The link between the vascular and extravascular phenomena is *exudation*, meaning by the act of exudation a passing out of plasma from the blood. At the beginning of inflammation—the moment of injury—blood rushes to the part injured with increased velocity, and in increased quantity. If the injury be trifling this is all that happens, but if it be severe the results are less transitory: the vessels become filled with blood, which stagnates in the capillaries of the part. Then follows a leakage of the liquid parts of the blood from the spoilt vessels into the tissue, producing the symptoms of redness and swelling. Thus the initial stages of the inflammatory process are three in number—viz., 1st, determination or *affluxus sanguinis*; 2nd, capillary congestion—*turgor* or *stasis*; 3rd, exudation. Each of these terms has been used loosely by writers at different periods, so that it must not be taken for granted that because the same terms were used in the past that the same things were meant by them as at present, or that because the older writers used different terminology they did not mean the same things that we do.

The first use of the word “determination” has been attributed to Paré. John Hunter called it the “incipient enlargement of the vessels,” and in no part of his treatise does he use the word “determination.” He says:—“The very first act of the vessels when the stimulus which excites inflammation is applied, is, I believe, exactly similar to a blush. It is, I believe, simply an increase or distension beyond their natural size. This effect, we see, takes place upon many occasions: gentle friction on the skin produces it; gently stimulating medicines have the same effect,” &c. Then he goes on to describe an experiment which is an admirable instance of his physiological acumen. In it he directs that an incision be made on the inside of a dog's thigh. “By pulling the cut edges asunder, and observing the exposed surface, we shall see the bluish or ash-coloured cellular membrane covering the different parts underneath, with a few arteries passing through it to the neighbouring parts. But in a little time we shall see these vessels increasing in size, and also smaller vessels going off from them that were not before observable, as if newly-formed or forming; the number and size shall increase till the whole surface shall become extremely vascular, and at last the red blood shall be thrown out in small clots on the exposed surface, probably through the cut ends of the arteries that only carried lymph before.” A more striking instance is given in another part of his treatise, where he relates how, on cauterisation of a patient's toe, the dorsum of the foot became swollen and reddened, and all the veins of the leg became distended. It is impossible to read Hunter's writings without being struck with the accuracy of his observations and the justness of his appreciation of phenomena; but the same clearness is wanting when he enters on theoretical discussions, and, unfortunately, his followers cherished these, rather than the facts from which his inferences were drawn. His theory was, that in the initial stage of inflammation there was a dilatation or paralysis of vessels, and yet he speaks of it as an increased action. He compares it to a blush, with this difference, that whereas in the blush the dilatation of vessels is transitory, in inflammation there is a special action in the vessels following an inflammatory cause which will soon lead to other changes in the natural structure of the parts. He goes on to say that “when we consider the whole of this as a necessary operation of nature, we must suppose it something more than a simple relaxation; we must suppose it an action in the parts to produce an increase of size to answer particular purposes; and this I should call the action of dilatation, as we see the uterus increase in size in the time of utero-gestation, as well as the os tincæ in the time of labour, the consequence of the preceding actions, and necessary for the completion of those which are to follow.” These considerations led Hunter to institute an analogy between inflammation and overgrowth of parts, every part increasing “in some degree to the action required. Thus, we find muscles increase in size when much exercised; vessels become larger in proportion to the necessity of supply—as, for instance, in the gravid uterus; the external carotids in the stag, when his horns are growing, are much larger than at any other time; and I have observed that in inflammation the vessels become larger, more blood passes, and there appear to be more actions taking place.” These comparisons are unfortunate, and

during the seventy years which have followed Hunter they have been repeated again and again, so that, being untrue, their influence has been the more detrimental. To understand his point of view it must be remembered that the one fact on which he based his statements was that of the enlargement of the arteries and veins. Hence, he concluded that the quantity of blood passing through the inflamed part was increased, not distinguishing between the conditions of afflux and of capillary congestion. His descriptions, indeed, show that he was quite familiar with the fact of capillary congestion, for he accurately notes the permanent redness of the part and the existence of capillary hæmorrhage; but he certainly did not know the true cause of these, and believed that the blood continued to flow through the capillaries with the same velocity as in the primary affluxus. Hunter's comparisons fail us in not being applicable to any part of the process. For example, in the enlargement of the mammary glands during pregnancy there are two changes taking place *pari passu*—viz., (1) enlargement of vessels, and (2) growth of gland. These changes are combined—there is a “solidarity” between them, and one cannot be said to be cause of the other. In none of these cases has it been shown that the increase in growth depends on increased blood-supply. The rabbit-fancier, in order to produce the “lop-ear,” exposes the creature to the cruel influence of radiant heat on repeated occasions; and a similar overgrowth of the rabbit's ear can be produced by dividing the vascular nerves. But this can only be successful when the animal is still growing—in which case increased circulation will promote growth; but when the animal or organ is no longer young and has ceased to grow, no excess of growth or new growth will be produced by increasing the vascularity of a part. So if it were possible to produce an afflux of blood to the non-pregnant uterus, there would be no overgrowth resulting. Probably, had the question of the mammary gland in pregnancy been put before Hunter, he would have said that the gland caused the enlargement of the vessels, but that this did not apply to inflammation.

Correspondence.

“Audi alteram partem.”

THE ARMY SANITARY COMMISSION.

To the Editor of THE LANCET.

SIR,—Will you be so good as again to allow me space to state a few more facts regarding the work of the Army Sanitary Commission which you have again criticised in last week's LANCET. You have quoted at length the criticism of the Commission on the absence of sufficient sanitary information in the reports on the Cholera Epidemic of 1872 in India, as invalidating certain conclusions which the Commission nevertheless drew from the reports. The fact to which I wish to direct your attention is, that this criticism was applied, not to absence of sanitary information on the part of medical officers only, but to absence of information from the Cantonment Committees also. There are two sanitary authorities—namely, medical officers for regiments and these committees for stations, which latter are included in an expression of regret that so little had been done by this inquiry on the part of *local authorities* to elucidate local causes (same report in which the criticism occurs, page 308, par. 35). The whole information required could only have been obtained by the co-operation of both departments, and hence it never occurred to us to cast doubts on the ability of some fifty able and experienced Indian medical officers on a question of etiology, merely because the sanitary information in their reports was defective, for which they were not the only parties responsible. In their own personal inspections and communications with regimental officers, they appear to have had no suspicion of cholera poison having been conveyed in drinking-water (although several of them believed that the disease was communicable), for on this important etiological fact the reports are silent. Further, the authorities in India afforded to these officers an opportunity of reconsidering their reports, and they have substantially adhered to their statements, including those on sanitary points, while on

the etiological question which has given rise to the present discussion they have preserved their former silence. I draw no inference; my object is to call attention to the fact.

You have likewise criticised a paper of the Commission on local conditions attending typhoid fever in India, which certainly is not a report on the subject, but mostly a condensation of a number of statements in themselves intended chiefly to give the results of a preliminary investigation instituted by the Indian authorities with a view to future extension to other stations, if such a step were warranted by the facts arrived at. This course was necessary because typhoid fever occurs under a different topographical distribution in India than it does at home, and several of the usual concomitants of the disease in England are not so manifest at these stations. For example, there are no sewers or house-drains through imperfections of which sewer gases could find access to living-rooms or water-cisterns. This preliminary inquiry answered its object, and this was really all it was intended to do.

As you have referred to Dr. Murchison, will you allow me, in conclusion, to state that immediately on the appearance of the second edition of his work on Fevers, the India Office, on our proposal, sent copies to every important station of British troops in India.

I remain, Sir, yours truly,

London, Dec. 14th, 1875.

JOHN SUTHERLAND, M.D.

THE RECENT OUTBREAK OF TYPHOID FEVER AT CROYDON.

To the Editor of THE LANCET.

SIR,—Your remarks are so correct generally on sanitary subjects, that I have looked week by week for more correct information in respect to the recent outbreak of typhoid fever at Croydon. Will you allow me to state a few facts in reference to the history of, I am glad to state, our late calamity.

After ten years' almost entire freedom from the disease, it has appeared twice this year, and each time simultaneously over the whole water district, especially, however, the higher levels. At its first appearance the Board of Health (which is constituted, as a whole, of men of business habits and great intelligence) voted the £14,000 to increase their pumping power and water-supply, and attended generally to the advice of their Sanitary Committee and medical officer of health. And on the appearance of the second epidemic, every effort was made to discover the causation and prevent the recurrence of this pest. Amongst other causes, the existence of the large overflow-pipe in the reservoir tower has been mentioned. This has been there for the past eleven years, and is about 4 ft. above the level of the water. It was well trapped, the top of the reservoir itself being ventilated by a huge trap door, and the water in a constant state of motion. Dr. Buchanan is making every endeavour to unravel the mystery, aided in every way by the members and officers of the board; and we are confident that, with our increase of supply and power, we shall again be able to provide cheap and pure water to the inhabitants of this, for the last ten years, almost the healthiest district in England.

Many strictures have lately appeared in the public prints on the conduct of the members of our Board of Health. I confess I do not see their justice. We must not forget that they are the custodians of the public purse as well as the public health. When Dr. Buchanan's report is published, it will be seen how far they were to blame.

Hoping you will find room for this letter in an early issue, as the town is beginning to suffer from the spread of utterly fallacious reports, founded on your remarks,

I am, Sir, yours truly,

ALFRED CRESSWELL, F.R.C.S. E.,

December, 1875.

Member of the Croydon Local Board of Health.

DUBLIN HOSPITAL SUNDAY FUND.—Last year the collections were £3306, but this year, although nearly fifty additional churches have joined in the movement, the result has not been satisfactory, and the total amount is much the same as in 1874. The inclemency of the weather on the 14th of November, the day fixed for the collections, is the chief explanation that can be given for this result.

Medical News.

APOTHECARIES' HALL.—The following gentlemen passed their examination in the Science and Practice of Medicine and received certificates to practise on Dec. 23rd:—

Dell, Joseph Francis, Dunstable, Beds.
Hayes, Thomas Edward Darley, Burton-crescent.
Horsman, Godfrey Charles, King-street, Portman-square.
Jones, David Rhys, Camden-street.
Mason, John Wallis Barron, Osnaburgh-terrace, Regent's-park.
Osborne, John Henry, Southwell, Notts.
Popert, Adolph Joseph, Workworth-terrace, Limehouse.
Smith, Stephen Francis, Stretton Villas, Hackney.
Steil, George Robert, Park Villas, Shepherd's-bush.
Weller, John, Amersham, Bucks.

The following gentlemen passed the Primary Professional Examination on the same day:—

Reginald Clarke, King's College; Richard Clarke and William Jenkins Quicke, Westminster Hospital; George Holloway, Queen's College, Birmingham; Augustus Charles Morton and Jeremiah Reader, Guy's Hospital; William Kay, St. Bartholomew's Hospital; David Edward Thomas, St. Thomas's Hospital.

A PORTRAIT (three-quarter size) was last week presented by "some friends and former pupils" to Professor Apjohn, who some time since resigned the Chair of Chemistry in the medical school of the University of Dublin.

BRITISH MEDICAL DEFENCE ASSOCIATION.—At a general meeting of the members of the British Medical Defence Association, held at the Guildhall Tavern, Gresham-street, City, on the 21st ult., Dr. B. W. Richardson, F.R.S., in the chair, the following additional vice-presidents were elected for the ensuing year—viz., Dr. Herbert Davies, Dr. A. Ernest Sansom, Dr. C. J. White (Snodland, Kent), and Mr. Spencer Watson, F.R.C.S. Dr. Herbert Davies was unanimously elected honorary treasurer.

NORWICH MEDICO-CHIRURGICAL SOCIETY.—The third meeting of this Society was held at the Norfolk and Norwich Hospital on Tuesday, Dec. 7th, Dr. Pitt in the chair. The following papers were read:—"On Obstruction of the Bowels," by Dr. Bateman; "The Therapeutic Value of Quinine in Enteric Fever," by Dr. Waddell; "Notes on a Case of Catalepsy," by Mr. Turner; and "On the Local Use of Cold in Abdominal Inflammation," by Dr. Eade. The next meeting will be held on Tuesday, Jan. 4th.

ADULTERATED TEA.—From and after Saturday, Jan. 1st, a provision in the late Food Act will take effect, by which all tea imported as merchandise will be subjected to examination by persons appointed by the Commissioners of Customs, and samples taken to analyse, and if found to be mixed with other substances or "exhausted" tea, is not to be delivered except with the sanction of the Commissioners, and if in the opinion of the analyst it is not fit for consumption it is to be forfeited and destroyed. The term "exhausted" tea means any tea deprived of its proper quality by decoction or otherwise.

Medical Appointments.

ALLDEN, J. H., M.R.C.S.E., has been appointed House-Surgeon to the London Hospital, vice Boase, resigned.
ANDERSON, R. J., M.D., has been appointed Demonstrator of Anatomy at Queen's College, Belfast, vice Charles, appointed Professor of Anatomy and Physiology at Queen's College, Cork.
BENNETT, Dr. H. S., has been appointed a Visiting Physician to the Margaret-street Infirmary for Consumption and Diseases of the Chest, vice Jagielski, appointed a Physician in Ordinary.
BLACKBURN, H. B., M.R.C.S.E., has been appointed Medical Officer to the Eekington Medical Association, Derbyshire, vice Rigby, resigned.
COLBY, W. T., M.R.C.S.E., has been appointed Medical Officer for the Malton District and the Workhouse of the Malton Union, Yorkshire, vice Wm. Colby, M.R.C.S.E., resigned.
COOPER, W., M.R.C.S.E., has been appointed Medical Officer for the Farnworth District, and Public Vaccinator for the Farnworth and Widnes Districts of the Prescott Union, Lancashire, vice Greenup, deceased.
DE WOLFE, G. H. H., M.D. Canada, M.B., C.M. Univ. Edin., has been appointed Medical Officer to the Tintern District of the Chepstow Union, and to the Tintern Abbey Iron and Wire Works, vice Audland, resigned.
DUKE, R. E., L.R.C.S.I., has been appointed Medical Officer and Public Vaccinator for the Western District of the Cerne Union, Dorsetshire, vice Ewens, resigned.
EASTON, J. A., M.D., L.R.C.S.Ed., has been appointed Medical Officer to the Tharsis Mines, Province of Huelva, Spain: £250 per annum.
FLOOD, Mr. F. P., has been appointed an Assistant Resident Medical Officer to the General Infirmary, Leeds, vice Horne, resigned.
FOX, O. A., L.D.S.R.C.S.E., has been appointed Hon. Dentist to the Brighton and Hove Dispensary, vice Brown, resigned.