The explanation of the case appears very simple; the body with which she had been struck must have been blunt, and, as usually happens, slipped obliquely from the skull, making a mere superficial wound, without doing further mischief there. She was, however, eating at the time, and there can be little doubt that the blow was unexpected; and, as occurs in all cases of injury and fright, it caused her to take a sudden and violent inspiration, and, in consequence, produced the sucking in of the vegetable she was about to swallow. The firm manner in which it plugged up the trachea, demonstrated the great force with which it had been drawn in, and the insufficiency of the convulsive efforts that followed to dislodge it. Had the trachea not been examined, (and how often is it neglected,) the cause of death would no doubt have been at once set down as the result of the direct effects of the blow upon the brain; and as I have not heard the issue of the legal proceedings, I cannot say how far,—if, indeed, in any degree,—the discovery of the true cause of death lightened the legal guilt of the prisoner in the eyes of the Viennese jurists.

CONCLUSIONS FROM CERTAIN EXPERIMENTS MADE TO ASCERTAIN THE NATURE OF EPIDEMICS.

By SIR JAMES MURRAY, M.D. T.C.D. & Edinburgh.

BEING anxious to solicit the attention of my respected medical brethren to a further consideration of malaria and epidemics in these alarming times, I long since sent for publication in *THE LANCET* four fasciculi of experiments upon these important subjects. Those papers contain details of experiments made by me when a member of the Board of Health at Dublin, during the occurrence of the cholera in 1832, and of various investigations in the malarious districts of Italy in 1834, and again in 1844.

Since it appears the above details are too extended for insertion in that periodical just at present, I have ventured to ask space for an *abstract* of the conclusions to which my trials have led me since the promulgation of my electrical theories in 1832.*

Only a short summary of the volumes of manuscript notes remaining at the office of *THE LANCET* can now be given. The reasons and experiments which led me to the following conclusions are so numerous that they would require a separate publication to lay all the explanations before my readers. The results of my experiments and observations led me to abandon the ordinary doctrines of *marsh miasmata*, and to attribute to emanations of a very different kind the exciting causes of what are called malarious diseases. Without the notes of evidence, however, the summing up, here condensed, must of course be very imperfectly understood:—

1st.—I consider that the exciting cause of epidemics, which is called *malaria*, is not “bad air” at all, as the name implies.

2nd.—That marsh miasms, gases, or effluvia of vegetable matters or putrid emanations, are not, as is commonly supposed, the exciting causes of agues or other diseases called malarious.

3rd.—That in denying the usual doctrine of marsh miasmata, I do not deny that general “malarious” ailments proceed from terrestrial, paludial, or atmospheric emanations of active, dangerous, and subtle qualities.

4th.—But I consider these noxious emanations are disturbed *electro-galvanic currents* and accumulations, sometimes positive, sometimes negative, causing a want of electrical equilibrium in human bodies.

5th.—That these electric agencies are untowardly excited or set free from soils of fens or marshes, drains and sewers, by the known effects of evaporation, chemical action and infiltration of decomposing substances and putrid deposits, or from foul waters, among minerals, ores, metals, and dissimilar strata of soils and sub-soils, and also in wet lands, or during rainy seasons, after long-continued absorption by the earth of solar heat.

6th.—That as it is notorious that there are more insalubrious dry and high places in the Roman Campagna affected with malarious diseases than wet and low situations, I consider that in such elevated and arid spots, long noted for insalubrity, there is emitted from the earth’s surface an untoward emanation of electro-galvanism, with its concomitant lethal agent called *ozone*, set free by causes operating within the soils of that locality, either by the juxtaposition of strata of dissimilar materials, acting electrically upon each other, or by the in-

filtration of subterranean streams or mineral waters, and by internal heat and consequent liberation of steam-electricity; or by some other agents, acting upon materials contained in the ground, analogous to the manner in which we operate upon artificial substances in a galvanic apparatus.

7th.—That in some of the thousand ways in which electro-galvanism is produced in the earth or air, its undue influence (under certain circumstances) disturbs the natural electricity of human beings, particularly when recumbent in contact with the ground, or on beds near the earth.

8th.—That this disturbance, either in the relative quantity of electricity itself, or in the due proportion of the positive or negative (fluids), alters the condition and functions of the human nerves, and probably the relative state of the particles, and the polar relations of the atoms or corpuscular molecules, and at all events is capable of exciting or depressing the vital functions, and of acting chemically on the circulating animal fluids. This is obvious near rivers, and during east winds, the agency of passive or negative electricity, then, and there, inducing diseases of debility.

9th.—That these untoward galvanic agencies account more clearly for the specific cause, specific symptoms, and specific cures of some classes of complaints, such as intermittents, than the hitherto assumed action of *marsh miasmata*, which are supposed to be so various in their nature. In regions in which there are no fens or marshes, such as the Island of Ascension, &c., the agues incident to strangers are the same as where morasses are extensive; in both circumstances the disorders occur at particular seasons, are confined to particular situations, and require particular and identical treatment.

10th.—That the doctrine of marsh miasms is untenable, because malarious diseases attributed to them are common where there are no marshes, and because domestic animals are in general perfectly healthy, whilst human beings fall by thousands, which surely would not be the case were noxious miasm *inhaled* into the lungs during respiration.

11th.—The immunity of lower animals seems to arise from the comparative density of their integuments, rendering them less liable than men to the influence of electric accumulations, galvanic currents, or the disturbance of the (natural) fluid in them by induction. The hairs or wool being wet at night, serve as pointed conductors, which diffuse or dissipate opposite electrical currents into the earth or air, and prevent their effects on the small brain and nerves of domestic animals.

12th.—That the general immunity of blacks (even those who have long lived in our climate) from malarious diseases, appears to prove that inspiration of malarious air by the lungs, is not absolutely noxious, and that the cutaneous texture, oily secretions, and non-conducting varnish of their daily anointing and painting, render their skins less susceptible, or more repulsive of electric agencies, than the integuments of whites. The black colour, as it absorbs heat sooner than white, may also make a difference in the electric conducting power. Even a black silk thread, ribbon, or stocking, presents very different electrical phenomena from those of white twist, or white fabrics of the same texture.

13th.—That this doctrine of the electrical origin of malarious diseases enables us to approach much more nearly to salutary means of prevention than the old theory of inhalation of miasms wafted in the air can lead us to apply preventive measures against.

14th.—That, with this view, in order to enable colonies to be planted upon the Campagna di Roma, and other insalubrious or desolate regions, I proposed to *drain some suitable sites thoroughly*; to place a horizontal zinc or copper rod or tube in each drain; to connect these cross-wires or tubes with two or more upright conducting or lightning rods; to carry away excess of electricity outside the habitation, and not to permit its passage up or down through the house or tenement, or through the bodies of its inmates.

15th.—That many trials have convinced me, that houses, when built upon such insulated platforms, floored with non-conducting compost of asphalt or bitumen, and protected above and below from electric currents by copper tubes or wires, are comparatively healthy in all situations. These insulated chambers prevent the natural electricity of the bodies of men from being untowardly augmented, diminished, or irregularly distributed through them, by the *abstracted* or the *excited* electricity either of the earth or of the air, as I have many times witnessed.

16th.—That as many failures have occurred to common protecting rods for want of moisture in the ground, in dry seasons and arid elevations, I have found hollow pipes, such as our copper gas-tubes, to present several advantages as lightning rods: by terminating below in the horizontal pipes

* “London Medical and Surgical Journal,” July, 1832, p. 721.

or drains containing water, and by being always wet inside by the rain contained in them, their efficiency is secured.*

17th.—That having secured a perfectly *drained area or platform* for a house or houses, I lay over the arches of the drains a solid floor of Roman cement, on brick or stone-work; and when the tenement is erected, and this platform is perfectly dry, I make it hot by a fire laid upon it. Whilst still hot, I spread over it a melted layer, about four inches thick, of asphalt and pitch, mixed with fine dried and sifted powder of Spanish clay. This makes a floor which does not crack, and which is almost impervious to moisture, or to passes of electric currents, either from the air above, or from the earth below.

18th.—That in building the walls in the first instance, a layer of sheet lead is laid in pitch and tar compost, on a level with the intended floors, with which layer the insulating compost above mentioned is made to unite, when making the non-conducting floor after the building is finished.

19th.—It is too tedious to detail in this abstract, but I have devised a ready insulating medium for existing walls and buildings, and also for raising small tubes or pipes from the house-drains into the air, higher than the chimnies of houses, or spires of churches, to serve as efficient *lightning rods*, and allow odious smells and hydrogenous gases to be blown away in the higher regions of the atmosphere.

20th.—This principle of insulating the areas or ground upon which the buildings are erected, is intended for habitations, hospitals, barracks, and all public or private edifices, in malarious localities, and particularly in those places where insalubrity is prevalent and dangerous. In such desolate situations, the inmates may in a great degree be preserved from the direct action or disturbance of electric passes, up or down, through the apartments or places of rest.

21st.—That this precautionary insulating measure is also well adapted to diminish the damp prevailing in many basement stories of houses, and, by rendering the air of the apartments dry, and therefore non-conducting, is calculated to diminish the danger of moisture, and many of the other evils commonly associated with the old or current theory of marsh miasms.

22nd.—That for so-called malarious districts, wet floors, or low places, a thick layer of dry lime, fresh from the kilns, produces very favourable galvanic changes; abates the low indication of negative electricity of these places for the time; puts a speedy end to several chemical changes going on in sewers and soils; and tends very much to ameliorate the atmospheric condition of the insalubrious habitations, in so far as electro-galvanic currents and accumulations are concerned. Dry lime is a non-conductor, and has been useful in absorbing the moisture of damp rooms, and thereby diminishing their power of carrying electric currents to or from the inhabitants.

It had long since been proposed by Dr. Priestley to electrify a great number of patients at once, by placing them in a chamber raised upon glass feet.

Mr. Ellis recommended, in 1831, that persons seized with cholera should receive their medical treatment in beds placed upon glass bottles, and be supplied with their remedies in glass vessels. All these ingenious suggestions were proposed for the use of persons already diseased; but my desire is to prevent persons from being epidemically diseased at all, as far as can possibly be accomplished. The above able gentlemen have suggested means of cure; I recommend measures of prevention. Their propositions were never carried into effect; whereas my insulated houses were tried, and saved the inmates from attacks of disease in places where labourers, unprotected, fell by dozens in faintings and fevers, from want of sufficient electricity to sustain the natural balance. Persons insulated by a very bad conductor, such as a floor of cold asphalt, and by *clean dry flannel, silk, or other insulators*, cannot readily communicate electricity to the earth, nor receive electricity from it, if the air of the apartment be dry, and free from filth, mist, or vapours.

The following may serve to convey an outline of my reasons for insulating public and private buildings:—A cloud strongly charged with positive electricity over the individual, will attract his negative electricity upwards, and repel his positive electricity towards the earth. After the cloud is discharged, passes away, or is neutralized, the two elementary fluids rush

towards each other into the centre of the person's body. The opposite currents of the two elements often kill instantly. In milder cases, such electrical disturbance affects the animal fluids, as it affects beer in the cellar, or milk in the dairy.

I consider that men's bodies, between the atmosphere and the earth, represent the chain of a Leyden jar or of an electric machine, conducting negative electricity from the outside of the jar to the ground, or supplying positive electricity from the earth to the rubber. Were the surface of the floor well insulated, the chain could not readily give or receive the currents which otherwise pass through it. Men, in like manner, may be saved in towns, camps, and houses, from being made the vehicles of currents which are quite capable of deranging the mechanical order, the chemical action, and the physical function of every atom and organ of the human body.

I have also recommended portable insulated chambers, or sheet-iron cottages, and pitch floors, for sailors or others while frequenting noxious shores or swamps for wood or water.

Should the editor of THE LANCET favour me with further space, I shall venture to explain some of my conclusions respecting cholera and other epidemics in an early number.

Merrion-square, Dublin, Aug. 1848.

ON THE TREATMENT OF GONORRHŒA IN THE FEMALE.

By J. C. EGAN, M.D., M.R.I.A.,

FELLOW OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND, AND LATELY ONE OF THE SURGEONS TO THE WESTMORELAND LOCK HOSPITAL.

IN a recent number of THE LANCET, some observations on the above subject appeared from the pen of Dr. Mayne, surgeon to the Leeds Lock Hospital, in the course of which he alludes to a paper published in the *Dublin Quarterly Journal*, which I had the honour of reading before the Surgical Society of Ireland at the close of its last session, and an extract from which subsequently appeared in the July number of the *Edinburgh Monthly Journal*.

After stating the reasons which induced him to devote his time and attention to this particular subject, and the opportunities which he enjoyed while thus engaged, Dr. Mayne proceeds to remark, "while in this manner patiently pursuing the investigation, and waiting for opportunities of more extended observation, I accidentally discovered, and was not at all sorry to perceive, by an extract from the *Dublin Quarterly*, quoted in the July number of the *Edinburgh Monthly Journal*, that similar views have been entertained, and that I have been anticipated in their publication by Dr. Egan, of Dublin, so far as the involution of the uterus in this disease is concerned. On this point I fully agree with that gentleman, but I cannot vouch for so very large a proportion of cases (97 out of 112) as he has laid down for diseased uterus. If the proportion really were so great, it could scarcely happen that the cures effected without recourse to special uterine treatment would bear the considerable average it does. On the contrary, they seem to me to form rather a minority of such cases, constituting those hitherto unaccountably obstinate and perplexing examples in which ordinary measures, including injections, have been again and again pursued with ample promise of success, teasingly falling short only of complete cure."

I regret, that before committing his observations to the press, Dr. Mayne had not an opportunity of reading in a connected form the paper upon which he comments, as in it I stated that the particulars of the cases were noted carefully and accurately in the presence of the patients themselves, and in no instance did I trust to memory for a description of the symptoms enumerated. He could likewise have perceived that this statement was further corroborated by reference to a statistical table, containing the name, age, length of duration of disease, appearances presented on examination with the speculum, of all the patients submitted to inspection; for the accuracy of each particular I can fully vouch, having in the majority of the instances alluded to instituted the same test on frequent occasions, lest there might have been any possibility of falling into error, by a superficial or cursory examination. Since my connexion with the hospital terminated, I have been further convinced, in private practice, of the correctness of the views which I was then led to entertain, and I feel assured, that in proportion as Dr. Mayne's experience and field of observation extend, will he be disposed to concur with me, contrary as it may be to preconceived opinions, that by far the majority of cases of gonorrhœa in the female are dependent on a diseased state of the lining membrane of the

* In trials on rocks and dry mountains on my experimental protecting pipes, small funnels were fixed to collect rain. The lips of the funnels were furnished with points; part of the horizontal pipes in the ground were bent down like an inverted syphon, to contain water where none was naturally to be found. The overflow from these tubes always kept some parts of the contiguous earth or sub-soil wet or humid, so as to form a good conductor at a sufficient depth.