidental, but the confusion in diagnosis which the association caused is typical. The same combination is constantly seen in cases in which the gastric symptoms are less pronounced. In this case, the distinction of the cause of the vertigo was easy, not only on account of its pronounced character, but because the gastric symptoms were those of organic disease, and organic disease of the stomach is less frequently accompanied by vertigo than the simple disturbances (chronic gastric catarrh: Trousseau).

The sufferers from this affection, besides their acute attacks, are often liable to a slighter chronic sensation of disturbed equilibrium, the "interparoxysmal reeling" to which Dr. Hughlings Jackson has called attention. It may take the form merely of a vague sense of instability, which is expressed by the word "dizziness" and the like. This condition is often in constant relation to the gastric functions. The least stomach-disturbance at once excites the feeling, and most careful dietetic management is necessary, in order to keep the patient free from his annoying sensations. The following case is an illustration.

A gentleman aged 35 sought advice on account of chronic gastric disturbance associated with slight giddiness, which he regarded as secondary to the dyspepsia. His tongue was clean and appetite fair, but he complained of acidity, flatulence, and frequent sense of prostration. There was marked epigastric aortic pulsation; no cardiac murmur, but a weak impulse and soft radial pulse. The giddiness from which he very often suffered was vague in character, and was worse when his stomach was a little out of order. It was only on inquiry for ear-symptoms that he said his left ear was a little deaf, and that he had occasionally "singing" in it, especially when his dyspepsia was troublesome.

Some years before, he had suffered from attacks of sickness and giddiness, but could give no detailed account of them. He dated his present symptoms from a series of severe paroxysms of vertigo six months previously. The first of these occurred without warning or apparent exciting cause. He was walking with a friend, who was on his right hand. Suddenly, he felt something which seemed like a blow on the left side of the head behind the ear, and made him "whirl round" to the right and fall on his right side with such force as to knock his friend down also. He said that it seemed "as if the ground on his right suddenly rose up to him". He stuck his hands convulsively into the ground, but did not lose consciousness, calling out at once to his friend, "Let me alone; I am giddy". In a few minutes, the giddiness gradually subsided, and he walked a mile or two home, but he had some difficulty in walking straight.

Two days afterwards, he had a second attack. He had been busy in law courts all day, and had omitted to take any food until long past his usual time. Then he had dinner, and afterwards walked along the street, when he suddenly found himself getting giddy. He had not time to call a cab, but managed to clutch hold of some railings. He seemed to hear a roaring sound in his left ear and fell towards the right. Although he held the railings with all his force, he could not prevent himself from falling against them and grazing his right cheek, and then sliding down to the ground. He believes there was no loss of consciousness; for he remembers the chaffing remarks of bystanders on his presumed intoxication. The giddiness soon passed, but he felt for a time weak and prostrate.

The third attack was less severe. It occurred in bed soon after waking in the morning. He was lying on his back, when the bed on which he lay seemed suddenly to be rolling over from the right; just as, in the first attack, the ground seemed to rise up from the right.

He had no subsequent attack until a day or two after my first interview with him, when he had a slight attack one evening while at

supper. He did not fall, but all objects seemed to revolve round a centre situated in front of him, those above the centre moving from right to left. Next day, he had an attack of diarrhoea.

When first seen, there was some wax in each meatus; but, after this had been completely removed by syringing, it was found that the hearing in the left ear was reduced to one-third. A tuning-fork in contact with the top of his head was heard, he thought, only in the right ear, but audition through the skull, tested by closing the meatus while a tuning-fork was sounding in contact with the parietal eminence, seemed defective in each ear. In each case, closing the meatus rendered the sound less distinct, and the diminution was greater on the right side than on the left. The watch in contact with the skull, however, was heard on the right side, and not at all on the left.

The case is thus a fairly typical one of labyrinthine vertigo. The noise in the left ear at the moment of the onset of the vertigo points to that ear as the chief seat of the mischief, and with this the defective perosseal audition of the watch corresponds, although the defect in the perosseal audition of the tuning-fork was greater in the right ear. The movement in the attacks was, therefore, as usual, from the side on which the ear was affected. The association of the giddiness and the gastric disturbance was marked both in some of the severer attacks and in the more persistent slight giddiness.

The most important point, then, in the diagnosis of auditory from gastric vertigo is the recognition of an impairment of the function of the auditory nerve shown, first, in deafness, and, secondly, in tinnitus, and the most significant change is the loss of the power of hearing a watch in contact with the skull. The point of next importance is the character of the vertigo. The sensation which results from a primary gastric disturbance is usually vague, a confused sense of defective equilibrium; that which results from a labyrinthine affection is definite, a sense of movement in a certain direction, subjective or referred to other objects. This statement is not in complete accordance with the descriptions of gastric vertigo which have been given by Trousseau and other writers, who have described vertigo of very definite character as the consequence of gastric disturbance only. But the fact that the patient may be unconscious of a most significant auditory defect, lessens the value of former observations as evidence of the definite character of stomachal vertigo. My own conviction is that, in the vast majority of the cases in which a vertigo of definite and uniform character is apparently excited by gastric disturbance, an auditory defect will be discovered on careful examination. In a small proportion of cases, no auditory defect may be found. In some of these cases, there may be disturbance of some other sensory nerve also related to the function of equilibration. But, on the other hand, the sensation which attends a labyrinthine disturbance may be vague in character. Hence definiteness in the character of the sensation is of greater value as suggesting a primary affection of the auditory nerve or the centre of equilibration, than is the absence of definiteness as excluding such a source of the giddiness. Lastly, the sequence of the gastric symptoms and vertiginous sensations is of some significance, although, as we have seen, this may easily be misunderstood. Vomiting, dyspepsia, or diarrhoea, after an attack of vertigo, is no evidence that dyspepsia is the cause of the trouble. Gastric derangement before the vertigo may be a primary cause of the vertigo, or may merely excite an attack in the presence of a derangement of the equilibrium centre.

Cerebral Disease.—Vertigo may be a symptom of cerebral disease, and the attacks which result from a labyrinthine affection may be of such a character as to simulate very closely those of cerebral origin. This resemblance depends chiefly on the occasional occurrence of loss of consciousness in the attacks of auditory vertigo, and on their suddenness. Sudden loss of consciousness may be a symptom of two forms of cerebral disease, apoplexy and epilepsy, and from each of these auditory-nerve vertigo has to be distinguished.

Apoplexy.—The resemblance to apoplexy struck Menière very forcibly, and the affection was accordingly termed by him "apoplectiform". Instances are occasionally met with which merit such a designation. A medical friend is now suffering from indubitable auditory-nerve vertigo, whose first attack was of an apoplectiform character. Now, the attacks are always referred by him to gastric disturbance. Although the sensations are described by him as intense giddiness and inability to stand, there is no definite sense of rotation or tendency to fall in a definite direction. The first sensation is a sense of suffocation and of oppressive heat; he then bursts into a perspiration and feels intensely giddy, so that he is obliged to lie down. As long as he is lying down, the sensation of giddiness ceases; but, if he attempt to rise, it comes on again. For many years, since an explosion near him he has been partially deaf in the right ear. A watch is heard six inches from the left, but is not heard at all with the right ear. A tuning-fork vibrating in contact

with the skull is well heard in the left ear, and increased by closure of the meatus. He thinks he can hear it in the right ear, but it is not increased by closing the meatus. He has continuous tinnitus in the right ear. When at his best, the noise is like a "dull buzzing"; but, if his stomach be deranged, or if overworked, the sound rises to a persistent hissing, "like an engine". It is greater for some hours before an attack of giddiness, but is not louder at the moment of an attack. His first attack was one of sudden and profound loss of consciousness, without much giddiness. He was walking in the City, when he suddenly lost consciousness and fell. He probably had no convulsion, but was taken to a hospital, where he was thought to be in a state of post-epileptic coma. Some hours passed before he recovered consciousness. The second attack, however, was attended with vomiting and no loss of consciousness.

But the cases are rare in which the loss of consciousness is so considerable and so lasting as to render the diagnosis a matter of real difficulty. A speedy return of consciousness, coupled with the persistence of vertigo and the absence of any symptoms of local weakness, generally renders the nature of a case sufficiently obvious. The history of preceding attacks will also indicate the nature of the affection. In a first attack, as in one depending on an acute inflammation of the semicircular canals, a diagnosis might be for a time impossible.

[To be concluded.]

ON BLAPS MORTISAGA AS A HUMAN PARASITE.

By T. SPENCER COBBOLD, M.D., F.R.S.,

Correspondent of the Academy of Sciences of Philadelphia.

THROUGH the kindness of Mr. J. Fletcher Horne of Barnsley, I am possessed of a living specimen of the larva of this somewhat repulsive coleopterous insect, commonly known as the churchyard beetle. In a letter accompanying the specimen, and dated February 3rd, Mr. Horne says: "The enclosed was this morning found in the motions of a child eleven weeks old. As it is, I believe, an unusual visitor in a child so young, I have thought that it might be of some interest to you. The child has been brought up with cow's milk, always boiled". On receiving the maggot, which I at once recognised as referable to the genus *blaps*, I wrote to Mr. Horne requesting him to make inquiries with the view of ascertaining the genuineness of the case regarded as one of parasitism. Replying to me on the 6th, he writes: "I have seen the mother of the child to-day, and have not been able to shake the evidence that the larva was passed from the bowel. The people have no garden, and they feel sure that the maggot passed into the napkin with the motion. Their washing is done at home, and dried before the fire. The child is apparently getting well rapidly, which I think strengthens the evidence."

Mr. Horne having been apprised of my desire to publish the case, he was good enough, in a subsequent communication, to mention some other particulars. Thus, in respect of the symptoms, it was noticed that the child had a cough soon after birth, and for five weeks previously to the time that it came under his professional care it "had a fit once a week", apparently convulsive in character, as the face was said to have turned blue during the paroxysms. "A neighbour says she detected, before the worm came away, a 'humming or buzzing' about an inch from the umbilicus on each side, which has now gone away." I may here remark that I agree with Mr. Horne in thinking that these supposed insect-like sounds were merely due to flatus; our informant probably using the term "buzzing" only because she had knowledge of the fact of an insect having been passed. Be that as it may, Mr. Horne adds: "The child has never had any diarrhoea, and its bowels are usually constipated, the motions being passed in small round pieces like little marbles. When I first saw the child, it had great difficulty in breathing, with frequent sighing. To-day (the 8th) the child seems to be getting on famously." In an earlier letter, Mr. Horne informed me that the treatment mainly consisted in the administration of powders containing hydrargyrum cum cretâ and rhubarb; and, although they were not given with the view of expelling the parasite (the presence of which was of course not so much as suspected), they nevertheless had acted anthelmintically.

Taken by themselves, the above particulars might hardly perhaps be considered as affording sufficient evidence of parasitism, or of having caused the symptoms in question. However, several authentic instances of the occurrence of the larvæ of *Blaps* having now been placed on record, it is clear that, even if this case were more than doubtfully genuine, it would not set aside the evidence afforded in the other and otherwise similar instances. For my-elf, no doubt remains respecting the parasitism in this case; Mr. Horne's opinion and my own being in entire agreement.

In my general treatise on the *Entozoa*, I have briefly alluded to the notorious and unquestionably genuine case of Mary Riordan, who not only passed *per anum* upwards of 1,200 larvæ, but also several perfect insects belonging to this species. I have likewise referred to Hope's Catalogue, wherein two other cases are given. The first-named case was reported by Pickells and Thomson, with the valuable co-operation of the well-known Dublin helminthologist Dr. Bellingham. One of the other authentic cases, in which only a few larvæ were present, was recorded by Patterson of Belfast, and the third by Bateman. I may mention that the Rev. F. W. Hope's Catalogue originally appeared in the *Transactions of the Entomological Society*, being afterwards published in the pages of the *London Medical Gazette* (1837). Patterson's case was also, I believe, first communicated to the Entomological Society. I mention this in order to show the difficulty of getting at the literature of this department of helminthology (if such it may be called), and also in the view of expressing my belief that several other recorded cases might be found, if diligently sought for, in the *Transactions of foreign societies*. The only other instance that I can at present find ready to hand is the one for which Sir J. Rose Cormack is responsible. A notice of this case appeared in the *Monthly Journal of Medical Science* (1841).

As regards the mode in which the maggot gained access to the child in the case before us, it is not easy to decide; but, in the case of Riordan the mode of ingress was sufficiently explained. The *Blapsidæ*, as a family, are closely allied to the meal-worms, and, like most of the *Tenebrionidæ*, are black and foul-smelling beetles, frequenting dark and damp situations, from which they retreat only at night. The family comprises numerous species, of which probably not more than three are found in this country. They are abundant in Africa, especially in Egypt, where (according to Fabricius, as quoted by Westwood, Figuer, and other entomologists) the women eat *Blaps sulcata* cooked with butter, in order to make them grow fat. The insects are also employed as specifics against ear-ache and the bite of the scorpion—a method of treatment which smacks somewhat of the principle of *similia similibus curantur*, since earache, amongst the superstitious, is often associated with the notion of there being maggots within the meatus. Moreover, many genuine cases of insect-larvæ within the external auditory passages have been published. The superstitious notion of a "charm" is generally at the bottom of all domestic theories on the subject of treatment. This was pre-eminently so in Riordan's case. Here, as Westwood observes, when epitomising Pickells's long account, the parasites "probably originated in an absurd and superstitious practice, which she had for some time followed, of drinking daily for a certain time a quantity of water mixed with clay, taken from the graves of two Catholic priests, and eating large pieces of chalk. One of these beetles was immersed repeatedly in spirits of wine, but revived after remaining therein all night, and afterwards lived three years".

The intolerance of light shown by the perfect insect seems to be equally shared by the larva. Of this fact I have had repeated evidence by observing the behaviour of the living specimen sent by Mr. Horne. Thus, when, on February 5th, I placed the maggot on the surface of some moist mould (taken from a fern-jar and put in a tin box), scarcely half a minute elapsed before it commenced to bore its way downwards, and in less than a minute all but the tip of the tail had disappeared. In like manner when, on the 7th, I raised the lid of the box, and found the maggot lying on the surface of the soil, it almost instantly proceeded to bury itself. In short, under similar conditions, its conduct is invariably the same; and, whether we speak of it as a larva or an imago, this insect may clearly be branded as "one that loveth darkness rather than light". At the risk of incurring the wrath of a certain society established for the prevention of cruelty to animals, I occasionally, for the benefit of the curious, poke up my *Blaps mortisaga*, when—judging by the alacrity it displays in its frantic efforts to escape—its discomfort, not to say distress, is sufficiently obvious.

NON-ERUPTIVE VARIOLA.

By ALFRED FLEISCHMANN, M.R.C.S. Eng.

IN the fourth edition of Watson's *Principles and Practice of Physic*, pp. 861 *et seq.*, will be found the following paragraphs.

"This frightful disease sets in with smart febrile symptoms..... pain in the epigastrium, with nausea and vomiting, and headache."The period of incubation is from ten days to a fortnight..... Amongst other symptoms, "vomiting is one, pain in the back another. Heberden noticed that acute pain in the loins was almost always fol-