It would afford me great satisfaction to have the opinion of your readers on this point, if they will favour it with their consideration. I remain, Sir, yours faithfully,
May, 1844. AUSCULTATOR.

ON THE USE AND ABUSE OF GELATINE IN THE DIET OF INVALIDS.

To the Editor of THE LANCET.

SIR,—Having perused some observations in THE LANCET of the 27th ult. on the nutritive, or, rather, the innutritive qualities of gelatine, permit me to state my personal experience in occasionally using it as an adjunct to the diet of pupils requiring extra attention from delicacy of health.

1. I do not believe that it should by any means supersede or lead to the diminution of any ordinary article of plain and wholesome regimen.

2. I only consider it useful in cases of marked constitutional irritability; when, if persevered in for some time, it certainly appears to soothe the local irritability of the mucous membrane, and may possibly also improve the condition of the pulmonary tissues. For the former purpose it will, perhaps, be found available during the exhibition of steel tonics.

3. To individuals of a lymphatic temperament it is, for the most part, useless, if not actually injurious.

4. As commonly swallowed, gelatine is innutritious and indigestible; but an ordinary glass of jelly, eaten very slowly, between breakfast and dinner, with a bit of dry and rather stale bread, the better to effect its mechanical division, and thus subject it more fully to the action of the gastric fluid, will frequently prove beneficial if tried for a month or six weeks without interruption, under the indicating peculiarities I have named. When eaten hastily and in undue quantities, it passes almost unchanged through the alimentary canal, and often causes derangement of the stomach and indigestion, in feeble and dyspeptic subjects.

Nutrient too highly concentrated, it may be further remarked, of whatever sort, appears to produce injurious results, even where no natural delicacy of health has originally existed. Domesticated animals, especially pets, frequently fall victims to a superabundant and very rich diet; and Magendie found that an ass fed on boiled rice exclusively, only survived the experiment twenty-eight days. Looking to facts of this simple and obvious character, I am fully persuaded that half the diseases of youth and manhood, among the more opulent classes, proceed from over-feeding and pampering children in the nursery, until the natural healthy and unvitiated appetite being destroyed, a system is commenced of one day enticing with dainties, and giving physic the day after to remove their effects; and thus, *tabes mesenterica*, or some other grievous ailment, is finally established, and the popular saying of "killing with kindness" very intelligibly explained to the unprejudiced observer. I have the honour to be, Sir, &c.

J. A. WALKER, Lieut. H.P., 34th Regt.

Torquay, May 23, 1844.

FOREIGN DEPARTMENT.

ACADÉMIE DES SCIENCES, PARIS.

CRITICAL OBSERVATIONS ON THE CHEMICAL PHENOMENA OF RESPIRATION.

By M. GAY LUSSAC.

Two principal theories, says M. Gay Lussac, have been proposed on the chemical phenomena of respiration. In one, long adopted by chemists and by physiologists, the formation of carbonic acid and of water, as also the production of nitrogen, takes place in the lungs themselves, on the contact of the oxygen of the atmospheric air with the capillary vessels. In the other theory the oxygen does not act immediately on the blood in the lungs, it is merely absorbed, and the chemical phenomena to which it gives rise, take place out of the lungs, in the circulatory process; and it is only on the return of the blood to the lungs that it throws off the products of the oxygena-

This last theory, which was promulgated some time ago, which has been alternately fortified or shaken by opposed facts, has at last been generally adopted, since the publication of the last researches of M. Magnus on the respiration. These researches, of a very difficult and delicate nature, were undertaken with a view to give to the new theory of respiration a solid basis, which it had not had hitherto, by proving the presence in the blood of carbonic acid, oxygen, and azote. If we are to judge from the acquiescence of some eminent chemists, and from the silence of criticism, the researches of M. Magnus would appear to have been accepted by public opinion, as giving the real interpretation of the chemical phenomena of respiration. It is not, therefore, without a feeling of diffidence, says M. Gay Lussac, that, urged by the doubts which have arisen in my mind, I enter into this examination of the question.

M. Magnus has first endeavoured to prove that human venous blood contains carbonic acid. In order to attain this end he passed through the blood a current of hydrogen, which, after having been dried, gave the carbonic acid with which it was loaded to potassa, in the apparatus of M. Liebig. Experiments, which lasted six hours each, gave the following results:—

Human venous blood.	Carbonic acid.	Or for 100 parts of blood.	Carbonic acid.
Cubic centim.*	Cubic centim.	Cubic centim.	Cubic centim.
66.8	16.6	100	24.8
59.8	12.8	100	21.4
62.9	22.2	100	35.2

After twenty-four hours, at which time the blood did not yet present any odour, the results were:—

Venous human blood.	Carbonic acid.	Or for 100 parts of blood.	Carbonic acid.
Cubic centim.*	Cubic centim.	Cubic centim.	Cubic centim.
66.8	24.9	100	37.2
59.8	23.9	100	40.0
62.9	34.0	100	54.0

On replacing the hydrogen by atmospheric air, by oxygen, or by azote, the results were the same.

M. Gay Lussac, after remarking that these results, which prove that the blood contains a deal of carbonic acid, are not complete, gave the result of fresh experiments, since performed by M. Magnus. For 100 volumes of arterial blood M. Magnus found 6.4967 of carbonic acid, 2.4178 of oxygen, 1.5131 of azote; and for 100 volumes of venous blood, 5.5041 of carbonic acid, 1.1702 of oxygen, and 1.6081 of azote. But before the results contained in this table are interpreted, adds M. Gay Lussac, it becomes necessary to explain more at length in what consists the new theory.

It is admitted that in the act of respiration the oxygen of the atmosphere is absorbed by the arterial blood of the lungs; that it is afterwards carried into the torrent of the circulation; that in its course, and by the secret processes of the capillaries, a certain quantity combines, a part with carbon to form carbonic acid, a part with hydrogen to form water. The blood, thus loaded with carbonic acid, is transformed into venous blood, arrives in the lungs, where it abandons its carbonic acid to the air, retakes oxygen, and, transformed into arterial blood, commences a fresh circuit.

M. Magnus is, therefore, principally called upon to prove—

First. That venous blood must contain carbonic acid, and in case the arterial blood should likewise present carbonic acid, the venous must contain a still greater quantity.

Second. That the difference between the quantities of carbonic acid contained in venous and arterial blood must be sufficient for the purposes of respiration.

Third. That the quantity of oxygen absorbed in the lungs by arterial blood, and abandoned subsequently in the circulatory trajet, must be sufficient at the same time for the formation of the carbonic acid, and for that of the water which always accompanies it in the act of respiration.

Fourth. That the venous blood must contain azote, and more than the arterial, should the latter likewise present it.

* Cubic centimeter.—The meter (metre) is equal to 3 feet 3 $\frac{3}{4}$ inches English.