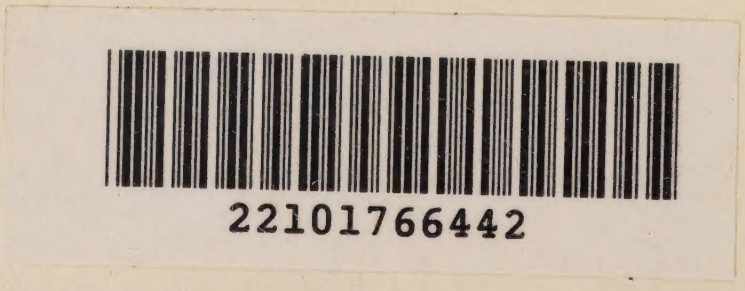

THE

BRITISH AND FOREIGN

MEDICO-CHIRURGICAL

REVIEW

OR

QUARTERLY JOURNAL

OF

PRACTICAL MEDICINE AND SURGERY.

VOL. LIII.

JANUARY—APRIL, 1874.

LONDON:

J. & A. CHURCHILL, NEW BURLINGTON STREET.

MDCCCLXXIV.

PRINTED BY
J. E. ADLARD, BARTHOLOMEW CLOSE.

CONTENTS OF NO. CV.

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Analytical and Critical Reviews.

I.—The Classification and Pathology of Diseases of the Skin.[1]

Having in a previous number of the 'Review' (July, 1870), surveyed the progress recently made in acquaintance with the minute anatomy of cutaneous diseases—an advance, as was then found, almost entirely due to the younger members of the Vienna school—we now propose to consider the present state of knowledge as to the pathology and natural affinities of the same class of maladies.

There is no department of medicine which proves more clearly than dermatology the evil result of its study being made a specialty, and we have merely to glance through the list of classifications printed at the end of Dr. Meldon's book to obtain so many illustrations of the fact. The only two works on the subject of original character—that of Willan and that of Hebra—which are alike admirable for power of observation and sound judgment, are in their pathology entirely dependent on the doctrines current at the time in the schools of Edinburgh or of Vienna.

There has been hitherto little attempt to use the domain of

[1] 1. *Lectures on Dermatology, delivered in the Royal College of Surgeons in* 1871, 1872, 1873. By Erasmus Wilson, F.R.S. 1873, pp. 291.

2. *Skin Diseases: their Description, Pathology, Diagnosis and Treatment.* By Tilbury Fox, M.D., &c. Third edition, rewritten and enlarged. 1873, pp. 532 (woodcuts).

3. *The Treatment of Diseases of the Skin, with an Analysis of Eleven Thousand Consecutive Cases.* By Dr. McCall Anderson. 1872, pp. 180.

4. *A Treatise on Diseases of the Skin and its Appendages.* By Austin Meldon. 1872, pp. 270.

5. *The Pathology and Treatment of Diseases of the Skin.* By J. L. Milton. 1872, pp. 358 (four coloured photographs).

6. *Notes on the Treatment of Chronic Skin Diseases.* By H. S. Gale, M.B. 1873, pp. 22.

the skin for learning lessons of the nature and course of morbid processes generally, in the same way as the eye was used when Dr. Watson wrote his 'Practice of Physic.' Yet, since there is no dexterity required for using the means of diagnosis, as is the case, for instance, with diseases of the larynx, nor for applying treatment, as in ophthalmic surgery, there seems to be no excuse for the separation of dermatology from general medicine to the detriment of both. It is to this unfortunate specialization that we must attribute not only the backward state of cutaneous pathology and the little help it gives to medicine generally, but also the frequent appearance of bulky treatises, a survival of nosologies and double nomenclature which represents an obsolete phase of scientific thought, and a fondness for inventing new, ugly and pedantic words.

We will first consider the subject of nosology or the classification of diseases of the skin.

The earlier works on medicine are full of definitions of disease; they were written under the influence of the scholastic discipline, and aimed at making the use of scientific terms as precise and accurate as possible. But the best attempts of the kind, as Cullen's, only succeeded in ensuring the accurate use of medical terms. His definition of pneumonia, for example, only refers to certain prominent symptoms—fever, local pain, dyspnœa and cough. It will always be possible to frame more or less arbitrary definitions of diseases so long as they are simply regarded as so many sets of symptoms. These symptoms, or coincident phenomena, then make up what is meant by a disease; and some diseases—as pruritus, chorea, or angina pectoris—can still only be defined in Cullen's fashion. But long before his practice of physic appeared, the notion of pneumonia carried with it that of a certain physical condition of the lung which would be found if opportunity were afforded; and, as the symptoms which defined the disease were found to be less constant than anatomical change, the language of medicine insensibly transferred the meaning of the term pneumonia from a collection of symptoms to an internal process supposed to be their cause. As post-mortem conditions were more accurately studied, other terms originally descriptive of symptoms became in like manner transferred to anatomical conditions of organs. Thus cancer, from meaning a bad, eating sore, whether in a woman's breast or on a man's foreskin, has now been made to signify a peculiar structure of microscopic elements, which may never give rise to any sore at all. The fact is, that we must give up the fruitless attempt at scientific definition of conditions which are undefinable, such as life, health, disease, consumption. These are popular terms, and the more precise their definition, the less accurate will it be.

What is meant by "health" is such a physiological state as does not seriously interfere with a man's comfort. Indisposition means a state which keeps him from business, and disease a state uncomfortable enough to drive him to the doctor. And in the same way the names of most diseases are popular terms, applying to the *painful sensations* of the patient, and, therefore, incapable of precise definition, so that, if they are to be classified at all, it must be by a strictly clinical and empirical method. But the *processes* to which we apply the same terms are capable of physiological comparison and explanation, and the *anatomical changes* in a "pneumonic" lung or an "apoplectic" clot can be as precisely defined, named and classified, as shells or seaweeds.

Thus, in scabies, to take a disease of which we know all that we can expect to know of any, we have first a collection of symptoms, those characters by which the itch was and still is popularly known all over the world; secondly, the pathological process in the skin, and its nerves, and its blood-vessels, on which the symptoms depend; and thirdly, the efficient cause, the acarus, which produces the disturbance of function. But when, as in this instance, the natural history of a disease is ascertained, definitions, classifications, genera and species become at once superfluous and unmeaning. We may classify scabies with "pruriginous" diseases to help us to remember what further questions to ask when a patient complains of his skin itching. Or we may investigate the process of dermatitis, and ascertain its relation to similar physiological processes in other tissues. Or we may cut sections of the skin, and describe its morbid anatomy as accurately as that of the liver. Or, lastly, we may class the itch-mite with its nearest congeners, and try to ascertain by what process it arrived at such a structure and such habits as led it first to burrow in human skin and create a new disease. But an attempt to bring the whole conception bound up in the word scabies into comparison with those of erysipelas or chloasma, and to express their true relation by a "mixed classification," can only end in a confusion which is neither scientific nor practical.

The nomenclature of disease has naturally followed that in use in other branches of learning; and, after the great reform accomplished by Linnæus in naming natural objects, it was almost inevitable that a similar plan should be adopted in medicine. Thus nosologies were established, with their classes, orders, genera and species. But the individuals composing each species or variety were not natural objects, the accidents of which could be readily ascertained and verified, but a heterogeneous collection of *words*, sometimes a mere popular expression for

some subjective condition, as gastralgia—sometimes a hypothetical morbid humour, as lues venerea—and sometimes an anatomical structure as steatoma. Happily, advancing knowledge has banished these cumbrous and unscientific nosologies from the greater part of medicine; but they have lingered long in dermatology, and must be got rid of before it can share in the progress of other branches of our profession.

Even in the case of animals and plants, the elaborate classifications put forth in the earlier part of this century by every systematic naturalist are seen to be less important than then appeared. There is an increasing tendency among naturalists at the present day to be content to recognise certain *types* of structure, about which individual forms group themselves with far too delicate degrees of difference to be expressed by the narrow formula of variety, sub-genus or species; and, instead of Systems of Nature, the botanist or zoologist now frames more or less successful genealogical tables, which at least attempt to express the true historical relations of the various forms which appear in them. Now if we are ever to have a really scientific nosology, it will be constructed in a similar fashion; and, when once we understand the chain of conditions which have led to this or that form of disturbed function, their mutual relations will be apparent and will stand in no need of more precise definition.

But while it is abundantly apparent that none of the systems of dermatology can express the entire relations of any disease, there is scarcely any mode of arranging dermatoses which may not be of service to show one or other of their multiform aspects. This indeed has been felt even by dermatologists; but, instead of recognising the real value of such classifications, they have either attempted to form consistent systems, in which one criterion only was taken, with a perfectly useless result, or have combined totally different bases of classification into a single arrangement. Thus in many dermatologies diseases are arranged in one class according to their locality; in another to their virulence; in another to their curability; in another to their causes, and so on. This is much as if the population of the world were divided into Mongols, Roman Catholics, photographers and Whigs, with a large supplementary class of "persons not included in the above orders," and an appendix for babies.

If, however, we take up the several points of likeness or difference, and apply them throughout in succession, we shall find that each will suggest some important relation. Thus the earliest classification made by Mercurialis into diseases of the body and diseases of the head rests at least on this basis of

fact, that the peculiar forms of many eruptions of the scalp depend entirely upon the locality which they occupy. Ringworm and impetigo capitis are illustrations of the fact; they agree in obstinacy and ready contagion, and they differ from the effects of trichophyton on the body and from ordinary impetigo respectively. The principle thus early laid down may be advantageously carried out into a complete study of the "geographical distribution" of cutaneous diseases, apart from their other phenomena. We should then find that many, perhaps most, have their favourite seats, so that it is often possible to decide on the prognosis and treatment of a disease from this consideration, apart from history, anatomy, or symptoms. Thus it is well known that psoriasis affects by predilection the extensor surfaces of the limbs, and especially the elbows and knees, while it rarely appears upon the face. Bearing this fact alone in mind will almost always serve to distinguish it from the scaly forms of syphilitic disease and the dry stage of eczema, with both of which it is so often confounded. Eczema, though more nearly universal in its range, has also its seats of predilection in an almost exactly opposite direction,—the thin skin of the face and ears, the flexor surfaces of the limbs, and especially the bend of the elbows and knees. The itch-mite and the crab-louse have their habitat as well defined as that of the honey-bee or white ant, and the occurrence of fungi on the human skin is as strictly dependent on soil and climate as that of thistles on commons. It would be very useful if Dr. Fox would expand the paragraph on "the seat of disease," at page 62 of his work, to an adequate account of this important feature, and would attempt some explanation of the remarkable local distributions, well described in many of the subsequent chapters.

We are not aware of any system of diseases of the skin arranged according to their bathymetrical distribution, but such a classification would be possible, and would bring to light some important facts in their relationship. In the alluvium of the scarf-skin we meet with pityriasis, psoriasis, callosities and horns. In the rete mucosum and papillary layer beneath, we find the seat of the ordinary cutaneous inflammations, erythemas and eczemas, syphilitic and febrile rashes; while, in the deeper layer of the corium, which forms but a single pathological zone with the subcutaneous connective tissue, all the scar-forming inflammations, zona, variola, anthrax, have their range, as well as new growths like lupus and gummata.

Most modern dermatologists admit a class of diseases which belong to the sebaceous follicles; but, though this is important as an anatomical fact, it is of no practical value. For

of the affections which come under this head, an ordinary steatoma, molluscum contagiosum, and the form of acne of the face so common at puberty, differ as widely as any diseases we could select in their importance, their prognosis and their treatment. In fact they only have the same bond of likeness as zona and pleurodynia, or as typhus and a fleabite.

Again, the value of the most widely accepted classification, that of Willan and Bateman, depends entirely on its true limits being understood. If a student supposes that all diseases in which vesicles appear upon the skin depend upon the same cause, or that they will follow the same line of development, or that they are curable by similar treatment, he will be grievously mistaken. But the recognition and definition of the external forms presented in diseases of the skin was a necessary, and perhaps the most important, step made in the progress of dermatology.[1] We may compare these elementary lesions to the physical signs discovered by Laennec. Every student must learn to know a vesicle when he sees it, and must understand what is its histological structure, in the same way as he must learn to recognise bronchophony and know the physical condition on which it depends; but, to make a pathological arrangement of diseases of the skin depend upon such lesions, is like classifying the diseases of the chest by their auscultatory signs.

Even pathological classifications like that of Professor Hebra cannot be of more than subordinate value; since, in the first place, we know too little of pathology to be sure that we can assign to each disease the morbid process on which it depends; and, in the second, diseases which to the best of our knowledge agree in their pathology, differ widely in the more important characters of tendency to spontaneous disappearance and reaction to external agents.

In many respects, an etiological classification would be the most valuable. But, whenever we have traced a disease as far back in the chain of its causation as we can at present hope to reach, the very need of classification appears suddenly to be superseded. For in medicine, as in other branches of natural history, we only classify objects so long as we are ignorant of the causes of their difference and likeness.

In Mr. Wilson's classification of 1857, half of which depends upon a knowledge of etiology and the other half on a knowledge of the special element of the skin which is affected, we have the defects of both systems illustrated. Thus the rashes of scarlet fever and of smallpox have this in common, that they

[1] Plenck's classification, made twenty years before Willan's, was founded on the same basis, but it was not so good in itself, and never exerted the same influence.

occur in conjunction with other symptoms, many of which, and these as far as we can judge the more important, are the same in both cases; but they certainly are not connected because they "arise from animal poisons of unknown origin." Moreover no reason can be given why pemphigus should be supposed to depend upon a general, and psoriasis upon a special and internal cause. And whatever points of resemblance herpes may have with pemphigus, they are none of them etiological. In fact, the etiological principle of classification enables us to make a great show with such diseases as syphilitic eruptions, or those depending on fungi, diseases which every one involuntarily associates together, because they not only depend on the same disturbing cause, but tend to the same result, and must be treated on the same principles: but after this we are reduced to make arbitrary groups of diseases which every village apothecary knows to be totally different, because some one has said that they depend on some hypothetical cause, which is always doubtful except when demonstrably false.

There remains a mode of classification of cutaneous diseases which would have as much scientific value as any other, and would be of practical service—we mean classification by treatment. Thus we might group together, as Mr. Hutchinson has so well done in one instance, the diseases which are benefited by mercurials, by iodide of potassium, by arsenic, by tar, by astringents, by laxatives. And the groups thus formed would be "natural" in some pathological aspect, as well as therapeutically; for diseases which are cured by the same remedy must to a certain extent have a common character.

As, however, we have already pointed out, all these systems of classification are of only subordinate value. What we really want in dermatology, just as in the study of diseases of the chest, is to recognise those disturbed conditions which frequently occur and which are sufficiently important to demand treatment, to connect them with certain external signs, with certain anatomical changes, and with a certain chain of preceding conditions. When this is done we have a disease as completely known as we can hope for. To frame a good nosology, we must trust rather to description than to definition, and adopt the principle of classification by types, with diverging and enosculating varieties, rather than by unnaturally specific distinctions. For example, we must study eczema as we study phthisis, admitting frankly to begin with, that both terms must always remain rather popular than strictly scientific; that they include certain conditions which have only broad and general likeness; and that we must carefully distinguish between the uncomfortable state which is the only concern of the patient,

the anatomical lesions with which that state is more or less constantly associated, the symptoms by which we recognise the existence of those lesions, the physiological changes by which they are produced, and, lastly, the cause or causes of this disturbance of vital processes. We should have to begin by forming rough clinical groups of cases which come under the disease we are investigating,—groups determined by common characters, such as the age of the patient, the tendency to recovery or to relapse, and the effect of remedies; and we should have to recognise how each disease would include outlying cases which would form natural transitions to some other type apparently far removed.

The greatest step towards such a valid and useful classification of diseases of the skin was that made by Biett,[1] when he separated from the different orders of Willan's system all the lesions which, however differing in anatomical structure or external appearance, agreed in being associated with other symptoms of syphilitic infection, in following a similar and more or less definite course, and in being amenable to similar plans of treatment.

All subsequent writers of importance accept Biett's natural order of syphilitic diseases of the skin; but their classification and nomenclature have varied very much. The only contribution of value made by Alibert was the invention of the convenient French term "syphilides;" but other French writers, and especially M. Hardy, have greatly added to our clinical knowledge of the group. The following is that given by the last-named eminent physician in his 'Leçons sur la Scrofule et les Scrofulides et sur la Syphilis et les Syphilides:'—

I. *Syphilides précoses:*
- S. exanthématique.
- S. papuleuse.
- S. pustuleuse superficielle.
- S. végétante.

II. *Syphilides intermédiaires:*
- S. pigmentaire.
- S. vésiculaire.
- S. pustuleuse.
- S. squameuse.
- S. tuberculeuse.

[1] The credit is chiefly due to this author, who imported into France the knowledge he had obtained from following Dr. Willan's practice, but made this great advance on the doctrines of his master. It is true that affections of the skin had been before described among the results of syphilis, and more or less ill-classified by Trappe, Lagneau, the elder Cullerier, and others, both in France and England, but it was Biett who saw the true importance of this group of diseases from the standpoint of dermatology.

III. *Syphilides tardives :*
S. pustulo-crustacée.
S. ulcereuse.

It would be well, perhaps, to admit a scaly form in the earlier series, bearing about the same relation to the rash and papule there mentioned which the so-called psoriasis diffusa of Willan (Eczema squamosum) does to an eczematous eruption. Again, the maculæ of the second series might also be placed among the latest traces of the disease; and syphilitic "tubercles"—which it would be better to call *nodules*—frequently appear later than S. pustulo-crustacée. But, on the whole, we must admit that the relative chronology of these affections pretty nearly corresponds to the table just given, however irregular the intervals may be, especially in the case of the later forms.

Mr. Wilson's arrangement of the forms of cutaneous syphilis is as follows :—(1) erythema and roseola = S. exanthématique ; (2) lichen = S. papuleuse, and lichen pustulosus = S. pustuleuse superficielle; (3) tubercula and ulcera; (4) rupia = S. pustulo-crustacée. 1 and 2 may be called early, 2 (including scaly syphilis) mid-forms, and 3 and 4 later or tertiary forms. To these Mr. Wilson adds syphilitic alopecia and onychia.

We think it not a matter of indifference whether we follow the French plan of calling all the forms of disease *syphilis*, and marking their peculiarities by an adjective descriptive of their form or seal; or keep to the method hitherto prevalent in this country, and still used by Mr. Wilson, of naming them syphilitic lichen, psoriasis, &c., a plan which suggests unreal relations and calls off attention from the essential part of the diagnosis.

Professor Hebra adopts the former method. He accordingly, in 1864, named the syphilides as follows :—*S. maculosa* (the primary exanthem, often called Roseola syphilitica—not the pigment spots which often follow later eruptions); *S. squamosa* (syphilitic lepra); *S. papulosa*, including two forms—the *miliary*, answering to "lichen syphiliticus"—and the *lenticular*, which includes so-called tubercular syphilis, condylomata, mucous patches and gummy tumours; *S. pustulosa*, corresponding to rupia and syphilitic ecthyma; *S. bullosa*, a very rare affection (except from the congenital form of the disease); *S. ulcerosa* and *S. vegetans*. The forms due to congenital syphilis are ranged in a group by themselves. To these varieties Dr. Neumann, like Mr. Wilson, has added alopecia and onychia.

The modern school of Saint-Louis have endeavoured to frame a category of scrofulous diseases of the skin corresponding to the syphilides, and MM. Bazin and Hardy use the term *scrofulides* in this sense. The former writer includes in his

definition a series of *scrofulides bénignes*—chilblain, erythema papulosum and induratum, strophulus, prurigo, lichen, eczema (in some forms), impetigo, and certain species of acne. These M. Hardy does not admit, regarding them at the utmost as maladies developed in scrofulous persons, but not themselves dependent on a scrofulous diathesis. The *scrofulides malignes* of M. Bazin are scrofulide erythémateuse, scrofulide tuberculeuse and scrofulide crustacée-ulcereuse. His colleague prefers to arrange them as follows :[1]

1. Scrofulide erythémateuse, which is identical with the Lupus erythematosus of Cazenave.

2. Scrofulide cornée ou acnéique. M. Hardy will not admit that this is a sebaceous affection and thus nearly allied to Pityriasis tabescentium.

3. Scrofulide pustuleuse, which corresponds with impetigo rodens.

4. Scrofulide tuberculeuse, or lupus, with its two forms, characterised by the presence or absence of deep ulceration (Lupus exedens and non-exedens).

5. Scrofulide phlegmoneuse or scrofulous abscesses and ulcers.

M. Caillault in his useful treatise on the 'Cutaneous Diseases of Children,' describes under the head of "lymphatic maladies," answering to Bazin's scrofulides bénignes—achor (*i. e.* Porrigo larvalis of Willan), pernio and molluscoid acne (*i. e.* Molluscum contagiosum) ; and only admits as true scrofulides—cutaneous and subcutaneous tubercle, tubercular ulcers, lupus and impetigo.

The characteristics of this group of cutaneous diseases, as described by MM. Bazin and Hardy, may be enumerated as follows :—

1. They attack the deeper parts of the cutis.

2. They are almost always limited to a certain region, from which they slowly spread, but never so as to become general.

3. They present a peculiar colour, especially around ulcers—a dark violet red, not so brown as the copper-red of syphiloderma, or so bright as the tint of ordinary exanthems.

4. Scrofulous ulcers have thin, irregular and undermined edges, with a bleeding base or soft pale granulations.

5. The crusts which cover the pustules or ulcers of scrofulides are very pale (d'un blanc remarquable), except when the pus has been mingled with blood.

6. There is great swelling of the tissues beneath the affected skin.

7. After involution cicatrices are always left, even when there has been no ulceration. This especially distinguishes scrofu-

[1] In M. Hardy's 'Maladies de la Peau' (1860), a sixth species *Scrofulide verruqueuse* appears, which is omitted in his 'Scrofule et Syphilis,' published in 1864. He now regards this as a subsequent form of Scrofulide pustuleuse.

lous from dartrous diseases. The scars are depressed, reticulated, and adherent to the subjacent parts.

8. At the same time the subcutaneous tissues shrink, so as to cause depression or thinning of the part which has been diseased.

9. There is entire absence both of local pain, heat and itching, and of constitutional disturbance.

10. The course of these affections is excessively chronic, and is accompanied by other signs of a scrofulous diathesis.

It would far exceed the limits and the object of this review to discuss the validity of these symptoms and the justification they afford for the erection of a distinct group of scrofulides. In the great difficulty, however, of defining what is meant by scrofula itself, what relation it bears to tuberculosis, and by what signs a scrofulous diathesis may be predicated, it appears premature to determine what effects it may have on the skin, especially as we have less means than in the case of the syphilides of verifying our diagnosis by the history, the concomitant symptoms, or the effect of remedies. The complications mentioned by M. Hardy—ophthalmia, spots on the cornea, white swellings—are themselves of very doubtful character. Indeed the whole subject of scrofula greatly needs the same thorough investigation by which Sir William Jenner has illustrated that of rickets and Mr. Hutchinson congenital syphilis.

Practically lupus is the only important affection of the skin which can be associated either with caseous enlargement of lymph-glands in children or tubercular phthisis in adults; and the coincidence of these conditions is not so frequent as not to be explicable as an accident. It is quite true that some cases of lupus may be cured by cod-liver oil and good living, but others are equally benefited by iodide of potassium, without any of the ordinary marks of a syphilitic origin, and the majority are completely curable by local means alone. The opinion of Professor Hebra, whose experience of this disease is larger than any other physician's, is against its being exclusively or even generally of strumous origin.

If the group of scrofulides must be considered of doubtful validity, we may admit that the "dartres" of French writers form a natural group, agreeing in a chronic course, in the tissue affected, in proneness to recur, in itching, and in being benefited by arsenic. Dr. Tilbury Fox argues well, and we think conclusively, against the hypothesis of a "dartrous diathesis," which when carried to its full extent by M. Gigot-Suard (as we had occasion to point out in a recent number of this review) makes herpétisme an almost universal causa morborum. Nor can we admit M. Bazin's claim to have shown the connection

of these diseases with an arthritic diathesis, though his view has been adopted by Mr. Hutchinson. Psoriasis certainly occurs very often in gouty subjects, but not in those subject to rheumatism or other diseases of the joints; and the remaining members of the group, chronic eczema and pemphigus (unconnected with syphilis), non-parasitic prurigo and true lichen, are not more common in gouty subjects than in others. Acute general eczema deviates very much from the ordinary form of the disease, in its sudden onset, its rarity, its tendency to recover and its reaction to drugs; nor is it often followed by the more common chronic disease. Indeed the acute form is in many respects more nearly allied to erysipelas. Eczema is the least special of these inflammations of the superficial cutis. We can produce it artificially at will; or rather a dermatitis, which resembles eczema in its anatomy, but differs in its distribution, course and tendency to recovery. The links between typical idiopathic eczema and the inflammation set up by a mustard poultice are the so-called eczemas dependent on local irritation, E. solare, grocer's itch, &c., and scabies, which is only a dermatitis of peculiar distribution and course, dependent from the peculiarity of its origin.

The successive discovery of the various vegetable parasites which infest the skin has given us another natural group of diseases, agreeing not only in their origin, but in the tissues they affect, the chronicity of their course, their mode of spreading, their contagiousness, and the principles of their treatment. In this department Dr. Fox's labours have been deserving of all praise, and his chapter on the subject is one of the most important in the book.

We venture to think that syphilitic diseases,—the febrile exanthems, the "tineæ," and perhaps the less defined group of which psoriasis is the type,—are the only natural classes yet established, and that we must be content to describe the remaining cutaneous affections, without forcing them into arrangements which are neither scientifically exact nor practically useful.

The nomenclature of cutaneous diseases has been scarcely less confusing and confused than their classification. Double nomenclature is troublesome in practice, and, as we have shown above, no less vicious in principle. It should be entirely discarded, except perhaps in cases like Tinea tonsurans and Tinea favosa, where each name is significant,[1] and in a few cases like Acne-rosacea, Molluscum-contagiosum, and Erythema-nodosum,

[1] Even here "Ringworm" and "Favus" are perhaps better terms, especially as Tinea sycosis and Tinea decalvans assume a conclusion which may be disputed in both cases.

where the so-called species has probably no real affinity to its supposed genus. The so-called species of eczema and psoriasis are mere varieties, depending on the stage of the disease or other secondary accidents, and are much better described in untechnical terms. Then there are a multitude of synonyms, of newfangled barbarisms, and of names coined in the prescientific ages of medicine, which ought to be proscribed, as naturalists refuse to admit any priority in nomenclature before Linnæus. Lepra and porrigo, pompholyx and elephantiasis, are only a few of the ambiguous and useless terms still in frequent use. All these would be far better consigned to oblivion. New names are rarely necessary; but we may admit that Mr. Wilson's xanthelasma is in every way preferable to the barbarous and misleading vitiligoidea, and the former name is now generally adopted in Germany. Would that all the emendations of our foremost English dermatologist had been equally happy. We may, however, forgive the revival from their unhonoured tombs of such useless words as psora, spargosis, psydracium, melitagra, phlyctis, madarotes, phalacrotes and asteatodes, since Mr. Wilson has abandoned the peculiar orthography he formerly used, which was as inconsistent as it was troublesome, for no one has proposed to write *oidema*, *phluctaina*. Beside, to spell *ekzema* with a "k" is to ignore the true history of the word; just as the American fashion of writing *favour* and *honour* without a "u" obscures the witness they bear of having come to us through the French, and not directly from Latin.

Dr. Fox's nomenclature is tolerably simple, and the glossary of terms at the end of his work is an improvement on that of the last edition, though there still remain some doubtful explanations. Nothing there, however, is half so amusing as the derivations volunteered by Mr. Milton: *e.g.*, "Tinea, from teneo, to hold;" "Erysipelas, from ἐρύω, to draw, drag, &c., and πέλας, near, surrounding."

With respect to the substance of Professor Wilson's lectures, his doctrines are so well-known to students of dermatology that it is unnecessary for us to enter upon a detailed exposition of them. The present volume includes the courses delivered in the years 1871 to 1873; and, like the preceding, contains numerous references to the excellent series of French casts which Mr. Wilson has presented to the College of Surgeons. The style appears to us to be more flowing and readable than that of the introductory course delivered in 1870.

Dr. Tilbury Fox's volume, after first appearing as a slim octavo, entered on the chrysalis stage of a small but close-packed little book, greatly resembling in style and in merit the

first edition of Dr. Tanner's 'Manual of Medicine.' In this, the third edition, it has followed the evil example of that clever little work, and has expanded to a thick, narrow-margined, closely-printed octavo. The best kind of book is that which represents the results, long matured and well tested, arrived at by a man capable of investigation, of judgment and of exposition. Such books,—rare of course, as all good books must be—are Watson's 'Physic' and Paget's 'Lectures,' Syme's 'Surgery,' Virchow's 'Cellular Pathology,' and Hilton's 'Rest and Pain.' They are often spoiled by subsequent attempts to incorporate an ill-digested knowledge of "the latest views" at home and abroad, received by telegraph up to the date of publication; but when subsequent editions are really improvements, they are usually smaller rather than larger. A second class of books, often of great value, though not attaining to the first rank, so scantily filled in all branches of human excellence, are those which begin as an *étude* or graduation thesis, to which the author adds as his experience and knowledge increases, usually spoiling them at some stage, but often succeeding at last in moulding his work into a permanently useful shape. To this praise Dr. Fox is entitled, for the present edition of his book is fuller and more accurate than those which preceded, and shows abundant industry, together with a large acquaintance with the foreign literature of the subject. It would be greatly improved by careful condensation and correction of some sufficiently obvious faults of style.

The histology of the subject is, we are glad to see, brought into due prominence, and the results obtained by Neumann, Auspitz, Biesiadecki, and other Viennese dermatologists, are fairly reproduced. The woodcut illustrations taken from the same sources are excellent, and no less praise is due to the original illustrations of epiphyta. The appendix of formulæ is also a valuable feature of the book, and it includes not only accounts of drugs and ointments, but of baths, mineral waters and soaps.

Mr. Meldon's book belongs to the same class as Dr. Fox's, but is in an earlier condition, being less complete, but also shorter. Its chief merit is the prominence given to the therapeutical part of the subject. The addition of a synonymy to the title of each chapter is a good point, but is not very accurately done. The appendix of the classifications of other authors is almost a reprint of that published in a separate form by Dr. Fox in 1864. Mr. Meldon himself has the good sense to adopt no classification; but almost any would have been better than to lump together in one chapter such entirely different diseases as zona, herpes-labialis, tinea circinata and herpes-iris.

Dr. Anderson's work is of a different class. It is not a systematic treatise so much as a series of practical notes, with especial reference to therapeutics, and a very sensible distinction between the more common and the rarer diseases. The pathology and classification do not offer much that is new.

Mr. Milton's book belongs to yet a different and, we are obliged to say, an inferior class. Much of it is of purely personal interest, but there are cases which are worthy to be on record, and useful hints as to treatment.

The pamphlet by Dr. Gale should have been entitled 'Notes on the Treatment of Chronic Skin Diseases by Electricity.' He employs a continuous current, and gives details of the effects in eight cases of psoriasis, favus, urticaria, acne-rosacea, &c., together with a general table of all the cases treated. The results are fairly stated, and, while in some cases the mode of treatment was useless or injurious, in others benefit appears to have followed. But much more detailed observations should have been given to enable the reader to form any judgment as to the importance of the treatment recommended. We may refer those of our readers who are interested in the subject to a paper in the 'Medical Record of New York' (Aug. 15th, 1873). The results appear to have been favourable in cases of eczema, acne and prurigo, less so in psoriasis. The two electrodes, however, were applied, one up and down the spine, the other at the epigastrium and middle line of the chest and abdomen; while Dr. Gale used two methods, either placing one electrode on the affected part and the other on healthy skin in the neighbourhood, or, "as a last resort, and often a successful one, galvanizing the spine and sympathetic nerves." To effect this the electrodes were placed one at the top and the other at the bottom of the spinal column, or one behind the angle of the jaw and the other on the manubrium or last cervical vertebra. That the operation was followed by recovery we are very willing to believe; but should refer its action rather to the cerebral than the sympathetic system.

II. Alcohol: its Friends and Foes.[1]

THE great social question, several phases of which are comprehended in the various works whose titles are prefixed to this article, is one which has the very highest interest for every member of the human family.

There is no question involving the interests of mankind which has not two sides to it: there is none in which these sides are more strongly contrasted than that of alcohol, under which generic term we include, for the nonce, every form of stimulant. In every respect the antithesis is sufficiently striking: here we have a vast source of national revenue, colossal fortunes realized, and very many families supported in happiness and comfort by the manufacture, the sale, and other transactions relating to the production and distribution of alcoholic drinks; and there, we have the deepest degradation and misery produced by their excessive consumption. The political economist—always more or less of a utilitarian—aghast at the immensity of the material interests at stake, yet fully aware of the evils of our present system, approaches the drink question in the wariest manner, temporizes, and looks to others for a solution of the difficulty, fearful of committing political suicide by bringing on himself a social avalanche which might be induced by the slightest disturbance of existing arrangements. The social reformer, goaded almost to madness by the degradation and misery around him, ignores every other consideration, and runs amuck at what he regards as the prime cause of the evil—alcohol, and would not hesitate to sweep from the earth all concerned with the

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[1] 1. *The Fallacies of Teetotalism; or, the Duty of the Legislature in Dealing with Personal Freedom, and an Elucidation of the Dietetic and Medicinal Virtues of Alcoholic Liquors.* By ROBERT WARD, Editor of the 'North of England Advertiser.' London, 1872, pp. 415.

2. *Stimulants and Narcotics; Medically, Philosophically and Morally considered.* By GEORGE M. BEARD, M.D. New York, 1871, pp. 155.

3. *L'Alcöol, son Action Physiologique, son Utilité et ses Applications en Hygiène et en Thérapeutique.* Par le Docteur ANGEL MARVAUD, Professeur agrégé à l'Ecole de Médecine Militaire du Val-de-Grâce, &c. Paris, 1872, pp. 160.

4. *Du Rôle que jouent les Boissons Alcoöliques dans l'Augmentation du nombre des cas de Folie et de Suicide.* Par M. le Dr. L. LUNIER, Inspecteur-Général du Service des Aliénés et du Service Sanitaire des Prisons de France. Paris, 1872, pp. 40.

5. *The Abuse of Alcohol in the Treatment of Acute Diseases: a Review.* By T. P. HESLOP, M.D. London, 1872, pp. 39.

6. *Second Annual Report of the Board of Health of the Health Department, City of New York: April 11th, 1871, to April 10th, 1872.* New York.

7. *Second, Third and Fourth Annual Reports of the State Board of Health of Massachusetts, January, 1871, 1872, and 1873.* Boston.

production and distribution of alcoholic drinks, out of excessive love and pity for their intemperate consumers. By means of Temperance, Teetotal and Good Templar Societies, he flies at the throat of the consumer; and, finding these means not so successful as he desires, he seeks, by what is termed a Maine Law, to control the distribution of alcoholic drinks, while both of these measures of necessity influence the production of them. If either the Political Economist or the Social Reformer were, in the first place, a Christian, we should willingly leave the whole matter in his hands; but, now-a-days, we have no reformer whose Christianity is not subordinated to one or other of these categories, who is not therefore strongly biassed in one direction or the other, and consequently incapable of guiding us in the right way, because he is a partisan of some special panacea which he is bound to support, even though he may have many misgivings as to the ability of the boasted specific to cope with the evils it is vaunted to cure. But we all ought to know that the policy of repression is useless while the human heart remains unchanged. We all remember Nathaniel Hawthorne's tale, entitled "Earth's Holocaust;" how the Washingtonians and Father Mathewites rolled into the blaze all the barrels and bottles of liquor in the world, and how the Devil sniggered in his sleeve (figuratively) at the futility of all the trouble taken, assured that the world would be the old world still, and that, until some means were discovered of purifying the human heart, forth from its foul cavern would reissue "all the shapes of wrong and misery—the same old shapes, or worse ones—which they had taken such a vast deal of trouble to consume to ashes."

Teetotallers, like other repressants, who feel more or less the peculiarity of their position, are strongly aggressive, and, as well as their allies, the Vegetarians, talk an infinite deal of twaddle about the perfectibility of man if he would only refrain from alcohol and beef; both of these classes, however, forget that it was Noah, a just man and perfect in his generation, who first "planted a vineyard and drank of the wine thereof," and was in consequence drunken upon one occasion, as we are informed; while it was as a punishment for his sins that Nebuchadnezzar was condemned to "eat grass as oxen," and under that regimen he very soon shuffled off every semblance of humanity. The same propensities for the flesh-pots and slow poisons have distinguished all Noah's posterity, and we may well believe that a great deal less harm results from them than some are desirous of making us believe; for, though

> "Gross riot treasures up a wealthy fund
> Of plagues, yet more immedicable ills
> Attend the lean extreme."

And all this we may believe without quite going the length of the famous Lord Hermand, who, according to Lord Cockburn, considered "drinking a virtue. He had a sincere respect for drinking—indeed a high moral approbation, and a serious compassion for the poor wretches who *could* not indulge in it, as well as a due contempt for those who could but did not;" and of whom it is related that when a counsel pleaded before him, in extenuation for his client, that he was drunk when he committed the offence, Lord Hermand, in a paroxysm of virtuous indignation, exclaimed, "Drunk, was he; if he could do such a thing when he was drunk, what might he not have done when he was sober!"—evidently implying that the most normal and most hopeful condition of human nature is one of intoxication. Without holding such extreme opinions, of which in the last century there were many examples, we may well be excused for not believing that alcohol is *per se* the root of all evil, or that Teetotal or Good Templar Societies and a Maine Law are all that is necessary to restrain that flood of iniquity and disease which deluges our beloved country. For we know that "every creature of God is good, and nothing to be refused, if it be received with thanksgiving;" and we also know that gold, that other root of all evil, may be made a source of much good, and that the sexual passions, which, when unrestrained prove such a frightful source of demoralization, brutality and disease, are, when well regulated, the origin of all that is loveliest, holiest and happiest in our domestic relations; and it would indeed be a strange thing if wine, which we are informed on the highest authority "maketh glad the heart of man," and which we are expressly enjoined to give to "those that be of heavy heart," should be the unmitigated evil which teetotallers depict it.

There is scarcely a work which deals with the subjects of death and disease that does not include a table of deaths stated to be due, directly or remotely, to intemperance. In one such now before us—'Report of the Board of Health, New York, 1871,' pp. 200, 201—they even go so far as to comprehend in such a table "Bronchitis" and "Child-birth"! The connection between bronchitis and alcohol is inconceivable; while the most probable argument for the latter would seem to be that, as the begetting was due to the stimulant effects of alcohol, the birth was therefore remotely due to alcohol also—we can suppose no other possible connection between intemperance and child-birth, and it is so remote and inconsequent as to bring to mind the congratulation offered by his ruling elder to a Scotch minister on his return from a trip taken for his health's sake, that they "hadna had a single bastard wean in the parish since he gaed awa'"! Carrying statistics to such extremes is injurious

to the very cause it is desired to serve; there is enough of disease and death in the world due, both directly and indirectly, to intemperance, without drawing such a very long bow as that. By-and-by we shall enter more into particulars: at present we are only dealing generally with generalities, and, as an important part of this, we should like to know where to find a table of the deaths *prevented* by the timely and appropriate use of alcohol. We have no reason to believe our own experience to be exceptional, and in our experience the latter class of cases have far exceeded the former. Partly, no doubt, this may be matter of opinion; but, with the modern accuracy attained in the use of the thermometer and the sphygmograph, there should be very little place left for the play of mere opinion.

We would be the last to deny the influence of the abuse of alcohol in shortening the days of many, although unquestionably we hold that it requires a good deal of abuse to produce this end; and we have no hesitation in saying that the very most has been made of a few unfortunate and prominent instances, those at least equally numerous examples which go to prove the converse being ignored and forgotten. Take, for instance, the gifted author of "Scotch Drink" and his two boon companions whose names are enshrined in the well-known verses beginning—

"O Willie brewed a peck o' maut,
And Rob and Allan cam to pree;
Three blither hearts that lee lang nicht
Ye wadna found in Christendie.
We arena' fou, we're no that fou,
But just a drappie in our e'e;
The cock may craw, the day may daw,
But ay we'll taste the barley bree."

Alas! not long after this was written, the following lines appeared which are not so widely known, though they possess a touching melancholy of their own, which makes them not easily forgotten:

"The moon still fills her silver horn,
But ah! her beams nae mair they see;
Nor crowing cock, nor dawning morn,
Disturbs the worm's dark revelry.
For they werena' fou, na' nae that fou,
But clay cauld death has closed ilk e'e;
And waefu'! now, the gowden moon
Beams on the graves of a' the three.

Nae mair in learning Willie toils,
Nor Allan wakes the melting lay,
Nor Rob, wi fancie's witching smiles
Beguiles the hour of dawning day;
For though they werena' very fou,
That wicked wee drap in the e'e
Has done its turn,—untimely, now
The green grass waves o'er a' three!"

This is, indeed, a sad picture, and, were it invariably true, would almost suffice to make us all total abstainers: we say *almost* advisedly, for there are many among us who could not become mere water-drinkers without shortening their days as effectually as by the most copious libations. We have no doubt that many humane and beneficent men have injured their health and shortened their lives by a too rigid abstemiousness, voluntarily imposed upon themselves by an earnest desire to do good. We must remember that, after an ancestral exposure of many centuries to the modifying influences of civilisation, many of us are born into the world with constitutions so enfeebled as to be unable to maintain the struggle for existence without all the aids to be derived from stimulating aliments, whether food or drink, and many are, by a proper use of these means, enabled to pass comfortably through a long life, who would otherwise have inevitably failed at the very threshold; while even those who, with better constitutions, lead quieter and more pastoral lives, and are not so much exposed to the wear and tear resulting from the anxious struggle of city life, require at least the occasional use of "wine, which cheereth God and man,"[1] to break the ill effects of that weary monotony which of itself is so often productive of disease—a fact which renders the melancholy chant of the Count of Toulouse expressive of no futile apprehension—

> "Oh dear! what shall become of us?
> Oh dear! what shall we do?
> We shall die of the vapours, if some of us
> Can't find out something that's new;"—

and to prevent which mankind, in all ages and in all countries, have sought out and made use of stimulants and narcotics of various kinds and possessed of divers properties, all of them injurious in excess, yet even the worst of them having uses of its own. The varieties of these stimulants and narcotics are, indeed, extraordinary: we have tea, coffee, chocolate, coca, *maté*, tobacco, wines, spirits and beers in infinite variety, opium, haschish, the "ava" of the Feejee and Sandwich Islands, and the intoxicating fungus of Siberia—the amanita muscaria, &c. These are the names of a few of the best known, but are very far from exhausting the class, every nation having its own peculiar and sometimes more than one intoxicant. To some it may seem strange to include tea, coffee, and tobacco, with spirits, opium, and haschish—certainly none of the three first are capable of producing the excessive narcotism with which we are familiar as the result of the ingestion of one or other of the three latter; but all are narcotic in excess, and the disease and

[1] Perhaps it is as well to give the reference to this quotation: Judges ix, 13.

misery produced by their inordinate use is probably not much less. "'Give me the choice,' said a physician of my acquaintance, who himself had once been a victim to intemperance in the use of tobacco—'give me the choice of which I should prefer for a son, the intemperate use of tobacco or of rum, and I should immediately say, 'Let him be a drunkard; rum is less hurtful than tobacco!' I quote this as a victim's judgment," says Dr. Bowditch, and to our ears no statement could be more significant of the evils arising from the intemperate use of tobacco. King James's 'Counterblast,' virulent though it be, contains no more bitter statement than this. It seems strange to speak so strongly against the weed so loved by Sir Walter Raleigh and by Sir Isaac Newton—gentle Sir Isaac, who is even alleged, when smoking on one momentous occasion, to have seized the hand of his lady-love with obvious intent to propose; but the necessities of the case were too many for him, and he only used the fair finger as a tobacco-stopper: this may have been for the first time—it is certainly not the last—that love has been extinguished by tobacco.

Death has been the occasional result of trying to learn to smoke—life-long misery has been no infrequent consequence of its attainment; the chains worn by the victim are, however, gilt, and their weight is unknown until he emancipates himself from the vice it has cost him so much to acquire and to keep up. We are no vain alarmists; we have read Lizars on 'Tobacco,' and many other similar one-sided statements, in the 'Lancet' and other medical journals about twenty years ago, and laughed at the frightful evils said to be brought upon mankind by tobacco. Mumbo-jumbo or the most atrocious Obi ever invented was a joke to tobacco; paralysis of the heart or the retina, cancer of the stomach or the tongue, were all, with many other evils, due to tobacco, and, what is even more wonderful, to be cured by "throwing away tobacco for ever"! But we keep within moderate and truthful limits when we say that tobacco, though at first it slightly stimulates, yet in the main soothes by its depressing action, and that—apart from the evil influences always excited and occasionally markedly manifested on the genital organs, the heart and the brain—it invariably has an injurious influence on the digestion; and we know of no votary of the weed who has restrained his propensities within such narrow limits as to escape this constant result, while we have seen very many serious effects consequent upon an immoderate use of tobacco, which we are persuaded we are right in regarding as, in our day, the most frequent cause of dyspepsia amongst males, and therefore the most common source of much misery to mankind. Yet there may be worse evils than tobacco; it is questionable whether tea, so often associated with it on village

signboards, is not even a greater curse to mankind than tobacco. Shade of illustrious Cowper! who could imagine that in "the cup that cheers but not inebriates" there lurked a poison potent enough to produce even this dire effect? Yet Bowditch says (p. 129):

"A physician who has under his professional charge a large institution for the maintenance of aged persons informs us that the demand among the inmates for stimulus in the form of tea is a matter of constant observation, and he moreover gives it as his opinion that from 20 to 25 per cent. of the whole number are *tea-sots*, drinking tea from four to six times daily, and as much oftener as they can procure it. They show the effect of this over-stimulation by increased mental irritability and muscular tremors—also in a greater or less degree by sleeplessness.

"The following fact has also come to our knowledge:—A domestic, in the family of a friend, appeared at times intoxicated. As it was certain she could not get any of the so-called intoxicating liquors great surprise was caused, until at length the problem was solved by the discovery that the individual drank large quantities of the strongest tea, of which she was constantly sipping."

This statement sufficiently conveys Bowditch's views—that tea in excess is an injurious nervine stimulant, and may occasionally become an intoxicant, and in this we perfectly agree. Between the action of tea and alcohol there is a very intimate relation as to their nature, though we admit a considerable variety as to degree. But when we speak of the injurious effects of tea we do not specially refer to its intoxicating qualities; these are only rarely exhibited, and their production may possibly be induced by individual or climatic peculiarities. Dr. Tyler, late superintendent of the Maclean Asylum for the Insane, New York, states that from long experience he is convinced that the tendency of the climate of California is to produce an exhilaration and excitement of the nervous system, the reverse of that depression which is so well known as the result of our own; while in higher latitudes the effect of cold in benumbing the faculties is so striking that Captain Parry says he cannot help thinking that many a man may have been punished for intoxication when he was only suffering from the benumbing effects of frost, and he adds that he had more than once seen his people in "a state so exactly resembling that of the most stupid intoxication, that he should certainly have charged them with that offence had he not been quite sure that no possible means were afforded them on Melville Island to procure anything stronger than snow-water;" and we all know how readily some become excited, and even in appearance intoxicated, from causes and under circumstances which have no tendency to upset the equanimity of stronger minds.

Having, however, made these concessions in favour of tea, we require similar concessions to be made in favour of alcohol, as we shall afterwards point out.

Theine and caffeine, according to the most recent researches,[1] are poisons which act to a considerable extent upon the circulatory system, stimulating, in the first place, and afterwards paralysing, the vaso-motor nervous system, and this action—even in such minute doses as are generally taken—cannot be without an influence on the circulatory and other systems; hence the palpitation and irregular cardiac action, the muscular tremors, and even the paralyses which occasionally follow even the moderate use of these drinks, and to which, of course, those who abuse them of choice or necessity—as tea-tasters—are specially liable. Add to this vaso-motor paralysis—the result of the theine—the local effects of tannin and hot water, and we have very efficient causes of that dyspepsia which in our day amongst females has its most frequent source in the inordinate consumption of tea; while hundreds labour under nervous and dyspeptic symptoms, varying in extent and degree, due to a very moderate use of tea or coffee, which act upon them as poisons, even when employed in the most limited quantities: such individuals are frequently quite unaware of the cause of their peculiar symptoms, and are quite struck with the complete and perfect relief obtained by ceasing the use of tea or coffee. We are now speaking of only the most moderate use of these beverages, and therefore of constitutional idiosyncrasy; but we know of many such individuals—nay of many families—so constituted, upon whom tea and coffee, and all those so-called innocuous beverages delighted in by teetotallers, act as perfect poisons, and who fatten, thrive and often do a fair amount of quite average mental work upon drinks which are said to make others either furious or fatuous; to them a Maine Law and Permissive Bill would prove simply torture, unless evaded by medical prescription, but medical opinion as yet is scarcely sufficiently alive to the existence of such idiosyncrasies. It need hardly be said that we fully endorse every word that Dr. Arlidge has said as to the injurious results of the abuse of tea,[2] especially among the females of the lower orders, an abuse not confined to the Pottery districts, but to be found everywhere, and an evil which is daily increasing, and which is, as he has very properly and only too correctly said, a source of "deterioration of health among the working classes, and a lowered vitality in the rising generation,"—results which are

[1] *Vide* Dr. Alexander Bennett's "Experimental Inquiry into the Physiological Actions of Theine, Caffeine, Cocaine, and Theobromine," 'Edin. Med. Journal,' October, 1873, p. 323.

[2] *Vide* also in regard to this, Dr. Anstie's work on 'Stimulants and Narcotics,' London, 1864, pp. 249, 250, &c.

not to be measured merely by the constant presence of chronic dyspepsia among large numbers of the females of the lower classes—though that is a never-failing result of the abuse of tea—nor by the occasional epidemics of scorbutus or allied affections dependent upon the imperfect nutrition of those who diet themselves on bread and butter and trust to tea for a stimulus, though these have been matters of no infrequent occurrence since 1845, and which, in spite of the very high wages now prevalent, have been perhaps more often observed during the last ten months than at any period since 1845. But, though they may be to some extent gauged by the prevalence of diseases of a low type amongst the labouring classes, they are more accurately to be measured by the puny condition of the rising generation, and the general deterioration of the race of labourers, which causes some to declare that the best of that type have been spirited away by emigration-agents. With freer air, more elbow room and better wages, the race ought to improve and not deteriorate. Take a racing-colt at a year old, after months of warm keeping and good feeding—three or four feeds of corn in the day—and contrast his bulk of bone and muscle, his spirit and power of endurance, with those of his fellow yearling allowed to gather his scanty living from the herbage of his native plains—those who have never observed the results contrasted could scarcely credit the vast difference between the two. And man is similar in constitution: the old proverb says—A cow and a countess are alike—and similar in possessing the power of being improved. "If a man work not," says St. Paul, "neither shall he eat;" but the converse is equally true and well known. "I send round my clerk," says a contractor, "when the men are getting their dinner, and those who can't eat he marks with a bit of chalk, and we send them about their business." Dire experience taught us this fact during the Crimean war, when our overworked and underfed soldiers died in thousands from disease, and not from the bullets of the enemy. When working at the railway from Balaclava to the camp, ten cubic yards of earth were all that each soldier could remove in a day, his daily rations amounting in all to 40 oz. of solid food, of which but 4·5 oz. were nitrogenous; while the navvies sent over to help them found no difficulty in shovelling out twenty cubic yards, but their rations amounted to 45·75 oz., of which no less than 5·75 oz. were nitrogenous. How can we expect the race to improve, or even to hold its own upon a diet of bread and tea? —something must be drunk—water, however palatable, does not supply the re stimulus, nor, we may add, nutriment; milk is to a grea t unattainable; and the usual resource is tea or coffee. do supply the stimulus, but not the

nourishment—hence we have innumerable ailments and a gradual deterioration of race—

> "Firm on his native heath the Caledonian stood,
> Prime was his mutton, and his claret good;
> Bid him drink port—the wily statesman cried—
> He drank the poison and his spirit died."

But he was a wilier statesman far, and a much more injurious member of the commonwealth, who first set up the cry of what is termed "a free breakfast-table," that is, the entire remission of the duties on tea, coffee and sugar, all the other usual accessories of the breakfast-table being for all practical purposes already free. In regard to this we shall say nothing of the manner in which the reduction of duty upon such articles of general consumption, involving great loss to the community, and the necessary retention of an obnoxious income-tax, gives no relief to purchasers of these commodities, as the amount remitted in duty is intercepted and pocketed by the class of middlemen who intervene between the producer and the consumer, because, after a time, trade-competition is sure to remedy this. One farthing per pound on an ordinary ship-load of tea amounts to £10,000, so that a very small fraction of a farthing is an object of competition to large speculators. But what we shall say is this: Is he a wise man, or a beneficent legislator, who seeks to encourage the increased consumption of a stimulant beverage the use of which is already so extensive and so injurious as to be fraught with serious results to a large proportion of the individual members of the present generation, and with the certain deterioration of the race? We trow not, and hold that such legislation has already reached its limits, and this opinion is amply confirmed by the testimony borne by the medical witnesses examined before the recent Parliamentary Commission in regard to the hours of labour in factories. In their Report the Commissioners—Dr. Bridges and Mr. Holmes—observe, generally, that dyspepsia is one of the most prevalent diseases amongst factory operatives, and is attributable to the excessive use of tea.

In his late work upon 'Foods' Dr. Edward Smith has attempted to deal with this part of the subject, and has fully homologated the opinion that tea may be injurious if taken with deficient food, and thereby may exaggerate the evils of the poor; but his entire want of practical experience is very well shown by his declaration that "his experiments" have not shown that tea is a *poison* to the rich, much less to the poor. What we regard as equivalent to a poison in a diet or a diet-drink is one whose "essential action is to waste the system or consume food, by promoting vital action which it does not

support," and this Smith confesses tea and coffee do; but, apart from this, we unhesitatingly assert that both tea and coffee act as special narcotic poisons to many individuals, though frequently only recognised to have been so by the relief obtained on giving them up.

Since the days of Lehmann and Bœcker tea and coffee, as well as coca, *maté* and alcohol, have been regarded as *paratriptics*—that is, as articles whose consumption prevents disassimilation or tissue-waste, and from this point of view might be regarded as useful to the ill-fed poor; but, according to Dr. Smith, even this support to their employment among the labouring classes is withdrawn, for he distinctly states that "tea increases waste, since it promotes the transformation of food without supplying nutriment, and increases the loss of heat without supplying fuel; it is therefore specially adapted to the wants of those who usually eat too much, and after a full meal, when the process of assimilation should be quickened, but is less adapted to the poor and ill-fed, and during fasting." Even from Smith's point of view, therefore, tea is worse than useless as a beverage for the labouring classes. But the whole subject of the actions of tea and coffee on the system is still too undetermined to allow us to reason with confidence on one set of experiments alone. During the last twenty years the most diverse opinions have been enunciated in regard to the actions of tea and coffee: Headland has called them sedatives; Lehmann and others, with more apparent reason, have called them powerful narcotic stimulants. Lehmann, Bœcker and others have asserted, on the authority of practical experiment, that tea and coffee are paratriptic in their action—that is, that they retard the process of disassimilation; Smith, as we have seen, opposes this view, which again has been quite recently reasserted by Marvaud. Meanwhile, the actual facts remain the same: whatever may be the cause, whether the action is paratriptic, or, as Anstie has called it, a peculiar food-action, all these so-called stimulants, including many—such as opium, &c.—whose action in large doses is even more highly narcotic, produce in moderate doses the remarkable effect of sustaining prolonged exertion without the use of nutriment in the ordinary acceptation of the term. The most extraordinary of them all in this respect is coca, of which, it is said by von Tschudi, that an Indian, sixty-two years of age, worked for him (at excavation) for five days and nights consecutively, without any ordinary food at all, and with a very short allowance of sleep, and yet, at the end of that time, was fresh enough to undergo a long journey, and this marvellous result was attained simply by chewing a few leaves of coca from time to time; this remarkable fact is also confirmed in innumer-

able other cases by various other observers. The moderate use of tea, coffee, coca, tobacco, alcohol, opium, &c., is in every case attended by more or less of this peculiar action, which, however we view it, must to some extent be associated with an arrest of tissue change; and this obstruction to disassimilation may be the cause of "paralysis, torpor, atony, fatty degeneration and necrobiosis of the cellular elements involved in the acts of nutrition" (Marvaud), and is always conjoined with a tendency to their production; hence the explanation of the occurrence of alcoholism, caféism, théism, and cocaism. Tea and coffee, therefore, are far from being the innocuous drinks they are so generally supposed to be: even in moderate doses they act as poisons to many, while, in excess, they produce various severe disorders of nutrition, and are, it seems, even likely occasionally to induce those degenerations which are more usually regarded as the result of alcohol alone.

As regards alcohol, the question of its use and abuse is so intimately bound up with the use and abuse of the drinks containing it, that we are apt to have disquisitions on the innocuousness of cider, perry, or wine; or, as in the great Gothenburg controversy, the absolute safety of beer and porter—with the great injury done to the mental condition, the bodily health, and the morality of those who use what the French especially are so apt to term, in their comprehensive way, alcohol, meaning thereby distilled spirits of various kinds and qualities. We have neither space, time, nor inclination to investigate the properties of all the various compounds containing alcohol, or to apportion the peculiar merits due to Gladstone's claret and Carnegie's porter in repressing drunkenness, nor is it at all necessary: apart from flavour, there cannot be any essential difference in these various drinks, which all owe their peculiar effects to the alcohol they contain; the matter at issue between them, therefore, is mainly one of degree and not one of kind, and may be safely disregarded except in so far as it is brought out in this relation.

In further pursuing this subject we beg most distinctly to state that we fully appreciate and most deeply deplore the moral and social evils which flow from the abuse of alcohol; but while acknowledging this, we see in it no reason for holding that all the ills that afflict mankind are due to alcohol, or that its moderate use is anything worse than a harmless luxury. To this part of the subject we shall, however, by-and-by return: at present we shall take up the general question of the hurtfulness of alcohol to the bodily health in its totality, and of its relation to a few of the forms of special ill-health which are commonly believed to depend upon the abuse of alcohol, or to be seriously and injuriously modified by it.

In a former number of this Journal (for April, 1847, p. 564) we find strong evidence as to the innocuousness of the mere act of intoxication, even when pushed very far indeed: "The other day," says our correspondent, "I found on inquiry that, since Dr. Tait has been surgeon to our police here (five years), not less than 27,000 people have been brought to the police offices *drunk*, and deeply so. Of these 27,000 three only have died (except in metaphor), and these *three from exposure to cold, &c., along with the whiskey.* This is one death in 9,000. Now, could you give 27,000 black draughts to 27,000 patients and show such a small list of killed and wounded? I take it that more than three would abscond from this life under diarrhœa, and so with regard to any other active medicine. *Intoxication*, then, would appear to be one of the safest *therapeutic* states we can induce!"

Of course the same concession must be made to alcohol that we formerly made to tea, and we must remember that even helpless intoxication is not always due to the ingestion of large quantities of alcohol, cold taking a considerable share in producing those symptoms which—as we have already pointed out—it is of itself even capable of originating. The alcohol induces functional exhaustion of the cerebro-spinal system, and renders it liable to become morbidly congested by the reflex action of cold: this congestion may be only sufficient to produce confusion of thought, with which may be conjoined, more or less, paralysis of some of the external muscles, or it may go on to that fatal drowsiness from which the unfortunate sufferer wakes no more. It is a frequent observation in cold weather, that cold increases the intoxicating effect of spirituous liquors; it would be more correct to say that previous indulgence in these liquors increases the stupefying effects of cold. In the very city from which the previous illustration is taken, we have frequently had proof of the truth of the statement just made. There the neighbouring farmers are in the habit of sending their servants daily to town with carts laden with farm-produce for sale, these returning in the afternoon with manure from the town-stables. At each of the main entrances to the town there is some one public-house which is a focus of attraction (or howff) for the carters passing: there they stop each day to take their *doch an dorras* or stirrup-cup, to keep them by the way, a quantity rarely, if ever, exceeded—one which has no obvious effect upon them in moderate weather, but which produces very evident symptoms of intoxication when the weather is peculiarly cold. This has been a matter of frequent observation by many eye-witnesses, may be accepted as a fact, and is *pro tanto* a reason for the innocuousness of intoxication in that northern city, as of course the harmlessness

of that state depends in a great measure on the smallness of the dose inducing it. On a reference to Dr. Tait's original letter, which is published at p. 207 of Sir James Simpson's Memoir, it will be seen that the actual numbers were 5,671 annually, or 28,357 in all. Dr. Tait personally saw only about 400 cases per annum, most of them incidentally; he was expressly called to see about fifty cases a year, and of these about twenty required active treatment, so that the actual deaths amounted to only 3 per cent. of the seriously poisoned cases, certainly a remarkably small mortality.

But not only is poisonous intoxication with alcohol apparently a matter of small moment, but even its continuous use in considerable doses does not appear to be attended by any great constitutional deterioration. Hector Boece, in his Chronicles as translated by Bellenden, says that in Orkney, "howbeit the pepill be gevin to excessive drinkin, and be plente of beir makis the starkest ail of Albioun, yet nane of thaym are sene wod, daft, or drunkin, als thay come haill and feir in thair bodyis to extreme age, but ony use of medecynary with strang and faire bodyis." Mr. Ward has put upon record a considerable number of instances of those who indulged freely in alcohol, and nevertheless lived to a good old age—we shall only refer to a few of them. First, there was Lewis Cornaro, who led an intemperate life in his youth, and thus, aided by an infirm constitution, brought on a complication of disorders which threatened to terminate in speedy death. Being a man of sound understanding and determined will, by the advice of his physicians, at the age of thirty-five, he determined to lead "a sober and regular life," as he termed it, and he thus attained the great age of one hundred years. Cornaro wrote several treatises on this "sober life," and to these or to Mr. Ward's book, cited at the commencement of this article, we beg to refer for the particulars concerning his life-long experiment. What we wish to point out now is that for more than sixty years his enfeebled frame was maintained in health and comfort by a diet which consisted of twelve ounces of solid food and fourteen ounces of wine in the day, therefore of *more poison than food!* But the most singular part of his history is, that about the beginning of July every year he ceased to be able to drink any kind of wine whatever, every species of wine at this season becoming, not only disgusting to his palate, but also disagreeing with his stomach; nothing, he found, could replace the wine, so that by the end of August he was so weak as to be at the point of death. He always took care, however, to have some new wine ready by the beginning of September, and one of the most remarkable facts concerning Cornaro is that, after three or four days' use of this new wine,

he was restored to his former degree of health and strength: to him, therefore, wine was both "meat, and drink and physic too."

According to Sir John Sinclair's statistical inquiries as to longevity, of 96 pensioners then living in Greenwich Hospital between the ages of 80 and 102 years, more than one half drank freely, and only five drank very little or very moderately, while the oldest, aged 102, acknowledged to having drunk "pretty freely" and chewed tobacco "freely." In a return of pensioners upwards of 80 years of age, in the Royal Hospital for Invalid Soldiers at Kilmainham, Ireland, Sir John describes the whole number as being 31, of whom 10 are described as drinking "freely," and the remainder "moderately." From these statements, and from other similar information to be gathered from Sir John Sinclair's work on Longevity, from Mr. Ward's book already referred to, &c., it will be seen that even a tolerably free use of alcohol is not inconsistent with considerable or even with great longevity, and our own experience is quite consistent with that view. Some years ago, in a small country village with which we happened then to be well acquainted, there were three old men; two of them might each have been taken for Tithonus, their bent and withered frames and shrunk shanks encased in breeches and long stockings, so put one in mind of a grasshopper, whilst the third was of a more portly nature. Of the two first one was, if not a teetotaller, at least so rarely known to taste alcohol in any form that he was credited with teetotalism; the other was a staunch worshipper of Bacchus, coming home every market-day under the safe guidance of his old white pony, on which he was barely able to sit, and every evening, summer and winter, light or dark, he might be seen, with his old-fashioned lantern in his hand, crossing the old bridge, and wending his way upwards to the public-house (dram shop—apology for hotel) which stood on the top of the opposite bank of the river from his own house, and that he never left till taken home far on in the night very comfortably drunk; the third was a moderate man who took his glass or two of wine every day after dinner like his neighbours, but was never known to exceed. These men were all above 80, and it used to be matter of speculation which would live longest: the moderate man died at 83, cut off by the results of an accidental chill; the old drunkard lived to 86, and died more from gradual failing than anything else; and the same might be said of the teetotaller, who lived to about the same age. Our own early experience was therefore rather in favour of alcohol as an aid to longevity. "Whiskey," as the venerable Dr. Guthrie used to say, "was only fit to preserve a man after he was dead; it killed him if taken when alive," but it seemed that, in certain circumstances, it might even

help to keep him in life, and we doubt not Dr. Guthrie himself would not have lived so long as he did but for a moderate allowance of good wine. Our later experience has all been to the same effect. In a large town we are as well acquainted with now as we were with the village formerly, the oldest man in the medical profession is one who, though above 80 years of age, still walks the streets (he has long since retired from practice) with a step nearly as firm and a frame nearly as portly as ever—yet he, it is alleged, has for 60 years never failed in renewing nightly his allegiance to Bacchus; while of his teetotal brethren all have died under 60 except one, who, however, bids fair in time to rival his opponent in longevity, and one or two others who gave up teetotalism in time. But though it is in the main, and only in certain classes and certain individualities, that the continuance of teetotalism does harm, yet in some few the very commencement of such a practice is occasionally injurious. Thus we are acquainted with a certain official, of some position, and of the utmost moderation, who thought to become teetotal; but after a very short trial was forced to give it up, because he could not otherwise get rid of the labours of the day, which, so long as he drank water only, kept coming through his brain to his great discomfort, this ceasing entirely as soon as he recurred to the moderate use of wine. Some might be willing to imagine that this was but a minor form of delirium tremens, which is so often alleged to be brought on by the sudden disuse of stimulants, and to be capable of being warded off by their continued moderate use; but this doctrine we unhesitatingly denounce as untrue and inconsistent with the experience of all hospital, prison and penitentiary physicians, who all know very well that the sudden disuse of alcohol is never the cause of delirium tremens, a disease which where threatened can only be prevented by giving up alcohol at once, and the cure of which is always at the best procrastinated in those very few unfortunate cases in which it is necessary to employ alcohol moderately as a stimulant. Fortunately the modern treatment of delirium tremens is so rapid and so certain that cases in which this exceptional use of alcohol is desirable are extremely rare, and with a long experience of the delirium tremens wards in the infirmary of a large town we can scarcely recollect a single death from that disease; whilst the only one which we can remember occurring in private practice during an experience of many years was in the case of a confirmed drunkard of many years' standing, who, for the last year or two of his life, only recovered from one attack of delirium tremens immediately to recommence the practices inducive of another—yet even he, in the pre-chloral days of expectancy and food, did not die from alcohol but from pneumonia, the effect of a stroll in

the street in his night-shirt, the result of careless watching. By the way, it is somewhat singular, and it shows in a very striking manner the looseness of most of our ideas as to alcohol, that Dr. Anstie—first pointing out that the stimulant action of small doses of opium and alcohol was often curative in delirium tremens, while the narcotism induced by large doses was not infrequently fatal, and that then the more rational plan of careful watching and feeding—introduced by Ware, of Boston, in 1831—were attended by the best results—states that "Food is *the* stimulus *par excellence* for the brain which frequent narcotism has reduced to the state in which delirium occurs . . . . . In all these cases the action of food may be supplemented or partially replaced by stimulant doses of alcohol, ammonia, &c., but true *narcotics are injurious*." After such a dogmatic statement from so high an authority the reader will, perhaps, be astonished to learn that the modern treatment of delirium tremens, which is so rapid, certain, and safe as almost to amount to an encouragement to vice, consists in administering large doses of one of the most powerful narcotics we possess—one which has no food action whatever—the hydrate of chloral. In itself alcoholic delirium is by no means a fatal disease; it only proves fatal from the alcoholic epilepsy occasionally accompanying it—from the occurrence of accidental pneumonia, &c.—from the exhaustion consequent on previous malnutrition, increased and cumulated by bad treatment—or from the result of organic degenerations consequent on the prolonged abuse of alcohol; but under proper treatment deaths from all these causes are comparatively infrequent. We have attended a hoary old sinner of 88 who recovered perfectly, and was quite unabashed at his position; and, in spite of the former difficulty of treating this disease, we can point to several who have had repeated attacks during the last twenty years, and who yet enjoy, to all appearance, very excellent health; some of these are now of considerably advanced age, and have indulged not merely freely, but excessively, for more than twenty-five years.

We perfectly agree with Dr. Heslop, in his estimate of the injury that may be done by the excessive employment of alcohol in the treatment of disease, and sympathise to a very considerable extent with the veteran Higginbottom's views as to the non-alcoholic treatment of disease, which he has so strongly enforced in the pages of the 'British Medical Journal' for 1862 and elsewhere. Unfortunately, if Dr. R. B. Todd erred greatly in the one direction, Mr. Higginbottom errs just as much in the other, for he would banish alcohol altogether from medicine; we can only say that by so doing many lives would be lost which now are saved, though we quite agree that lives saved by alcohol

are not so numerous as Todd and his followers suppose. To enter fully into this question would involve a critical discussion on the actions of alcohol, and an equally critical disquisition on the pathology of the various diseases in question, for which there is at present neither time nor place, nor, we may add, necessity. One of the diseases, the origin of which has often been ascribed to the abuse of alcohol, is Pulmonary Phthisis. In the 'Fourth Annual Report of the Massachusetts Board of Health,' January, 1873, Dr. Bowditch has published an analysis of a correspondence on some of the causes or antecedents of consumption. This correspondence comprises the answers to twenty separate queries, and contains a great amount of information on the causation of phthisis. At present we shall only refer to questions 4, 5, 6, 7 and 8. Question fourth:—Is consumption caused or promoted by the drunkenness of the parents? Out of 210 correspondents only 109 (51·43 per cent.) answer in the affirmative, while 101 (48·09 per cent.) take either the negative, or are doubtful, or decline to answer. Question fifth:—Is consumption caused or promoted by the drunkenness of an individual? Of the 210 correspondents who answer this question 109 (51·9 per cent.) say, Yes; 47 (22·38 per cent.) say, No; 13 (6·19 per cent.) are doubtful; and—pardon the bull—33 (15·71 per cent.) decline to answer. The question is a difficult one; but it cannot be said that medical opinion, as tested by this correspondence, sustains the idea that consumption is either caused or promoted by intemperance. Question sixth:—Is consumption prevented by the drunkenness of an individual? In other words, is a drunkard less liable than others to consumption? 46 (21·9 per cent.) decline to answer; 17 (8·09 per cent.) doubt; 113 (53·8 per cent.) answer in the negative; while 27 (12·86 per cent.) answer "Yes;" and 7 (3 per cent.) say that consumption is retarded. Dr. Bowditch, in reference to these replies, says that—

"In the present state of public opinion, in regard to the use of intoxicating drink, it requires some moral courage to say anything in favour of alcohol. To declare that it sometimes seems to save the drunkard from the consumption to which he is hereditarily predisposed, requires not only moral courage, but a sincere conviction of the truth of the assertion . . . . Meanwhile there have been some very peculiar examples in certain families, which seem to indicate that intemperance, bad as it is at any time, does, nevertheless, in certain cases, apparently have some good effect in warding off consumption, for in these instances the only persons that have escaped out of entire families were the one or two who indulged inordinately in the use of spirituous liquors. Perhaps one of the most curious documents supporting the idea that intoxication with ardent spirits tends at times to prevent consumption may be found

in the letter of Theodore Parker to the Chairman of the Board, written in 1858, in which he gives details of his own family history. Mr. Parker had no doubt about the matter, and in that letter expresses the belief that 'intemperate habits (where a man drinks a pure though coarse and fiery liquor, like New England rum) tend to check the consumptive tendency, though the drunkard who escapes may transmit the fatal seed to his children.'"

In the individual affirmative answers to this question there is not merely a statement of opinion, but many interesting facts are recorded in support of the views taken, forming a most striking contrast to the prevalence of opinion and the absence of facts in the answers to the next query. Question seventh:—Is consumption prevented by total abstinence on the part of an individual? in other words, will total abstinence save a man from consumption? Nearly one half, 89 (43·38 per cent.) answer in the negative; 22 (10 per cent.) are doubtful; 56 (26·67 per cent.) do not reply; and 38 (18·09 per cent.) answer affirmatively, that consumption is prevented by total abstinence. This question was asked mainly in the hope of ascertaining whether in the family of some drunkard, where many had been given to intemperance, and had died of consumption, one who had practiced total abstinence might have escaped the disease. Dr. Bowditch adds—"No such case, I believe, is on record. I regret the conclusion, but think it possible that no such case has occurred." Question eighth:—Is consumption ever caused or promoted by the total abstinence of an individual from intoxicating liquors? 106 (50·47 per cent.) answer negatively; 26 (12·38 per cent.) affirmatively. This, of course, is to be expected; the cases in which total abstinence had any marked effect in causing or promoting consumption must be rare, as they must indicate either an inability to bear alcohol or a martyr-like spirit of abstinence for principles' sake, both of which, to the extent indicated, must be very rare, for even the most rigid abstainer does not usually refuse stimulants when directed by the physician. Dr. Bowditch adds that—

"The small number of affirmative answers (12·38 per cent.) suggests either a careless mode of answering—which I am not willing to admit, inasmuch as each person could, if he had chosen, have declined to answer that question, as, in fact, 58 (27·62 per cent.) actually did—or it suggests that there are a certain number of cases in which physicians believe that total abstinence really promoted what the *temperate* use of alcohol might have retarded or prevented.

"I am quite sure that there are individuals now in this community who are ill from various other complaints in consequence of their strict adherence to rules of total abstinence, and who are immediately benefited by a physician's prescription of the temperate

use of some alcoholic medicine. One can believe, therefore, that rigid abstinence might so lower vitality in some persons that consumption might more easily occur (in them) than in others who use alcohol carefully."

These are strong statements, but they are well supported by individual responses, which deserve to be carefully considered. The feeling in the profession on this side of the Atlantic has never been attempted to be defined, and for want of this it probably varies with each individual. Some few years ago we remember a distinguished physician—not Dr. Todd—who treated all his cases of phthisis with small regulated doses of alcohol—we are not aware with what result. For our present purpose it is enough to show that there is no reason to suppose that alcohol of itself ever induces phthisis, and we think the evidence already given is sufficiently probative of this. That the tonic action of alcohol may occasionally be even actively useful in the cure of phthisis is rendered probable by the evidence narrated, confirmed as it is by the following anecdote related by Dr. Stokes in the 'Medical Times' for 1855:

"Some years ago (says Stokes) I saw a gentleman, who came to town labouring under all the symptoms of well-marked phthisis. The disease had been of some months standing, and the patient *was a perfect picture of consumption.* He had a rapid pulse, hectic, sweating, purulent expectoration, and all the usual *physical signs* of tubercular deposit, and *of a cavity* under the right clavicle. I may also state that the history of the disease was in accordance, in all particulars, with this opinion. I saw this patient in consultation with a gentleman of the highest station in the profession, and we both agreed that there was nothing to be done. This opinion was communicated to the patient's friends, and he was advised to return to the country. In about eighteen months afterwards a tall and healthy-looking man, weighing at least twelve stone, entered my study, with a very comical expression of countenance:—'You don't know me, Doctor,' he said: I apologised, pleading an inaptitude that belonged to me for recollecting faces. 'I am,' he said, 'the person whom you and Dr. —— sent home to die last year. I am quite well, and I thought I would come and show myself to you.' I examined him with great interest, and found every sign of disease had disappeared, except that there was a slight flattening under the clavicle. 'Tell me,' said I, 'what you have been doing?' 'Oh!' he replied, 'I found out from the mistress what your opinion was, and I thought, as I was to die, I might as well enjoy myself while I lasted, and so I just went back to my old ways.' 'What was your system of living?' said I. 'Nothing particular,' he said; 'I just took whatever was going.' 'Did you take wine?' 'Not a drop,' he replied; 'but I had my glass of punch, as usual.' 'Did you ever take more than one tumbler?' 'Indeed, I often did.' 'How many? three or four?' 'Aye, and more than that; I seldom went to bed under

seven!' 'What was your exercise?' 'Shooting,' he said, 'every day that I could go out.' 'And what kind of shooting?' 'Oh, I would not give a farthing for any shooting but the one!' 'What is that?' 'Duck shooting.' 'But you must often have wetted your feet?' 'I was not very particular about the feet,' said he, 'for I had to stand up to my hips in the Shannon for four or five hours of a winter's day following the birds.'"

Magnus Huss, and other writers following him, seemed to prove that almost all the diseases to which humanity is exposed were either caused or increased by the abuse of alcohol, and rabid teetotallers have improved upon this by substituting use for abuse. The teetotallers are right: careful statistics will unquestionably show that all our diseases are associated with the use of alcoholic liquors, and therefore (?) brought on by them, for we have no doubt that the occasional indulgence in strong liquors is the rule with all the inhabitants of Great Britain except teetotallers, who form but an insignificant fraction. The argument is invariably from *post* to *propter*, a most unsafe mode of reasoning; by means of it we may prove that the use of any common article of food, as potatoes, bread, or salt as the Chinese think, is the cause of all our ills. In order to prove that alcoholic drinks have a direct tendency to induce any special diseases, a much more careful investigation is required than any that has been attempted hitherto. The subject is confessedly one of extreme difficulty; but there is, at all events, a disposition evinced in the present day to investigate it in a philosophic manner. It is a question, in the decision of which statistics may unquestionably be most usefully employed, but in which statistics must be carefully corrected and kept within due and legitimate bounds. For instance, Mr. Neison has published several well-known statistical tables, all calculated to show that teetotal lives have a much better chance of longevity than the lives of those who partake of alcohol, even after the most moderate fashion; but the same fallacy lurks in this statement as in that of a brother statistician, who some few years ago sought to prove statistically that marriage possessed similar life-giving powers. In our opinion it takes a man of even more assured health and stamina to be a teetotaller than to be a Benedict, while the teetotaller has the advantage in being able to have recourse, on medical prescription, to alcoholic stimulants when required; while it is very doubtful whether the present representative of Sir Cresswell Cresswell could be brought into action on medical prescription only, and still more doubtful whether, when so applied, his action would have the same life-giving effect as a draught or a series of draughts of *aquæ vitæ*. In Dr. Dickinson's paper on the morbid effects of

alcohol as shown in persons who trade in liquor, published in the 'Lancet' for November 2nd, 1872, comprising the dissection of 149 alcohol traders, collected from the hospital records of thirty years, and compared with a like number of non-alcoholic traders, he has stated that tubercle was greatly increased in the alcoholic class, bearing in them a proportion of sixty-one to forty-four of the non-alcoholic class. But the careful inquiry by Dr. Bowditch, already referred to, pretty conclusively proves that a serious fallacy lurks even in this mode of collecting statistical information on the point in question; the data are too few to warrant the conclusions drawn from them, but the more important fallacy doubtless is, that they include the operation of other causes besides alcohol. These statistics also showed that amongst these 149 alcoholic traders empyema and the suppurative process generally was greatly more frequent than in the non-alcoholic class; but this also is opposed to modern opinions, there being the strongest reasons for believing that alcohol prevents, instead of encouraging, such processes.[1] By means of the statistics referred to Dr. Dickinson has confirmed the statement he formerly made—in his work on 'Albuminuria'—as to the influence of alcohol in the production of kidney disease, viz., that—

"Whatever influence alcohol may have as a cause of renal disorders, there are other agencies by which it is over-ridden. The places where deaths from drunkenness or delirium tremens is most frequent are not those where renal disease most abounds, and, indeed, in some instances, enjoy a remarkable immunity from such disorders."

Having just shown that there is an undoubted fallacy in these statistics in regard to other diseases, we cannot, of course, accept them as certainly truthful in regard to this, though we think that something might be said in favour of insufficient food and exposure to cold, which are so likely to induce tubercle, having also a similar effect in inducing kidney disease, so that in a series of statistics in which tubercle prevails kidney disease ought also to be frequent, and thus we might argue that alcoholic trading was an actual preventive of such affections. But, indeed, we hold that the statistics at present available are quite unsuited to give the information desired. For instance, in gathering information as to kidney disease, Dr. Dickinson has availed himself of the Registrar-General's 'Reports' for Scotland, and in doing this he has argued that the rural districts are not so drunken as the town districts, but this, if true at all—which is doubtful—is only true of the truly agricultural districts, in which the labouring population are always poor; whenever, however,

[1] We need hardly say we allude to the hindrance presented by alcohol to the *auswanderung* of the white corpuscles.

quarries, coal-mines, or other sources of better pay are introduced, the drunkenness largely increases. In looking over the Scotch 'Reports' for 1866, 1867 and 1868, we found that the total mortality of the town districts during these three years was 102,388, and in the rural districts 99,589, while the deaths from nephria alone were respectively 456 and 310, showing a large preponderance of this disease in the town districts. Nay, more, taking "ascites" as probably a more certain indication of cirrhosis than the more comprehensive rubric of "liver disease," these statistics show a proportion of 90 in the town districts to 111 in the rural districts, while, if we include "liver diseases," the total numbers are 1134 in the town to 1155 in the country, showing a preponderance of deaths in the rural districts under both headings. And yet, according to the same statistics, the deaths from delirium tremens and intemperance were 282 in the town districts to 145 in the rural districts. The statistics for three years, therefore, are the direct counterpart of those collected by Dr. Dickinson, and it would almost seem as if, for these three years at least, the most of the town drunkards had died directly from the poison, and thus lessened the mortality under the indirect headings. They are directly opposed to the correctness of the principle upon which Dr. Dickinson has collected his statistics, or, if we concede that, then they are opposed to his conclusions. The lesson we would draw from such a discrepancy in statistics is simply that already referred to, viz., that we have at present no statistics suitable for giving us the desired information as to the influence of alcohol on the production of disease.

The classes from which our statistics are mainly drawn are very often termed intemperate, or drunkards, upon very insufficient evidence; because, though on their own confession they get drunk at regular or irregular intervals, yet very many of them consume not a tithe of the alcohol which finds its way into the stomachs of more reputable parties, at shorter intervals and in more regulated quantities. Many diseases are thus liable to be set down as originated or as aggravated by alcohol, because they are of frequent occurrence among these proletarian drunkards, while they are comparatively unknown among those more respectable parties who nevertheless consume more than double the amount of alcohol, but who, by reason of its regulated ingestion are never drunk—who would repudiate with scorn the idea of being drunkards, and who, by reason of their very respectability, are not exposed to a number of most effective morbific agencies—such as defective nutrition, irregular and excessive exposure to atmospheric influences, &c.—which act with greater force upon the lowest grades of society, in whom these so-called alcoholic diseases are most prevalent,

and from whom our statistics are usually drawn. Besides intemperance is so widespread a vice, that, unless it had a very evident and well-marked prophylactic action, it must be found, as it really is found, in close connection with all diseases—diseases which vary with the age, position, &c., of the persons affected. In making these statements we by no means wish it to be inferred that we deny that, even after making every possible allowance, a much larger proportion of certain diseases shall be found to occur amongst those distinctly proved to have abused alcohol than amongst temperate men or teetotallers. We only say that as yet nothing of the kind has been conclusively shown; and we also say that, even if this had been proved, there is a still further inquiry to be made before we can credit alcohol with any active share in the production of these diseases.

The abuse of alcohol, as is very well known, is invariably accompanied by the almost complete disuse of any other article of food; and we venture to say that there is probably no other article of diet restriction to which for two or three weeks even would not be followed by serious disease, if not death. Yet a dipsomaniac emerges not very much the worse from his three weeks' debauch, during which he has taken nothing but alcohol in some shape or other; and Dr. Anstie tells us a remarkable case of a man, aged 83, who for more than twenty years had led an active life upon a bottle of gin a day, the only other sustenance he took having been one finger length of toasted bread daily, and a few pipes of tobacco. It may truly be said that this old gentleman's clay took a good deal of moistening to make it stick together; and we think we may safely add that nothing but alcoholic moistening would have kept it together so long. The strong argument against even the moderate use of alcohol, and in favour of its being in itself in all probability the actual cause of various diseases, is the assumption supported by Perrin, Lallemand, Duroy, &c., that it is a poison utterly alien to the system, which may be imbibed, but cannot be assimilated, and which in its passage through the system paralyses nutrition, and so produces various degenerations, initiates sundry acute diseases, or gives sudden rise to nervous attacks of different kinds. But Dr. Hutson Ford, of New Orleans, has disposed of this argument by detecting alcohol in fresh blood and in fresh lung tissue of those who had not been using alcohol; he believes that it is derived from glucose, and that its destiny is to be burned, forming, as he believes, an important source of animal heat; and M. Béchamp has confirmed the existence of alcohol as a normal constituent of the body, by finding it in the urine of rigid abstainers—the urine was prevented from fermenting by

the addition of creosote, and M. Béchamp has obtained from it, by simple distillation, enough of alcohol to set it on fire. It is most unlikely that what is a natural constituent of the body should act as a poison in every dose; it is equally unlikely that what is very generally used can be an agent of any very great harm; it is much more likely, from what we know of life as the product of stimulation, and of the action of the vital stimuli—air, food, &c.—that perfect health should be maintained within certain definite limits of variation in the use of alcohol. And this indeed has been shown to be the case by the experiments of Anstie, and of Wollowicz and Parkes, who have independently arrived at the conclusion that to maintain perfect health in an average man the limit of excess must not be greater than a couple of ounces of pure alcohol in the day; but, as this allows of 4 oz. of brandy, 10 oz. of sherry, or 40 oz. of beer in the day, it permits of a reasonable indulgence without any dread of after ill effects, while the results of excess are just as much to be dreaded in other things as well as in alcohol—in food as well as in drink. It is idle to say that alcohol is not necessary for man under any circumstances—that it is a mere luxury, whole nations, such as the Hindoos and Mussulmen, being able to do without it; while under all circumstances of exposure to great heat, or great cold, of excessive bodily labour, of great mental work, or of defective supplies of food, &c., man has been able to do quite well, and has sometimes fancied he has been able to do much better, without alcohol than with it. A precisely similar argument might be employed against the use of animal food, or indeed against any other article of diet, all of which are replaceable by others, though habit and other circumstances combine to make certain articles of food more agreeable and more convenient in certain conditions than others. Besides a man's health does not depend entirely on the mere measure of his food and drink—it depends in a considerable measure on its quality also. Cheerfulness and flow of spirits have indubitably a great deal to do with proper nutrition and the maintenance of health; it is well known that beaten troops rapidly deteriorate in health, while victorious ones improve and become more fit for their duties; and during the late American Civil War, one regiment was known to have become scorbutic, although well supplied with plenty of both animal and vegetable food, simply from the deteriorating effects of idle listlessness. But are not cheerfulness and flow of spirits greatly favoured by social intercourse and a moderate use of exhilarating liquors? Teetotallers may perhaps plead their own examples; but do they not owe their present power of whiling away their time at social meetings

without the aid of exhilarating liquors to the novelty of their position, the excitement of agitation, and that sense of superiority over the rest of mankind which their creed gives them? And indeed the history of alcoholic abstinence to a great extent answers this. Those who remember the stern simplicity of the old Temperance movement, which found bare facts and dry statistics quite sufficient to bowl it triumphantly along—who recollect the apostolic fervour and enthusiasm of Father Mathew's semi-religious crusade, and have seen these replaced by the rabid propagandism of Teetotalism, and the ornate and inane vulgarity of Good Templarism—will, we think, agree that, but for the reasons given, and but for repeated periodic excitements and spasmodic revivals in novel and varied forms, abstinence from alcohol would long since have lost its injurious pretensions to political vitality, and have become what it ought to be, a simple portion of the Christian life, in which sobriety is inculcated as one of the virtues to be followed, while of the opposite vice we are solemnly warned that no drunkard shall inherit the kingdom of heaven. And indeed it is a frightful picture of the egotism of mankind that they should desire to supplement the mild yet effectual rule of Christianity by a Maine Law, a Permissive Bill, or an oath to Teetotalism!

We have pointed out,—and this might well have been shown in greater detail and in more forcible language—that none of the *ex parte* statements, either for or against the use of alcohol, are based on any very accurate scientific or statistical basis, and that therefore it is safer to rest for the present upon the simple facts; and these are that the moderate use of alcoholic beverages is almost coextensive with the distribution of the human race, that it is not inconsistent with health and longevity, and that it has not been proved to be an active agent in the production of any special form of disease. And we think the facts might even warrant us in saying further, that the large use of alcohol by the nations most advanced in civilisation proves that it is not inconsistent with mental, physical and social progress, while to many amongst these hardest workers of the nations the food stimulant action of alcohol is a positive necessity.[1]

Were there no sunshine there could be no shade—were there no good there could be no evil—if alcohol were incapable of good, it would also be powerless for evil. We deplore the evil,

[1] The above words, written long before the delivery of Lord Houghton's speech at the Social Science Congress, might almost have been borrowed from it:—"A national love for strong drinks," he says, "is a characteristic of the nobler and more energetic populations of the world; it accompanies public and private enterprise, constancy of purpose, liberality of thought, and aptitude for war; it exhibits itself prominently in strong and nervous constitutions, and assumes in very many instances the character of a curative in itself."

the sin, the misery and the disease to which the abuse of alcohol gives rise; but even Dr. Lunier, who has written forcibly against alcohol as a great source of madness and of suicide, points out that it is not so much wine, cider, &c., as ardent spirits that originate these evils—that is, it is not alcohol moderately used that is injurious, but alcohol abused—taken as a narcotic, and not as a mere stimulant, and that abuse no sane man would defend.

We have brought forward a considerable amount of evidence to show that alcohol is by no means the only stimulant that brings disease and misery on mankind. Suppose a strict rule were made that no nervine stimulant was to be employed by any one professing abstinence principles, what would become of the party representing them then? Would it not be split into cliques, each excluding the other for its intemperate use of its own peculiar stimulant—tea, coffee or tobacco. Yet to many these latter, though frequently preferred, are infinitely more injurious than alcohol. Is it not possible for philanthropists to unite on some common ground to promote temperance, and thereby restrain intemperance. We fear there is none but the old fashioned carrying out of the true principles of Christianity—"Let your moderation be known of all men."

"*Naturam expellas furca tamen usque recurrit!*" In Mr. Ward's book will be found a succinct history of the past attempts at repressive legislation, and the many evils to which they have given rise: we refer to it for information upon these points, which would take up too much space to recapitulate here. The attempts to repress intemperance by legislatively promoting the substitution of beer and the lighter wines for the stronger alcoholic fluids has frequently been made, and now the experiment is going on at Gothenburg, with great success, say its promoters—with the very reverse, say its opponents. In the Third Annual Report of the Massachusetts Board of Health, Dr. Bowditch recommended very strongly this means of repressing intemperance; in the Fourth Annual Report Mr. Aldrich equally strongly declares that this is one of the very best means of inducing intemperate habits in the previously sober. And yet such legislation would seem to be about the wisest thing that could be done. The cheapening and rendering popular the lighter and less strongly alcoholic drinks is certainly one means of bringing about temperance: to make it effectual it must be accompanied by the legislative repression—not of the making or selling of drink, which would be in every way too dangerous an interference with the liberty of the subject—but of drunkenness. Marvaud says, that to punish drunkenness is not to repress intemperance, because the seasoned cask would then escape,

while the rigour of the law would fall upon its accidental infringer; but to punish such accidental infringements would go some way, at least, in preventing the manufacture of seasoned casks. The law ought, therefore, very properly to take cognizance of and punish all open drunkenness,—all parties found drunk upon the streets,—quite irrespective of their being either turbulent or incapable. And it ought, furthermore, to provide means for the temporary seclusion of all those, whether dipsomaniacs or merely ordinary drunkards, who, by the petition of their nearest relatives or neighbours, can be shown to be squandering their means and impoverishing their families, or even ruining their health, by habits of intemperance. Any other means of aiding in the repression of intemperance among which Marvaud specially mentions a due care for the lower classes, in providing them with food and amusement, and taking a general interest in their welfare—may be summed up as aforesaid in the practical exercise of Christian principles, which it is the duty of all of us to carry out, and, indeed, in any other sense it is a little out of place in these days, when the working classes have much more money with which to buy food, as well as everything else, than any other, and has its antithesis in the avowal which one woman was lately overheard to make to another, "Oor Jock gies me thretty shillins a-week to keep the house on, and dae what he like he canna drink the ither thretty." Poor man.

III.—Traumatic Fever and Purulent Infection.[1]

The phenomena which accompany the infliction and repair of injuries must always have great interest for the surgeon, and any time devoted to their accurate appreciation and interpretation will not be misspent. Among these phenomena, there is none more constant and striking than that which is commonly known as traumatic fever—none more seemingly capricious and fatal than that which we call "pyæmia."

Concerning both of these there are many things desirable for us to know, which are not yet so certainly determined as to enable us to speak surely of them; but, as for the attainment of a better knowledge there is nothing more essential than a clear

[1] 1. *De la Fièvre Traumatique.* Par J. Lucas-Championnière. Paris, 1872.
2. *De la Fièvre Traumatique, et de l'Infection Purulente.* Par P. Em. Chauffard. Paris, 1873.
3. *Gulstonian Lectures on the Heat of the Body, delivered at the Royal College of Physicians, March,* 1871. By S. J. Gee, M.D.
4. *Transactions of the Pathological Society of London,* vol. xxiii.
5. *Twelfth and Thirteenth Reports of the Medical Officer to the Privy Council; containing Dr. Sanderson's Reports on the Intimate Pathology of Contagion*

understanding of how much we already know, it may be useful to set before ourselves some idea of existing views with regard to them.

Of traumatic fever, an excellent description, evidently drawn from careful clinical study, is given by M. Lucas-Championnière, in his recent essay on the subject. His definition runs thus: "Traumatic fever is the febrile action which supervenes shortly after an injury, and coincides with the beginning of the phenomena of repair."

Mr. Croft defines traumatic fever as "that species of inflammatory fever which is produced by the one constant cause implied in its particular denomination; in other words, the febrile condition which, as a general rule, rapidly follows the infliction of a wound of any magnitude."

Dupuytren defined it as "the fever which supervenes upon the infliction of a wound, and which has for its end the commencement of healing;" or, as M. Chauffard thinks, it may be proved from the context that Dupuytren really meant "the fever which supervenes upon the occurrence of a wound *and of the action* which has for its end the commencement of healing."

Richerand's definition limits traumatic fever to "the fever which accompanies wounds of a certain size, and which heal by suppuration," which is nearly identical with that of MM. Littré and Robin, who describe it as the fever which accompanies the suppuration of large wounds. M. Follin also describes traumatic fever as only occurring when the wound suppurates.

These definitions, it will be seen, do not imply any particular theory as to the intimate pathology of the affection, although some of them connect it with suppuration; but the German school, on the other hand, mostly express in their definitions their idea of the cause of traumatic fever; for instance, O. Weber describes it as an elevation of temperature with increased tissue change, which is produced by a poisoning of the blood by the products of the decomposition of tissues, which act like ferments. And M. Verneuil, the chief French advocate for the German view, says, "Traumatic septicæmia has several degrees; sometimes it is so slight as to pass unperceived; in this case, the dose of the poison absorbed is very small, and is promptly eliminated; it is this which happens in simple traumatic fever, which is a mild manifestation of septicæmia."

M. Lucas-Championnière, after a short historical chapter, passes on to a description of traumatic fever, the accuracy of which every clinical student will recognise. He points out that the first effect of a serious wound or important operation is a state of depression, or restlessness; that is to say, that in some

cases the patient suffers most from nervous excitement, in others from shock. In some cases the thermometer shows at this period a decided fall in the temperature, which may be the result of loss of blood, but also may be the direct effect of the injury. The whole system shows a certain amount of disturbance; and, as M. Verneuil has shown, the urine is notably diminished. Then, towards evening, the temperature may rise slightly, and the pulse become somewhat more frequent; the night is passed in perhaps some imperfect sleep, but the next day the patient is but little disturbed, and takes his food pretty well. Usually, however, towards the evening of the second day, or in the course of the third day, a more active disturbance commences, the traumatic fever begins. There is hardly ever any initial rigor, such as occurs in many of the complications of wounds; and this absence of rigors is a notable fact, and to be remembered in considering the cause of the fever. The invasion is marked by malaise, restlessness, and pain about the wound; the skin becomes hot, and even painfully so; the eyes brilliant, the cheeks flushed, and there is nearly always headache. This last is often the first obvious symptom of the commencement of the fever. The digestive apparatus is constantly disturbed, sometimes to the extent even of vomiting. The mouth is dry, the tongue clammy, the appetite gone, and there is much thirst. The urine is scanty, thick, and high coloured; the skin hot and dry, the temperature of the body increased. The pulse is variable, but usually rapid, and gradually becomes fuller; the respiration is quickened. Sometimes the nervous excitement is extreme. This, O. Weber thinks, is especially the case with drunkards, an observation which we ourselves have frequently verified. These symptoms rapidly increase, and reach their maximum generally in twenty-four hours; then, after another period of about the same length, decline; and in two or three days the patient has returned very nearly to his normal state, the declension being accompanied by an increase of urine and perspiration. During this time the wound has shown corresponding signs of activity. After the first twenty-four hours it becomes the seat of tension and a sense of weight, then shooting pains and swelling occur, and the edges become puffy and the adjacent skin red. The temperature of the part is also raised. From the surface of the wound there is a serous discharge, which gradually becomes purulent; finally, after one, two, or more days, the tension diminishes, the swelling lessens, and suppuration is established. The establishment of suppuration corresponds pretty nearly with the end of the fever. The fever usually lasts from three to six days, its maximum intensity occurring on the second or third day; on its subsidence the

reparative action goes on unless hindered by complications. In short, traumatic fever is thus described: "Shortly after the injury, general malaise, fever, declension of febrile symptoms, progress of repair."

But, of course, these phenomena present many variations. The fever may be so slight as hardly to be appreciable without thermometric observations; and, we would add there is good reason to suppose may sometimes be entirely absent, even in considerable injuries.[1]

Doubtless some persons are less prone than others to febrile excitement, and the amount of fever may be influenced very much by the previous state of the patient, by hæmorrhage, by the character of the injury, and by the mode of dressing. On the other hand, the fever may be unusually intense or prolonged, the severity of the fever depending most on the condition of the patient, while the period of its invasion seems to have most relation to the nature of the injury. Thus, wounds the result of cauterisation. which have been said by some not to give rise to traumatic fever, really produce an active attack which begins unusually soon after the injury. This is especially the case with regard to gun-shot wounds, after which the fever rapidly sets in—even on the field of battle (*soif des blessés*)—and is usually very severe. Among the causes which are said to exaggerate the fever are—hæmorrhage, drinking, fatigue, violent emotions, or any depressing cause; and when these are are combined, the patient may rapidly die in a state of extreme nervous prostration. M. Lucas-Championnière thinks (judging from its effect on the temperature) that chloroform also may have an effect similar in this respect to loss of blood. Anæsthetics are so constantly used now for all operations of magnitude, that it is difficult to obtain sufficient materials for a comparison of the relative severity of traumatic fever in cases where anæsthetics are, with those in which they are not, used; but we are not inclined to think that they materially influence this symptom, for observations that we have made upon the temperature of the body before, during, and after the administration of chloroform, showed that the inhalation of this drug has no appreciable effect in this respect.[2] Moreover, the regularity of the fever

[1] Dr. Gibson in an article on "Traumatic Fever" in vol. xxxvii of this Review, found (p. 186) the fever entirely absent in eighteen out of sixty-two cases, but as his criterion was "the existence or non-existencee of any persistent rise of temperature above 99·5°" it is not clear that some of the very slight and evanescent forms may not have been overlooked.

[2] But these observations were made upon persons who were for the most part in good health, and who suffered but very slight operations (chiefly ophthalmic) attended with no loss of blood. This may perhaps explain the fact, that this opinion is opposed to that of Scheinneson and others, who consider that the administration of chloroform lowers the temperature.

may be interfered with by the occurrence of some of the complications of wounds.

The duration of the fever is from two to six days, and it is usually easy to distinguish its commencement and end, but these may be marked by the supervention of erysipelas or some other complication; and M. Lucas-Championnière considers that all cases of fever commencing after the fifth day from the injury are due to such complications, and are not true traumatic fever, which has occurred earlier and been overlooked. Purulent infection does not generally occur till after the traumatic fever has ended, but yet may in some cases do so.

M. Lucas-Championnière devotes a chapter of his essay to the temperature in traumatic fever, of which temperature the most notable point is its rapid increase, the early attainment of the summit, and the speedy decline. There is first a fall of temperature, rapidly followed by its elevation. This primary fall is especially marked in cases of loss of blood, injury to large nerves, rupture of viscera, extensive burns, or very large wounds, and, as M. Demarquay points out, is especially to be observed in cases of strangulated hernia.

M. Redard has shown that if the reaction is not proportionate to this depression the patient generally succumbs; and he says that a temperature below 95·9° is so certainly fatal as to preclude an operation for gunshot wounds. We have already given reasons for doubting that chloroform depresses the temperature; but we have observed that a condition of anæsthesia does not prevent the effects of the shock of a severe injury being manifested by the patient, albeit he is not sensible of it. The maximum temperature reached is from 100·5° to 104°, seldom higher, and is attained ordinarily in the evening of the second day. The summit is almost always reached in the evening, very rarely in the morning, there being ordinarily slight matutinal remissions. The rise is especially rapid in severely contused wounds.

Then comes the defervescence—still with slight depressions in the morning, and elevations in the evening—the fever coming to its end from the fourth to the sixth day. In making thermometric observations, especially upon the slighter forms of fever, the normal diurnal variations must not be forgotten. Dr. W. Ogle,[1] in his paper on this subject, says:

"The lowest temperature of the body occurs about day-break. At this time a rise begins, which continues till late in the afternoon, reaching its maximum at different hours in different persons, for reasons to be presently considered. The maximum reached, the temperature again falls. The fall is at first slow, but becomes more rapid after nine or ten o'clock; and this fall continues, till day-

[1] 'St. George's Hosp. Reports,' vol. i, p. 221.

break or thereabouts, when the cycle begins again. The average variation in the course of the twenty-four hours is about $1\frac{1}{2}^{\circ}$ Fahr."

As has been pointed out, various influences may modify the course of the fever, as *e. g.* the age and condition of the patient, the kind of injury, the amount of blood lost; but especial stress has been placed by some on the character of the dressing.

Professor Lister thinks that patients whose wounds are dressed on the antiseptic method have the fever very lightly; this we think is, as a rule, true, but we have certainly seen cases showing that it is not invariably so.

The accuracy of M. Lucas-Championnière's description of traumatic fever would not, we suppose, be by any impugned; but when we come to the discussion of the nature and causes of the affection, we meet with opinions the most diverse. These are also well described by M. Lucas-Championnière. He first divides the authorities on the subject into those who do not clearly distinguish traumatic fever from the various febrile complications of wounds, and those who admit it to be a distinct disease.

These last he divides into—

1. Those who see in it simply the phenomena of vital reaction, as M. Chauffard.

2. Those who consider it an inflammatory fever, as MM. Bouillard and Legouest.

3. Those who attribute it to the absorption by the vessels of a poison formed by the tissues of the wound, as Andral, Bergmann, &c.

4. Those who suppose it to be the result of the action of the wound on the nerves, as M. J. Guerin.

Then he again divides class 3—those who attribute the fever to septic poisoning—into—

(*a*) Those who believe in one poison, which produces, according to the amount absorbed, traumatic fever, inflammatory fever, or septicæmia, as Weber, Bergmann, Billroth, Verneuil. And of these, some think that the poison acts directly on the blood, and thus produces the fever; others, that it acts through the medium of the blood upon the heat-regulating centres of the nervous system.

(*b*) Those who believe with M. Gosselin in a separate poison for each variety of the fever, even for the light or the severe form of it.

(*c*) Besides which there is the theory of Mr. Lister, that it depends upon the local action of the products of decomposition upon the nerves of the part, which thus gives rise by a sort of reflex action to the fever.

Having thus stated the opinions of the principal authorities,

M. Lucas-Championnière goes on to prove that injuries give rise to a fever distinct from the complications of wounds, and contrasts traumatic fever with septicæmia, laying particular stress upon the clinical characteristics of each. This we think is a point of view of especial importance in this class of diseases. It has been the fashion of late to regard too exclusively the morbid anatomy of disease, which, though it has its own, and that a great, value, is a guide which often comes to us but too late, and which, using for the future, we ought to read in the light of the clinical history of the past. For it should be remembered that disease is only to be seen and studied in the *living* body; that in the dead we see only the results of disease—results often, doubtless, telling us what sort of enemy has therein been at work, but not to be too solely trusted as helpful towards the discovery and conquest of that enemy. Looking thus at traumatic fever and septicæmia, M. Lucas-Championnière points out that the one is a constant phenomenon attending wounds, which presents great regularity in its evolution, course, and end; the other an exceptional occurrence, coming on nearly always after the traumatic fever has passed, and at any period or in any state of the wound. The one is influenced by the age, sex, and nervous condition of the patient; the other attacks all classes indiscriminately. The one is almost unattended with danger, and tends to cure; the other is nearly invariably fatal. The one is scarcely ever ushered in by rigors, which constantly occur at the onset of the other.

The regular temperature of the one contrasts with the great oscillation of the temperature in the other. Healthy suppuration mostly comes on at the end of the one, whereas the wounds take on an unhealthy appearance with the occurrence of the other. There are no lesions characteristic of the one, but several strikingly so of the other.

Purulent infection may, however, occur before the end of the traumatic fever, and then, of course, the symptoms of the one merge into those of the other; and it is probable that, when the traumatic fever has been severe, the patient is proportionately prone to be attacked by complications, such as phlebitis and its consequences. Our author then reviews the experiments adduced to prove the septic origin of traumatic fever. These are—(*a*) The application of putrid substances to wounds. (*b*) The injection of similar materials into the cellular tissue. These cause either local inflammation and suppuration, or the animals die with diffuse gangrenous inflammations, but they afford no proof of any absorption into the blood. The local effects are quite sufficient to produce an inflammatory fever without any septic absorption, as is shown by the fact that simple irritants,

not septic, produce the same results. (*c*) Injections into the circulation. The similar results obtained by the injection of the most diverse materials, such as water, blood, pus, the so-called sepsine, hydrocele fluid, &c., seem to show simply that the introduction of foreign matters into the blood disturbs its functions, independently of any septic properties, and causes an elevation of temperature and even death.

The symptoms, moreover, in no way resemble traumatic fever, injections, even of small quantities, of such matters producing vomiting and diarrhœa, thirst, depression, and loss of weight, with post-mortem signs of intestinal inflammation. Billroth considered, however, that these materials injected into the blood, or absorbed from the surface of wounds, produced traumatic fever by causing chemical changes in the blood and increasing oxidation; just as the injection of carbonate of ammonia, on the other hand, might diminish oxidation. But in his latest works he has abandoned this opinion, and attributes the production of the fever to the nervous system, which is acted upon by the contaminated blood; still, however, agreeing with the supporters of the septic origin of the fever in their belief that it is only a minor degree of purulent infection.

The doses used in these injections have been often very large in proportion to the size of the animal, and the effects by no means constant; and these effects seem to have a much closer relation to the amount of local irritation set up, than to the dose of the poison used. Moreover, as Bergmann has shown, when foreign substances are introduced into the blood, its functions are disturbed and an eliminative action set up, an action which is not observed in traumatic fever. And whereas traumatic fever commences usually a few hours after the infliction of the wound, it is yet to be proved that the secretions of the wound, at that period, are in any way septic.

It has been said that traumatic fever is sometimes absent, when a wound (such as that of cauterization) is in a condition unfavorable to absorption. But M. Lucas-Championnière shows that, not only do such wounds give rise to traumatic fever, but that in these cases it commences very early, and is usually severe. Then, again, it has been asserted that traumatic fever may supervene after the reparative process is ended; but the fever occurring at this period will always be found to be due to some complication, and is to be distinguished from true traumatic fever. It is true that in dissection wounds febrile symptoms ensue upon the absorption of morbid matters; but then in only a very small proportion of the wounds to which putrid matter is applied does absorption take place, and when this does occur it gives rise, as has been shown, to

symptoms entirely different from those accompanying traumatic fever.

In fact, to study traumatic fever accurately it is very needful to distinguish it clearly from, not only purulent infection, but other complications of wounds, as phlebitis, phagedæna, erysipelas, &c.

Two clinical observations adduced by M. Lucas-Championnière tell powerfully against the septic theory of traumatic fever. First, that purulent infection is directly relative to conditions of putridity, whereas the severity of traumatic fever is dependent upon the organization and previous condition of the individual. Secondly, that when septic poison is absorbed we may always see an effort on the part of the system to eliminate it by a diarrhœa; whereas in severe cases of traumatic fever (in which, according to the septic theory, a considerable dose of poison must have been absorbed) there is almost always constipation—a fact that we have ourselves repeatedly verified.

M. Chauffard, although he does not agree with M. Lucas-Championnière's explanation of the phenomena of traumatic fever, is equally opposed to the septic theory, and furnishes additional arguments against it. He points out, for instance, that the absorption of matters discharged from the surfaces of wounds is quite hypothetical, and that it does not follow that, because soluble salts are absorbed from wounds, the same process occurs with effete organic materials.

On the contrary, as M. Chauveau has shown, a seton may be kept open, and the matter secreted in its track become extremely putrid, without any absorption of this matter taking place, or any disturbance of the animal's health; and yet the injection of the same pus under the skin of the animal proved fatal in four days. Again, a large absorbent surface is often attended with less traumatic fever than a small one, the difference having a much more obvious relation to the condition of the patient than to the size of the wound. The sloughs over the sacrum which occur in the course of fevers, and which, while gradually separating, leave an enormous wound bathed in foul discharge, do not, as a rule, give rise to any symptoms of blood poisoning by absorption.

Then he asks—Why does the fever abate after a few days, when the wound is still bathed in the same kind of discharge? To which we might add, that a patient affected by even the mildest form of septic infection has an appearance markedly different from one in any stage of traumatic fever. A study of the facies of disease will enable a careful observer to detect many diseases simply by the aspect of the patient; and certainly many, especially of the acute diseases, produce most charac-

teristic facial expressions. Septicæmia is a remarkable example of this; a very mild form of the disease, and one which may be completely recovered from, will yet be characterised by an expression and aspect quite unmistakable. We recently saw a child suffering from acute necrosis of the tibia, with suppurative periostitis rapidly spreading to the knee-joint, who had rigors and sweating, effusion and pains in joints, the peculiar pinched and sunken aspect which is the result of septicæmia, accompanied by rapid loss of flesh and diarrhœa, and who was becoming speedily worse; but who yet perfectly and quickly recovered after amputation. Doubtless she had imbibed but a small dose of poison, such as was eliminated by diarrhœa and other excretory processes, and which was not sufficiently large to produce the more commonly fatal result. But immediately after the amputation the prostration and lassitude attendant upon the condition of septicæmia were replaced by the restlessness, flushed face, and thirst of traumatic fever; which soon subsided and gave place again to some of the milder symptoms of the previous blood poisoning, which gradually passed off.

Now, according to the septic theory of traumatic fever, which attributes it to a mild degree of blood poisoning, this was a case which ought only to have been characterised from the first by the phenomena of traumatic fever; yet how utterly different were both the aspect and the symptoms from any which ordinarily result from operations or injuries. Then, with regard to the period of invasion: in eighty-two cases of pyæmia, in which the date of the accession of the disease is given by Mr. Savory ('St. Bartholomew's Hospital Reports,' vol. iii), the average period which elapsed between the injury and its commencement was thirteen days, whereas traumatic fever comes on almost immediately after the injury. And it is certainly remarkable, if traumatic fever is due to septicæmia, that we should never see it followed by any secondary effect, excepting when other complications supervene.

Having thus fully discussed, and we think disposed of, the septic theory of traumatic fever, M. Lucas-Championnière next examines the facts relative to its dependence upon the nervous system. He alludes to Claude-Bernard's experiment of driving a nail into the hoof of a horse, and thus producing traumatic fever, which, however, was prevented by previously dividing the nerves leading to the foot; and he shows that this experiment was doubtful and inconstant. Breuer and Chroback made more elaborate experiments in this direction. They removed portions of the chief nervous trunks of a dog's limb, and also in some instances (with a view to excluding the influence of the sympathetic nerve) a portion of the crural

artery. Some weeks afterwards they inflicted injuries upon the limb thus treated, with the result of producing an elevation of temperature; thus proving, as they supposed, that traumatic fever is produced independently of the nervous system. But these experiments were quite inconclusive. In the first place, the enervation of the limb was not complete, for the skin was intact, and there must have been many branches of the sympathetic remaining undivided. Then the injuries inflicted consisted of large wounds and the injection of irritating fluids into the joints, the results of which were evidently open to misinterpretation, as the fluids may have been absorbed into the blood and produced therein important changes. Besides this, an animal who has suffered the primary injuries to the nervous system, in addition to the ligature of the main artery of the limb, is in a condition in which it must be difficult to deduce any facts having regard to the production of traumatic fever in a healthy animal.

On the other hand, Albert and Stricker have shown that the injection of croton oil into the ear of a rabbit was followed by a fall of temperature, succeeded in two hours by an elevation. Now in this time there could not have been formed any putrid products, and it is difficult to refer the effect on the temperature to aught else than the nervous system. M. Lucas-Championnière next refers to the conclusions arrived at by Weber and others, to the effect that there is, in the medulla oblongata, a vaso-motor centre, the excitation of which diminishes, and the paralysis of which increases, the loss of heat; and a calorific centre, the excitation of which diminishes, and the paralysis of which increases, the production of heat; fever being a disturbance of this balance between the loss and production of heat. Finally, he shows that there is a direct relation between the amount of elimination that has to take place from a wound, and the severity of the traumatic fever. Thus, in contused and gunshot wounds it is always severe; in wounds treated antiseptically, there being less elimination from such wounds, and less irritation from decomposing discharges, it is usually slight. From all of which the conclusions drawn are—that traumatic fever has a distinct relation to the phenomena of repair, and especially to the amount of elimination from a wound; that the first effect of an injury is a fall, which rapidly gives place to an elevation, of temperature; a local inflammatory process then commences, which gives rise to an irritation of the nerves, and this, acting upon the heat-regulating centres, causes the fever, which ceases when the local elimination is complete and the wound has begun to granulate. These opinions naturally lead to the recommendation of a treatment calculated to allay irri-

tation, both local and general, such as antiseptic dressings or ice to the wound, with opium and chloral internally.

M. Chauffard is not quite so clear in his statements as to the mechanism by which he thinks traumatic fever is produced, but describes it as a vital reaction provoked by the wound and its consequences. He points out that no process in the body takes place in an isolated manner, but is the result of the vital action of the whole—a fact that, we think, is often not sufficiently remembered in the interpretation of such experiments on animals as those to which we have alluded. M. Chauffard appears, therefore, to recognise the importance of the nervous system in the production of traumatic fever.

In forming a judgment upon these various theories concerning traumatic fever, we ought chiefly to consider how far each of them is in accordance with the ascertained facts concerning fever in general, for the accuracy of the theory will probably be in proportion to this agreement. This might tempt us to a consideration of the whole question of the genesis of fever, but that there are two good reasons for treating this part of our subject with brevity. First, there is the great uncertainty still prevailing on many of the most important questions relating to the production of the febrile state; and, secondly, it would be quite impossible, within the limits of our space, to give anything approaching to a comprehensive view of the different opinions prevailing on this vast subject. Yet we may not pass it by, without a brief glance at a few points which stand out with sufficient prominence from the rest, to enable us at once to select them for remark. First, the chief but not the only characteristic of fever is pyrexia; secondly, all fever is accompanied by increased chemical change, of which the result must be an overloading of the blood with the products of such metamorphosis; thirdly, there is a heat-regulating power, whose root, at least, is most probably in the nervous system, the disturbance of which gives rise to pyrexia.

Dr. Gee, in his 'Gulstonian Lectures,' says—

"If it be highly probable that pyrexia induces changes of structure identical with those consequent upon inflammation, it is hardly less probable that these local changes react upon the body at large in the same way as inflammations act (the pyrogenic power of which we have already discussed); that is to say, fever produces fever; and the same is probably true of putridity in fevers—it tends to perpetuate and to multiply itself. This opinion is rendered still more plausible when we call to mind the baneful effect which fevers in general, and putrid fevers in particular, exercise over local inflammations. Moreover, the opinion of Liebermeister is certainly very probable, that the unfavorable course which fevers run in the aged, the intempe-

rate, and the fat, is partly due to the degenerations which have already taken place in their tissues—degenerations of much the same kind as those produced by pyrexia."

Now, bearing this in mind, we are able to see why the severity of traumatic fever should be so greatly influenced by the previous condition of the patient; and also why, after the decline of the fever, especially if it has been severe, the patient should be so prone to the complications of wounds, such as purulent infection, erysipelas, &c. Moreover, it is to be remembered that, as Berthelot has shown, the mere rearrangement of the elements of a compound may generate heat, as, for instance, in the fermentation of grape sugar. And we know that for the healing of an injury it is necessary that a certain amount of tension force should be set free; we know also that the nervous system is the great controlling power of the animal tension force, whence it is easy to see how the infliction of an injury should, through the medium of the nervous system, give rise to an elevation of temperature—to pyrexia—in fact, to traumatic fever.

In the same lectures Dr. Gee has well pointed out that—

"The theories of fever, which are not open to the charge of explaining the little known by the less known, do yet, for the most part, err by narrowing the meaning of the word fever down to the measure of our knowledge. The theories of fever put forth are either comprehensive enough and altogether groundless, or are founded on fact but altogether unable to explain more than a part of the subject."

Dr. Gee then goes on to say what are the desiderata for forming a true theory of fever:

"We want to know what are the antecedents of that disturbance in the heat-regulating function of the body which commonly manifests itself as pyrexia. We want to know what are the other consequences of those antecedents; what, in fact, are the concomitants of pyrexia? And we want to know what are the necessary consequences of pyrexia and of its concomitants. When knowledge is obtained on this behalf we shall be able to define, exactly and comprehensively, what we mean by fever, and not until then."

Now, these remarks of Dr. Gee's seem to us to apply with equal force to the particular variety of fever that we are considering; for an impartial study of traumatic fever will, we think, show that none of the theories intended to explain its phenomena contain the whole truth concerning it, but that several of them contain a portion of it.

This, then, we think may be certainly affirmed:

1. That injuries give rise to a distinct fever, which has its origin in the injured part.

2. There is good reason to think that this fever is produced

through the agency of the nervous system, whereby the balance of the production and loss of heat in the body is disturbed, so as to give rise to pyrexia.

3. There is no sufficient evidence that this disturbance of the nervous system is due to the absorption of morbid products from the wound; although the pyrexia, doubtless, gives rise to an increase in the blood of the products of tissue waste.

4. The fever is probably the combined result of local nervous irritation, and of the general systemic preparation for the active process of repair.

In other words, traumatic fever is that fever which is the result of the tension force set free by the nervous system, in consequence of the stimulus of an injury, and of the action requisite for repair.

M. Chauffard's essay on traumatic fever is succeeded by several chapters on purulent infection, of which we cannot say that they add much to our knowledge of that subject. M. Chauffard devotes the greater part of an introduction of thirteen pages, to a defence of the French against the German school of pathology; from which it would almost seem as if the political animosity of these two nations had even tinctured their scientific opinions. M. Chauffard's doctrines, as well as his method of maintaining them, are certainly very different to those of the majority of German pathologists; and, moreover, seem to be not altogether free from some of the faults, such as vagueness and want of clinical proof, with which he charges his opponents. We agree with him, however, in the importance which he assigns to the combination of clinical study with experimental or anatomical investigation, and the necessity of remembering the complex character of all vital actions, in our interpretation of pathological facts. He is probably right also in saying that M. Verneuil's opinion that pyæmia is an ill-defined and variable affection, depends upon that pathologist having confounded traumatic fever, and other complications of wounds, with purulent infection, and regarded them all as various stages of one disease. M. Chauffard regards pyæmia as an increase of the pyogenic state naturally attendant upon injuries. He lays stress on the fact that suppuration is the result, not of local, but of general activity; that it is produced, not merely by the wound, but by the whole body; and he quotes, as confirmation of this opinion, the observation of Brouardel, who found in the blood of patients affected by secondary abscesses after variola, an increase in the number of the white globules, as compared with the blood of patients recovering from the same disease, but not affected by suppurations. He then describes common pyæmia as a disease due to an increase of this pyogenic condition, which gives rise

to subcutaneous abscesses and to feverish disturbance, but which is usually recovered from, unless the multiplicity and duration of the suppurations exhaust the patient. Purulent infection, he considers as a malignant form of pyæmia, in which there is a still greater tendency to pus formation than in the common form, this giving rise to the secondary deposits in various organs, and to all their attendant symptoms. The rigors he considers, not to depend upon absorption of successive doses of poison, but to be the prelude of fresh pus formation. This altered pyogenic state has its origin in unfavorable influences acting upon the patient, and which affect chiefly the condition of the blood, such as bad living, poverty, dissipation, excessive fatigue, over-crowding, and the presence of exhalations from wounds, and he thinks this view satisfactorily explains the so-called cases of spontaneous pyæmia in which there is no wound. This author classes cerebro-spinal meningitis and other purulent diseases, as puerperal fever, with pyæmia; but, on the other hand, looks upon putrid infection as a separate and curable disease, due to prolonged contact of large surfaces with decomposing materials. M. Chauffard states also that hospitals for children are especially prone to generate the pyæmic state. But whatever may be the cause of pyæmia, we think that this statement is erroneous, our experience having been that hospitals for children, although certainly not exempt from that disease, exhibit decidedly fewer cases than hospitals devoted to adults.

M. Chauffard's theory, however, does not explain the anatomical characteristics of pyæmia. An examination of the secondary deposits has shown that, at any rate, the majority of them depend upon emboli, and the origin of these emboli can often be traced directly to the wound. For instance, we have quite recently examined the body of a boy who died with secondary abscess and infarcts in the lungs, a week after a contused wound of the thumb, and in which clots, in various stages of disintegration, could be distinctly traced from a small vein originating in the wound, along the radial and cephalic veins, almost as far as the axillary. It seems needless in a case like this, to go further for the cause of the pulmonary lesions. Moreover, it is easy to understand how a certain amount of blood poisoning should give rise to such modifications of the blood, and of the circulating force, as to produce capillary thrombosis, leading either to gangrene or to extension of the thrombus, and, by its disintegration, to subsequent embolism of infective character. Occurrences, these, which would be very much favoured by depressing or other bad conditions affecting the patient.

This seems to be the connecting link between the systemic infection, and the secondary lesions of pyæmia. But what gives to the secondary deposits their peculiarly purulent and infective tendency? Why do the infarcts of pyæmia so certainly become purulent?

Upon these questions much light has been thrown by the researches of Dr. Sanderson and others on the intimate pathology of contagion.

In his first paper on this subject Dr. Sanderson describes the experiments of M. Chauveau, of Lyons, and gives strong grounds for believing that the infective material is neither soluble in water nor watery liquids, nor capable, without losing its properties, of assuming the form of vapour. The most important of these experiments were repeated, and varied. They consisted chiefly in separating the particulate, from the soluble constituents of infected liquids, by the process of diffusion; when it was found that the diffused liquid, though it contained all the soluble elements of the infective liquid was wanting in those on which its activity depends.

Dr. Sanderson then proceeds to investigate the question whether the particles of contagium are living organisms, or whether their infective properties depend upon their chemical composition. He first points out that—

"There are two obvious objections which stand in the way of the acceptance of any chemical explanation of the phenomena of contagion. The first is, that the multiplication of contagium in the body of the infected individual, is a process which cannot be compared to any which is brought about by chemical agencies independently of organic development. The second is, that all contagia possess the power of retaining their latent virulence for long periods (often resisting the most unfavorable chemical and physical conditions), and only show themselves to be what they are, when they are brought into contact with living organisms. Outside of the body the contagious material withstands all those changes to which on chemical grounds we should expect it to be liable, while in the body it manifests a degree of activity, and gives rise to an amount of molecular disturbance which is quite as unaccountable.

"Neither of these difficulties stands in our way if we suppose that the contagious process is connected with the unfolding of organic forms. The excess of contagium in the body of the infected individual is not more rapid than many known cases of organic reproduction; and, on the other hand, the explosion of infective action which occurs the moment that particles of contagium are, so to speak, fecundated by contact with living substance, has its parallel in a vast number of organic processes, in which the collision of one organized particle with another of antagonistic properties, manifests itself in a sudden outburst of previously latent formative activity."

Then, after alluding to Professor Hallier's researches into the organic forms which occur in contagious matter, and the insufficiency of these researches to prove the specificity of microzymes, Dr. Sanderson shows that there are good reasons for regarding it as "probable that, although all microzomes are not contagium particles, yet all contagium particles may be microzymes."

Dr. Sanderson's second paper deals with "the origin and distribution of microzymes in water, and the circumstances which determine their existence in the tissues and liquids of the living body." The most important facts ascertained by this investigation are—

"1. That the growth of microzymes is attended with the absorption of oxygen and the discharge of carbonic acid.

"2. That they are remarkably independent of the chemical constitution of the medium, provided that they are supplied with oxygen.

"3. That they take nitrogen from almost any source which contains it, and use it for the building up of their own protoplasm.

"It is this last power which especially indicates what may be called their place in nature as the universal destroyers of nitrogenous substances, acting as the pioneers, if not the producers, of putrefaction. They exercise this function, not by virtue of any special relation of their own nutritive processes to putrefaction as such, but simply by their extraordinary power of seizing on the elements which they require for the construction of their own bodies.

"4. That animal fluids withstand decomposition for very long periods so long as the germinal matter of microzymes is excluded, while the slightest contact with media containing this material at once determines septic changes.

"5. That the normal liquids and tissues do not possess the zymotic property;" *e.g.* that normal blood contains no microzymes, actually or potentially.

"6. Neither do the normal secretions possess the zymotic property.

"7. That the liquid products of inflammation are occasionally but not always zymotic.

"8. That there is no developmental connection between microzymes and fungi."

Dr. Sanderson has recently also communicated to the Pathological and Medico-Chirurgical Societies the following facts arrived at by experiments in pyæmic infection:

1. "That in all infective inflammations in the lower animals microzymes abound in the exudation liquids."

2. "That the same forms are also to be found in the blood of animals when in the state of acute infective fever."

3. "That the condition expressed by the word septicæmia (including

not only septic fever, but also the intense mucous and serous inflammations by which it is accompanied) may be produced, independently of the entrance of septic matter from without, by the introduction into the serous cavities, or into the circulation, of liquids derived directly from living tissues in certain stages of inflammation; and that the process by which infective abscesses are formed in various organs and tissues, at a distance from some primary focus of inflammation, is of similar origin; both being due to the existence in the circulating blood of an infective agent, which, although of purely intrinsic origin, yet possesses all the characters of a septic poison."

Now, the phenomena of pyæmia, regarded in the light of these facts, become at once more intelligible. We see that the disease is due to septic changes in the blood, and that these changes may have their origin, not only in the introduction from without of septic matter, but by the entrance into the circulation of certain inflammatory products of infective character; that these products, wherever arrested in the course of the circulation, give rise to the secondary deposits so characteristic of the disease, but that these deposits may probably also be determined by the mere septic quality of the blood, which gives rise to thrombosis, which, from its infective character, is prone to rapid degenerative changes; and that this infective quality and its associated fever is characterised by the presence of microzymes both in the blood and the inflammatory products.

And having arrived thus far, we might be tempted to a still further procession towards a theory of the origin of the infective agent or contagium, a subject truly of the intensest interest, but as yet veiled in so great obscurity that it will be wiser, following the Baconian precept, to stop here, "not wishing to spin fine and specious theories," but content with the endeavour "to attain a certain and demonstrative knowledge."

IV.—Irish Poor Law Medical Relief.[1]

The first annual report of the Local Government Board for Ireland embraces a period marked by some adverse circumstances, which, in the matured opinion of the Board, at any time

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[1] *Annual Report of the Local Government Board for Ireland, being the First Report under 'The Local Government Board (Ireland) Act,' 35 and 36 Vic., c. 109; with Appendices.* 1873.

2. *Reports from Poor Law Inspectors in Ireland, in pursuance of Instructions, dated 9th May,* 1872. *Given by desire of Her Majesty's Government for the purpose of obtaining Information on the subject of Labourers' Dwellings in that Country, &c.* 1873.

3. *Report of the Executive Committee of the Dublin Sanitary Association to the General Meeting, held June 11th,* 1873, *&c.*

4. *An Analysis of the Population, Acreage, Expenditure under Sanitary Acts and Medical Charities' Act in the various Provinces, Counties, Rural and Urban Districts, in Ireland, along with the Average Salaries of the Medical Officers,*

previous to the great famine of 1846, would have been attended by a serious amount of distress and sickness among the indigent part both of the urban and rural population. A partial potato blight, sufficiently severe to raise the price of that important esculent beyond what has been the case for many years; deficiency of turf, owing to the continuance of wet preventing its preparation; and, in towns and localities where coal is used, the extraordinary price of this fuel, contributed, with the enhanced price of food generally, and of almost all other necessaries of life, to render the year to which the report refers an unusually trying one.

For these reasons, as the report shows, it was to be expected that, notwithstanding the wonderful changes for the better since the famine period, distress and sickness would prevail to an unusual extent, and the weekly returns of pauperism were looked to with anxiety. Steps were accordingly taken to warn the several boards of guardians of the threatening aspect of the then coming winter, and advising due preparation for a possible increase of inmates of the workhouses. However, it fell out that no very serious increase occurred beyond that usual in the winter season, while the weekly rate of mortality in the workhouses was, up to the first week in February, considerably less than at the corresponding period of the preceding year. We must here, however, bear in mind that this comparison with a period when smallpox was raging does not prove much, and the fact that, even in the face of that circumstance, the mortality in the workhouses rose, during the last three weeks in February, higher than in the previous year, shows the serious result of inclement weather and a dearth of fuel amongst the indigent.

We are not favorably disposed towards out-door relief in general, regarding it to have, in many cases, a demoralising effect; but in the course of the year in question this form of relief was most legitimately called for in not a few instances. Its necessity was particularly shown in Connemara and the islands off the coast, where the population is very poor and sparse, and the means of communication most difficult.

Persons conversant with the question of the health of the people, will at once recognise the vast influence that healthy or unhealthy dwellings exercise upon the population; but whilst this point is kept in view, it is but just to consider the matter in reference to the rights of property. We cannot but agree with the reports under notice as to these two phases of this question. We have, however, only to do with this matter in so

Poor Law Valuation, Total Poundage on Valuation and Poundage on Medical Salaries. Prepared for the Irish Poor Law Medical Officers' Association, by the Hon. Sec., D. Toler T. Maunsell, M.B. Dub., M.R.I.A. 1873.

far as it is influential in affecting the sanitary state of the people. There is no need to demonstrate that national power depends upon the sanitary condition of the masses of the people, and that decreasing numbers of the working classes is a matter which especially demands the attention of the Government.

But over and above these considerations, the high rates of mortality and the depreciation in the physique of our civil populations generally form additional inducements to consider well what remedial measures can be adopted. For every reason, then, we approve of the step taken by the Irish Government for the promotion of a better character of dwellings for the rural labouring classes. Nor are those measures needed for those classes only, for we learn from reports published in Dublin,[1] and based upon observation and the records of the Dublin Corporation, that a very large proportion of the tenements occupied by the working classes of that city are unfit for human habitation, and become, ever and anon, centres of contagion whence issue epidemical and endemical forms of disease which extend alike to all parts of the city and to all classes of its inhabitants.

The inquiry into the state of labourers' dwellings was entrusted to the Inspectors of the Local Government Board, ten in number, four of whom are medical men. It embraced the following heads:—The most suitable tenure for labourers' dwellings; the quantity of land to be let with each cottage; the rent; the mode of letting; if any, what restrictions should exist as regards landlord and as regards tenant to occupier; lastly, as to registration of labourers' cottages, and whether any change in the present system of procuring loans, either to encourage more numerous applications or to simplify the present mode of obtaining advances, would be desirable.

The general tenor of the replies to the first query is, that labourers should hold by a yearly, monthly, or weekly tenancy, with provisions guaranteeing the landlord the possession in case of non-fulfilment of contract, as by refusing to work or on account of misconduct. One gentleman strongly advised, and with reason, that the relation of master and servant should not be complicated by adding to it that of landlord and tenant; he, therefore, advocated that there should be no tenure at all.

While each of the Local Government Inspectors points to the necessity of some means of compelling labourers to work, they very generally speak of the necessity for providing suitable cottages to induce that class to remain in the country; they also advise that little be done by enactment, but that the petty sessions magistrates should, with certain restrictions, be empowered to deal with all cases requiring legal interference.

[1] By the Dublin Sanitary Association.

From a quarter of an acre to one acre, varying to some extent with the quality of the land, is recommended as a suitable quantity for each labourer to hold with his cottage.

While a sum not exceeding £5 yearly is advocated generally, it is by others recommended that no rent be charged, and that the use of cottage and land should be regarded as part of the payment for labour. A simple form of letting, in writing, is approved of in every case, and it is made the landlord's duty to keep the cottage in repair, except where wilfully damaged. An appeal in cases of difficulty is advocated from petty sessions to quarter sessions. Subletting on the part of the occupier of a cottage, and putting in any joint tenant or lodger on the part of the landlord are alike to be prohibited. Registration, as with the clerk of the union, of the condition of each cottage, and inspection as to sanitary conveniences, &c., by competent persons, is recommended. For the latter duty some recommended an officer of the Board of Works, others the Dispensary Medical Officer. Indeed, the law as it now stands provides for the employment and payment of the latter officer as a Sanitary Medical Officer at times of epidemic disease, or when such threatens; and it would seem only consistent that his duties should at all times embrace the work of inspection proposed, inasmuch as the beneficial results of sanitary supervision are to be secured by constant, deliberate measures, and not only in epidemical but also in endemical disease, which latter oftentimes involves a greater because a more constant loss, both by sickness and by death, to a community.

With regard to the designs for cottages, several examples of which are given, it appears difficult to settle upon any one plan for Ireland generally, owing to the differences of climate in various parts. We would prefer referring this matter to some persons of intelligence, as local architects or builders. Our own experience is not in favour of many small rooms, especially when ceiled, as it is very difficult to maintain the necessary ventilation. The old-fashioned capacious chimney was very favorable to this end.

We have often seen in Ireland and elsewhere otherwise tolerably good dwellings rendered unwholesome by want of judgment in selection of a site, or by proximity to foul heaps of manure or stagnant pools of liquid and semi-liquid refuse matters.

It is not our province here to enter into these structural details, which are, however, well worthy of forming a part of the education of all classes concerned. We feel, however, called upon to ask why some system that would prevent the pollution of the soil, air, and water, has not been recommended in the plans referred to. That something of the kind has not been done in

a systematic way, and so as to prevent contamination of the air of the dwellings, of the adjacent ground, and of the surface wells, is not the fault of the medical men of Ireland, some of whom, at least, have drawn attention to the great importance of this subject.

The system of placing children "out at nurse," instead of retaining them in the workhouses, has not been adopted in any considerable number of unions in Ireland, nor have the results heretofore justified any great extension of the plan. In one union "the inquiry" (that was undertaken by directions of the Local Government Board) "disclosed a grievous state of neglect of several poor children placed out to nurse." On the other hand, we may observe, that some charitable institutions for orphans have pursued the system of out-nursing with very satisfactory results for a great number of years; but strict attention has been paid to the selection of suitable persons to take charge of the children, and inspection has been conducted by responsible and intelligent persons.

The commission reports that whenever a child is sent out of the workhouse, not at a tender age and for the purpose of maintaining health, but at a later age, and for the purpose merely of being brought up in a family instead of the workhouse school, the power given to boards of guardians by the Legislature has been perverted to an injurious instead of a beneficial end, and the true intention of the Legislature not faithfully carried out.

It would be well if guardians of the poor generally could be induced to pay stricter attention to the state of those receiving poor relief. In some instances officials have not sufficient time to devote to all the cases requiring looking after; in others it happens that relief, especially medical relief, is given to persons possessed of means which should preclude them from being a burden to the ratepayer and an imposition upon the medical man, who but too often incurs the ill-will of individual guardians if he attempts to obtain the cancelling of tickets issued to persons seeking poor relief.

The persons on out-door relief numbered in	1857	1,098.
" "	1861	4,713.
" "	1866	11,810.
" "	1871	23,544.
" "	1873	31,142.

Of the numbers so relieved in the year ending February 15th last, 13,462 were persons permanently disabled from labour by reason of old age, infirmity, or bodily or mental defect. We have before expressed our disapproval of out-door relief in general, unless under the strictest supervision, and with a view to the

great diminution, if not abolition, of workhouse relief. This result does not appear to have followed, for in 1859 and 1860 the number of persons on out-door relief was, respectively, 1448 and 2093 against 27,010 and 31,142 in 1872 and 1873 (on the last Saturday of February in each year); whilst on the first Saturday of January of the same years the numbers in the workhouses were, respectively, 43,599 and 43,218, and 48,738 and 49,856.

It must also be observed that the population has fallen from 6,009,113 and 5,988,820 in the two years first quoted, to 5,402,759 and 5,368,166 in the years last mentioned. A falling-off in so short a period of more than 600,000 in a population, coupled with an increase of destitution, is a matter demanding most searching inquiry.

This appears a suitable place to mention that many persons of the present as well as of the past generation, including the late Mr. Daniel O'Connell, are and have been averse to poor law relief in Ireland. Not a day passes but we hear of instances in which the principle of the poor law system is abused. Employers find that workpeople but too often labour only in the summer and the finer seasons of the year, and spend not a little of that time in drunkenness, whilst in the winter, or if suffering from the effects of drink, they adjourn to the workhouse, and, if possible, to the workhouse hospital. Indeed, to some extent, all hospitals are resorted to by the drunken, especially when suffering from alcoholism or other diseases traceable to drink, and from accidents met with whilst drunk.

The object of legislation should be, not to house the spendthrift, the idler and the debauchée, but to punish such, and to encourage the hardworking, the sober and the industrious; the very classes that we now tax for the encouragement, the sheltering and support of the disreputable.

To the maudlin sentimentalism of modern times about the honest, laborious, horny-handed working people, we are sacrificing our respect as a nation, our vitality, our principles of justice and our wealth, and, in their place, we are fostering infamy, villany and beggary.

The 'Annual Report of the Dublin Sanitary Association' exposes many sanitary evils calling loudly for redress. What would be thought in London of storing thousands of tons of refuse matter in some of the most crowded and poorest parts of a city, and this, notwithstanding repeated memorials and other remonstrances, to the detriment of the public health.

With a comparatively thinly-peopled area, Dublin contrasts unfavourably with London and many other British towns. In Edinburgh, Glasgow, London and Dublin, we find the ratios

of deaths to births to be 75·7, 75·1, 68·1 and 96·4 per cent. respectively, and in the same order 132·1, 133·2, 146·9 and 103·8 represent the ratios of births to deaths.

Several other urban districts in Ireland also stand much in need of energetic action in like matters. The rural districts generally present comparatively favorable returns of the state of public health, and, from containing about seven-eighths of the whole population, are highly important.

Bad as the state of things is in Ireland, England shows a still greater proportional expenditure on poor relief, the sum thus spent in 1872 on the poor of a population of 23,000,000 being £8,007,403, that is, at the rate per head of 6*s.* 11½*d.*; whereas, in Ireland but £729,331 were spent upon the poor of 5,368,166 people. This great disproportion of expenditure has been explained by the fact that in Ireland the operation of the Medical Charities' Act is most beneficial in treating the sick of the poor and labouring classes, thus, as it were, arresting in the early stages of its operation that chief factor of disease—pauperism. This excellent result has, however, its drawbacks, for, like other poor relief, it tends to gender want of self-reliance and to encourage recklessness and dissipation, for the drunkard has little or no fear of not being cared for so long as he or his friends can command the aid of a warden or guardian authorised to issue tickets for the attendance of the medical officer. The election of small traders or publicans as guardians of the poor, entrusted with the disposal of the tickets for medical relief, is, as pointed out on former occasions, fraught with evil; and experience amply shows that these tickets are often given to individuals well able to pay for the services they receive.

If due circumspection by intelligent and responsible persons was exercised in the distribution of medical and of other relief most valuable results would be attained; and, if the promised new Public Health Act for Ireland grapples with the evils of past legislation, and couples with the present duties of dispensary medical officers that of local health officers, for which their knowledge and their local experience so well fit them, there is but little doubt that disease and poverty would be much lessened. The services rendered by these medical officers are highly important, and should be better paid for; at present the average cost of the medical staff amounts just to three farthings on the poundage valuation of Ireland, whilst the expenditure on sanitary matters during last year is computed to have amounted only to about one-eighth of a farthing in the pound on the poor law valuation. Vaccination, it appears, is also paid for at a rate considerably lower than in England.

In Ireland the law at present allows six months after birth

as the period within which vaccination may be performed, instead of three as in England. Three evils result from this extension of time:—one is, that in not a few cases the vaccination is indefinitely postponed by the parents; another, that the concurrence of dentition with vaccination, being frequently accompanied by complications, as cutaneous eruptions, &c., these are often attributed by the parents to the vaccine used; and, lastly, that if an epidemic of variola breaks out, very many infants under six months old perish unvaccinated, as occurred in the recent epidemic. To this delay of vaccination, and to the number of persons who escaped as being over the age required by the Compulsory Vaccination Act, as well as to the general neglect of revaccination previously to the last epidemic of smallpox—coupled with the very defective sanitary conditions of most of the Irish towns, and to the refusal of Government to expend anything on carrying out preventive measures with regard to vaccination of the crews of vessels trading with Ireland, and to the want of any regular supervision and isolation of arrivals from infected ports,—may be traced the large prevalence of smallpox in 1872. The number of cases of that disease treated by medical officers of dispensary districts in Ireland had fallen rapidly from 2000 in 1865 to 27 in 1869, but rose again to 10,317 in 1872; whilst the mortality from it (in Ireland at large), which had been 854 in 1864, and had fallen to 19 in 1868, advanced successively to 20, 32, 647 and 3197 in 1869, 1870, 1871, and 1872 respectively. It is satisfactory to add that the disease has now again almost, if not entirely, disappeared from the Dublin registration district, where but 8 deaths occurred from it in January, 2 in March, and none from that time up to the date at which we write the end of November, 1873.

Alterations have been made by the Local Government Commissioners in some extensive rural districts by the appointment of additional medical officers, and by altering the boundaries of districts. Similar measures are still much required in many places where at present useless labour is thrown on the medical officers, and much distress caused to the sick by the great distances from the dispensary that many of the poor reside at. Such are some of the many points of interest contained in the works under consideration, and in conclusion it may be observed that, while there are many matters of a satisfactory nature, it would be useless to deny there are others needing the grave attention of those entrusted with the public administration of affairs, and of all having the well-being of the United Kingdom at heart.

V.—Warren on Rodent Ulcer.[1]

If we are somewhat late in noticing this little treatise, it is not because we fail to recognise its value as a very able contribution to a sufficiently difficult subject. Occupying a position on the borderland of cancer, rodent ulcer has long been in the thick of the skirmishing which pathologists have carried on with ever-increasing vigour of late years upon the disputed territory of new growths. A glance at the long list of names successively given to this intractable ulcer shows at once the number of conflicting views which have been entertained of its nature. Rodent ulcer, Jacob's ulcer, cancroid ulcer, ulcère rougeant, ulcère chancreux du visage, cancroid de la face, fressende Flechte (rodent lichen), rodent cancer, flâche epithelial Krebs, lupus exedens, and noli me tangere—are all titles which have been given to this disease, and which seem to indicate the clinical malignancy apart from well-marked anatomical characteristics which distinguish it.

The disease itself is sufficiently familiar to surgeons. The patient is usually in excellent health, but on the face, generally spreading from the neighbourhood of the nose or eyelid, is an unsightly ulcer, in its earlier stages superficial, with smooth, indurated base, and slightly raised and hardened edges, and, in rare cases, perchance an outlying, pale, hard tubercle in the adjacent skin. There is hardly any pain, nor are the lymphatic glands diseased, whilst the surrounding skin is supple and healthy close up to the margin of the sore. But it is remarked that this quiet, harmless-looking sore resists all treatment, and pursues its course—very slowly, indeed—but with terrible earnestness, checked by no tissue, but eating away all alike, until, in the worst instances, the greater part of the face may be destroyed, and the brain itself may be exposed in the hideous chasm, before death releases the sufferer. And yet all this time the disease, frightful as it is, is strangely localised. Very seldom, indeed, are the lymphatic glands involved, even in the latest stages, and to the last the adjacent skin remains healthy. Many years have passed before the last stage has been reached—so many, that some intercurrent disease usually saves the patient from enduring the full extent of possible deformity—but the surgeon's inquiries will generally elicit the remembrance of a pimple or wart as an old source of trouble and annoyance before the skin began to give way before the ulcer.

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[1] *The Anatomy and Development of Rodent Ulcer: a Boylston Medical Prize Essay for* 1872. By J. Collins Warren, M.D. Boston, 1872.

This sketch of the malady few hospital surgeons will be unable to verify. It has chanced to the writer to see some formidable instances of the disease, and in a few cases to enjoy the opportunity of making microscopical examination of the indurated edges, and he is the better able therefore to bear grateful witness to the light thrown upon the subject by Dr. Warren's researches.

For there can be no question that the doubt and obscurity which envelope the pathology of rodent ulcer are due, in no small degree, to the extreme difficulty attending its microscopic investigation. Since the researches of Virchow gave a new impulse to the inquiry into the anatomical structure of new growths with a view to their scientific classification, surgeons have been unwilling to apply the term cancer loosely to any growth in which certain definite structural elements are not to be distinguished. Hence the importance of carefully examining all tumours which from their clinical habits may seem to be allied to cancer, and it is in the very meagre and unsatisfactory way in which this essential part of the subject is treated in the late Mr. C. H. Moore's work on 'Rodent Cancer,' that the chief blemish of that otherwise excellent clinical memoir lies.

To appreciate aright the careful work of Dr. Warren in endeavouring to clear up much of this confusion by minute examination of a number of well-marked cases of the disease, and the publication of the results of his inquiry in clear scientific language and ample detail, it is necessary to remind ourselves of the views already put forth by other observers. We think that it will be found that, although these views differ to a great, and at first sight confusing extent, those observations which are recorded with the greatest clearness and detail are also those which tend to corroborate the opinion of Dr. Warren as to the true nature and alliances of rodent ulcer.

Commencing our retrospect with the most eminent of our own pathologists, we find that Sir James Paget[1] says:

"It (rodent ulcer) has been confounded by many with different forms of cancer, yet it is distinct from them in structure as well as in history. . . . . The constantly progressive ulceration is a character in which this disease resembles cancer, especially epithelial cancer. The likeness in this respect may indicate some important affinity between them, but the differences between them are greater; for, not only is the rodent ulcer usually unlike that of any cancer in its aspect, rate and mode of progress, but the tissues bounding it and forming its base and walls never contain any epithelial or other cancerous structure; they are infiltrated with only such structures as may be found in the walls of common chronic ulcers. . . . . This

[1] 'Lectures on Surgical Pathology,' edited by Turner. 1863, p. 709.

indurated substance at the base and borders of the ulcer appears, on section, very firm, pale greyish, uniformly or obscurely fibrous; little fluid of any kind can be pressed from it. It is composed of the same elementary structures as common granulations are, and these, in the deeper layers, are inserted among the tissues on which the ulcer rests. I have examined very carefully six of these ulcers, removed by excision, and have never seen in or near them a structure resembling those of epithelial or any other form of cancer."

Mr. Jonathan Hutchinson, who reported a series of forty-two cases of rodent ulcer in the 'Medical Times and Gazette' in 1860, came to a like conclusion, the indurated base and margin of the ulcers always showing him "fibroid tissue in which were imbedded numerous nucleated exudation cells."

Mr. Moore's[1] account of the minute anatomy of the disease—which he considered should be placed amongst the cancers, but in a position by itself—hardly satisfies the requirements of modern pathologists; but he appears to have seen usually elements such as are commonly met with in chronic ulcers, with an occasional addition of structures supposed to be characteristic of ordinary epithelioma.

The late Mr. M. H. Collis,[2] of Dublin, in his valuable work on Cancer, separated rodent ulcer — called by him Jacob's ulcer, after the distinguished Irish surgeon who first described the disease carefully in 1827—from all forms of cancer, including epithelioma, placing it in the group of fibro-plastic (sarcomatous) new formations. He says :—"After making several microscopic examinations of the edges of these ulcers, I have always found them composed of a fibro-plastic material." Whence it would appear that Mr. Collis found only spindle or fusiform cells in the hard tissues of these ulcers, for his "fibro-plastic" cells are those commonly recognised in the present day as forming the bulk of most of the sarcomata, and as of distinctly connective tissue rather than of epithelial affinities—a statement singularly at variance with most other recorded observations.

Mr. Henry Arnott[3] has usually found masses of small round and oval cells dipping into the textures surrounding rodent ulcers; but varied in some cases by a more distinctly epithelial tissue, with even, rough "bird's-nest" bodies in the thicker portions, and he is therefore inclined to place those ulcers amongst the epitheliomata.

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[1] 'Rodent Cancer.' By C. H. Moore. 1867.

[2] 'Cancer and the Tumours analogous to it. By Maurice H. Collis, M.B. 1864, p. 178.

[3] 'Cancer: its Varieties; their Histology and Diagnosis.' By Henry Arnott. 1872, p. 74.

Finally, not to prolong this list—in which, however, we have only quoted the views of those who have made careful investigation for themselves, and who have therefore a right to speak on the subject—that excellent pathologist Mr Hulke,[1] in a communication to the Pathological Society of London, two years since, described five cases of rodent ulcer with great care. In all the same structure was met with, namely, an infiltrating new growth of cell-tissue, roughly comparable with that of the rete mucosum, infiltrating the subcutaneous fatty and muscular tissues.

The following paragraph, taken from Mr. Hulke's paper, describes clearly the appearances ordinarily presented by the induration-material of these ulcers :

"It consists exclusively of cells, without the admixture of an intercellular substance. The cells are small and round; they resemble those of the epidermal rete mucosum. At the periphery of the hard-edged base they form cylinder and bud-like masses, which intrude into the normal tissues underlying the ulcer. Near these invading buds the connective tissue corpuscles are unusually numerous, and in some situations appearances indicating proliferation of these corpuscles, and evolution of the morbid tissue out of them, were observed."

To these views of British surgeons may be added the conclusions by foreign pathologists. They mostly incline to rank rodent ulcer amongst the epitheliomata, Förster, however, failing to find any other elements than those of ordinary granulation tissue. Billroth speaks of an infiltration of the skin with epidermis scales, and subsequent cicatricial shrinking, and calls it a flat carcinoma of the skin, one of the mildest forms of cancer. Rindfleisch does not separate rodent ulcer very clearly from ordinary epitheliomatous ulceration, for he speaks of cicatrization as a peculiarity of the ulceration, and he calls it "cicatrizing epithelioma." Cornil and Ranvier seem to make no special distinction between this disease and the variety of epithelioma called by them "épithelîome pavimenteux lobulé."

Turning now to the work of Dr. Warren, we find that in dealing with this difficult subject he has started in a thoroughly practical way, by recording at sufficient length, and with ample detail of their microscopical examination, five cases of well-marked rodent ulcers, stating at the same time that these are only types of a larger number of other cases coming under his own observation :—"The examination in all cases was the same, all showing that rodent ulcer is but a name given to a form of epithelial cancer."

[1] 'Trans. of the Pathological Society of London,' vol. xxii. 1871, p. 326.

In fact, Dr. Warren's description offers a striking testimony to the truth of the observations of Mr. Hulke, and a comparison of the drawings taken from each of these observer's preparations shows at a glance, not only that both workers are truthfully describing the same appearances, but that they are justified in pointing out the close resemblance of the small cells depicted to those of the rete mucosum of the skin.

Dr. Warren points out a difference in the anatomical arrangement of the cells which is worthy of notice. The clusters of round, or of roundly-oval nucleated cells which dip into the underlying tissues in bud-like or tubular masses, are sometimes arranged in irregular alveoli in which may be traced the remains of a central vessel, and the development of these cell-clusters may apparently be traced back to the exudation from that blood vessel of white corpuscles, which, once free, have assumed the size and charateristics of growing epithelial cells, and in their growth have blocked up the vessel from which they escaped.

Other anastomosing clusters of the same cells have a more distinctly tubular shape, and the disposition of the inter-spaces "reminds one strongly of the now well-known system of plasmatic canals, from which the lymphatic capillaries take their origin. Indeed, it is quite possible that the lymphatics themselves may have been invaded for a certain distance, though this was a point which could not be demonstrated. There was no epithelial lining to the tubes to be seen, indicating their lymphatic nature." Both sets of cell-clusters then are found in spaces of the connective tissue of the cutis. In the former set of irregular clusters, separate alveoli, distinct bird's-nest arrangements of epithelial cells are often to be noted in the midst; but not in the more tubular clusters. This difference Dr. Warren is inclined to attribute to the free scope for proliferation in the anastomosing tubes, whilst, in the shut-off alveoli, the marginal cells press on those in the centre and cause them to assume the well known form of epidermic balls.

Dr. Warren thus places rodent ulcer amongst the cancers, as a small-cell or flat, or superficial variety of epithelioma, thus following the teaching of Thiersch and Billroth.

It is probable that the explanation of the great diversity of opinion hitherto prevalent on this subject is to be found in the close resemblance of the cells of the rete mucosum of the skin to those of ordinary granulation tissue. If the observer carefully examines the structures to be met with in an ordinary healing wound, he will meet with, in the layers of granulation cells near the bottom of the cut, round and roundly-oval cells precisely like those infiltrating the parts beneath a rodent ulcer; and if these granulation elements be traced up to the skin,

spindle-forms (as described by Collis) will be seen to gradually take their place and pave the way to more distinct epithelial scales. It is in the arrangement of these several structures that their true significance lies in rodent ulcer, and it is in the care with which this arrangement is described that the main value of Dr. Warren's work lies. He has, as it seems to us, shown that the apparently discrepant observations of previous workers are really all partly true, and he has succeeded in establishing a genuine claim for the rodent ulcer to be classed as a variety of epithelioma.

In the second part of the treatise, that concerning the development of the elements of rodent ulcer, Dr. Warren gives an interesting sketch of the conflicting opinions of Continental pathologists upon the origin of the epithelial cell, and sums up the results of his own observations as follows:

"1. The formation of the cancer cells is preceded by an escape of the white-blood corpuscles through the walls of the vessels, and an accumulation of similar cells in the adjoining lymphatic canals.

"2. That this is followed by an apparent transformation of these cells into cells resembling strongly the epithelium of the rete Malpighii.

"3. That the epithelium of the parts affected does not appear to take an active part in the process, but may exert a certain influence on the character of the formation taking place.

"4. That the cancer cells lie in the lymphatic spaces of the connective tissue, and do not invade to any appreciable extent the lymphatic vessels."

Finally, in discussing the interesting problem of the slight malignancy of the disease, Dr. Warren believes that the low formative power of the elements, the absence of power to multiply themselves with facility when first formed, and their extremely short-lived character, afford the most satisfactory explanation of the very local nature of the process. For ourselves, we think that the *position* of the ulcer is not taken into sufficient account in such inquiries. So long as the ulcer is situated on the upper part of the cheek, temple, or bridge of the nose—parts comparatively free from movement, and with unimportant vascular and lymphatic connections—the destructive action is exceedingly limited; but when once the cavity of the mouth is reached, or the eyelid invaded, the ulceration has seemed to make progress out of all proportion to its previous slow march, and it is in these more advanced and, happily, rarer cases that the lymphatic glands become also involved.

We cannot conclude this brief sketch of an interesting and hitherto obscure subject, without again tendering our thanks to Dr. Warren for his valuable contribution to its literature.

VI.—Chapman on the Diseases and Displacements of the Uterus, &c.[1]

This work is the last of the many volumes on the diseases of women which our American brethren have of late years so abundantly produced. It does not profess to be a systematic treatise on gynæcology. It has a higher aim than this, since its author appears as the orginator of an entirely new theory of uterine disease, which he is under the impression he has evolved from his own practical experience. This theory may be summed up in the one word "congestion," which he supposes to be the "fons et origo mali" of the multifarious disorders of the female sex which have recently attracted so much attention. We have carefully gone through most of the book, by no means an easy task, since it is cumbrously arranged, over-burdened by the lengthy narration of numerous cases which it is impossible to read, and which serve no purpose but that of literary padding, and disfigured by tall writing, of which, "in limine," we venture to give a specimen, chosen at random, that our readers may judge of the style of the work:

"To the luckless woman subjected to these many ills, whether those arising from anæmia or plethora, there is little pleasure derivable from animal life, since each sensuous avenue in which the vital forces are wont to move in health without impediment is barred; and as little from intellectual life, since the body, racked and tortured in its vain endeavours to accomplish its various functions, reacts on the mind, poisoning every thought, darkening every hope, and throwing a pall over the inner and the outer world."

In spite of these defects, there is much that is good in the book, and, were it not for the pretension to originality, we should be inclined to say that the author's views of the causation of uterine disease were, in the main, right, and his treatment, on the whole, judicious. But, certainly, neither the one nor the other appears to us so entirely novel as the author fancies, and they are, we believe, very much like those we have all along held and acted on, although we have not, perhaps, defined with accuracy the precise pathological changes that have been going on. In the portion of the book which describes the changes occurring in the uterines texture, and the influence of congestion and sub-involution, there is much that will repay perusal.

We are inclined to think that the difference which the author draws between the morbid action going on in a multiparous and nulliparous uterus is clinically correct, and this point has

[1] *Hysterology: a Treatise, Descriptive and Clinical, on the Diseases and the Displacements of the Uterus.* By Edwin Chapman, M.A., M.D. New York, 1872.

certainly not been dwelt on sufficiently in most of our gynæcological works. In the multiparous uterus should any cause produce and maintain preternatural fulness of the vessels the rugæ and mucous crypts of the cervix become hypertrophied and engorged, and large quantities of albuminous discharge are thrown off, a condition which has no natural tendency to recovery. This gives rise to the bright red circle of engorgement so commonly observed around the os. As this state of things advances the cervix becomes puffy and elastic, both by the implication of its capillaries in a common disorder, and by the infiltration of serum into its substance. When thus affected the entire structure of the cervix is swollen, its canal expanded, its sphincter fibres are relaxed, and its labia are enlarged, elongated and relaxed. As disease advances the whole uterus gets engorged, and, congestion assuming an active type, nutrition is stimulated, and there arises in all parts less equable growths, the uterus often attaining three or four times its natural size. In the nulliparous uterus, however, essentially different pathological changes are produced. In consequence of the uterus never having undergone the hypertrophy of pregnancy, its tissues remain dense and unyielding, and resist a great accumulation of blood in its vessels, whence it arises that neither the corporeal nor the cervical walls expand.

"The capacity of the multiparous uterus for enlargement is, contrary to received opinion, a most fortunate circumstance, since it allows a simple form of congestion to take place that is, when judiciously treated, removed with little difficulty. The incapacity, on the contrary, of the nulliparous uterus for enlargement is a most unfortunate circumstance, as an extraordinary influx of blood into its dense and resisting tissues begets a supersensitive state of the uterine nerves—a persistent hyperæsthesia—that, by instituting and keeping alive an active type of disease, adds greatly to the severity of the symptoms, and renders a cure well nigh unattainable. As a rule, it may be stated that womb disease, whether affecting a multipara or a nullipara, is rebellious to treatment in proportion to the greater or less implication of the uterine nerves, and that, with the latter class of patients, a neuralgic condition is nearly universal."

We have often been struck in practice with the difference with which cases of this kind respond to treatment, and with the greater ease with which cases of uterine leucorrhœa, accompanied with a large, spongy and hypertrophied uterus, are cured; and it seems to us, that the distinction above drawn, and which we do remember to have seen described elsewhere, may very probably give the correct explanation of a fact not otherwise easily understood.

As one would naturally suppose in an author holding such opinions, his theories of the causation of some common conditions detected in examination of uterine diseases are diametrically opposed to those of several other authors. Thus with regard to the causation of flexions of the uterus, about which we have all been so much exercised of late in this country, the following views are enunciated:—

"A flexion previous to puberty will give rise to no symptoms, nor after this age, if, as is commonly the case, the menstrual flow be unimpeded; a fact explaining the slender knowledge of many members of the profession of this variety of uterine deviation. Even when the uterus, doubled into this characteristic shape, is congested, and is, from the severity of the pelvic symptoms, examined with special care, this distortion is apt, save by the practised touch, to be unrecognised, or even mistaken for a version or enlargement of one of the ovaries.

"The pathology of flexions is as little understood as its causation. Many, if not most cases, are congenital, originating during the period of fœtal development from a defective or perverted cell-life; but others are accidental, being acquired during the menstrual reign, from the involution after a labour or an abortion, or the sub-involution after the cure of a congestive enlargement of the uterus, proceeding too far in its destructive disintegration. At least it is certain that an uterus originally of the normal shape may, as it returns after delivery to its former size, become flexed in the operation; and it seems to the writer that a like change may follow upon any development of the uterine walls, whatever the cause,—congestion, polypus, tumour, &c.,—when a similar process is instituted for the removal of the superfluous and effete materials."

And farther on—

"A flexure will cause no reaction on the system, nor give any local manifestation of its existence, unless the menses be obstructed, the uterus congested, or the neighbouring organs intrenched upon; and, notwithstanding this deformity is often the occasion of dysmenorrhœa and congestion, and thence, secondarily, of the symptoms attending uterine disease, yet it is, when uncomplicated, of such slight importance as not to demand treatment."

These are very much the views held by many gynæcologists of eminence, notably by Bernutz and Goupil; and in thus attributing the symptoms attending flexions to the concomitant conditions of the uterus rather than to the distortion itself, the author enunciates an opinion which we believe to be nearly the truth, although by no means a truth of his own discovery.

Naturally, and very properly, the author combats these conditions by attempting to remove the cause which he believes to produce them. We are greatly surprised, however, to observe that no notice is taken of the use of the Hodges pessary in

retroflexion. Whatever view is taken of the causation of the affection, no one can doubt the extreme utility of supporting the dislocated organ in its proper position by a suitable contrivance; and the only thing of the kind mentioned is the antiquated, and, we believed, obsolete, globe pessary. We were under the impression that that mischievous contrivance was now only to be seen in the chamber of horrors of obstetric museums, and it is not a little astonishing to find its use recommended in the most recently published work on diseases of women.

There is much besides this in the chapter on treatment with which, did space permit, we could readily find fault. The chief panacea is the local abstraction of blood, either by scarification or by leeches. The value of this in suitable cases no one will deny; but it is certain that the author recommends it with a freedom and a frequency which can hardly fail to be pernicious, unless indeed American patients are differently constituted to those on this side of the Atlantic. In conjunction with it, suitable medications to the interior of the cervix are recommended, such as a solution of nitrate of silver or chromic acid, when there is evidence of a morbid state of the cervical mucous membrane; but these are supposed to have a secondary value in the cure, instead of a primary one, as is much more probable.

To the skilled gynæcologist, able to recognise its faults and shortcomings, a careful perusal of Dr. Chapman's work will be of interest and of value, and will furnish another instance of the tendency which is so apparent in writers on diseases of women to look at the subject from their own point of view only, and on that account to follow a narrow and one-sided plan of treatment. Perhaps in future years, when the subject is more studied, more catholic views will prevail; but, at present, the tendency to which we have alluded is unquestionably a common one, and is deeply to be regretted. For this reason we hardly think Dr. Chapman's work can be recommended to students as a guide in the emergencies of practice.

VII. Lunacy in England and Scotland.

The Reports of the Commissioners in Lunacy are always replete with facts and reflections calculated to interest not only

1. *Twenty-seventh Report of the Commissioners in Lunacy to the Lord Chancellor.*

2. *Fifteenth Annual Report of the General Board of Commissioners in Lunacy for Scotland.*

medical readers, but sociologists also. Besides statistical returns concerning the number of lunatics, their distribution and their discharges, they set before us their condition and the prevailing views respecting management, and supplement all such matters by inquiries and comments on the causation of insanity, on its increase and on the means of providing for the progressively-accumulating insane. The reports of the Scottish Commissioners are particularly valuable by reason of the thoughtful examination of various points upon which either accurate information or sound judgment is needed.

By the courtesy of the Commissioners for England and for Scotland, the annual parliamentary blue-books in question are forwarded to us; but the official returns for Ireland do not reach us, and consequently we are unable to examine and compare the state of lunacy in that country with that of England and Scotland. This we much regret, as it would add to the interest and value of our review to include in it a notice of the principal topics relating to asylums and the insane in the whole realm of Great Britain and Ireland.

We have marked for consideration a considerable number of subjects in the two Reports before us, but some of them, we fear, will, from want of space, not be admissible in this present article. First and foremost are the general returns of lunatics known to the Government officials; for, we apprehend, the actual number of the insane is far from being accurately represented by the figures in the reports; more particularly in England, where the machinery for a census of lunatics is less complete than in Scotland, and where, likewise, those unfortunates fall under the cognizance of one or other of three State authorities, each exercising jurisdiction which need not, in the nature of things, be always congruous or harmonious with another.

It has for some time past been a debateable point whether insanity is on the increase in the country. However learned statisticians may settle this question, it is abundantly evident to the unsophisticated mind, from the annual reports of the Lunacy Commissioners, that the number of the insane year by year grows in a very appreciable manner. Thus in England there was during the year ending January 1st, 1873, an addition of 1656 individuals to the insane population of the year previously. In Scotland, account being taken of the population in the two countries, the increase of 112 has not been proportionally so great. But both in England and in Scotland, every year since statistical tables have been kept, a considerable augmentation has occurred in the number of lunatics. At the same time the rate of increase has not been uniform, and a

small modicum of satisfaction might be felt that during the last official year the number added was 229 less than in the previous twelvemonth, were it not shown (table ii, English Report) that the ratio of the insane to every thousand of the entire population of England has steadily and without interruption advanced year by year, so that, whereas that ratio stood at 1·86 in 1859, it was 2·58 in 1872. Again, if we examine the returns of patients *admitted* into "establishments," we discover the same indication of augmentation in the number of insane people, and this too after deducting those who have simply been transferred from one institution to another. This fact equally holds good in Scotland.

We cannot at present discuss the conditions productive of this annual increment of the insane in the population, but may, in passing, remark that one principal circumstance is accumulation.

The English Commissioners illustrate this circumstance by their remarks (p. 18) on the extent to which county and borough asylums progressively become receptacles for chronic lunatics, and cease to perform their proper function as curative establishments. That such an accumulation of chronic lunatics must go on is made patent enough by the facts, that in England the rate of recoveries per cent. has been, on the whole number under treatment, only 8·81 per cent., and on the admissions not more than 30 per cent., whilst the deaths, calculated on the population resident in asylums, have been under 10 per cent. How greatly the incubus of chronic insanity must press upon our public asylums is likewise exhibited by the circumstance that only 8·12 per cent. of their inmates are deemed curable.

With such facts before them it is not to be marvelled that both the English and Scottish Commissioners are concerned in seeking an explanation, and also a remedy. The former see their way to recommend the discharge from the costly-built and organised asylums of the land, of harmless patients, imbeciles, idiots, and others for whom simpler provision for care and oversight may be made, either with their friends, in workhouse special-wards, or in "intermediate asylums," such as those of Leavesden and Caterham, built for the metropolitan parishes. They do not encourage the boarding out of patients with strangers, on account of the risks that, in the existing state of the law, are incurred. In Scotland, however, this last-named mode of dealing with the insane finds more favour, and has received more attention, the difficulties in its way and its risks being diminished by better legislation, and by a much more efficient plan of visitation and supervision. For in this division of the kingdom, the appointment of two Assistant Commissioners makes it possible to inspect generally those of the insane lodged

whether with strangers or with relatives, and to secure them proper treatment. In England no machinery exists for watching the welfare of single pauper cases save what is to be found in the appointed visits of the Poor Law medical officers; and how insufficient and faulty those visits are to secure their well-being, is abundantly exhibited in official reports whenever inquiries have been instituted. To quote words used by the English Commissioners:—"The infrequent visitations by the District medical officers at present provided for, and the vague nature of their duties, powers and responsibilities in reference to these patients, are matters urgently requiring amendment by the Legislature."

In the 'Scotch Report' this question of accumulation is more fully discussed. It is pointed out that the cost of maintenance, the straitened accommodation, and the difficulties of management at home, are inducements to throw the charge, particularly of cases already chronic, or fast becoming so, on public funds, and further serve as a reason against their removal when once admitted into asylums. When the cost of maintenance is defrayed out of the public purse, the temptation is to seize the advantage; and whether the condition of the patient may require prolonged asylum treatment, or might be as well or even better met by removal home or elsewhere, the transfer will be rarely promoted or sanctioned. In these considerations may be found one source of asylum abuse and, *quantum valeat*, an explanation of the accumulation of chronic cases in public institutions. Deputy-Commissioner Dr. Paterson writes ('Scotch Report,' p. 267)—

"There are numerous causes which tend to favour the accumulation of chronic and incurable cases in asylums. Such are the saving of trouble and responsibility to local authorities; the idea that the material comforts and orderly arrangement of an asylum must necessarily conduce to the increased happiness and contentment, if not to the recovery of the patients; the use which many of these chronic and incurable cases not unfrequently are of in asylums and the like. But experience has shown that a very considerable number of chronic and harmless lunatics may, with at least equal contentment and happiness to themselves, and with perfect safety to the public, be placed in private dwellings under the care of their own relatives or other suitable guardians, and that to retain such persons in asylums when all reasonable hope of benefit is past, is to inflict an unnecessary expense upon the public, not only in so far as the cost of the maintenance of these patients and of the room in asylums which they occupy is concerned, but also in rendering necessary an additional outlay for increased asylum accommodation throughout the country."

The same writer further refers to the useful provision of the Scottish Lunacy Act of 1866, that no patient shall be detained in an asylum longer than three years from the date of the sheriff's order of committal, without a certificate from the superintendent, which is required to be renewed annually, that the patient's continued detention is necessary and proper, either for his own welfare or the safety of the public. This provision, Dr. Paterson considers, has served a useful purpose in weeding out many chronic cases from asylums. We likewise learn from other parts of the 'Report' that the parochial boards are acting upon the principle contained in it, by transferring patients in increasing numbers from the asylums, particularly to the roll of single patients.

We will now examine the distribution of lunatics in the two countries. In England one half of the total number are detained in county and borough asylums, one eighth in public hospitals for the insane and in licensed houses, one fourth in workhouses, and nearly one eighth singly as out-door paupers. Moreover, the tables show that the ratio of the insane chargeable as paupers, and relatively to private patients, has, within the last fifteen years, been advancing; and that, although public establishments have so increased in number and dimensions, they have failed to meet the demands upon them as pauper institutions, so that, whilst the aggregate provided for in asylums has about doubled within the fifteen years in question, that found resident in workhouses has augmented equally (see Table I). At the same time, both private and pauper patients "residing with relatives or others" have multiplied, and in place of 122 of the former and 5798 of the latter in 1859, there are now respectively 423 and 7070. This augmentation of single patients may, however, be in some measure illusory, forasmuch as in the former year the commissioners were less informed of the existence of such cases than at present, and particularly of *private* single patients. Indeed, at the present time it may be safely averred that many such exist unknown to them.

The proportion per cent. of the total number of pauper lunatics provided for in asylums, hospitals, and licensed houses, in workhouses, and with relatives or others, is displayed in Table IX (p. 13), from which we learn that there was a percentage of 56·70 in asylums in 1859, and in 1872 one of 59·81; that whilst in the former year the proportion in workhouses was 25·06, it stood at 26·92 in the latter, thus confirming the statement above advanced, that no impression has been made by extended asylum provision upon the insane population lodged in workhouses. In fact, the ratio of pauper lunatics in workhouses has augmented during the two last years beyond that obtaining

in 1859. On the other hand, the *proportion* of single pauper patients has steadily and progressively declined, so that, whereas this stood at 18·24 in 1859, it is now 13·27; although, as stated above, the absolute number of such persons has increased.

Turning to the 'Report' of the Scottish Commissioners, we find from a table on p. 37 that, taking the ten years since 1862, the pauper lunatics maintained in "royal and district asylums," have advanced from 39 to 56 per cent., whilst those kept "in parochial asylums and lunatic wards of poor-houses" have decreased from 31 per cent. to 23 per cent. There has also been a decrease (one, however, not continuous) of those in private dwellings (from 31·9 to 23·5), and a rapid one among the pauper inmates of private asylums, who have been reduced from 12·6 to 1·1 per cent. Thus, so far as county or district asylums are to be accounted the proper receptacles for the pauper insane, Scotland has the pre-eminence in meeting the requirement.

The relative proportion, in England, of the two sexes among lunatics deserves a few words. In private asylums the males exceed the females in number by nearly one ninth; whereas, in pauper establishments the reverse is the case, and the females surpass the males by above one ninth. This remarkable predominance of female pauper lunatics over the male, contrasting with the opposite condition among private patients, deserves investigation; for it is certain that it is not wholly explicable on the assumption that madness is so much more rife among poor women than among those of a higher rank. In fact, the Scotch returns suffice to show the fallacy of the assumption, for we find from them that the disparity in the proportion of male and of female pauper lunatics vanishes, the two sexes being equally numerous in the district asylums, and that, unlike what happens in England, the females are in a higher ratio in the other institutions.

The variation in the number and in the distribution of the insane in different counties (heretofore touched on in the article on "English and Scottish Lunacy" in this 'Review' for July, 1872) presents peculiarities well deserving inquiry. The variation in numbers, though, no doubt, primarily connected with the extent of population, is not wholly accountable for on this ground, but is attributable also to divers conditions and circumstances affecting the population, foremost among which are the amount of pauperism and the wealth of one county compared with others, and, in a subordinate degree, the prevailing occupations of the inhabitants, the rural or urban distribution of the majority, the geographical features of the county, and the extent of and facility of access to public establishments for the reception of the insane.

In the matter of distribution, it seems that the boarding out of patients with relatives and others prevails much more extensively in agricultural and hilly counties than in others. The large proportion of the insane so bestowed in Wales is very striking; and now that this mode of disposing of the imbecile and harmless is so much a question of the day, it would be very instructive and important to get from the English Commissioners in Lunacy a full report on the actual condition of those lunatics thus singly boarded out in that country, and on the advantages and disadvantages which attend such a method of disposal. The Commissioners for Scotland have largely examined into this question, and their experience has shown, that though this distribution for the insane exhibits many advantages, it must be placed under strict supervision and control. Indeed, the revelations from the investigations made by those officials, particularly when first entrusted with the duty, were of such a character as to demonstrate the necessity of making as thorough an examination and inspection of lunatics singly boarded out in England and Wales, if the well-being of such afflicted persons be deemed a matter of as much interest in the southern as in the northern half of Great Britain. As matters stand, the staff of English Commissioners in Lunacy have only a casual and intermittent acquaintance with those singly placed lunatics, and no sufficient and satisfactory inspection of them, as before noticed, is supplied by the officers of the Local Government Board, under whose auspices they are especially placed. Why and how long should this dual administration in regard to lunatics exist? Cannot all the pauper lunacy in the kingdom be under the inspection and control of one Board? And cannot that Board be made sufficient for its duties, which clearly it is not at the present time?

The variation in the proportion of the insane in different counties has, in the report before us, been very fully discussed by the Scottish Commissioners.[1] The subject is one practically debatable in connection with pauper lunacy almost entirely; for the insane referable to the class "private," and truly dependent on private resources, constitute but one tenth of the whole lunacy of the country. Moreover, this class of private patients is either a non-increasing, or an absolutely diminishing body. In England, regard being had to the growth of population, their increment is inappreciable; and if the advance of the country in wealth be taken into account, and with it the fair inference that there must be an augmenting ability in the community to maintain lunatics at their private cost, this non-

[1] See also article on "English and Scottish Lunacy," 'Brit. and For. Med.-Chir. Rev.,' July, 1872.

increase of private patients is well calculated to attract attention, even although it prove wanting in the element of satisfaction.

In the English Lunacy Report this point has ever and anon been noticed, but it has more fully arrested the consideration of the Scotch Commissioners; the more so since the proportion of privately maintained lunatics is very visibly declining in Scotland, and it has become too apparent that the seductive benefit of making one's neighbours chargeable with one's own responsibilities in the payment and care of diseased relatives, is increasingly appreciated in that country.

We have already glanced at the influence exercised by the abuse and misuse of Asylums on the multiplication of insane persons charged on the rates of the county, but this can be only a subordinate cause of that circumstance, and others more influential must be sought. The Scotch Commissioners remark that insanity is essentially a disease affecting the less affluent classes, and "that a healthy condition of the nervous system affords protection at one and the same time against pauperism and insanity." These two propositions thus laid down are true generally, but not universally. The former is especially open to exceptions, and by its enunciation the Commissioners really beg the question which they propose to solve, viz., the cause of the preponderance of pauper-insanity. It would not, we believe, be impossible to show that the affluent classes have their share of mental disorders in proportion to their numbers, and that unhealthy conditions of the nervous system are as rife among them as among the poor. But letting these propositions pass without further question, we are ready to accede to the corollaries, viz., that an unhealthy condition of the nervous system leads directly to pauperism, in the absence of private fortune and friends, by destroying the capacity for labour and so favouring a downward course "step by step through the various grades of society, until they reach the final sedimentary deposit of pauper lunacy." The same authorities proceed further to survey the circumstances that hasten on this downward career, and denote them generally as being such as destroy health, but which are not fairly referable to modern civilization, excepting so far as that term is made to cover the departure from the necessary laws of health.

At this point the Scottish Commissioners stay to make the confession, that, whilst they still adhere to the foregoing physiological views regarding the causation of insanity, as propounded in previous reports, they hesitate

"Whether in their comparisons between the numbers of the private and pauper insane, they formerly made sufficient allowance for the small proportion which the independent or affluent classes

bear to those which must necessarily sink into dependence whenever they are struck by such a calamity as insanity."

The validity of the doubt expressed becomes apparent on inquiring into the social position of the Scotch people, when it comes out that only "11·95 per cent. of the population constitute the wealth and support of the country, while the 88·05 per cent. constitute the artisan, labouring and pauper classes." The conclusion deducible is, therefore, that the source of supply of pauper-lunacy is so large that the preponderance of pauper insane need not be looked upon as so curious and alarming as it commonly is.

We cannot now follow the Commissioners in their judicious remarks on the means to arrest the progress of lunacy among the poorer classes, or on the overcrowded state in which those classes usually exist in Scotland; but content ourselves with calling attention to the table exhibiting the fact of the overcrowding in houses, and with signifying our concurrence in the astonishment expressed that, amid the physical and moral evils implied in that fact, the mental and bodily disease which prevails is not greater. However, an incidental consequence of crowded abodes is here deserving notice; viz., an inevitable inducement to the removal of insane inmates to public institutions, and an impediment to their subsequent discharge.

The following reflections recommend themselves to consideration, and it will be a happy day for our country when the truly sanitary conditions alluded to are realised. That day, however, we fear, is yet far away in the future:—

"It cannot [write the Scotch Commissioners] be too frequently repeated, or too deeply impressed on the public mind, that the chief agent in the reduction of insanity must be sought for in the co-operation of the people themselves."

The necessity for lunatic asylums and lunacy commissioners

"Has in a great measure arisen from the evils which flow from the defective education and training of the people. Every man, when properly qualified, must be regarded as his own best guardian; and, until every man is fitted by appropriate education and training to discharge this duty towards himself, we may lay our account with an increase and an intensification of those manifold evils which degrade our intellectual, moral, and physical nature, and which, among other lamentable results, bring insanity in their train. The compulsory instruction of the people . . . . cannot fail to prepare the way for a reform in the mode and scope of education; but we fear it is not yet seen that mere scholastic teaching, which does not include *moral training and a knowledge of the laws which regulate the bodily and mental health* is, in reality, no safeguard against either crime or insanity" (pp. xxvi—xxvii).

The discrepancies in the proportion of pauper-lunacy in different counties are very remarkable, and, from the differences that obtain between the temporary and permanent forms of insanity, in various areas, it becomes manifest that comparisons of the prevalence of insanity in different districts, which rest only on returns relating to the number of lunatics on certain fixed days, are valueless. In illustration of this dictum the Scottish Commissioners quote the statistics of Renfrewshire and Perthshire, from which it appears that, although far more pauper lunatics are annually 'intimated' in the former than in the latter county, yet that in Renfrewshire, with a population of 216,947, there are only 237 pauper lunatics; whilst in the county of Perth, with 127,768 people, there are as many as 394. They add:—

"Various causes probably contribute to produce the higher proportion of persistent pauper lunacy in Perthshire. Such are the smaller ability of the poorer classes in relief, the more acute and less enduring form of lunacy in Renfrewshire, and the more limited amount of the fatal forms of insanity among a population chiefly rural, like that of Perthshire, than among one chiefly urban, like that of Renfrewshire. It is, however, a remarkable fact, of which we have some difficulty in offering an explanation, that in 1871 an increase of no less than twenty took place in the number of pauper lunatics in the Perthshire district asylum."

Various considerations are rightly adduced by the commissioners as of necessity to be borne in mind in any attempts to account for the unequal distribution of the insane, not explicable on reference to the variations in population. Such are—the rule that the proportion of patients exempted from removal to asylums is much greater in poor and thinly-populated districts; the circumstance of greater difficulty of finding suitable accommodation for patients in private dwellings in towns than in the country, whence again it follows that a higher proportion will always come under cognizance in urban than in rural localities; the differences to be found in the mental and bodily constitution or social position of the inhabitants, and to which the more numerous intimations in towns of pauper lunatics are partly due. As of lesser, but still appreciable influence, they add that where the intimations are more numerous there is likewise, in general, more active movement among the patients, in the way of changes among them by admissions, discharges, and deaths; and, further, that the varying opinions of medical men concerning the indications of insanity and the conditions requisite for its care and management, make themselves manifest in the proportion of cases remitted to asylums.

In connection with these different considerations the general

truth is insisted upon that pauper lunacy has a double origin in pauperism and lunacy, and that this fact

"Adds greatly to the difficulty of determining the conditions which lead to the intimation of pauper lunatics, and render comparisons of their number in different counties, without a full knowledge of all the concurrent circumstances, of but little practical value; in one county pauperism may be the predominant element, and in another lunacy. It has further to be kept in view that insanity is not a simple disease like pneumonia or hepatitis, but that it is the indication of a disturbed or abnormal action of the brain, which may have its origin in a hundred different conditions. Accordingly, the insanity of a large town represents a very different state of matters from the insanity of a rural district. The former comprises a larger proportion of those fatal forms which are the result of the manifold influences comprehended under the general term of fast living, and of which general paralysis is the type; and the latter a larger proportion of those forms which depend on imperfect development and imperfect training, but which are not incompatible with long life. Of these idiocy is the type. Comparative statistics, in which these differences are overlooked, cannot fail to be utterly misleading" (p. xvii).

Deputy Commissioner Dr. Sibbald has ably analysed the causes which regulate the extent of pauper lunacy and its mode of distribution in different districts, and his method of inquiry and his conclusions are fully set forth in an appendix. He classifies the counties according to their degrees of wealth represented by the returns of property- and income-tax, and after throwing them into several groups, and taking into account the returns of lunacy, he finds a broad correspondence between the amount of pauper lunacy and that of ordinary pauperism, but no constant proportion in these particulars in regard to the general wealth. "In the Highland and insular group both kinds of pauperism are less than in the southern counties, where the general wealth is more than double;" nevertheless the smaller proportion of pauper lunacy in the insular and Highland districts is no proof of the less prevalence of insanity in their population, but is chiefly referable to the poverty of the localities and the consequent inability of the ratepayers to bear any greatly increased pressure on their resources. Another fact, due to the same cause, is that the proportion sent to asylums is less in these poorer districts, and that of lunatics boarded out greater. This circumstance likewise is partly attributable to the difficulty, or even the impossibility, by reason of the distance, of sending them from their homes to any of the asylums at present in existence.

The following general conclusions are arrived at:—that an exact correspondence obtains between the comparative wealth of a county and the amount of its expenditure on lunacy, and

that the localities where least is paid for the maintenance of each lunatic pauper are those where the cost of pauper lunacy presses heaviest on the ratepayers.

Such are the principal lessons derivable from Dr. Sibbald's painstaking injury. Their importance will be patent to every reader who has reflected on the inequalities presented in different counties in the prevalence of lunacy and the ratio of asylum inmates. They certainly do not solve all the questions that arise, but are contributory thereto in no small degree; and we should be gratified to find the ratio of lunacy in the English counties examined by the aid of the light afforded by Dr. Sibbald's conclusions.

Another matter is very ably handled in the Report of the Commissioners for Scotland, viz., the mortality of the insane in Asylums, and a fresh illustration furnished of the fallacy of drawing conclusions from figures only, without a knowledge of concomitant circumstances. Another lesson conveyed is, the folly of representing Asylum accommodation, management, and treatment to be necessarily satisfactory, because the mortality, as calculated in the ordinary manner, is low.

The movements—and among them the mortality—of Asylums are under manifold influences attaching to the condition of patients before admission, and to such as react on their bodily and mental health after admission.

"For instance, on an average of many years, the mortality in the Dundee Asylum, when calculated upon the average number resident, is only about one half of that which occurs in the Glasgow Asylum. But it does not on this account follow that the patients in the Dundee Asylum are placed in more favourable circumstances than those in the Glasgow Asylum. Before this conclusion could be adopted, it would be necessary to determine, not only that the condition of the patients on admission was identical, but also that the numbers admitted stood in an equal relation to the numbers resident."

Now, while the accession of a larger proportion of unhealthy members must exert some influence on the deaths, yet by far the major part of the augmented mortality found in the one asylum compared with the other, is referable to the greater number of admissions relatively to the numbers resident. The statistics of the two institutions named, examined in conformity with these views, are confirmatory of them; so that when the mortality is calculated upon the admissions, it comes out actually less in Glasgow than in Dundee.

Indeed, to rightly read asylum statistics, we must ever keep before us the important general fact "that an asylum fulfils the double purpose of an hospital and a boarding-house, and that the

statistical results of each will be different according as the one or the other function predominates." Reference to the returns of recent and of old standing cases in the various Scotch Asylums shows, that among those institutions no great difference prevails in the proportions of their hospital and boarding-house sections. In England it is much otherwise.

The average rate of mortality, calculated on the numbers resident, is greater in England than in Scotland; and, what is more, that rate when calculated on the admissions, is also greater in the former than in the latter country; whilst, at the same time, the ratio of admissions to the numbers resident is less.

"In whatever way, write the Scotch Commissioners, the mortality is calculated, it is higher in English than in Scotch Asylums; and this must arise, either from a higher ratio of mortality among the boarding-house section of the inmates of the English Asylums, or from a worse physical condition of the patients on admission. We have not the means of forming any precise estimate of the proportion which the hospital department bears to the boarding-house department in the English Asylums, but we are inclined to think it must be considerably higher than in the Scotch Asylums, or it may be that in Scotland the mortality is, to a not inconsiderable extent, kept down by the removal of patients already in a dying condition. These various considerations will sufficiently show how extremely difficult, if not altogether impossible, it must be to draw sound conclusions from statistical details which leave out of sight those ever-changing elements on which the results so much depend."

The justice and truth of these observations need no illustration; but in reference to them we may add two or three considerations that occur to us. There is no doubt, we fully believe, that the boarding-house department of English Asylums exceeds that of the Scottish. Moreover, in contrasting the mortality in the institutions of the two countries, it must be borne in mind, that, taken as a whole, the Asylums of England are of longer standing than those of Scotland, and that consequently in the former accumulation has had more time to operate, both as a cause of a general increase of inmates, and, what is more, as a cause of aggregation of a larger proportion of aged inmates, among whom death claims more frequent victims. Again, we have the impression that in England, the ratio of the more fatal forms of insanity, general paresis and epilepsy, particularly the former, is higher than in Scotland; but this impression needs the accurate examination of statistical returns to confirm it, and, unfortunately, such returns are not forthcoming. If, however, our surmise be right, we have another factor towards the solution of the problem in question.

The perversion of English county and borough Asylums from their primary purpose as hospitals for treatment to boarding-houses for lodging incurables,—of which fact ignorance cannot be pleaded, particularly in face of the dismal record published by the English Commissioners, and before quoted, that only 8·12 per cent. of their inmates are "deemed to be curable,—" demands the serious consideration not only of medical men but also of statesmen. What has led to this disastrous state of things is a question to be first solved before that remedial measures can be devised. In the English Report we meet with the following remarks which point at least to one cause:—

"We have, indeed, writes the commissioners, long been satisfied that much of the present pauper lunacy of the country is the result of delay in procuring early curative treatment in asylums, and we feel assured that, if boards of guardians generally could be impressed with this view, and instead of struggling to keep down immediate expenditure by retaining recent cases in their union workhouses, would encourage the medical men and relieving officers in their efforts to procure immediate asylum treatment for all such cases, a few years would show a gratifying decrease in the number of pauper lunatics, and a consequent diminution of charge on the poor-rate."

The inference drawn relative to the consequence of the blind policy animadverted on is undeniable, but the excellent homily addressed to boards of guardians will, like many that have preceded it, fail in its object. The sound advice has been repeated variously for many years, and was particularly impressed upon unwilling ears in the special report made respecting the insane in workhouses some years ago. Its failure is sufficiently demonstrated in the report before us. The quotation of Acts of Parliament even is not terrifying to the obtuse and obstinate boards, and in several instances nothing short of the exercise of the statutory powers vested in the commissioners has served to arrest their ill-doings.

What is wanted to prevent the evil spoken of is, the reversal of the policy and practice pursued in England. Why, it may well be asked, should workhouses be legalized by Acts of Parliament as receptacles in the first instance for the insane, and thus, in that point of view, become the feeders of Asylums, instead of the latter institutions being always made the places for primary admission, and the workhouses the receptacles for many of those chronic cases which unhappily will remain as a residuum after the best treatment has been afforded? And, to put the question in another fashion;—why should one policy be pursued in England and another in Scotland?

In the latter country not only do the commissioners exercise

to the utmost their authority and influence to secure asylum accommodation for every recent case of insanity, but, by the powers vested in them, they limit and regulate the transfer of patients to workhouses; so that none can be received into these establishments without their permission. Moreover, before giving their sanction for the removal they satisfy themselves, upon medical evidence,—furnished in almost all instances by the physician of the asylum whence the patient is to be removed, of the fitness of the case for the sort of accommodation supplied by the workhouse. The excellence of this arrangement should surely commend it for imitation in England. It not only prevents at the very threshold the introduction of curable and otherwise improper cases into workhouses, but it also weeds out from asylums those hopeless cases that otherwise encumber their wards, and lodges them more suitably and at less cost to the rate-payer, and, at the same time, keeps within the knowledge and under the supervision of the commissioners all those unhappy incurables who are, in England, but partially under their cognizance and oversight.

It must also be stated that similar authority is exercised by the Scottish commissioners with regard to single patients boarded out. These patients are under "methodical inspection," chiefly by the deputy-commissioners. As a matter of course, when the Scotch commission was first appointed they found ready to hand a very considerable number on the "roll of single patients," amounting (in 1859) to 1847. This number had decreased in 1870 to 1463, the commissioners having used their powers during the intervening years to remove many such patients to asylums as unfit subjects for cottage residence. Other causes of less weight concurred in producing the decrease, and now again, for the two last years, an increase has become apparent. Thus, we are informed, "of the pauper lunatics in private dwellings, the greater number have never been under asylum treatment; but the proportion of those who have been in asylums is steadily increasing," and has now risen to 57 per cent. In other words, there is a growing feeling against the detention of a large class of chronic patients in asylums, and a conviction that many such can be provided for in cottage-homes with greater comfort and advantage to themselves. The reports of the commissioners relative to the condition of the patients so placed are highly satisfactory; their mortality is lower than in asylums or workhouses; and, what is more remarkable, there is a very appreciable ratio of recoveries among them equal, according to Dr. Sibbald, to rather more than one third of that which occurs in asylums.

In this matter, again, of single patients, something surely

may be learned from the experience of the Scottish Board; and if, in the opinion of the English commissioners, it is "the existing state of the law" in England that lends no encouragement to the boarding-out of cases in private houses, and the present machinery for the inspection of such cases is found insufficient and unsatisfactory, then it assuredly becomes necessary that the law shall be amended and a proper system of supervision inaugurated. The present condition and necessities of English asylums make it imperative that some very decided measures be adopted to render them more efficient as curative institutions, and to rid them of the incubus of their much preponderating incurable population.

J. T. Arlidge.

VIII. Observations on Myology.[1]

The present century has been preeminently fruitful in scientific discovery, and yet, the more extended our researches, the wider the vast and illimitable plains of knowledge seem to expand, until the observer is tempted to say with Faust that "we can nothing, nothing know." Probably, however, there is not a single department of science which has received less attention than that of myology—not mere descriptive myology, but philosophic myology based upon the grand principles of the metamorphoses of muscles in the vertebrate series of animals. Limited resources and biassed imaginations have contributed their ban to progressive knowledge of this locomotive tissue equally with that of other great departments of science.

It is only within the last hundred years that the ordinary deviations of muscles in the human subject from the average type have been deemed worthy of record. And it is to a still more recent date that we must refer these constantly recurring irregularities to something more than mere "lusus naturæ." It is to the extensive researches of still living observers that credit is due for rescuing this essentially important branch of scientific anatomy from the miserable and diminutive status it had so long occupied; and to the observers themselves more especially for elevating it to the rank and position which it now occupies. Philosophic myology is something more than the

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[1] *Observations in Myology, including the Myology of Cryptobranch, Lepidosiren, Dog-fish, Ceratodus and Pseudopus Pallasii, with the Nerves of Cryptobranch and Lepidosiren, and the Disposition of Muscles in Veterbrate Animals.* By G. M. Humphrey, M.D., F.R.S., &c.

attachments of muscles, and it embraces a far wider field than locomotion, inasmuch as it abundantly illustrates evidences of the great and unknown law of evolution, and more so than any other tissue in the living body. Before that earnest-minded master of science, Darwin, had published his views on Natural Selection, Wood, the talented Professor of Surgery at King's College, London, had recorded in the proceedings of the Royal Society numerous transitional varieties of muscles. Further investigations led this observer into the right path, namely to seek for an explanation of these constant deviations from an average type of distribution in animals lower in the scale than man. His researches stimulated other observers, and soon afterwards Turner and MacAlister identified themselves with this comparatively unexplored field of research, with a corresponding success in the interpretation of many previously unexplained—and in some respects ignored—myal phenomena.

The researches—extensive enough in all conscience in certain and limited directions—recorded in the book under review, carries out the elucidation of muscle tissue from its simplest vertebrate status to that met with in the higher forms of animals. How far the author has succeeded in his attempt is a question not readily solved; and, further, how far his somewhat novel method of description of the muscles met with in the animals which he has so patiently and exhaustively dissected will contribute to the progress of this branch of science, is not by any means so clear as the mass of facts tabulated would at the first impression lead us to suppose. The author, however, is truly impressed with the fact that "much remains to be done to furnish a clear and sufficient exposition of the morphology of the muscular system;" and that "many of the views" which he has promulgated may require modification. Furthermore, Dr. Humphrey is honest enough to admit that some of the ideas given in the book under review are modifications of views previously expressed. He makes one important admission, especially important in contradistinction to remarks made in other places on the same subject, that "these observations, &c. furnish numerous illustrations of the unity which underlies the great variety of animal forms." The next sentence of the preface—"I have, however, refrained from entering upon the theories associated with that great principle"—is only intelligible upon the hypothesis that he had already discussed the question. In an address on physiology, delivered at the meeting of the British Association at Nottingham, 1866, Dr. Humphrey said, "there is a simple uniform law, underlying and working out the vastly diverse forms and structures of vegetable and animal life." This uniform law, he suggests, "*may* be one of combining

proportion presiding over masses of living matter similar to that dominant among the atoms of the inorganic world."[1]

Again: "As each chemical compound remains in its given condition, without change, till circumstances have culminated to favour and induce a change which then takes place, not by slow gradation, but by *sudden start* to some other definite compound, so the several animal forms may remain fixed till the conditions for a change, which conditions may be external to themselves, are complete." Now, without questioning these extraordinary views, we should like to know how this theory is reconcilable with the preface of the book before us; and with the mass of matter which it contains, the whole burden of which is intended to demonstrate the evolution of muscle tissue from simple continuous orbicular belts in the lowest vertebrates to a terminal system of cleavage—as far as we know—illustrated in the highest forms by an olla podrida series of muscles longitudinally and transversely cleft almost beyond primitive recognition. The assertion that a progressive interposition and absorption of fibro-sclerotomes accounts for myal multiplication is as far wide from the actual and absolute truth as the assertion that animal forms are determined by sudden starts from one to another condition. There is another law—as important, if not more so, than the one which removes fibro-sclerotomes in favour of muscle—it is the law which degrades muscle to fibrous tissue—the law which leaves behind it its marks of retrogradation, as the receding tide leaves sticks and stones on the sea-shore. There is more to be learned from certain fibrous elements in animal bodies than in the more characteristic tissue muscle. But it is almost impossible to appreciate the value of these pauperized elements when biassed by the untenable view that "muscle is found just where it is wanted." Muscle is oftentimes found where it is not wanted, where it is of not the slightest use: and it is oftentimes absent where its presence would be of considerable advantage. It is unnecessary to quote here examples in support of these assertions. It will be evident as we proceed that there are many useless elements—useless practically—in the animal economy.

Sixty-one out of the one hundred and ninety-two pages are occupied by the description of the muscles and nerves of the great Japanese salamander, which, fortunately for the interests of science, died from the effects of a cut throat, in the Zoological Society's Gardens, Regent's Park, London. The chief interest in the muscular system of the cryptobranch, according to the author, consists in the massing together of the several muscles, &c., "so that it allows us, to some extent, a natural means of

[1] Sir John Herschel says the atom is an absolute necessity of the human mind 'Fortnightly Review,' No. i, 1865.

ascertaining the relationships of the muscles of the higher animals to one another, and so of grouping them." Now, it seems a somewhat hazardous assertion to make, that the muscles of higher animals can be grouped by the standard elicited from a salamander. Yet it must be granted there is some truth in the statement. Although it is as impossible to group the muscles in higher animals from so low a standard, thoroughly and accurately, as it is to understand many muscles met with in man, without appealing to comparative myology for elucidation of their status and character. There are numerous muscles in the higher animals which cannot be classified—muscles which neither find analogies nor homologies in animals lower in the scale. At the head of all these stands the human being, possessing as characteristic a series of inimitable muscles, as he undoubtedly evinces a superiority in brain power which far outrivals the most precocious exhibitions of reason recorded of animals lower in the scheme of nature.

After a careful perusal of the myology of the cryptobranch it is evident enough that the author has been at considerable pains to tabulate the vast amount of information comprising the, almost, memoir.

As an addition to the immense value of the descriptive part, Dr. Humphrey has appended numerous explanatory remarks in small type; and, with a praiseworthy effort to avoid confusion, he has given all reference to the labours of others in still smaller type. It is a great pity that he did not extend his foresight a little more, and embody the initial letters to the figures in the text, rather than following the tedious method of separate references.

There is another fault in the descriptive myology of the cryptobranch—a fault which may be in some respects accidental; but, nevertheless, it diminishes materially from the value of the observations, *i. e.* the similarity of language adopted in the description of certain parts of the cryptobranch, and that used by Owen in corresponding parts of his context on the myology of fishes and reptiles: *e. g.* Humphrey says:—"They (the great lateral muscles) are separated from one another, that is, the lateral muscle of the one side is separated from that on the other by membranous septa passing vertically in the mesial line above and below from the vertebræ, and ossifications extending into these septa above and below constitute the 'neural' and 'hæmal' spines."

Owen says ('Comparative Anatomy,' p. 204):—"The myocommas of one side are separated from those of the opposite side of the body by the vertebræ, by the interneural and interhæmal aponeurosis," &c.

Again :—" The muscles of the trunk may be clearly regarded as, in part at least, formed by an extension of the caudal muscles forwards." Owen (p. 203) says :—" A superficial view of these segments has led to their being regarded as forming a series of longitudinal muscles, extending lengthwise from head to tail."

Again, Humphrey (p. 9):—" Like these (the muscles of the tail), they (the muscles of the trunk) are divided by a lateral septum into a 'dorsal' and 'ventral' series." Owen (p. 203) :—" The upper portions of the myocommas being grouped together and described as a dorsal longitudinal muscle, the lower portions as a ventral longitudinal muscle," &c.

To turn to a pleasanter and more congenial theme. The cryptobranch appears overburdened with coracoid muscles. Dr. Humphrey has described no less than seven muscles with a coracoid prefix, namely, " epicoraco humeral," " precoraco-brachialis," " coraco-brachialis longus," " coraco-brachalis brevis," " coraco-brachialis quartus," " coraco-olecranalis," and " coraco-radialis."

Now, however desirable it may be to substitute more appropriate for the old-fashioned names of certain muscles, it is unadvisable at the present time to do so. The nomenclature of myology is much similar to Gould's species of humming-birds. A bad name well known is worth any amount of good names utterly unknown. But if every author is to be allowed the privilege of naming muscles according to his own fancies, the sooner we understand this status of affairs the better. The duty of an observer is to write intelligibly, not to add to the terrible confusion which is so predominant already. We are constantly preaching the doctrine of unity; why, then, in the name of common sense, not cultivate a uniform standard of nomenclature? No observer acquires credit by substituting a fanciful name for a long-recognised one. The author in question plays with names of muscles much in the same way as schoolboys do with a ball in the game of hockey. Can anything be more perplexing to an enthusiastic but inexperienced student of myology than the following:—A muscle is described as " epicoraco-humeral" in one paragraph; in another it is mentioned as " epicoraco-brachial." Again, the author says :—" It is not improbably the representative of the pectoralis minor;" but the next muscle, he tells us—the " precoraco-brachialis" —is called subclavius by Mivart in his description of menopoma and menobranch, though he (Mivart) regards it as that named by him " epicoraco-humeral" in the echidna.

Again, the " coraco-brachialis brevis" is described as passing beneath the " coraco-brachialis superficialis," without the slightest reference to the muscle we are asked to consider to be

the "coraco-brachialis superficialis." To add still further to our confusion, Humphry says:—"It corresponds with the "ordinary coraco-brachialis"! Which is the ordinary coraco-brachialis? Is it the short, middle, or long variety? One and all of these three forms are frequently found coexisting in the same animal. In the dog, cat, badger, hare, &c., the short variety is the only representative of the coraco-brachialis. In the bonnet monkey there are the short and median forms. In many other animals the median and the long varieties may be, respectively, the normal representations of the coraco-brachialis.

The "coraco-brachialis longus," a muscle described as arising from the coracoid, afterwards dividing into two portions, one of which "is partly inserted into the side of the long tendon of the biceps, while a bundle of its fibres is continued on over the elbow, and is inserted into the ulna near the joint," the author says *must* represent the short or coracoid origin of the biceps in man. This is every whit as confusing as the ordinary "coraco-brachialis."

The biceps in man presents many important variations, not the least of which is a veritable short head springing from the humerus, and occasionally a secondary short head of origin, which is attached to the coracoid process more internal than the average one, and on a deeper plane. The part of the muscle in question corresponds more to one of the many variations of the brachio-radialis. Dr. Humphry names the *subscapularis* as a "coraco-brachialis quartus." This reminds us of Macalister's attempt to rechristen the *achselbogen* as the pectoralis quartus. In both instances the old names are far better and more suggestive than such exceedingly weak nominals.

The author has described a common reptilian triceps head of origin as the "coraco-olecranalis." It is not in any way entitled to be considered as a distinct and independent muscle, and therefore not deserving of a special name. This coracoid adjunct of the triceps is neither peculiar to the reptilia nor to the urodelans. A modified variety of this accessory triceps, or rather quadriceps, is found in a much higher type of animal, namely, the *Balænoptera rostrata*. In the latter animal the posterior of the two tendons of insertion of the coraco-brachialis passes behind the tendons of insertion of the latissimus dorsi and teres major muscles, partially joining the external head of the triceps. We might just as well consider one of the heads of the cubit extensors of the alligator as a distinct muscle, or rather as two independent muscles, under the names "coraco-ulnaris" and "scapulo-ulnaris," if the analogy as well as the homology did not irresistibly point to a much more important deduction,

namely, that the two heads of origin in question are respectively the analogues of the straight and reflected tendons of the rectus femoris.

There is infinitely more reason in naming the triceps in the crytobranch "coraco-radialis;" but of what avail is it? We cannot tolerate a nomenclature based upon the myology of a brute like the Japanese salamander. On the other hand, there is some inconsistency in naming a muscle "dorsalis-scapulæ," which, the author admits, *must* represent, in the main, the infra-spinatus. And it is, indeed, difficult to understand, on Dr. Humphry's showing, how a muscle evidently belonging to a deep stratum can contribute to the formation of the scapular part of the deltoid; while, on the other hand, it is easy to comprehend that it is the parent, virtually, of the infra-spinatus series of muscles, viz. infra-spinatus, teres minor and major, as found in the higher animals. The two former muscles are, in the majority of the higher animals, essentially one muscle. Even in man they are oftentimes so blended as to constitute one indivisible muscle.

Irrespective of these points to which we have drawn attention, there are numerous valuable facts recorded, the importance of which cannot be well understood without a broad and extensive knowledge of comparative myology. The author has very briefly described the myology of the *Uromastix spinipes*. Brief, however, as the description is, there are several observations of the highest grade of interest to the morphologist, and none more so than the association of the sartorius with the quadratus lumborum. In a foot-note the author states that "in the *Orycteropus* the sartorius extends over the iliacus and the quadratus lumborum as far as the hindmost ribs." According to Galton it arises from the strongly developed ileo-pectineal tubercle; and in the dasypus-sexcinctus from the outer edge of the psoas parvus above an inch from its insertion. "In the rabbit it springs from the middle of Poupart's ligament" (Krause). We may add to these variable sartorian attachments another met with in the great ant bear (*Myrmecophaga jubata*). In this animal the apparent origin of the sartorius is from Poupart's ligament, to which it is undoubtedly closely attached. By careful dissection the tendon can be traced as far as the distal lumbar vertebra and the lumbo-sacral articulation.

The continuity of the gracilis with the rectus—another important point—can be more readily understood than the preceding peculiar variations in the attachments of the sartorius in different animals. Its sequential gradations are evident enough in the few animals already mentioned, viz. from the last rib to the lumbar vertebra, from the latter to the psoas muscle,

next to Poupart's ligament, and, finally, to the anterior superior iliac spine.

It is questionable whether this animal possesses a true representative of the brachialis anticus. Dr. Humphry says "it joins the biceps at the lower part of the arm." This disposition of the muscle in question simulates, if it is not so in reality, a humeral or quasi head of the so-called biceps. It is by no means uncommon in the higher animals to find the third head of the long flexor of the cubit arising in conjunction with the brachialis anticus.

"The flexor sublimis digitorum" is minus both humeral and radial attachments. The delicate muscle which the author describes as extending from the mastoid to the subcutaneous *colli* beneath the hyoid seems to be an aborted specimen of the occipito-hyoid muscle, which is found in some animals, and occasionally in man, rather than the representative of the posterior belly of the digastric. If this is not the case, it is an illustration of that which is not uncommon, namely, two isolated and independent factors tending to continuity by fusion through accidentally impinging upon each other.

The chief interest in the muscular system of the *Lepidosiren*, the author states, is, "that it is somewhat more simply disposed, and occupies an intermediate position between that animal and the fish." "There is no appearance of a transversalis stratum." This is what we should naturally infer. As we review the scale of animals, we find a certain simplicity at the beginning progressing towards complexity, and that not from new, but identical elements, becoming more extensively distributed and more definitely isolated.

The simple dorsal and ventro-lateral muscles of the fish undergo certain forms of cleavage; the dorsal muscle is subjected to a passive segmentation as compared with the ventro-lateral. In addition to its cleavage into distinct planes, the outer and inner of these myal planes gradually extend towards the axial line, investing the dorsal factor, and form strata above and below it. The importance of this axial extension cannot be overestimated. It explains the nature of the peculiar fibro-muscular abdominal strata which is found in higher animals. These points, however, will be found fully and ably discussed by the author in his remarks on the dorsal muscle of the *Lepidosiren* and elsewhere. The descriptions of the myology of the "smooth dog-fish," "ceratodus," and "glass-snake," are valuable contributions to science. The concluding section of the book is "On the Disposition of Muscles in Vertebrate Animals." In this section the author has given us such an amount of information, described to us so many varieties of analogous muscles in

a number of different animals, and so ably and exhaustively reviewed their homologies, that we are almost lost in the avalanche of material which is presented to us. In discussing the dorsal trunk muscles Dr. Humphry says:

"In the fish the dorsal mass from which they are derived indicates a division into an upper or 'mesio-dorsal,' and a lower or 'latero-dorsal' part. This division corresponds, on the whole, with that into the spinalis and longissimus dorsi, and the sacro-lumbalis parts in higher animals."

This passage is a modification of one which occurs in 'Owen's Anatomy of Vertebrates,' vol. i, p. 215; *i. e.*—

"In the salamander the neural or upper halves of the myocommas, &c., have a tendency to group themselves into distinct longitudinal tracts as they advance forward, just as their homologue, the common erector spinæ in man, subdivides into longitudinal masses called 'sacro-lumbalis,' 'longissimus dorsi,' and 'spinalis dorsi,' &c. The median portion in salamander representing the spinalis dorsi, &c.; the lateral portion answering to the longissimus dorsi and sacro-lumbalis, &c."

The author in remarks on the sheath of the rectus abdominis states:

"Though we are in the habit of thus referring the walls of the sheath of the rectus to the expansions of the lateral parts of the ventral muscles, we may, with equal right, assume them to be deep and superficial strata of the median part of the ventral muscle, that is, derivative of the rectus itself, &c.

This reasoning is decidedly formidable. Of course the rectus is a derivative of the ventral muscle, which, in its lowest form, is a merely transversely segmented contractile mass. A ventral median portion is fissured off from the parent mass, forming a distinct rectus muscle. The next process is one of transverse cleavage into a cutaneous, median, and peritoneal series of strata. One of these layers may undergo a secondary cleavage. During the preceding the ventro-lateral masses are following corresponding ones, as we have previously mentioned, and, expanding anteriorly, meet with the ventral median strata, and an amalgamation ensues.

The history of muscle tissue from its piscine status of 'vegetative repetition' to man is not altogether one of a simple process capable of being easily and exhaustively followed. We trace muscle through various evolutionary stages, to a certain extent, but difficulties beset us at almost every point. But it is in the muscular system of man that we meet with phenomena of the most complex and intricate nature. Outside of the immense mass of evidence which illustrates the great law of unity of disposition of muscle tissue existing between man

and the higher and lower vertebrates, there are many examples met with in the muscles of man which from their extraordinary excentricity, evidence a modifying power constantly at work in each and every individual, which cannot be demonstrated. No theory yet promulgated is capable of explaining muscular variations. The process is undoubtedly a gradual one, but it is as unceasingly as the motion of a planet, and to all intents and purposes as persistent. It is not by wild and fanciful transitions that nature evolutes; it is not by sudden starts that she remodels her locomotive tissue; and it is not without a definite—even if not evident—purpose that she carries out her programme in a most unflinching manner. If we could interpret the phenomena so familiar to us, we should say that the invasion of the Teuton-like tissue "nerve" civilises the barbarian tissue muscle and impels it into more extended usefulness at half the cost of productive power. No anatomist can doubt a certain degree of unity between man and the higher animals in general configuration, and no man can gainsay that all living and mutable beings have not had a common origin. But this we can say, that man stands alone upon his lofty pinnacle of intellectual loquacity, separated by more than a silvery streak of ocean from his nearest kin amongst animals in the lower scale. It must not, however, be imagined that all human beings are alike. Few indeed of the many can be said to be identical in a structural sense. There are some whose muscles are of a very low type, while on the other hand there are frequent illustrations met with showing a status of muscle development as superior to the former as a dog is in natural status to a crocodile.

The observations on myology by Humphry unmistakably fail to appreciate the higher varieties of muscular evolutions. If the author had availed himself of the labours of observers on irregular myology as extensively as he ought to have done, we should have been spared the useless infliction of another new edition on serial homology. What possible good can accrue, except a sort of mental exercise, from constantly tracing out the homologies of the appendicular parts? At the best there is only a general similarity between the muscles of the superior and inferior, and at the worst there is more similarity between certain muscles in one part and their non-admitted serial homologues iu another, than there is between those admitted. It is as impossible to reduce natural living structures to a plain rule-of-three sort of condition as it is to induce nature to clothe the earth with identical strata. It is impossible to deny that there is not some grounds for considering the muscles of one part to be serially homologous with those of another, but

the question is *cui bono?* The simplest status of the radial carpal extensors cannot, without a long stretch of imagination, be likened to any muscles in the leg. Then what shall we say of the many varieties of radial extensor differentiation so frequently met with in man? Are they to be regarded as of no morphological importance while their homologies are manipulated beyond recognition. The working out of serial homologies is straining at a gnat and swallowing a camel with a vengeance. If authors would only bestow one quarter the labour, and exercise one fiftieth part of the ingenuity which they now expend on homology, in tracing the history of any given muscle from its simplest status to its most complex one, or *vice versâ*, or in short, the various phases of muscles in different animals, then we should soon be in possession of an immense amount of truly valuable information, and far more capable of discussing the great questions of unity and evolution than ever can accrue from a forced comparison of family likeness between aged members of a common root stock. The comparative anatomist makes a grand mistake when he fancies he can dovetail muscles as the joiner or carpenter does well-seasoned timber. The upper and lower moieties of the animal body cannot be homologically analysed. Nature scorns the idea of being bound to repeat similar structures at both ends of the trunk, each end having to perform as widely diversified functions as can be imagined. But, because there are broad principles of homology evident, some anatomists believe that nature works out her structures after one and that an undeviating law. The rule may in a great measure hold good in certain reptilians, but step beyond them and the rule is at every stage nullified.

It is generally admitted that the radius is the serial homologue of the tibia, and the ulna of the fibula. What can be said of the distribution of the posterior interosseous branch of the musculo-spiral nerve? It perforates the supinator basis and crosses to the outer side of the radius. So the perineal both perforates the peroneus longus muscle, and winds round the neck of the fibula. Are these homologous nerves or not? If they are, how does it happen that there should be such a discrepancy in the osseous homological elements?

It is notorious to every experienced anatomist that there is a certain degree of conformity between the upper and lower extremities; but the constant vagaries of the muscles, arteries, and nerves, in one part, vitiate absolutely all homology as an absolute rule in the other. The higher the animal in the scale of nature and the wider the differences between the upper and lower halves of the body.

In the upper extremity of man there are certain muscles

which preserve an almost identical analogy with corresponding ones in the lower by position and ligamentous associations. The biceps brachii is an example in illustration. Its ligamentous associations are in many respects identical with those of the long flexors of the leg. The coraco-acromial ligament is, to all intents and purposes, the serial homologue of the great sciatic ligament; but if it is surmised that all the tarsal and ligamentous elements can be as readily determined in the two appendicular parts it is, to say the least, absurd.

Where homologies can be most thoroughly traced, and with the least strain, they are simply ignored. Why? Because observers will not avail themselves of the work already ably done by others, or they cannot see the importance of average muscle attachments with their irregularities, which have already been published. Even in the manus of man the numerous variations met with in the arrangements of the extensor ossis metacarpi pollicis, the extensors carpi, radialis, longior, and brevior, the extensor carpi ulnaris and the profundus extensors of the digits, have never been so exhaustively contrasted with deviations beyond the average in the muscles of the leg and foot as they ought to have been. There is an explanation of this lack of true observation. All text-books on anatomy are in a great measure compilations. Each author prefers to perpetuate errors rather than verify assertions by actual and personal observation. If this was not the case such egregious blunders as the following could not be so persistently perpetrated:—The extensor ossis metacarpi pollicis is inserted into the pollex metacarpal base; the extensor carpi radialis brevior is distally attached to the radial side of the third metatarsal; the flexor longus pollicis manus has *occasionally* a coronoid origin; the extensor carpi ulnaris is attached (invariably, we suppose, from text-books) only to the base of the fifth metacarpal; the tibialis anticus is (as persistently) attached to the cuneiform bone and base of the hallux metatarsal; the extensor longus hallucis has a simple attachment at the base of the distal hallux phalanx; and the peroneus brevis an equally single insertion into the proximal extremity of the fifth metatarsal. Whereas, in fact, these are as oftentimes the exceptional rather than the average attachments. The extensor ossis metacarpi pollicis in man has rarely a single tendon of insertion; it is more frequently double—oftentimes treble—rather than single. The extensor carpi radialis brevior has, in nearly half the number of cases, an attachment to both the index and middle finger metacarpals.

The extensor carpi ulnaris very frequently indeed sends a tendinous slip of insertion to the base of the first phalanx, corresponding with the thin and almost constant tendon of the

peroneus quintus in the foot. The extensor longus hallucis pedis invariably, or almost so, sends a moderately well-developed tendon to the base of the first hallux phalanx. These important points in general anatomy are ignored; although, if homology is worth anything, they are of the utmost value to determine it, while other elements are strained beyond recognition to carry out the homological theories of visionary anatomists.

If the human subject did not afford an immense variety of tendinous structures—evidently the transitional abortions of muscles exemplified in animals lower in the scale—we could understand the energy of authors to ignore them; but as they exist, and as they have neither been traced nor explained, it seems wholly unintelligible that Dr. Humphry, as an anatomist, can have grasped these instructive elements in a sufficiently appreciative light. At many places in the book rash statements and assertions are made upon the bases of observations of a few specimens of animals, the author totally ignoring that he is not writing an exhaustive compendium of general myology. This method of rationalising is at once abrupt and misleading. As an example we may instance the following:

"In the three highest orders of vertebrates, &c., the intermuscular septa are represented only or chiefly by the inscriptions in the rectus abdominis, biventer cervicis, digastric, and omohyoid, by occasional inscriptions in the sterno-hyoid and sterno-thyroid, by the clavicle or the inscription which, in carnivora and some others, is substituted for it between the trapezius and the deltoid, and by Poupart's ligament."

Now, these are neither only nor chiefly met with in the higher animals, as every anatomist knows. There are many others of equal, if not greater, morphological importance. These additional inscriptions are of frequent and regular occurrence. As examples we may instance the following:—The flexor sublimis digitorum, an inscription between the extensor ossis metacarpi pollicis and the abductor pollicis; btween the flexor carpi ulnaris and the abductor minimi digiti; the coracobracialis and the quasi third head of the biceps; the sternalis brutorum and the sterno-cleido-mastoideus;[1] as occasionally found between the biceps brachii and the flexor carpi radialis; the peroneus brevis and the so-called peroneus quinti; the tibialis posticus and its terminal relative, the flexor brevis pollicis; the psoas parvus and the levator ani, and many others; *e. g.* the direct communication which frequently exists between the deltoid and outer fibres of the brachialis anticus,

[1] This only rarely occurs.

and eccentric varieties of origin of the abductor pollicis, with many others as equally illustrative and instructive examples.

Besides all these there are many tendons and ligaments which bear upon evolution.

As we have already said, the book contains much valuable information, some original, much old—described with charming innocency as if new—and some which is neither old nor new. There is throughout the whole book decided evidences of (1) a want of time to methodically arrange the various groups of muscles discussed, and (2) of suggestive ideas derived during the description which had not previously occurred to the author. With the immense mass of matter at his command, with the extensive knowledge as an anatomist which the author most undoubtedly possesses, and with somewhat exceptional facilities of obtaining animals, Dr. Humphry could have produced a much more useful book, arranged his materials much more intelligibly, and thus have rendered his treatise what it really deserves to be—a valuable addition to general myology, and one which would have been much more frequently consulted than it will be in its present state.

Bibliographical Record.

Mivart on Men and Apes [1]—Mr. Mivart has, in the present work, placed in the hands of the student, in a clearly accessible form, a knowledge of what has been really ascertained by anatomists as to the relation which man bears to the inferior forms of life. The treatment of the subject is singularly original. Other observers had selected this or that species of manlike ape to compare with the higher form, and had descanted on the affinities and resemblances borne by man to the gorilla, the chimpanzee, and the orang respectively. Mr. Mivart has taken a loftier flight. It is his task to attempt to point out the marvellous apparent series of connecting links and interdependencies, not only between man and these higher forms, but with the lowest members of the quadrumanous order. Such a task naturally required a far greater acquaintance with the lower forms of the *Lemuridæ* than most of the elder zoologists possessed. The elaborate monographs which Mr. Mivart has already published on this subject renders his opinion on this matter of peculiar interest. Let us attempt to follow the author through a portion of an argument which extends over so large a field.

On the first part of the work, which treats of the external form, habits, geographical distribution, and classification of apes, we shall say little. The author gives a careful conspectus of the various genera of Quadrumana, beginning with the chimpanzees, and descending to the aye-aye. He is inclined to adopt the old Linnæan word "primates" in a non-Linnæan sense to include man with the apes and half-apes, excluding the bats from consideration. If this retrograde step has not the advantage of novelty, it has that of convenience to the zoologist who studies the anatomy of the anthropomorphous apes. For our own part we prefer to retain man apart in a separate subclass, that of Archencephala, as originally proposed by Professor Owen. Into Mr. Mivart's classification of *Quadrumana*, which is singularly concise and lucid, we shall not now enter further than to remark that in this most controversial and exciting

[1] *Man and Apes; an Exposition of Structural Resemblances and Differences, bearing upon Questions of Affinity and Origin.* By St. George Mivart, F.R.S., V.P.Z.S., Lecturer on Zoology and Comparative Anatomy at St. Mary's Hospital. London, 1873.

subject it has clearly been the author's aim to avoid all polemical opinion.

The pith of the work, however, lies in the answer to the question, What are the various degrees of resemblance to man which the various kinds of apes exhibit? To solve this problem the external skeleton (skin and hair) and the internal skeleton (the bones) are considered in detail and with great elaboration. We can here only give a few of the links in the argument.

Mr. Mivart casts just ridicule on the theory of Mr. Darwin, that the naked skin of man has been produced by selection by the males through successive generations of females in which the naked skin on the lower part of the body should be greater than in their neighbours. The persistent choice of more and more hairless spouses ought, according to Mr. Darwin's theory, to have produced the hairless condition which man (except the *homme-chien* now exhibiting in Paris) uniformly presents. The fact that the highest apes show no naked spot on the skin was set on one side by Mr. Darwin.

Mr. Mivart points out that it is amongst those species of South American ape which least resemble man that a beard is developed in some way resembling that of the human species. His researches on the pedal differences between man and the lower forms are in accordance with those already published by him. The substitution of the words *manus* and *pes* for the complicated and artificial ideas expressed by those of hand and foot is a step in advance, and certainly has the advantage of intelligibility. In the skeleton he notices that it is in the lower baboons that a greater approach is made to the beautiful sigmoid curvature of the back-bone of man than in the higher or latisternal apes. The construction of the metapophyses and anapophyses of the lumbar vertebræ in the slender lemur (Loris) resembles, to a great extent, that of man. We think our author might have extended this argument, which can be carried as far as the greater ant-eater (*Myrmecophaga*), in which there is a great apparent similarity to the human structure of the thoracic vertebræ.

The whole law of mimetic resemblance, roughly indicated by the late Professor Agassiz, becomes, in the hands of Mr. Mivart, a potent mace, which he wields unsparingly against that section of transmutationists who have inferred the descent of man especially from the latisternal apes (gorilla, chimpanzee, orang), and from them alone. His argument, in fact, is that if man and the orang are diverging descendants of a creature with certain cerebral characters, then that remote creature must also have had the wrist of the chimpanzee, the voice of a long-armed ape, the blade-bone of the gorilla, the chin of the siamang, the skull-bones of an American ape, the ischium of a slender loris, the whiskers and beard of a saki, the liver and stomach of the gibbons, and a number of other characters, in which the various several forms of higher or lower primates

respectively approximate to man. It is this difficulty which renders the problematical ancestor of the human race a much more difficult beast to find out than Mr. Darwin's picturesque protoplast "with pointed ears."

On every conceivable hypothesis of the origin of man there are similar structures, each of which, in more than one instance, must be deemed to have been independently evolved. In the words of Mr. Mivart—

"If the number of wrist-bones be deemed a special mark of affinity between the gorilla, chimpanzee, and man, why are we not to consider it a special mark of affinity between the indris and man? That it should be so considered, however, would be deemed an absurdity by every evolutionist. If the proportions of the arms speak in favour of the chimpanzee, why do not the proportions of the legs serve to promote the rank of the gibbons? If the 'bridging convolutions' of the orang go to sustain its claim to supremacy, they also go far to sustain a similar claim on the part of the long-tailed, thumbless spider-monkeys. If the obliquely-ridged teeth of simia and troglodytes point to community of origin, how can we deny a similar community of origin, as thus estimated, to the howling monkeys and galagos? The liver of the gibbons proclaims them almost human, that of the gorilla declares him comparatively brutal. The ear-lobule of the gorilla makes him our cousin, but his tongue is eloquent in his own dispraise. The slender Loris, from amidst the half-apes, can put in many a claim to be our shadow refracted, as it were, through a lemurine prism. The lower American apes meet us with what seems 'the front of Jove himself,' compared with the gigantic but low-browed denizens of tropical Western Africa."

It becomes thus impossible to range the various genera of *Quadrumana* in one ascending series, of which man stands at the head. Mr. Mivart one by one extends this argument. He brings proofs that human characters which do not appear in the highest apes are one by one repeated in the lower forms. The nose of man reappears in the long-nosed guenon (*nasalis*). The chin of man is quite wanting in the gorilla, as also in the orang and chimpanzee. A more or less developed chin, however, exists in the siamang, although no other species of gibbon, and, indeed, no other ape or lemuroid, exhibits a similar condition. On this we may remark that one, at least, of the species of *Semnopithecus* shows a fairly developed chin, thus illustrating the mysterious bond of affinity which seems to bind together the long-armed and long-tailed apes, and to separate the former from the orangs.

It is Mr. Mivart's great argument that the psychical manifestations of the lowest men and of the highest apes express differences of kind and not of degree. Some of the most brazen Lucretians outside the pale of science have sought to invalidate this difference. Thus the truism has been insisted on that intellectual power does not

depend on the development of the brain alone, but also on that of the organs of the senses and motory apparatus. In these points, however, there is not much difference between man and apes. It was also objected that cerebral differences between man and apes may be of so minute a character as to have escaped observation; and the brains of man and apes have been compared with two watches, one of which will, and the other will not, keep accurate time. Some difference so slight that the practised eye of the watchmaker may alone detect it may be the source of all the difference. On this Mr. Mivart with a pitiless and sarcastic logic remarks:

"It would be, however, to say the least, somewhat singular to attribute to *hypothetical* and *confessedly minute* differences, effects which as yet we have *not* seen to accompany, or be produced by, *certainly present* and *confessedly considerable* differences which we *have seen*."

The structure of the muscular system of the human foot has been very well shown by Drs. Alix and Gratiolet to be unlike, not only in degree, but in plan, from that of the foot of the ape. The foot of man also possesses a peculiar form of the facets of one of the cuneiform bones, which it is difficult to imagine that any slow process of change could have effected. In fact, granting the existence of an ape, and supposing external circumstances to have led to a change of the form of its foot-joints in the human direction, such change would have deprived the earlier generation of apes the power of acquiring nutriment, and of consequently taking their part in the struggle for life, which they would have had to maintain in order to have become in time men. This argument, the anatomical accuracy of which has been elsewhere proved, appears destructive of the Darwinian theory. Whatever analogies or even affinities may be discernible between the lower races of men and the highest apes, resemblances which those who have most loudly advocated man's bestial origin have vehemently denied, but which nevertheless exist, is beside the question. The fact remains that there is a wide difference between those miserable races of man, *abest omnium proxime à Simiis*, as the Australian and even the highest known ape. This wide leap in classification led Professor Owen to assign to man a distinct sub-class in the mammalian class, to which was given the name of Archencephala. The moral and psychical characters which are correlated with this great leap in the brain-structure are well worthy of our notice, and it is to these that we shall specially refer when attempting to answer our second question. But we must, before leaving this part of our subject, incidentally refer to the fact that the modifications of man's structure which distinguish him from the lower animals, are in no wise such as are consequent upon his erect position and the development of his large

and potent brain. Man has not the thumb of his foot brought into a parallel line with the other toes because he is erect; he is erect because of the formation of the bones of his foot. It is consolatory to quote Lucretius on this occasion against those whose arguments in science have been in favour of Lucretian doctrines.

> "Illud in his rebus vitium vehementer et istum,
> Effuge errorem vitareque præmeditentur
> . . . . denique membra,
> Ante fuere (ut opinor) eorum quam foret usus."

There is a vein of real science in these words which the advocates of what is called the Lucretian philosophy have been slow to perceive even in the writings of their own masters. There is almost a comic idea in the Comtist advocates of positive science taking up the dregs of an argument which Niewentyt and Paley have exaggerated on the theological side against the teachings of their own Epicurean system of philosophy, which possibly contains a more near approach to the truth than the theories of our more modern Lucretians. They borrow the argument of a certain theological school to contradict the teaching on which so great a part of their own theory depends. This inconsistency in reasoning shows the looseness with which the modern Darwinists are accustomed to convey their thoughts to the world, which is expected greedily to accept them.

When considering the position of the gorilla in the quadrumanous order there are a few points on which Mr. Mivart might, we think, have insisted a little more strongly. No one can insist more honestly and more decisively than he has done that the larger equatorial ape of Africa resembles man more than does any other in the great bulk of the whole body; the possession of a lobule to the ear, the prominence of the upper parts of the bones of the nose, the development of a vaginal ridge beneath the skull on each side, the shape of the scapula, the relative lengths of the hand to the spine and of the fore arm to the upper arm, the length of the neck, of the thigh bone, and a few other differences. But we think that a few other points might advantageously have been insisted on by Mr. Mivart. No orang, chimpanzee, or gibbon, shows any rudiment of mastoid processes; but they are present in the gorilla, smaller, indeed, than in man, but unmistakable; they are also, as in man, cellular, pneumatic, and with a thin outer plate of bone. It may be true that some of the *Cynocephali*, or baboons, exhibit a similar character. In them the development of the mastoid process is not correlated with an upright position, as was inferred by our earlier speculators as to the probable functions of the mastoid processes in man. Excepting the gorilla, no other latisternal ape shows a trace of mastoid process. We are bound to accept such a fact as proof of the closer analogy of the gorilla to man. In the orang the orbits have a full oval form; they are almost circular in the chimpanzee

and siamang, more nearly circular and with a more prominent line in the smaller gibbons; in the gorilla alone do they present the form which used to be deemed peculiar to man. The molars compared with the incisors are larger compared with those in man in the gorilla than in the chimpanzee. A comparison of the bisected cranial cavity in the gorilla also shows the greater affinity of it to man.

But when we refer to the form of the brain in the gorilla, chimpanzee, and orang, we are almost surprised that Mr. Mivart should have laid so much stress on the testimony of M. Gratiolet alone that the gorilla shows especial affinity to the lower baboons. The rough dissection by Professor Owen of the brain of gorilla, which has been already figured in the 'Zoological Society's Transactions,' may be advantageously compared with that of M. Gratiolet, in which the cerebellum had already been converted into a mash by the preserving process. The investigation of the gorilla brain made by Professor Owen shows distinctly the large size of the frontal lobe of the gorilla and the mass of the cerebrum; which is co-extensive backwards with the cerebellum. Like characters are not afforded by the brain of the orang, whose frontal lobe is admittedly in excess of that of the chimpanzee. We fail, as we have always failed, to see the resemblance between the general cerebral contour of the gorilla and that of the Cynocephali. Still less when we pursue the analysis of the convolutions from the imperfect material which the late Professor Gratiolet placed at our disposal, when we remember the personal examination of his *pièces* which it was our good fortune to make in his presence in 1866, can we see any analogy or possible affinity between the cerebrum of the gorilla and that of any of the baboons. The definition of "bridging convolutions" is too vague for us to endeavour to identify them either on the cerebrum of the gorilla or on the internal surface of the bisected cranial cavity.

We have followed Mr. Mivart through his chief anatomical generalisations. Into the psychical portion of the work, for obvious reasons, we shall not enter. We merely wish to record his opinion that if a body had existed of some latisternal ape, with vast brain, and according generally with human anatomical characters:

"If we were convinced from whatever reason that it was inconceivable and impossible for such a body to be developed or to exist without such informing soul, then we should, with perfect reason and logic, affirm that as no natural process would account for the entirely different kind of soul, one capable of articulately expressing general conceptions, so no merely natural process could account for the origin of the body informed by it, a body to which such an intellectual faculty was so essentially and intimately related."

Anatomy alone is thus declared impotent to solve the mysterious

problem of the existence of man, who is so closely allied by a series of mutual independences and relations to various forms of *Quadrumana*.

Quatrefages on Human Crania.[1]—M. de Quatrefages' work is vast in design and of much promise to science. It aims to give a thorough *conspectus* of the characters of the human crania of all races of man which have inhabited this globe. The first *livraison* is devoted to the examination of the fossil evidences of man. The anatomist who, a dozen years ago, would have endeavoured to write the history of human skulls would only have had to deal with races of mankind now peopling the globe. It is far different with the modern anthropologist, who has to consider forms of humanity professedly unlike any existing race, and whose analogues are only found with difficulty amongst those forms of living savages which now struggle for existence before the advance of the white races.

The first extinct race of which M. de Quatrefages speaks is that of Canstadt. This is familiar to us by the history of the Neanderthal skull alleged to have been derived from a prehistoric deposit containing the remains of an extinct species of bear, and presenting certain characters which, on an insufficient induction, were declared to be somewhat similar to those exhibited by the higher anthropoid apes. It has been satisfactorily demonstrated by Dr. J. Barnard-Davis, and others, that the peculiarities of this cranium, which was enormously long, and whose superciliary ridge resembled, to a great extent, that in the chimpanzee, depended upon a premature synostosis of the cranial bones. Subsequent observers have proved that, while the alleged exceptional characters of the Neanderthal skull were remarkable, similar features are presented in frequent modern instances, especially in the Celtic race. M. Godron has shown us that even in the skull of a reputed saint (Mansuy, bishop of Toul, in Lorraine, in the fourth century) those characters exist which some English students have even described as the missing link between man and beast. At Gentoud, in France, and Louth, in Ireland, skulls were discovered which assimilate the construction of the Neanderthal skull closely with the existing Celtic types. M. de Quatrefages takes the Canstadt skull, which has been known for the last hundred and seventy three years to us, and which has only recently been revived for our scrutiny, as the type of this race.

When, however, even taking into consideration the possibly ancient human skulls from Eguisheim and Olmo, which are something like the Canstadt skull, we look at M. de Quatrefages' beautiful lithograph of the man who was coeval with the mammoth, we are unable to detect anything so peculiar and singular as would indicate an extinct race of men. There is nothing so very peculiar, and even nothing especially brutal, in the side view of the extremely

[1] Crania Ethnica. Les crânes des races humaines. By A. de Quatrefages and E. T. Hamy. 4to, Paris, 1873.

fractured skull, and we are forced to regret that, on evidence so fragile, an attempt has been made to assert the existence of a race of man in Europe akin to the ancient Egyptians, and to the modern inhabitants of the Dekhan and Eastern Australia.

The Canstadt skull is, according to M. de Quatrefages, the first human fossil type in Europe. He briefly passes over the evidence of man from Savona, which belongs to the historic time, though there were not wanting palæontologists who assigned it to the pliocene period, from Rocco-blanco, near Cabrières (Hérault), and from Foxhall, near Ipswich. The men who at this time cut coarsely flints or chopped bones at St. Prest, and in the valley of the Arno, are absolutely unknown to us from the anatomical point of view.

Reverting to the Canstadt man, the oldest of known human races, to judge from its relative age by the *débris* of animals almost entirely extinct associated with it, is also that which has been longest known to us. Though discovered in 1700, the skull of Canstadt almost disappeared from human consideration until 1835, when Jaeger redescribed it. Büchner mentioned its low and narrow forehead and the strong projections of its superciliary arcades. Its characters were almost neglected till Professor de Quatrefages had it for description in June, 1870. A minute account of its alleged peculiarities follows, as well as that of the Eguisheim skull, which was said to be of extreme antiquity. Beyond the fact that the frontal bone is much depressed, we are unable to detect anything remarkable in the rare characters of skulls which have been alleged to form links in that wonderful chain which is supposed to have united the West German peasants with the Australian savages and the higher forms of ape. The celebrated Neanderthal skull shows some analogies with this form, and also with the skull from Brüx, in Bohemia, which is almost unknown to us. M. de Quatrefages, at great length, wades through the description of the prodigious mare's nest which amused anthropologists for so many years, till at last it received the *coup-de-grâce* from Drs. Barnard-Davis and Pruner-Bey. He repeats the vague and indefinite woodcuts which caused a temporary sensation in England a few years ago, instead of the photographs which its original describer, Professor Fuhlrott, circulated, and which showed very well that the form of the skull was owing to an abnormal development, which is not and cannot be considered as a rare character at all, but which is not in one degree or another, an unfrequent occurrence among all races, and that this abnormal development presents a great variety of degrees or modifications according to the particular combinations of sutures which are ossified. Reference to the works of Lucae, Virchow, and Welcker shows the extent to which the law may be supposed to operate, that in the synostosis of a suture the development of the skull is always arrested in the direction perpendicular to the synos-

totic suture (Virchow, 'Gesammelte,' 1856, s. 936) of this general rule. Professor Hermann Welcker has said, "Ich betrachte es als eine eben so unerlässliche wie dankbare Aufgabe unserer Wissenschaft." Application of this law to the Neanderthal skull, as well as to one in Dr. B. Davis's collection marked 1029, and others from Louth and Antrim in Ireland, showed that the alleged simial peculiarities were merely produced by premature synostosis. A writer in 1865 rather tartly remarked that "although to allude to the Neanderthal skull in the present state of the controversy may appear to some a superfluous digression, the lesson cannot be too often insisted upon that, in examining a skull purporting to be that of "the missing link," it should have been worth while to have inquired whether its peculiarities were not in some degree traceable to the premature ossification of the sutures of the skull" ('Mem. Anthrop. Soc. Lond.,' vol. ii, p. 81). But the science of common sense is distasteful to many. The natural explanation had nothing sensational or romantic about it. The advocates of missing links felt no difficulty, after the annihilation of one cobweb, in spinning a

"Slight, self-pleasing thread anew."

Years passed by, during which the Neanderthal skull was given as one of the *pièces justificatives* in favour of the doctrines of the "evolutionary" ascent from ape to man, a very fair theory enough in its way if there were only a single anatomical or palæontological fact to support it. The best and most elaborate description of the Neanderthal skull was that which proceeded from the pen of Professor W. King, of Galway, although the learned author concluded that the Neanderthal man was probably destitute of a soul! In addition, he asserted that the parietal bone in the Neanderthal skull originated from more centres than in the typical man of the present day. The first theory was incapable of proof; the second probably arose from a misconception of the characters presented by the casts of the skull, when they were first brought to England in an extremely shattered condition, and repaired (a fact we believe unpublished) by the late Dr. S. P. Woodward, F.G.S.

There are a few skulls which have some resemblance to the skull from Neanderthal, but whose ages are uncertain. Amongst these M. de Quatrefages figures the frontal bone from Denise, which he considers to belong to what he is pleased to call the "masculine type" of his Canstadt man.

The "feminine" type has little which need be said about it. The skulls from Stangenæss, Olmo, and Clichy exhibit characters of great length, with more or less frontal depression and slight development of the superciliary ridges. But that these remains afford any characters which might be supposed to be characteristic of any particular race, or which may not be found in the majority of our lower

classes in England, and especially in Ireland, is a vague assumption which M. de Quatrefages, while he does not deliberately assert it, at least induces his readers to accept. We have rarely read so much learning, eloquence, and thorough anatomical knowledge wasted to prove a theory which a sight of a dozen Kerry or Tipperary skulls would have thrown to the winds. The cranium from Forbes Quarry, Gibraltar, covered as it is with stalagmite, is pressed into the service to prove that there once existed in Western Europe, at a period of time far antecedent to existing man, a race with "foreheads villanous low," and a great length of skull. How few the facts are which are in favour of such an hypothesis M. de Quatrefages (than whom no other man in Europe could accumulate better evidence) has himself demonstrated by the paucity of his arguments.

The next human remain—though why it should be brought into juxtaposition with these semi-modern skulls we are at a loss to determine—is the celebrated lower jaw from the La Naulette Cave, on the banks of the Lesse, Belgium, which was discovered by Dr. E. Dupont in 1866. That this jaw, in which the chin was entirely absent, and the genial tubercles were not developed, presented peculiar and striking features there can be no doubt. Its great peculiarity, however, lay in the form of the molar teeth, the third of which, instead of being, as in the European, smaller than the second true molar, or, as in the African, of about the same size, vastly exceeded it in dimensions. This character appears to be unique in the present specimen, which indicated, in this solitary character alone, a step towards the "simious" type. But it may be remarked that, in spite of the gross misquotation which Mr. Darwin ('Descent of Man,' vol. i, p. 126) has given, the teeth themselves are unknown to us, and merely the alveoli exist. It has been well said by Dr. F. C. Webb, F.L.S., that the sizes of the alveoli do not of themselves indicate the size of the teeth; and the slightest inspection of a series of African or Malay jaws will show that a very large alveolus is often correlated with a very small molar, and *vice versâ*. Still, the La Naulette jaw, found as it was with remains of mammoth and rhinoceros, was particularly strange, and, to our minds at least, it is the most "simious" evidence as yet brought forward, and the lowest type of human jaw which we have ever seen. It must not, however, be forgotten that as yet it is only one solitary specimen, and it would be hazardous in the extreme were we to attempt from this single instance in any way to generalise on the forms of man which were unquestionably contemporary with mammoths in Southern Belgium. A few jaws have been found at Clichy, Arcy, and other spots in France, which present some analogy to the Naulette jaw, but which, unlike it, do not exhibit the extraordinary and exceptional characters to the same extent.

Such was the earliest type of man, which, according to M. de

Quatrefages, inhabited our shores. In the next volume of the present gigantic work he promises to investigate the second great race of fossil man, which has left its relics in one, at least, of the Aquitaine bone-caves, and to which he gives the title of race of Cromagnon. It is this peculiar race of men of which Dr. Broca, in 1866, wrote—"This race is entirely different from any other race, ancient or modern, that we have ever seen or heard of!" How far this opinion can be considered safe, and in what respects the race which inhabited the Aquitaine bone-caves accords with many existing human forms, are questions for the solution of which we must await the publication of M. de Quatrefages' next volume. We may incidentally say that the illustrations of this gigantic work are in the most costly style, and that although it may take years to complete, it, nevertheless, is undoubtedly the finest and most elaborate which has ever appeared on the subject of the skulls of the various races of men.

Nicholson's Manual of Palæontology.[1]—Professor Nicholson is a most industrious bookmaker, besides being a good observer and an able geologist. This volume on palæontology does him credit as a painstaking writer, and will be useful to the general public and to those who, knowing nothing about the animal and vegetable kingdoms, desire to learn something of the wonderful past. It is full of good illustrations, and is written clearly enough. Commencing with a general definition of the science of extinct forms, the author explains briefly the mineral metamorphosis which produces a fossil, and proceeds to classify the rocks in the usual manner of geologists. The causes of the absence of strata are stated, and an ideal section of the crust of the earth is given before treating of the value of specific identities in establishing contemporaneity of rocks. In this part the persistence of types, migrations, and "colonies" are considered, and reference is made to Huxley's doctrine of homotaxis; but the author has not seized the correct idea of this part of his subject, and it would have been better to have quoted Huxley, whose language is rarely improvable. A good chapter on the imperfection of the geological record precedes very short notices of the sudden extinction of animals, the disappearance of fossils, and the conclusions to be drawn from organic remains.

There does not appear to be any reference to what are called derived or *rémanié* fossils in this part of the book, and there is occasionally a want of exactitude. The reason is obvious, for too much has been attempted, and this is the great fault of the book, although it is very creditable to the author's industry. The tabular

[1] *A Manual of Palæontology for the use of Students, with a General Introduction on the Principles of Palæontology.* By Henry Alleyne Nicholson, M.D., &c., F.G.S., Professor of Natural History and Botany in University College, Toronto, pp. 601. Edinburgh and London, 1872.

view of the chief divisions of the animal kingdom precedes a disquisition on the general succession and progression of organic types, which would produce any amount of wrangling at the Geological Society, and which certainly will not meet with the approbation of the advanced palæontologists of the day.

The second part of the book treats of descriptive palæontology, and here there is too much zoology, which has the effect of crowding out matter with which Dr. Nicholson is well acquainted. No work for the use of students can be valuable with such short descriptions of such forms as nummulites, and with a statement which connects the flints in the white chalk with the periodic growth of large crops of sponges, although it is or was believed in by Owen. Moreover, what is the use of introducing descriptions and diagrams of a soft actinia in a work on fossils? They occupy the space which was really required in order that more should have been made out of the corals, for the explanation, for instance, of the reason why the figures 38 and 39 should belong to the genera with which they are associated. These figures are placed to represent *Petraia calicula* and *Zaphrentis Stokesi*, but they are so alike that they cannot be said to belong to different genera. Moreover, where is the genus Petraia differentiated?

What there is written concerning the corals is well done; but it is to be regretted that exceptional matters should have been introduced; for instance, the placing of Calceola amongst the Rugosa, for there is more to be said against than for this determination.

The Echinoidea are rather hurriedly passed over, and there is a fair description of the Crinoidea and Cystidea, but the figures of Pentremites are execrable. The comparative anatomy of the Crustacea is too fully noticed for a work on palæontology, and too much is said about the recent forms. On the other hand, the description of the Trilobite is very good, and the author places the details of the debate upon the leg question very fairly. The Eurypterida are slurred over, and the Insecta have two pages allotted to them. One of Dawson's pretty figures of Fenestrella is associated with the well-worn cuts of D'Orbigny in reference to the Polyzoa, and the Brachiopoda are well illustrated. The vertebrata are disposed of in 170 pages, and here again the zoology overwhelms the palæontology. Opening the book to obtain an idea of the author's treatment of the Cephalaspidæ great was the disappointment. Surely Dr. Nicholson will not expect students who have to pass examinations to be content with the few lines devoted to this important group. The Amphibia and Reptilia are shortly treated, and most of the correct description is from the best sources. Turning to the Mammalia, and selecting the Quadrumana as a test, we find the same want of palæontological details and the introduction of unnecessary zoology, of which complaint has already been made. The classifica-

tion of Owen is followed, and, of course, the Strepsirhina are introduced, although they are not represented in the fossil condition. Platyrhina are noticed zoologically, and the author states that "in South America, in late tertiary or post-tertiary age, have been found the remains of monkeys referable to the existing genera—Cebus, Callithrix, and Jaccus—along with a large form, which constitutes the extinct genus Protopithecus, and which is allied to the recent Mycetes." Surely more than this should have been culled from the descriptions of the Brazilian caves. Then we are told that "the pliocene (or miocene) deposits of India have yielded the remains of Semnopithecus, Macacus, and a form allied to the orang." Now, as a matter of fact, the bones of Quadrumana found by Falconer and Cautley were discovered in undoubted miocene deposits and not in the pliocene, and they were referred to (1) a form seven and a half feet high, closely allied to the existing orang outang; (2) a gigantic form allied to and not identical with *Semnopithecus entellus;* and (3) a form larger than, but allied to, the common *Pithecus rhesus.*

In treating of the fossil plants, Dr. Nicholson introduces one under the name of Eophyton, which most geologists believe to be the result of the mineralogy of rocks; and his method of describing the carboniferous flora adds to the confusion of the student instead of helping him. The last part of the book consists of what Dr. Nicholson terms historical palæontology; and here again a mass of geology is introduced unnecessarily. Finally, a fair glossary ends the work.

It is to be hoped that in the next edition the author will cut out two thirds of the zoology and geology, and that he will give a commensurate amount of good palæontology. Then the book will be a very valuable addition to the student's library. Now, and in its present state, we recommend the book to the beginner, but not to the advanced student.

Nicholson's Outlines of Natural History.[1]—This is another elementary work on natural history from the fertile pen of Dr. Nicholson, who has rendered himself pre-eminently the teacher of zoology to students. As a matter of course, the present small treatise contains no novelties, but presents a useful compendium of natural history information gathered from the author's larger works. It appears as one of Blackwood's Class Books in Science, and may be safely recommended to those commencing the study of zoology.

Ecker on Cerebral Convolutions.[2]—This translation of Ecker's book, descriptive of the convolutions of the brain, will be acceptable

[1] *Outlines of Natural History for Beginners, being Descriptions of a Progressive Series of Zoological Types.* By H. Alleyne Nicholson, M.D., &c., 1873. Pp. 113.

[2] *The Convolutions of the Human Brain.* By Dr. Alexander Ecker. Translated by J. C. Galton, M.A., &c. London, 1873.

to every worker in nerve physiology and pathology. There is much need of a description of those convolutions, or, in other words, of an accepted organography of the brain, to enable observers to make their facts intelligible to others. Such a desideratum is supplied by the small treatise before us.

The prevailing sentiment of the present day is that the several convolutions have special functions, and Ecker accepts the notion as a fact, and, in no philosophic spirit, treats the opposite opinion as a myth. For certainly the doctrine of special localisation of intellectual actions is not established, but is opposed by many facts generally recognised. However, as Ecker, in the substance of his treatise, restricts himself to the duties of a descriptive anatomist, his physiological hypothesis will not embarrass the reader.

Mr. Galton has fairly performed his task of translation, although failing to suppress the German idiom of the original, which ever and anon displays itself to the obscuring of the meaning; moreover, we regard Ecker's attempt to reduce chaos to order in the matter of the convolutions to be only a forerunner of a simpler and clearer organography, and also of a simpler nomenclature than is yet arrived at.

In conclusion, we have to add that several diagrams are dispersed throughout the text in illustration of the descriptions, and without which, we greatly fear, the reader's mind would be in tedious mazes lost. The translator has likewise added a very valuable bibliography, noting all the principal treatises and essays on the anatomy and physiology, human and comparative, of the brain.

Recent Works on Medical Chemistry.[1]—We have selected these two volumes for notice not because they present any similarity of object or treatment, but rather because they relate to two fields of chemistry, widely dissimilar, yet both of great importance to the physician. Dr. Ralfe's little book is intended to furnish students and practitioners with a concise laboratory guide to the qualitative and quantitative analysis of the tissues, fluids, and excretory products of the human body, and at the same time to form a handy manual of physiological chemistry; whilst Dr. Hoffman's work is intended to form a guide for the identification and determination of the quality of medicines and the substances used in their preparation, a knowledge of these matters being placed as a responsibility upon those who prepare, compound, and dispense them. The two works have this in common, but they are both manuals of analysis, and of analyses which fall within the province of the physician.

[1] *Outlines of Physiological Chemistry.* By Charles Henry Ralfe, M.A., M.B. London, 1873.

Manual of Chemical Analysis as applied to the Examination of Medicinal Chemicals. By Frederick Hoffman, Ph.D. New York, 1873.

Physiological chemistry has for long, we fear, been at a low ebb in this country, and it is to the continent of Europe that we have had to look of late years for fresh discoveries and for advances in that science. This is the more to be lamented, as our country has in past years produced worthy labourers in this field. But in recent years our most brilliant and accomplished chemists have devoted themselves to the discovery of new synthetical compounds of interest to the purely scientific chemist, rather than to the perhaps more difficult and laborious task of the examination and elucidation of the animal products. In saying this, we do not mean to deny that the physiological chemist has derived great benefit from synthetical researches, for light has undoubtedly been thrown on some of the more abstruse products of the animal body by the building up of these products from other and simpler substances.

On the continent, and especially in Germany, on the other hand, the study of physiological chemistry has earned the devotion of an ardent band of students, and it is to them that we have had to look, and still continue to look, for discoveries in this fruitful field of science.

It is not difficult to assign a cause for this our insular seeming apathy and neglect. In England physiological chemistry has almost perished from sheer starvation. Its pursuit is at once difficult, costly, and laborious, requiring the devotion of a life, and greater expense than all but the more wealthy can afford. No wonder then, that, unfostered by governmental aid, and looked upon coldly by our leading English chemists, unsupported too by endowments, this branch of science should have languished, and that scientists and physicians should alike have exerted their energies in fields more fertile in results, or more lucrative. In Germany physiological chemistry survives, but perhaps can scarcely be said to flourish, under the ægis of the endowed professorships which British chemists sigh for in vain. But even in Germany it is an evil sign that a periodical devoted to this branch of knowledge, and under the able editorship of Professor Hoppe-Seyler, has been abandoned because its circulation did not justify the heavy expense involved in its continuance.

We trust that the establishment of courses of practical physiology as an essential and obligatory part of the ordinary medical curriculum will have the effect of directing attention to the much neglected study of physiological chemistry. We fear, nevertheless, that the chemical portion of such a course of practical physiology has little existence except in name; and we know that some of the chemical teachers at our medical schools are apt to discourage the study of physiological chemistry on the ground that the science is wanting in definiteness and precision. Such an objection lies, however, only against its too early study, before the student has grasped the fundamental details of general chemistry.

The instinctive want felt by the more able among our junior students of medicine, physiology, and pathology, for a text-book adequately representing modern views respecting physiological chemistry has induced authors to publish a few manuals, among which the foremost ranks must be assigned to the section of Sanderson and Klein's text-book of practical physiology which has proceeded from the pen of Dr. Lauder Brunton. Dr. Ralfe's little volume has a less ambitious, though equally practical, object in view. It has been compiled, the author says,

"In the hope that it may furnish students and practitioners of medicine with a concise and trustworthy laboratory guide to the qualitative and quantitative analysis of the tissues, fluids, and excretory products of the human body. It has purposely been made as simple as possible. The best processes have been selected from the English, French, and more particularly German text-books and journals, and although these processes have been very succinctly described, care has been taken to omit nothing which is essential to success."

A careful examination of the volume has convinced us that this statement in the preface is well borne out in the body of the work. After an introductory sketch of physiological chemistry, a description is given of the proximate principles of the human body; then of the products of decomposition. The inorganic constituents of the organism have then a short chapter devoted to them. Finally, a description of the tissues and fluids occupies about one half of the volume; and in this part, concise yet tolerably full analytical details are given. An appendix on weights, measures, and manipulation might well have been omitted, since the book is one adapted rather to the wants of the advanced student, already accustomed to ordinary chemical manipulations, to whom this appendix is hence unnecessary. Another appendix, containing a list of authors referred to, and from whose works extracts have been taken by Dr. Ralfe, is invaluable; it is not only a proper and graceful acknowledgment in a work which does not pretend to be more than a compilation; but it also is of real use to the student and practitioner, enabling him to refer to other works when fuller details are required than could fitly find a place in a handy manual.

Since the pith of a book is a good index, we the more regret the absence of one from Dr. Ralfe's volume. In any future edition we should advise this defect to be remedied by the insertion of a full and copious index, besides the continuance of the present table of contents. We notice one other blemish. Although the proof-sheets have been revised by Mr. Heaton, the lecturer on chemistry at the Charing Cross Hospital Medical School, we have detected a goodly number of erroneous chemical formulæ, obvious misprints, yet puzzling enough to the tyro in chemistry.

Dr. Ralfe's little work, spite of its defects, forms an excellent and readable manual, and supplies a real want in our scientific literature.

Dr. Hoffman's manual supplies an entirely different want, and is a work more adapted to the use of the pharmaceutist than the physician, though it will form a valuable adjunct to the library of those general practitioners who dispense their own medicines. It has become now-a-days too much the fashion to trust in the reputation of the wholesale druggist for the purity of medicinal chemicals than to submit them to appropriate tests. This work will, however, form an indispensable portion of the library of the professed pharmaceutist. It gives plain and simple directions for ascertaining the purity of all the more ordinary, and some of the rarer medicinal chemicals, with fuller details than those described in the British Pharmacopæia.

Without pretending to have examined all the processes recommended, we may say that we have found the statements and descriptions contained in Dr. Hoffman's book, as a rule, reliable. The tests employed have also the advantage in many instances of novelty, and several happy methods of analysis are described. In any future edition of the work we should recommend a free use of the process of excision. It is surely superfluous to state the operations involved in simple tests are familiar to the pharmaceutist, and then to proceed to describe them in detail. At least three fourths of the woodcuts in the book might also be dispensed with, especially as most of them represent very simple apparatus. The same cuts are reproduced again and again *ad nauseam*, some of them so many as nine times.

Nevertheless, spite of these defects, and the somewhat puzzling employment of the old troy weights, we can highly recommend Dr. Hoffman's volume to the attention of the physician and pharmaceutist.

Thorpe's Chemical Analysis.[1]—This volume belongs to Messrs. Longmans' series of 'Text-books of Science.' We consider it to be a very valuable addition to chemical literature, although we are told that the work is "adapted for the use of artisans and students in public and other schools." There is no doubt that every working analyst will appreciate it as a guide in his own laboratory investigations as much as in the instruction of his pupils. The work contains a vast amount of information as to all the more trustworthy methods of determining the quantitative composition of many useful and important products. The newest and best processes are described with accuracy and minuteness, and illustrated by means of numerous well-drawn figures of apparatus. Here and

[1] *Quantitative Chemical Analysis.* By T. E. Thorpe, pp. xii and 387. London, 1873.

there the contrivances shown and which have been adopted in order to fulfil the best conditions of individual estimation, may appear too fragile or too complex for the requirements of ordinary analysis; but if the author errs in this direction, it is, at all events, a fault on the right side. We heartily wish that every public analyst had gone carefully through the course of work marked out in Mr. Thorpe's manual. Such a training in chemical manipulation would go far to supplement the very slender acquaintance with chemical science and method which too many analytical chemists, so called, possess.

In order to point out the distinguishing characteristics of Mr. Thorpe's manual in a more explicit manner it will be as well to mention the various subjects of which he treats, in the order in which they are arranged by the author. Part I describes the balance, its construction, verification, use, and preservation. The chief general methods for preparing substances for estimation are then given, the operations of mechanical subdivision, desiccation, evaporation, and filtration being duly and fully described. Part II contains a series of eighteen examples of quantitative analysis, intended to illustrate the simpler gravimetric processes. Part III includes alkalimetry, acidimetry, and chlorimetry, with other volumetric methods, such as those dependent upon oxidation and reduction. Part IV is entitled "General Analysis, involving Gravimetric and Volumetric Processes," and occupies nearly 200 pages. Most of the common commercial and industrial products which are usually submitted to chemical analyses and assay are here considered. The processes given appear for the most part excellent, but the methods for the analyses of manures and plant ashes certainly require revision in a few points. The concluding part of the volume is devoted to organic analysis, while an appendix will be found to contain a series of useful tables.

In taking leave of Mr. Thorpe's text-book we must again commend it to the attention of all our readers who are in any way interested in the methods and results of quantitative chemical analysis.

Practical Examples in Quantitative Analysis.[1]—We have read this book carefully, and yet have been unable to find out why it has been written. A protest must be made against the continued increase of such scrappy little books on chemistry as the one before us. It is costly considering its almost microscopic dimensions, and very costly indeed considering its infinitesimally small value. The book is written in very slipshod English, while the woodcuts are really too childish to be called illustrations. Witness the ludicrous fig. 12 on page 42, which is meant to represent the apparatus for distillation.

[1] *Practical Examples in Quantitative Analysis.* By Ernest Francis. Pp. vi, 57. London, 1873.

The processes described amongst the "practical examples" relate to the examination of water, milk, and urine. The directions for the analysis of water are less open to adverse criticism than those given in the two other cases, for Mr. Francis has here followed very closely the methods described by Messrs. Wanklyn and Chapman in their work on water-analysis. But as to the analysis of milk, let any chemist who has had experience in such work read the directions given on pp. 13, 39, &c., and we are quite sure he will *not* follow them. To take one example. Under the heading "Estimation of Cream in Milk," Mr. Francis says, "Take a tall glass cylinder graduated into 100 volumes, and fill it with new milk; after a time the cream rises to the surface, and the amount formed can be read off in percentages." The writer does not tell us how long we should give the cream to rise, nor the temperature at which the milk should be kept. That his own results in the analysis of milk are of a very unusual character may be concluded from his remark (p. 40), that "unadulterated milk should never yield less than 5 per cent. of cream!"—5 per cent. of *cream,* be it noted, not of butter.

We must give one more illustration of the value of the book before us and then put it away. To estimate the amount of the total solids in urine, we are told to evaporate a measured portion on the steam-bath till it ceases to lose weight, and to "finally dry in an air-bath." As no temperature is mentioned, while the air-bath shown in the accompanying figure is being heated by a Bunsen burner turned fully on, all we can say is that we pity the poor residue.

United States Pharmacopœia.[1]—When at the present time the old creed in the value of drugs is undergoing so considerable modifications—when experimental researches in physiology and therapeutics are conducted with a completeness unknown in former periods—when the medicinal agents used in various countries of the world are made known to us in a far fuller degree than of old—and when chemists and pharmacists apply their ingenuity and skill in devising new compounds and improved preparations—it seems a right and proper course that the authorities in each country charged with the preparation of the national pharmacopœia should undertake a pretty frequent revision of the codex. The convention, in whose hands the profession in the United States has lodged the revision of the generally accepted pharmacopœia of the Union, has agreed to a decennial examination and publication, and we have now before us the fifth of the series issued.

This degree of frequency appears a fitting one. If published at

[1] *The Pharmacopœia of the United States of America.* Fifth Decennial Revision. By authority of the National Convention for Revising the Pharmacopœia, held at Washington, 1870. Philadelphia, 1873, pp. 383.

shorter intervals there would be much wasteful expenditure and much annoyance, from alterations of formulæ and changes among the articles of the materia medica. Alterations, indeed, should be made charily, and the mere fashion of the day be little regarded.

The American Convention is constituted of delegates from most of the schools of medicine and pharmacy in the States. In 1870 it was presided over by Dr. Joseph Carson, of the University of Pennsylvania. Fifteen members were appointed a committee for the work of revision, and communications were solicited and received from various public medical bodies respecting the work in hand.

The convention recommended "that measures of capacity be abandoned in the pharmacopœia, and that the quantities in all formulas be expressed both in weights and in parts by weights." To this direction the committee objected that it would entail "the use of a metrical system not employed in this country or in England, and which would have to be constructed for the purpose. Such a change would involve changed proportions in almost every formula, and would produce a corresponding disturbance in many of the doses;" and altogether it was held to be impracticable. At the same time the proposal appears to have had some weight, for we notice that in many formulas the quantity of fluids is expressed in troy weight and not by liquid measure—a proceeding without advantage in itself, and entailing extra trouble upon those called upon to make the preparations.

The articles of materia medica are grouped in two lots, of which the first contains the most important and the most numerous drugs. To this "primary list" twenty-four articles have been added, whilst only one has been removed from it. The secondary list has been increased by three and diminished by four articles. To the preparations eighty-two have been added, while seven have been dismissed.

"Under the head of new classes will be found Chartæ, including cantharides paper and mustard paper; Glycerita, including glycerites of carbolic acid, of gallic acid, of tannic acid, of tar, and of borate of sodium; Suppositoria, including suppositories of carbolic acid, of tannic acid, of aloes, of assafœtida, of belladonna, of morphia, of lead, and of lead and opium; and Succi, including juice of conium and juice of dandelion."

Alterations have been made in the Latin officinal names of some preparations, and also in the chemical nomenclature, in order to place the work in accord with the progress of chemical science.

Such are the chief changes, noted by its compilers, introduced in this last edition of the 'United States Pharmacopœia.' A few remarks are called for on comparing it with our own official publication. On a general glance the impression arises that a considerable similarity obtains between the two works in arrangement, in

the substances admitted into the materia medica, and in the pharmaceutical processes and formulas. However, a more minute examination exhibits a very great divergence between the two in all those particulars.

Looking at the extent of territory comprised in the United States, to the vast diversities of climates, and to the varied and abounding resources existing, particularly in the vegetable world, a very considerable list of articles unknown in the 'British Pharmacopœia' might naturally be looked for in its American counterpart. But in this matter, we apprehend, something like a surprise would be experienced by most people at the comparatively small number of novel drugs, particularly in the primary list, which may be taken to include the articles of best repute and in most frequent use. In this last we have counted only thirty-two articles, representing species and genera of plants not included in our own materia medica, and among these we recognise many that have been discarded from our lists as useless encumbrances, or as articles represented by others of more certainty and potency of action.

The novel inorganic or mineral substances are few in number, and, for the most part, present no strong claims to recognition. Those we have noted are—chromic, lactic, glacial phosphoric, and valerianic acids; the nitrate and sulphate of ammonium; hypophosphites of potash, soda, and iron; the sulphites of soda and potassa; the hyposulphite of soda; the sulphate of manganese and iodoform. Of these, several are of little or no therapeutical value, and rank only among tests or materials directly or indirectly required in processes of manufacture of recognised drugs. In fact, hyposulphate of soda occupies a place in the 'British Pharmacopœia' as an article employed in testing, and valerianic acid is prepared officinally in the formation of valerianate of soda, although not ordered to be separated as a distinct acid.

In the way of new medicinal substances, whether simple or natural objects, or compounds due to the chemist, there is very little suggestive to our Pharmaceutical Committee.

If, again, we turn to the classes of preparations represented by tinctures and infusions, we find few actual novelties, but many departures from British officinal formulæ bearing similar names. Of new formulæ we may note Tinctura Opii Acetata and Tinctura Opii Deodorata. The latter is made as an ethereal extract dissolved in dilute spirit, and suggests itself as a useful preparation.

There are, besides, several tinctures of plants peculiar to the United States codex, but what we would particularly call attention to is, the almost constant departure from the directions given in the 'British Pharmacopœia' in the matter of the proportion of ingredients used, so that whilst many tinctures and infusions are considerably stronger than ours, there are many weaker. Thus, for

example, the infusions of calumba, cascarilla, and senna are made only of half strength, whilst those of digitalis and gentian are considerably stronger, the former being of double strength. Likewise, in the matter of tinctures, we find the tinctures of aconite, belladonna, nux vomica, and cantharides made double strength, whilst those of cannabis, of hyoscyamus, of digitalis, and of colchicum, are one fourth weaker. Lastly, tincture of opium and the camphorated tincture are made weaker than the British preparations.

It may be that the Americans are justified, at all events in some cases, in not following our authorities in this matter of the strength of preparations; but, at the same time, it is a matter of regret that greater uniformity in this matter between two nations speaking the same language and so intimately bound together by social and commercial ties does not prevail. To British medical men cast abroad in America, and to American physicians landed in England, it must be vexatious, and probably at times a cause of injury to patients, to find that well-known formulæ, common by name to both, differ widely in their doses and activity on one and on the other side the Atlantic. Speaking generally, these variations unhappily affect the more potent remedies rather than others.

The notion of an international pharmacopœia has been broached, and has many recommendations, although we apprehend the more or less divergent medical opinions afloat in different countries, and, still more, circumstances dictated by peculiarities in modes of life, in climate, and in floras, will lead each nation to claim more or fewer special drugs, and so destroy absolute uniformity. On the other hand, there would be a sufficient array of substances and formulæ, admitting of so much concurrence as in some measure to attain the object desired; but, however this may be, there is good reason for bringing the British and the United States pharmacopœias more in accord, and so far making the first move towards an international codex, and we should be pleased to hear of communications being opened between the committee for the British and the convention for the United States' pharmacopœia in anticipation of so desirable an object.

Griffiths' Pharmacopœial Preparations.[1]—This book forms a well-executed outline of pharmacy. It deals with each sort of pharmacopœial preparation in alphabetical order, noting the directions given for the manufacture or preparation of each compound, the physical and chemical properties, the adulterations to be looked for, and the tests to be applied. It well exhibits the chemical composition of chemical agents, the reactions occurring in their preparation, and,

[1] *Notes on the Pharmacopœial Preparations, especially arranged for the Use of Students preparing for Examination.* By W. HANDSEL GRIFFITHS, PH.D., &c. London, 1873.

with regard to compound drugs, displays clearly the relative proportions of their ingredients.

Dr. Griffiths has the best qualifications for the work he has performed, and students must be thankful for the aid he has rendered them in mastering the details of pharmacy required of them by the examining boards.

Our only regret is that such an amount of details is demanded from students of medicine. It is quite right would-be medical men should become acquainted with the therapeutical agents they are to wield; but it appears to us that examiners err in asking for a detailed knowledge of processes of manufacture and preparation such as is represented by the teachings of this book, for if gained for examination it will for the most part be soon forgotten, since little of it is required in practice, or even practically applied.

The practitioner, indeed, concerns himself as little with the manufacture of the larger part of the drugs, particularly the chemicals he employs, as he does with the making of the soap or the gas he consumes in his house. He must resort for supplies to those whose business it is to manufacture his drugs, and trust to their knowledge of the business they exercise, and in an almost equal degree to their honesty.

An acquaintance with the strength, the doses, and the uses of drugs is quite another matter, but has received from examining boards much less encouragement than the trade details to which we have adverted.

Life of Sir James Simpson, Bart.[1]—Sir James Simpson was made up of several men, and he will need several biographies.

Professor Duns knew one of these men, and has very fairly depicted him. Perhaps, on the whole, it is fortunate that the first portraiture we get is of that Sir James whom he knew and admired.

It is not always an advantage to have a many-sided nature, even when all the sides show power. The actions and words of the possessor are apt to be now the expression of one side and then of another, and it may sometimes be difficult to reconcile the doings and sayings of to-day with those of yesterday.

The many men who formed Sir James Simpson differed considerably from one another. Not one of them was insignificant. They were all, on the contrary, powerful, and that some of them were loveable even those men who were least friendly to him are ready to admit.

No one denies that Sir James had great ability. It is probably true that in recent times no man has exercised a greater influence over his fellow-men, whether within or beyond his own profession. In some directions this influence will undoubtedly prove permanent, but in others it is too plain that already it is passing

[1] *Memoir of Sir James Y. Simpson, Bart., M.D., &c.* By J. Duns, D.D. Edinburgh, 1873, pp. 544.

away. It scarcely detracts from his greatness to say this. No other result, indeed, was possible. Such restless activity, combined with so much power and ambition, operating in so many directions, could scarcely fail to expend itself uselessly as well as usefully—injuriously as well as profitably. There was too little of calm and of indifference to fame in his unceasing search after the new, and too much of *a struggle,* in which, unhappily, he sometimes allowed all the men he was made of to be engaged.

Holding these views of Simpson, we cannot help feeling a certain disappointment in this memoir. But we should perhaps have felt a like disappointment in any other, for what biographer could have painted him as he was seen by all the circles in which he moved? One thing is certain—his life as a physician has yet to be written, and we are glad that such is the case. Time must elapse before we can judge fairly of his medical work, and neither he nor we will suffer by waiting.

Professor Duns knew Sir James intimately, and was his warm personal friend. Being a clergyman, it is not wonderful that the religious aspect of the life he has written should be so prominently brought forward. When we say that, on the whole, this is done judiciously, we are far from meaning that Dr. Duns has so trimmed his expressions as to take from the squareness of those opinions on religious subjects which he holds and never hesitates to enunciate. Some may think that less might have been advantageously said of the *conversion* of Sir James, but we think all will agree that it would be difficult to say so much more judiciously.

In reference to this, there is one thing Dr. Duns fails to bring out, namely, that Simpson's life was a wicked and godless one before his conversion. The picture of him which is drawn in the biography gives no support to such a view. It is a defect, indeed, of the work that it points out no faults. It would have been a defect in the man if he had had none. To those who know nothing of Simpson but what this life reveals, it may seem that the greatest faults he had were want of method in his work, unfaithfulness in keeping appointments, and a disregard of the weary waiting of his patients. These were certainly well-known and serious faults, but they were merely the outcome of faults more serious still.

We think there is something objectionable in the way in which the power of Christianity is held to be illustrated in the conversion of a man of such intellectual ability and engrossing pursuits. This seems to imply that the feeble-minded and the idle are those we naturally expect to come under its influence, and that ability, culture, and industry tend to exclude a man from its blessings. It is unfortunate, we think, when anything is written which may lead to an inference so unworthy of our religion.

There is one part of this memoir for which all must feel grateful

to Professor Duns. No other person was in a position to do it so well, and if it had not been done now it would probably, to a large extent, have been lost for ever. We refer to the story of his early life, which is admirably told. It is full of incident and interest, and no one will read it without benefit. Never was there a case in which the after life of a man was more clearly foreshadowed in that of his boyhood. It is a question, indeed, if Simpson was not even greater as a boy than he ever was as a man.

In this part of the book, if not rather in all parts of it, we hear much of his relatives, and they always appear pleasantly—lavishing their substance and their love on their kinsman, and glorying in his successes. All through his busy career, from boyhood down to the day of his death, his relations with his brothers and sisters were of the closest and most affectionate character, and their faith in him was as great as was their pride.

It is pleasant to have all this recorded. We should probably have missed it if the life had been written twenty years hence instead of now, for there is little chance that a biographer would then be found whose acquaintanceship with Sir James began among his kinspeople at Bathgate.

The Spas of Marienbad and Wiesbaden.[1]—Mineral springs for drinking and bathing, with a view to cure and alleviate diseases, are among not the least of the material resources of Germany, and, like other products of a country, must be duly made known to other lands and duly advertised. Hence, like the spas themselves, there is a constant welling forth of treatises recounting the virtues of the various Teutonic mineral waters, and this usually with such enlargement that the reader, who should take the pains to note all the maladies in which their efficacy is asserted and the marvellous cures related, would well nigh wonder that disease can find victims in Germany, and that those of other lands who resort to them are not infinitely more numerous than they are, and better known among us as rescued from the bodily ills that pester and kill so large a percentage of our population.

However, passing by the evolvments from the inner consciousness of our supposed reader and analyser of the mineral-water literature of Germany, we have to remark that the two books now before us present the characters usual to such works. They are intended as much for the non-professional as for the professional reader; rather, indeed, for the former, who is an object for attention, and for whose

[1] *On Marienbad Spa and the Diseases Curable by its Waters and Baths.* By A. Victor Jagielski, M.D. London, 1873.

The Mineral Springs of Wiesbaden and their Effect in Disease, with Instructions as to their Application. By H. Roth, M.D. Translated from the fourth German edition, by C. Benson. Mayence, 1870.

special benefit pathology and therapeutics are made easy in their pages. To show the adaptation of the mineral waters to cure this or that disease a chemical pathology necessarily commends itself as the correct one; and to explain the therapeutics some salt or other mineral ingredient is advanced as the active agent, although, either by reason of its quantity, or quality, or both, it would anywhere else than in the spa in question rank as a very common-place medicine, of doubtful energy or absolute inertness.

Indeed, we might refer to the pathology and therapeutics of mineral-water literature as appertaining to a particular school, in which the imagination and credulity are much in request. In Dr. Roth's book on the Wiesbaden waters much debateable physiology and pathology more especially appears; nevertheless, after exhausting our scepticism respecting the alleged virtues of spas, there yet remains a considerable residuum of reliable facts which must ever tell in favour of mineral waters in the treatment of disease, particularly when their action is aided by external surrounding conditions—good air and scenery, enforced healthy exercise, abstemious diet, and all such measures as are accounted hygienic. These latter aids to recovery are, indeed, of primary importance in a very large class of those who resort to mineral springs, who have, as general characteristics, over-pampered bodies, calling for temperance and exercise. In a great number of cases it would be hard to draw the line in estimating the relative value of the drinking and bathing at the spa, and the regulated diet and exercise coupled with change of air and scene. What will be accounted of most worth in these and like books on mineral springs by the professional reader will be the general statements as to the chemical composition of the waters, the rules for employing them, the accommodation available for patients, the character and surroundings of the locality, and, in a general way, the recorded results of experience in using them.

There is some amount of ecstatic writing in Dr. Jagielski's book on the Marienbad Spa, but with it a fair account of its characters and uses. Dr. Roth's book has had the misfortune to be translated from German into English by a German, and, as a consequence, abounds in much un-English composition and phraseology.

As guides to the particular spa which each is concerned in recommending, they may be read with profit by those who propose to betake themselves there, but as popular directions we would prefer the medical disquisitions left out.

Mandl on the Laryngoscope.[1]—We owe so much of our knowledge of the larynx and its diseases to German genius and German in-

[1] *Traité Pratique des Maladies du Larynx et du Pharynx.* Par le Docteur L. MANDL, avec 7 planches gravées et coloriées, et 164 figures intercalées dans le texte. Paris, 1872.

dustry, that the work of other schools is very apt to be overlooked. This is notably the case with the contributions which have been made in France to this branch of practical medicine. While English and German work has been carefully studied in that country, and Mackenzie's handbook has found an editor and translator; on this side of the channel French authors have not been so widely read as they deserve. The French school, besides many other merits of a higher order, must be credited with great ingenuity and marvellous compiling power. Nearly all French books are specimens of artistic skill in construction and style; all the parts are kept in due proportion, and each subject is treated so fully, so scientifically, and withal so gracefully, that the reader escapes the weariness which the writings of other less gifted nations produce.

The volume before us is an example of some of these qualities, for in about 800 pages Dr. Mandl has produced a very complete treatise on the anatomy, physiology, pathology, and therapeutics of the larynx and pharynx. It would be impossible in the limits at our command to enter fully on the consideration of all the five sections into which the book is divided, we shall therefore confine our attention to those which are of more especial interest to the physician. The second part of the treatise is devoted to the art of laryngoscopy, and all the details of the mode of examination are very lucidly described. We have, indeed, read nowhere any better instructions for the beginner than in those paragraphs which treat of the laryngeal image and the positions of the mirror necessary for obtaining views of different parts of the larynx. The manner in which the mirror should be held in order to show each part is illustrated by an excellent woodcut. The experienced laryngoscopist will not find much that is novel in this section, but to the student the plates will be found most useful, and particularly the fourth chapter, which treats of the difficulties of laryngoscopy and the way to overcome them. Speaking of that nuisance, a long uvula, Dr. Mandl has figured a mirror with a little pouch on its posterior surface, into which the offending organ can be received and held out of the way. Like most others, however, he considers patience and a large mirror the best means of overcoming this difficulty. He speaks strongly against excision of the uvula, as an operation profitless to the patient and often only proposed in the interests of laryngoscopic inspection. We gladly call attention to this opinion, as the practice of removing this little organ has become very frequent of late years.

The two sections on general and special pathology and therapeutics compose the bulk of the volume. The division of these two parts of the subject into general and special appears to us a disadvantage. To devote a section to the general pathology of special disorders is an unnecessary refinement in our opinion, and is an alarming development of specialism. Pathology as a science has the same laws

for the larynx and pharynx that it has for the same tissues in other localities, and these laws should be studied, not in connection with special disorders, but as general morbid processes. The division is, we think, to say the least, uncalled for, and practically inconvenient in the case of therapeutics as well as pathology. Both sections have been weakened by the division, as far as matter is concerned, and neither has, in our opinion, gained in clearness.

The chapters on general pathology are, in other respects, remarkable for their excellent method and the full and fair statement given of the most recent views of German pathologists. In this respect the remarks on diphtheria are well worth perusing, although our author remains an advocate of the views of his own countrymen. Here and there some odd statements are made, as, for example, the author's belief that the black sputa of colliers must, on account of the quantity, be due rather to some pathological elaboration of black pigment than to inhaled carbon. The general pathology of laryngeal polypi strikes us as meagre after the elaborate chapter in Mackenzie's essay. Under the head of symptomatology there is given in the section of general pathology an alphabetical list of the symptoms of the diseases of the larynx and pharynx. Under each symptom, which is defined, there are arranged the several causes which may produce it, and other information. In some instances this is done very fully and in all very well. We quote one of the shortest of these paragraphs to show how useful such a glossary may be made. The figures refer to the physiological part of the book :

"*Sifflement* inspiratoire (253). Inspiration difficile, qui produit un son glottique, rapellant le sifflet (397) cornage des vétérinaires. Œdèma des replis ary-épiglottiques ; rétrécissement de l'ouverture glottique (tuméfaction, polypes, spasme) ; laryngosténose ; sténosis de la trachée (tuméfaction, corps étrangers, tumeurs, anévrysmes, fistule aérienne), croup."

Turning to the chapters on special pathology, there are some sections, such as those on tubercle, which contain valuable matter. Mandl has previously written on tubercle, and has, therefore, some views of his own to enunciate. The most interesting point to us, however, is a peculiar appearance on the anterior surface of the posterior wall of the larynx, to which he calls attention as characteristic of primary laryngeal phthisis. It consists of a collection of primary vegetations, varying in number and size, and of the colour of the mucous membrane. He particularly observed these vegetations in a case which he has figured among the beautifully executed coloured plates placed at the end of the book. The man was apparently in robust health, and had no symptom except hoarseness. The laryngoscope discovered these vegetations in the situation mentioned, but there was no tumefaction and no ulceration near or

distant. The most minute examination failed to detect any lung lesion or trace of syphilis. Anti-syphilitic remedies were, however, given without result for two months. For nearly a year afterwards the patient was not seen, but after that time he returned with ulcerations in the larynx and well-marked pulmonary phthisis, which proved fatal in six months. The original vegetations had been destroyed in the course of the disease by ulceration. Tobold has described similar vegetations having a cauliflower appearance, but he does not refer them to a special form of tubercular laryngitis, whereas Mandl says that he has never been able to discover this appearance in secondary laryngeal phthisis, antecedent to the laryngitis, as it is in the primary form. The vegetations may appear in the course of the secondary affection, but they do not precede it.

This observation of Mandl's appears to us worthy of further investigation, and, if confirmed, will prove an important distinguishing sign of the forms of laryngeal phthisis.

The volume contains a large amount of therapeutical information. In the section on general therapeutics, which consists of about 140 pages, are discussed the general hygiene of throat diseases, the many causes which produce and develope them, and the effects of climate. After some remarks on general treatment, and some wise doubts of the efficacy of some much-vaunted mineral waters, our author proceeds to the local treatment. Under this head, after giving general directions, he describes and illustrates by excellent woodcuts the many kinds of instruments useful for local treatment. He prefers the use of brushes or drop syringes for the application of fluids, which he considers act much better than either powders or atomized liquids.

The first attempt to atomize fluids was made, it seems, in 1849, by Auphan, at Euzet-les-Bains, and soon afterwards at Lamothe-les-Bains. Sales-Girons, however, must be considered the true inventor of this method, which has scarcely yet lost its wide popularity. After giving a very full account of the many instruments which have been devised as atomizers, and an interesting epitome of the experiments which have been made on the extent of penetration of atomized fluids, Mandl concludes by saying that he cannot express a favorable opinion of the employment of atomized fluids in the treatment of pharyngo-laryngeal affections, which may be cured or relieved more surely or more promptly by the sponge or the brush. The most eminent authorities in this country agree, we believe, in this verdict.

The chapter on the treatment of laryngeal polypi is well worth attentive study, on account of the full description of the different forms of instruments and the analysis of their respective advantages. After suggesting that pediculated polypi in the supra-glottic portion of the larynx often require for their removal no more elaborate instrument than a good finger-nail and a skilled finger, he sums up

his experience in favour of operating through the natural passages in all cases where possible.

The success of the operation is independent of the size, number, and nature of the polypi. The choice of instruments and method of operation depend on the operator. Mandl himself destroys small polypi by caustics, and removes the larger fibromata by cutting or the écraseur. He does not like evulsion except for larger polypi after incision, and for friable growths and those with slender pedicles.

Galvano-cautery he regards with much favour, and quotes a case in which he extirpated a large sub-glottic growth too dense for evulsion by two cauterizations. The electrolytic action not being limited to the point of contact, causes absorption of diseased tissue, while the sound parts, if touched slightly by accident, undergo no serious change.

In speaking of thyrotomy he quotes the results collected by Durham, and also some cases by Elsberg, of New York, but concludes his analysis of the cases by the opinion "that in the present state of our knowledge we must give the preference to operation by the mouth, even if the removal be less complete, because the life of the patient is never compromised thereby and because the results are more satisfactory." We have no time to speak of other practical parts of the book on which we would willingly dwell, nor of the excellent chapters on the physiology of the larynx.

To these we refer our readers, with the assurance that a perusal of the book will repay the student of laryngology.

Keene on Deafness.[1]—This book is a short résumé of what has been written of late years on diseases of the ear, and the matter has been gathered from the works of Tröltsch, Politzer, Gruber, and Toynbee, articles by Mr. Hinton in 'Holmes's System of Surgery' and 'Guy's Hospital Reports,' and occasional papers by various authors in the medical journals. This is so plainly the case that in reading the descriptions which the author gives it would be not very difficult to turn to the book and page from which the account is taken. This is particularly observable in the part which deals with perforations of the tympanic membrane, and in the description of an appearance of thin fluid in the cavity of the tympanum that is "rarely observed;" this latter bears a striking likeness to a case of serous accumulation in the tympanum related in the supplement to Dr. Adam Politzer's work on the membrana tympani.

On some of the chief matters of interest in aural surgery the author abstains from expressing an opinion. Thus, in speaking of

[1] *The Causes and Treatment of Deafness.* By JAMES KEENE, F.R.C.S., M.R.C.P., Assistant-Surgeon to the Central London Ophthalmic Hospital, late Surgeon to the West London Hospital.

the operation of incision of the tympanic membrane in cases of accumulation of mucus in the tympanic cavity, the subject is briefly dismissed as follows:

"When the tympanum is distended by excessive secretion within, so as to cause thinning and threatened rupture of the membrane, or when we fail to remove the inspissated mucus by the means I have enumerated, we must have recourse to paracentesis of the membrana tympani in the manner described at page 67. After the operation the middle ear must be washed out daily, until the opening closes, with an alkaline solution of carbonate of soda or potash. This may be done through the catheter or by the meatus externus."

Of what has been Mr. Keene's experience of the results of this treatment, or what rules guide him in the selection of cases for operations we learn no more. In the matter of bougies used through the Eustachian catheter, he says—

"We shall often succeed in making the bougie enter the cavity of the tympanum, where it may be seen with the aid of a speculum at the lower part of the anterior superior quadrant."

But of the permanent effects to be expected from this treatment, the cases in which it may be employed with advantage, except that bougies are used to—

"dilate the Eustachian tube in cases where this is constricted by plastic deposition in its walls;"

or how often the bougie should be passed, we are simply informed that—

"The passage of bougies, though occasionally very useful, is not frequently required, and has been known to give rise to emphysema of the neck, even where every precaution appeared to have been taken."

So that we are almost induced to hope that the student will get some further information on the subject before he "often succeeds" in the direction indicated. The structure and treatment of polypi of the ear is dismissed in a few words. In justice to the author we must say that in no way does he endeavour to convey an impression that he is speaking from a large experience in treating diseases of the ear; at the same time we can hardly congratulate him upon having achieved the object which he states that he had in view when writing this little book, viz. "to throw some light upon a much neglected department in surgery," for it is difficult to dispel the idea that the light, however good it may be, is rather a borrowed than a direct one.

Green's Morbid Anatomy.[1]—The publication of a second edition of this excellent little work, at a very short interval after the

[1] *An Introduction to Pathology and Morbid Anatomy.* By J. Henry Green, M.D. Lond. Second edition, 1873.

appearance of the first edition, demands some notice from us. The present volume is, indeed, in every way creditable to its author, for, as he tells us, some of the chapters have been entirely re-written, and additions and alterations have been made in various subjects. The important subjects of acute tuberculosis and pulmonary phthisis, which were somewhat briefly alluded to in the former edition, have been treated at much greater length, and a chapter has been added on pyæmia and septicæmia. It has also been deemed advisable to append a short chapter on the preparation and mounting of specimens for microscopical examination. As many as forty new woodcuts have been added, drawn from the author's preparations.

We remember that when 'Green's Pathology' first appeared a distinguished, but no longer youthful, physician expressed to us his high approval of it, as "giving one the meaning of all those new-fangled German names, you know." And we have no doubt that much of the success attained by this little book has depended on the circumstance that it has been found extremely useful by men who are removed from the great centres of medical study, but who, nevertheless, wish to keep themselves *au courant* with the existing state of pathological science, at least so far as its leading facts are concerned. The late discussions on the subject of tubercle, and even the reports of meetings of the various medical societies, must have taught every medical man throughout the country who ever looks into a journal that he will have to bring his mind to regard tubercle and cancer and inflammation in lights far more varied than before. The information contained in this work is just that which such a man requires. And we must and that it is presented to him in a most convenient and agreeable form. The chapters are no mere inventories of the several diseased states to which a particular organ is liable; they do not consist of minutely detailed discriptions of morbid appearances; they are rather compact and readable essays on all the divisions of pathological science in their turn. Only five of the forty-two chapters concern specially one organ rather than another; the remainder deal with general morbid conditions, the affections of particular viscera being introduced at those points where they can be most fitly considered in connection with the subject as a whole.

To this arrangement in part, but perhaps still more to the small size of the work, must be attributed a defect which we think the present race of students must have become sensible of—those, we mean, who are endeavouring earnestly to make themselves particularly acquainted with morbid histology. They will hardly find in 'Green's Pathology' the text-book they need. They will not be able to do without Rindfleisch's larger work, the character of which is, as it seems to us, much better adapted to the purpose they have in view.

We have already insisted on the merits which this book possesses, as being a concise and consecutive exposition of the existing science of pathology. We welcome it the more heartily because, among English books on allied subjects, such expositions are, unhappily, rare. The writers of the present day seem too often to direct their whole energies to the consideration of details, and to lack either the time or the ability to discuss general principles.

Fairlie Clarke on Diseases of Tongue.[1]—Notwithstanding the importance of the tongue in the human economy, and the number and variety of the affections to which it is liable, this is the first treatise —as far as we know—devoted specially to the study of its diseases, and the thanks of the profession are due to the author for the labour he has bestowed upon the subject, and the care and clearness with which he has laid before us the result of his observations. The part of greatest interest to surgeons at the present time in this work are those chapters which treat of "syphilis as it affects the tongue," and of cancer and its treatment. The diagnosis of cancer from syphilis is well known in many cases to be extremely difficult, and there can be little doubt that operations have not infrequently been performed for ulcerations which would have readily disappeared under the influence of iodide of potassium. The form of syphilis so closely resembling cancer is the deep gummy tumour terminating in ulceration, and Mr. Clarke furnishes us with a tabular view of the chief points of difference to aid us in the diagnosis. This table seems to refer partly to superficial ulcerations and partly to ulcerating gummata, so that its value is to some extent impaired. Thus, we are told that in syphilis the ulceration is primary, and that the sore never sloughs. Surely Mr. Clarke must have seen muscular gummata in which the ulceration was long secondary to the tumour, and in which the characteristic yellow slough became apparent as soon as the softened gumma reached the surface. This tenacious, slowly separating, yellow slough is about the most characteristic sign of a broken-down gumma with which we are acquainted.

Mr. Clarke is of opinion that the diagnosis may be still further complicated by the gradual transition from a syphilitic to a cancerous sore, the syphilitic ulcer "becoming gradually malignant." We are not prepared to contradict Mr. Clarke on this point, but it would have been more satisfactory if he had backed his opinion with a few recorded cases.

The subject of cancer of the tongue is dismissed by the author somewhat more briefly than we should have expected. During the last few years, in fact ever since the invention of the écraseur, operations for this disease have become more frequent and have

[1] *A Treatise on the Diseases of the Tongue.* By W. Fairlie Clarke, M.A., M.B. (Oxon.), F.R.C.S.

been performed with greater success than was before considered possible; but we are still ignorant of the exact percentage of mortality directly due to the operation, although the melancholy fact that recurrence of the disease has almost invariably occurred is only too well known. During the early part of the present century the fear of hæmorrhage prevented the majority of surgeons from venturing to attack a cancer of the tongue by any means but ligature, and this was only applicable to slight cases favourably situated. Indeed, the idea of seizing the tongue in a vulsellum, cutting off a portion, and then groping in a deluge of blood amidst the cries and struggles of the patient, and perhaps completing the operation by the application of the actual cautery, was almost too horrible to be entertained even by the courageous surgeons before the days of chloroform. After the invention of chloroform matters were but little improved, the danger of suffocation from the blood entering the trachea being sufficient to deter most surgeons from venturing on so serious and difficult an operation. Removal of the whole tongue was, therefore, until lately, one of the rarest operations in surgery. The operation may now, however, be considered to have been brought as near perfection as is possible by the invention of the galvanic écraseur. By the use of this instrument all fear of hæmorrhage is removed, while the length of time occupied in the division of the tongue is reduced to less than two minutes. The surface left after the section by the hot wire is certainly as healthy as that by the chain-ecraseur, and the shock of the operation is materially less, as the severe measures adopted by Sedillot, Syme, Regnoli, and others, to expose freely the divided lingual arteries, are no longer necessary. It is highly important, therefore, that the exact statistics of the operation should be collected, if possible, and we beg to recommend this point to Mr. Clarke's attention in his next edition.

In the earlier part of the work is a most interesting and valuable chapter on hypertrophy of the tongue, of which rare disease the author has collected 43 recorded cases submitted to actual treatment. Of these, 25 were congenital, a few arose from mercurial glossitis in adults, and all the rest commenced in childhood. In cases in which compression is impossible, from the youth of the patient and the moisture and mobility of the organ, Mr. Clarke recommends removal of the protruding part with the écraseur, an operation which was certainly most eminently successful in a case under his own care.

The work is illustrated by some excellent lithographic drawings by Mr. Burgess, which add greatly to its value.

Maunder's Operative Surgery.[1]—This second edition of Mr. Maunder's well-known guide to the operations upon the living and the dead subject exhibits a great advance upon the first one. During the twelve years which have elapsed since the author first entered the ranks of literature, he has been diligently employed at the London Hospital—a hospital which offers an almost unrivalled field for the practice of operative surgery. The experience which he has there gained makes itself visible throughout his whole work. He no longer speaks, as he did in his first edition, chiefly from knowledge obtained in the dissecting-room, or in conducting classes of operative surgery on the dead body. He speaks from the vantage-ground of one who has performed a sum total of operations upon the living subject such as few surgeons can boast of. Nor has his experience, like that of some, been almost or altogether in one particular line, or on one particular organ. He has performed operations ranging over the whole field of practice, from the simplest and commonest to the rarest and most difficult. Indeed, there seems to be hardly any operation of which he does not speak from personal acquaintance with the details of its management.

Upon two points Mr. Maunder claims the merit of originality, and there can be no doubt that it is fairly his due. In his preface he says, "The first edition contained no novelty; but now I venture to claim originality for an improvement on the method of excising the elbow-joint, and also on the usual mode of operation on the lower jaw." In excision of the elbow-joint he has shown that, in order to preserve the active movements of extension, it is most important to retain uninjured those fibres of the triceps which are inserted into the fascia of the forearm over the anconeus. If these are preserved, our author holds that extension may be secured with certainty; and the point is one of so much nicety in anatomy, as well as of so much practical value, that Mr. Maunder deserves great credit for having drawn special attention to it. The other original feature claimed by our author relates to an ingenious method of excising a great part of the lower jaw through the mouth without making any wound in the cheek, but, in order to understand the details of the proceeding, our readers who are curious on the subject must refer to the interesting narrative in which the author explains his method.

Though, on the whole, we can speak of this volume in terms of commendation, and confidently recommend it as one of the best text-books that are extant on the subject, yet, as a composition, it is very unequal in its several parts. Some chapters, more particularly those which deal with the major operations, are almost as full and

[1] *Operative Surgery adapted to the Living and Dead Subject.* By C. F. Maunder, Surgeon to the London Hospital, formerly Demonstrator of Anatomy in Guy's Hospital. Second edition. London, 1873.

explicit as we could desire, while others are much less satisfactory. The opening chapter, on splints and bandages, is meagre in the extreme. Again, some subjects are treated very briefly, while others are introduced and discussed at more or less length which might well have been omitted altogether. Thus, transfusion is an operation of great delicacy, and can hardly be adequately dealt with in seven lines. It is true that when it is required it is generally performed by the obstetric physicians, but that is no reason for passing it over so lightly. If it is to be included at all it ought to be accompanied by fuller and more detailed explanations. *Per contra*, the treatment of stricture of the urethra by caustics is so obsolete that it might well have been omitted altogether. We thought that when Mr. Wade died a year or two ago the last advocate of this method was gone. But it would be unfair to imply that our author recommends the practice. Far from it; indeed, he says that he questions the propriety of destroying by caustics the least portion of the lining membrane of the urethra, so that it is the more strange that he should think it worth while to expend three quarters of a page upon the subject. The space might have been used to much better purpose.

If we glance for a moment at Mr. Maunder's style we find little to praise, and one or two things which strike the critic unfavorably. Thus, the writing is sometimes obscure. For example, the long sentence at page 4, in which the author appears to be describing what is commonly known as the capitellum bandage, is not calculated to convey a very clear idea to the student, or to help him to apply it in such a way as would satisfy the examiners in Lincoln's-Inn-Fields. Again, it is not a mark of good taste in an author to introduce his own name into the body of the work, as Mr. Maunder has done at pages 206 and 328. A periphrasis might easily have been framed which would have conveyed the desired information without offending the reader's sense of the modesty which an author ought to show in respect to his own work.

Mr. Maunder uses some words which are either wholly new to us, or new in the sense in which he employs them, *e. g. tortured* (for twisted), page 31; *gastro-stomachotomy* (for gastrotomy), page 267; and *phalange* (for phalanx), page 286. These novelties of language, we trust, will not become common.

On the whole, there is a stiffness about this book which suggests that Mr. Maunder does not write *currente calamo*. We suspect he is more at home with the scalpel or aneurism needle than he is with the pen. Probably literature is not with him a labour of love. However this may be, there is certainly a want of fulness about his work—a want of detail, which detracts from its otherwise great merits.

Gallard—Diseases of Women.[1]—This large and important volume is another evidence of the great attention which has of late years been paid to the diseases of women. The work is one well worthy of study on account of its own merits, and is obviously the fruit of much thought and experience. It is, perhaps, more especially interesting to us on account of the diametrically opposite teaching it inculcates to that which recent writings have rendered fashionable in this country. With us, of late years, uterine flexions have become the simple explanation of all kinds of uterine disorders; and it appears that they suffice to account for all the morbid phenomena, or, at least, very nearly all, which are so commonly met with in women. Every other condition, we are distinctly told, may readily be explained by its dependence on some twist in the womb. Very different are our author's views of uterine pathology, and, we are bound to say, very much nearer to what we hold to be the true state of the case. Hence we find that flexions take a very subordinate place, and that the author holds that the large proportion of uterine diseases, including flexions themselves, are the immediate results of metritis, either acute or chronic, affecting both the mucous and muscular tissues of the uterus. Probably all who read this book, and it is well worthy of study by every one who is interested in gynæcology, will admit that the author falls into the apparently inevitable error of over-riding his own particular hobby; but the course it takes seems to us to be much straighter than the somewhat erratic one over which so many of our leading authorities are now running. Space will not admit of our criticising, or even mentioning the author's opinions, but we may briefly indicate the general tenor of his teaching. The author recognises two principal divisions of inflammatory diseases affecting the uterus—the acute, or rather subacute, and the chronic, the latter being much the most common, and under this heading he places all those varying conditions often described under the name of congestion or engorgement.

Internal metritis, affecting chiefly the mucous lining of the uterus, is, he says, much the most important variety of inflammatory disease, and explains, not only those affections described as uterine leucorrhœas or uterine catarrhs, but also the cause of severe and intractable metrorrhagia. He does not believe in menorrhagia as an independent affection. Whenever met with in at all a severe or continuous form, provided it is not dependent on some such definite cause as a fibroid tumour, polypus, or carcinoma, it may be traced to a chronic inflammatory condition of the uterine mucous membrane, and to this also he refers cases accompanied by vegetations, such as those described by Recamier, as well as cases of membranous dysmenorrhœa.

[1] *Leçons Cliniques sur les Maladies des Femmes.* By Dr. T. GALLARD. Paris, 1873.

He specially dwells on a fact which has been pointed out before by various writers, that in all old-standing cases of internal metritis the canal of the cervix and the cavity of the uterus are dilated, so that the interior of the organ is much more readily reached for the purpose of medication than under ordinary circumstances. Naturally the author lays much stress on intra-uterine medication, but by no means to the exclusion of other and simpler methods of treatment, all of which are discussed at considerable length. The form of intra-uterine treatment he recommends is that of injections into the cavity of the uterus; indeed, this is the only method he employs, except, occasionally, the insertion of medicated tents. He does not seem to have met with the distressing, if not serious, consequences which many authors have attributed to their use, and on this point we cannot but think his teaching is bad, if not dangerous. The evil effects often following intra-uterine injections have so frequently been pointed out that we hold them to be contra-indicated, especially as there are many other simpler and safer plans by which the same effects may be produced.

With regard to flexions, as we have said, the author believes them to be generally the secondary results of a pre-existing inflammatory disease. We are glad to see, however, that he does not, as one is so much tempted to do, take too one-sided a view with regard to them, but distinctly admits, what can hardly be doubted, that, especially with regard to new flexions, they occasionally are so important as to require the treatment to be especially modified in reference to them; while, again, in other cases they may safely be left to themselves until the concomitant inflammatory affection is cured. We have long held this to be the true line to take on this *quæstio vexata*, and the one most concurrent with clinical experience.

We cannot discuss the author's views as to constitutional and local treatment, which seem to us, on the whole, judicious. We think, however, that he has greatly under-estimated the importance of general and physiological rest as an element of cure.

Fully one half of the book, which contains over 800 pages, is occupied by the subjects we have alluded to; the remainder consists of chapters on other topics, such as hypertrophic elongation of the cervix and prolapsus, pelvic peritonitis, hæmatocele, and the like. All these are well and carefully handled, and give evidence of much research and observation. We can confidently recommend the work to such of our readers who are well acquainted with the French language, and would welcome an English translation, an honour of which the work is well deserving.

West Riding Asylum Reports.[1]—Dr. Browne's work evidently

[1] *The West Riding Lunatic Asylum Medical Reports.* Edited by J. Crichton Browne, M.D. London, 1873.

grows upon him, for he not only now issues a larger volume than either of those preceding, but also one which, as a whole, outweighs those others in the importance of its contents. He has likewise had the good fortune to attract to his aid several eminent workers in nerve physiology and pathology, to some of whom he has been able to afford the ample field for observation among the inmates of the large West Riding Asylum.

The present volume contains fourteen papers or essays, some of considerable length, on various subjects connected with mental and nervous disorder. A critical review of the facts and doctrines conveyed in these papers is out of the question in the space at command, for, with regard to several of the topics discoursed on, such a review might exceed the dimensions of the original essay. We must, therefore, restrict ourselves to a recapitulation of the contents, accompanied by a few general remarks.

In the first paper Professor Turner, of Edinburgh, sets forth in a clear style the present state of knowledge regarding the convolutions of the brain and their relation to the intelligence. It was composed by way of a lecture given at a medical conversazione at the asylum, and consequently traversed only the ground already occupied by accepted researches and hypotheses. Nevertheless, no one can read it without interest and instruction.

The second paper is one of exceeding interest. It contains the "Experimental Researches in Cerebral Physiology and Pathology" by Dr. David Ferrier, which have everywhere attracted the attention of scientific men by their originality and the light they would seem to cast upon the functions of the brain. To this paper that by Dr. Hughlings Jackson, entitled "Observations on the Localization of Movements in the Cerebral Hemispheres," may be considered the complement. Its main purpose is to enforce the study of palsies and convulsions as experiments made by disease, which—

"from this point of view is the study of the effects of 'destroying lesions' and of the effects of 'discharging lesions.' And for an exact knowledge of the particular movements most represented in particular centres, we must observe and *compare the effects of each kind of lesion.*"

By such methods we may hope to discover—

"not only the particular parts of the nervous system where certain groups of movements are most represented (anatomical localization), but, what is of equal importance, we shall also learn the order of action (physiological localization) in which these movements are therein represented." (p. 177.)

Every one who reads this admirable paper by Dr. Jackson will learn to view disease from a new stand-point, and will proportionately acquire a more thorough understanding of it. The same author contributes also an essay "On the Anatomical,

Physiological, and Pathological Investigation of Epilepsies," in which his views and his mode of proceeding as an interpreter of disease are further ably illustrated and enforced.

Dr. Major has a contribution on the histology of the brain in the insane, setting forth the results of minute examination of the cerebral substance in several cases; and, in further elucidation of brain alterations among lunatics, Mr. Clapham records the weight of the brain in 716 cases, a sufficient number, as it would seem, from which to deduce some general conclusions relatively to the matter of weight, as affected or not affected by madness. However, Mr. Clapham has simply supplied data, and, perhaps wisely, left theorising to others.

Heart disease has by some observers been spoken of as a very frequent concomitant of insanity, and some even have affected to consider the two related as cause and effect. Two papers in the present volume record observations on cardiac affections among the insane. Dr. Milner Fothergill examined the state of the heart in fifty-five sufferers with general paralysis, and, for comparison sake, in five cases of sub-acute mania, and found, as the leading fact, that in general paralysis and in other conditions of cerebral hyperæmia the heart's aortic second sound is usually accentuated. Dr. Burman contributes a complete essay on "Heart Disease and Insanity," in which he examines the influence of the former as contributing to the development of the latter, and as a cause of death, and gives the result of post-mortem examinations and of researches into the state of the pulse. His conclusions are summed up in nine propositions.

"The Power of Perceiving Colours possessed by the Insane" forms the subject of a paper by Dr. McDowall, one of the assistant medical officers of the asylum. The author states that this contribution is but introductory, and he therefore occupies it chiefly with a preliminary sketch of the general results and opinions concerning colour-blindness. It is only the last two or three pages that record his observations on the insane, and at present their results have not been drawn out. We may consequently look for more information from future papers, and, happily for Dr. McDowall, he would seem to have a field of research to himself hitherto unoccupied.

Dr. Crichton Browne has experimented with *nitrite of amyl* in epilepsy, and appears to have established its value in arresting fits when given on their approach, and also in arousing epileptics who have fallen in the frequently fatal condition styled the *status epilepticus*, wherein one paroxysm succeeds another in nearly unbroken series. If further experience confirms Dr. Browne's, a very valuable addition will have been made to our means for dealing with a most intractable and painful malady.

Waning space forbids further notice of this volume beyond an enumeration of the subjects of the remaining papers. These are

"Electro-excitability in Mental and Nervous Diseases," by Dr. John Lowe; "Notes on the Condition of the Tympanic Membrane in the Insane," by Mr. J. C. Galton; "The Obscurer Neuroses of Syphilis," by Dr. Allbutt; and "The Change of Life and Insanity," by Dr. H. Sutherland.

In conclusion, it is but simple justice to Dr. Crichton Browne to state the opinion that, in promoting and aiding in the carrying on of original observation and experiment, such as the present volume of the 'West Riding Asylum Reports' gives abundant evidence of, he is doing a great work for his profession, and one redounding immensely to his own credit. He moreover exhibits a bright example to other asylum superintendents in so turning to scientific account the resources of the institution of which he is the medical director; and certainly something is needed to arouse many of those gentlemen to a sense of their responsibility as professional men who ought to be scientific observers and utilisers of the grand fields for research their asylums offer.

Hubert Smith's Tent Life in Norway.[1]—We have been favoured with a copy of this narrative of a journey in Norway, and are pleased to recommend it to our readers. It contains nothing falling within the range of medical criticism, a fact, we are persuaded, which will further commend it to our medical friends. It will be refreshing to them to forget physic, and to follow Mr. Smith in the simple but sparkling narrative of his adventures day by day with the odd though interesting companions he took with him on his journey.

Moreover, medical men will learn from its pages how readily and inexpensively they may enjoy the grand natural scenery of Norway, if they can come to the conviction that their clientèle can well do without them for two or three weeks in summer. And it is singular to observe how well patients will keep, and how happy they seem, when the doctor is abroad. The volume is illustrated by many excellent engravings of scenery and incidents.

Nichols—How to Cook.[2]—The author of this book announces himself as also the expounder of "how to live on sixpence a day," and, consequently, must be held to have capped Abernethy, who got no farther than advising some folk to live on sixpence a day, failing to tell them how to do it. But Dr. Nichols has performed another marvel, and, "all for a shilling," undertakes to instruct his readers in "the principles and practice of scientific, economic, hygienic, and æsthetic gastronomy." Happy the cook who realises

[1] *Tent Life with English Gipsies in Norway.* By Hubert Smith, Member of the English Alpine Club, &c. With engravings. 1873. Pp. 540.

[2] *How to Cook: the Principles and Practice of Scientific, Economic, Hygienic, and Æsthetic Gastronomy, &c.* By T. L. Nichols, M.D. London, 1872. Pp. 134.

the principles of æsthetic gastronomy, and happier still the master of the æstheticised servant! All the senses duly and proportionately gratified, the spirit lulled in sweet satisfaction and enjoyment, the mind unclouded by noxious dishes, ... but we cannot continue the picture. Try to realise it, gentle reader, for yourself, and hesitate not to part with the trumpery shilling to learn how.

However, seriously speaking, although, unlike our brother professional Dr Nichol, dreadfully ignorant of the art and mystery of cooking, we are greatly impressed by the amount of instruction in his book, and, having embraced opportunities of testing several of his 'recipes,' we can speak to their excellence, and so confidently recommend his little treatise as a marvel of cheapness and of most valuable information, which, whatever be our pretended indifference about our dishes, cannot fail to contribute much to our comfort and enjoyment as "cooking animals."

Transactions of Societies.[1]—The volumes of transactions of the medical societies of London, issued annually, constitute no mean or unimportant additions to the medical literature of the country. Among their contained papers we find the results of work accomplished by many of our leading physicians and surgeons, and essays of originality in research which will leave their mark in the history of the progress of theoretical and practical medicine. Moreover, we are sure to find among them contributions reflecting the present tendency of opinion in most of those matters which are pre-eminently the questions of the day. Among such questions are those respecting the phenomena of fevers and inflammation, the nature of contagion, the functions and diseases of the nervous system, and tuberculosis. And so, if we turn to the volumes before us, we find these subjects discussed in papers of great merit, or illustrated by careful records of cases. Thus, in the transactions of the 'Medical and Chirurgical Society' we observe one of Dr. Lockhart Clarke's able and painstaking contributions on "Progressive Muscular Atrophy," a paper "On the Infective Product of Acute Inflammation" from the experienced physiologist Dr. Burdon Sanderson, and an "Analysis of Observations on the Temperature, Pulse, and Respiration in Phthisis and Acute Tuberculization," from a scientific physician, Dr. Wilson Fox.

Another subject that attracted much attention, which is to be found discussed in papers contained in this last and the previous volume of the 'Medico-Chirurgical Transactions,' is that of the

[1] 1. *Medico-Chirurgical Transactions, published by the Royal Medical and Chirurgical Society of London.* Second series, vol. xxxviii. London, 1873.
2. *Transactions of the Pathological Society of London.* Vol. xxiii. London, 1872.
3. *Transactions of the Clinical Society of London.* Vol. v, 1872.

pathology of Bright's disease and its relations to general vascular alterations. The discussion was marked by more than usual warmth, and it will be interesting to pathologists to read and compare the views and statements of the distinguished physicians who advanced the opposing hypotheses.

The transactions of the Pathological and Clinical Societies are less readable works than the 'Medico-Chirurgical Transactions,' but their value rests in the careful record of cases, the material from which the truths and principles of medicine must be drawn. The volume under review, sent forth by the Clinical Society, contains the address of its late president, Sir W. W. Gull, which, as a composition and a general discourse on physic, is very praiseworthy, but as a contribution to science or to the study of medicine presents no features calling for notice.

Speaking generally of the several volumes before us, they are highly creditable to the societies which have issued them, and also to English medicine.

Hunter on Health in India.[1]—In this little treatise, addressed to the public, Mr. Hunter has succeeded in conveying much valuable instruction, based on his personal experience. He first sets forth various considerations respecting the sanitary conditions of India, of Indian life, and of the climate, which may serve to guide those who contemplate a residence in the country in deciding on their fitness. And we may observe that the general lesson to those about to proceed to India is "Don't!" Better stay at home in your own murky climate, than bask in the sunshine of India and gather orient pearls and gold!

The next branch of his subject is to tell people who are infatuated enough to go there how to take care of their own health, and that also of their wives and families, should their unwisdom have further betrayed them to have wives and children in so undesirable a country. The chapter on "The Indian Nursery" is one valued by its writer as replete with information not elsewhere conveyed in a compendious form.

The last branch is appropriately addressed to those happy ones who escape the unhealthy region with their lives, though, it may be, scathed by fever, by liver disease, or by nervous or other maladies. For these his solicitude has prepared certain rules of living, and has imparted advice regarding the localities in their native land where they shall settle themselves.

We recommend the book for its sound advice, yet we must admit to considerable depression of spirits after reading its pages, and to

[1] *Health in India: Medical Hints as to Who should go there, and How to Retain Health whilst there, and on Returning Home.* By G. T. Hunter, Surgeon, Bombay Army. Calcutta, 1873.

the dissipation, always unwelcome, of the charm which occupies the mind of denizens of this cloudland of England, who dream of the tropics as good Bishop Heber, among other poets, has pictured them, where all is bright and glorious, and "only man is vile."

Hunter's Medical Hints.[1]—Although disbelievers in the value of short and easy guides to treat disease by those uninstructed in medicine, yet we are compelled to admit the necessity of popular medical works for the guidance of those who, by circumstances of locality, cannot avail themselves of the services of properly educated medical men. Such must be the case with many of our colonists, and not less so with those who are distributed over the wide regions of our Indian Empire. To the last named Mr. Hunter addresses his little book, and, as appears from the brief preface attached, not without encouraging recognition and appreciation, inasmuch as the first edition was rapidly sold off.

To carry out his objects, he gives a list of medicines he deems essential to be at hand, noting their action and doses. Following this, the next portion of the book is taken up with very brief notes of symptoms and treatment of the most common diseases, arranged in alphabetical order. A third chapter deals with accidents, their symptoms and treatment; whilst the fourth and concluding one is occupied with "hints for the prevention of disease."

It is clear the author has studied simplicity in discoursing of the several matters noted, and generally his memoranda respecting symptoms and treatment are truthful and in accordance with general opinions and practice.

It strikes us, however, that the author has too widely directed the use of mercury and antimony. Calomel, blue-pill, and antimonial wine figure the most frequently in his prescriptions. Directions to take *alterative* pills perpetually occur, these so-called pills containing blue-pill as a principal ingredient.

With this exception, there is no other teaching in the book to call for unfavorable criticism.

Griffiths' Posological Tables.[2]—This is a convenient chart of the simple drugs and compounds of the 'British Pharmacopœia,' showing their doses. Similar officinal substances having like doses are bracketed together, and the resemblance of them thereby facilitated. The typography is good, and altogether these tables will be found useful to those for whom they are intended.

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[1] *Medical Hints for the Districts, &c.; arranged for Government Officials, their Families and Camp-followers.* By G. T. HUNTER, Surgeon, Bengal Army. Second edition. Bombay, 1872.

[2] *Posological Tables, being a Classification of the Doses of all Officinal Substances; for the Use of Students and Practitioners.* By W. H. GRIFFITHS, Ph.D. Dublin, 1873.

Original Communications.

I.—Community of Disease in Man and other Animals.

By W. Lauder Lindsay, M.D., F.R.S.E., F.L.S.

"For that which befalleth the sons of men befalleth beasts; even one thing befalleth them: as the one dieth, so dieth the other; yea, they have all one breath; so that a man hath no pre-eminence above a beast."—Ecclesiastes, iii, 19.

The time has now gone by in this country when it was a heresy, provocative only of ridicule, to assert that man and other animals are subject to the same kinds or forms of disease. But, a quarter of a century ago, he, who had the hardihood to express such an opinion, was derided, or was liable to derision, as a speculative fool. I very well remember that little more than twenty years ago, when I ventured publicly to affirm, *inter alia*, not only that man, in common with at least certain other animals, is subject to a number of diseases previously generally regarded as specifically or peculiarly *human*; but that certain human diseases may be artificially produced in the lower animals, and that I had myself succeeded in artificially inducing *human cholera in the dog and cat*,[1] I was laughed at by some of the most eminent medical authorities in Edinburgh. This did not deter me for a moment from pursuing the line of *experimental investigation in comparative pathology* that I had proposed to myself, and which I have followed, when opportunity afforded, ever since. Latterly, however, my studies in comparative pathology have given place to others of at least equal importance and interest in *comparative psychology*; or, rather, I have changed the course of my investigations in the direction of the *psychology* of the lower animals, both in health and disease—in that of the twofold relationship of the *physiology and pathology of mind in the lower animals*. The announcement made, only two or three years ago, as the result of these latter studies, that the lower animals,

[1] (1) "Experiments on the Communicability of Cholera to the Lower Animals," 'Edinb. Med. and Surg. Journal,' April and October, 1854; 'Gazette Hebdom. de Méd. et de Chirurgie,' Nov. 24th, 1854.

(2) "Clinical Notes on Cholera," 'Association Med. Journal,' 1854, especially pp. 1110 and 1111.

or certain of them, not only possess *mind resembling that of man*—but are subject to the same classes of *mental disorder, produced by the same predisposing and exciting causes*,[1] was received with apparently as much surprise and incredulity, in some quarters, as the expression of my earlier opinions regarding certain of the bodily disorders common to man with other animals.

A wonderful revolution has taken place, however, during the last twenty years, in public and professional opinion, regarding the attention due to the study of the *diseases of the lower animals*. The cattle plague in this country of 1865[2]—the horse epidemic in the United States and Canada of 1872—the various recent cases in London, Glasgow, and other towns, of typhoid fever produced by poisoned milk—the appointment of public analysts and of medical officers of health under the Public Health Act, have all contributed to this result. But there remains an inveterate tendency, even among men of the highest special culture or general intelligence, to *differentiate man from all other animals*. The majority of men and minds insist on his occupying quite a different zoological platform—in respect equally of his structure, functions, mind, soul, and even diseases. Comparative anatomists, however, have shown conclusively that man's body is built up exactly on the same plan, and of the same materials, as that of other animals; and that there is really little anatomical difference between his body and that of the animals standing next him in the zoological scale—the anthropoid apes. Comparative physiologists have pointed out with equal clearness the identity of at least the majority of his functions with those of other animals. The scientific evidence as to man's structure and functions—anatomy and physiology—is so strong and so clear that even the most pertinacious upholders of man's supremacy are forced to concede that, in these respects, he constitutes but an upper link in the zoological chain. They still maintain, however, that his supremacy is sufficiently maintained—that his pre-eminence over what are so complacently called the "lower" animals is sufficiently indicated—by his possession of *mind*, soul, and spirit; while the alleged marked difference in the character of man's *diseases* is regarded as a corroborative differential diagnostic. *Comparative psychology* is, indeed, so little known in this country,[3] even by name, that Professor Cob-

[1] (1) "The Physiology of Mind in the Lower Animals," 'Journal of Mental Science,' April, 1871.

(2) "The Pathology of Mind in the Lower Animals" (including "Insanity" or "Madness"):

(*a*) 'Brit. and For. Med.-Chirurg. Review,' July, 1871.

(*b*) 'Journal of Mental Science,' July, 1871, and January, 1872.

[2] *Vide* my papers on "Cattle Plague (or Murrain)" in the 'Lancet,' May 16th, 1857, and 'Perthshire Advertiser,' January 25th, 1866.

[3] It is not, however, altogether unknown on the Continent. The 'Annales Médico-Psychologiques' for 1863 contain the "First Lecture of a Course in Comparative Psychology," by Professor Chauvet.

bold, of the Royal College of Veterinary Surgeons, London, lately wrote me (in December, 1872), "Comparative psychology is a *new field of research*, and you are the only British representative of the science." Referring especially to *morbid* psychology—the *pathology* of mind—the natural history, that is, of *insanity* in the lower animals—Professor McBride reports (letter of May 23, 1871), "I know of no articles bearing upon the subject in veterinary works. . . . . As far as my own reading goes, I must say I *do not* remember ever seeing the subject mentioned." And even yet, *comparative pathology*, also, is a study little attended to in this country, whether by medical or veterinary practitioners.[1]

Believing that—

(1) The *experimental study* of the diseases of the lower animals is at present the most promising direction or source in or from which to expect material assistance in further research on those of man;

(2) The diseases of animals (*a*) arise from the same causes;[2] (*b*) exhibit the same symptoms; and (*c*) require the same treatment or remedies as those of man—*mutatis mutandis*—making all due allowance, that is, for differences in structure and habits; and

(3) Few, if any, diseases are absolutely *peculiar to man*;[3]

it occurs to me to submit to others some at least of the data on which my own strong opinions are based, in the hope that, in the course of time, these opinions may be generally both accepted and acted upon.

In the course of my reading during the last twenty years I have been in the habit of keeping a record of the different types of disease that occur in the lower animals, and the result is a large

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[1] Professor McBride, of the Royal Agricultural College, Cirencester, reports (May 23, 1871)—"I am sorry to say we have *no* scientific British work on the Diseases of the lower animals."

So long ago as 1858 I brought under the notice of the Council or Secretary of the New Sydenham Society the propriety of issuing a volume on Comparative (including Experimental) Pathology, suggesting as the joint editors Professor John Gamgee, then of Edinburgh, and Dr. Benjamin Richardson, of London. I submitted a scheme of the contents of such a volume, illustrating their variety and importance to public health. I am more than ever of opinion that such a work would be of infinitely higher value than any which that society has yet issued.

[2] *Vide* Gamgee in 'Edinburgh Veterinary Review,' January, 1861, p. 4.

[3] I do not profess to claim this opinion as peculiarly my own, though it is original in so far as it is based on my own inquiries. In the course of my reading I have occasionally come upon similar opinions expressed by veterinary or other writers. A perusal, for instance, of Fleming's 'Animal Plagues' must, I think, convince any competent judge of the evidence offered—that there are few human diseases that do not also affect the lower animals. That work abounds in illustrations of the close connection (*e.g.* as to coincidence in time, symptomatology, and etiology) between the epidemic and sporadic diseases of man and those of other animals. Even Hippocrates "speaks of having been informed by those who understood *horses* that these animals were liable to *all* the infirmities with which mankind is afflicted" (Fleming's 'Animal Plagues,' 1871, p. 8). Blaine has made a similar statement regarding the *dog*.

accumulation of notes on the subject. This reading has included a great variety both of veterinary and medical works, pamphlets and periodicals, books of travel and natural history, as well as the current newspaper and serial press. What it seems to me most desirable at present to do is simply—from the records above mentioned—to tabulate the chief diseases common to man and other animals; and this for a variety of reasons, which include the following:

(1) The subject is much too vast to admit, in such a paper as the present, of more than a mere enumeration, or *catalogue raisonné*, of diseases. I must reserve for subsequent exposition or comment[1] many points of great interest connected with the natural history and investigation of special diseases or conditions, such as rabies and hydrophobia, smallpox, and alcoholism.

(2) Such a mere list will, nevertheless, suffice to give a general idea of both the number and variety of those diseases which are (*a*) common to all the higher animals at least; including those affections which are (*b*) intercommunicable between them, and those which are (*c*) artificially producible.

(3) It will serve also as a basis for future comment and research in comparative pathology and psychology by showing how probable it is that *few, if any, diseases are peculiar to man on the one hand or to other animals on the other.*

My list does not profess, then, to be exhaustive or complete. It merely contains the names (with certain notices) of those diseases that I have seen mentioned by medical, veterinary, or general writers in the course of my own inquiries in comparative pathology and psychology during the last twenty years. To give a *full* catalogue would require the co-operation of foreign veterinarians and physicians, and an enormous amount of bibliographical investigation; while this is by no means necessary to my present and general object, which is simply, as I have said, to show how few, if any, of the diseases at one time supposed to be peculiarly *human* really are so, and how closely allied to man are other animals in their pathology, as in their anatomy and physiology. My catalogue, may, however, easily be rendered fuller by any student who will take the trouble of consulting the various and voluminous veterinary journals or standard veterinary manuals of this and other countries, more particularly of Germany and France.

In separate (special) sections of my list I specify the main diseases.

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[1] The convenience equally of reader and writer will be best consulted by first tabulating the diseases common to man and other animals; and thereafter—probably on some future occasion—commenting at length on some of the most interesting or puzzling of them, pointing out certain problems regarding them that still await solution.

(1) Communicable—either
  (*a*) From the lower animals to man, or
  (*b*) From man to other animals;
(2) Re-transmissible between man and other animals; or
(3) Artificially producible in the lower animals—either by
  (*a*) Exposure to contagion;
  (*b*) Inoculation;
  (*c*) Excitation or destruction of particular parts of the nervous system or other bodily organs;
  (*d*) Inhalation (pulmonary); Ingestion (gastric); or other means.

This latter category (of diseases artificially producible) is, I believe, destined to be largely added to; and its importance in relation to the study and progress of *human pathology* must be obvious.

Simply for convenience' sake, I name and classify according to 'The Nomenclature of Diseases drawn up by a Joint Committee appointed by the Royal College of Physicians of London,' published in 1869. It is the newest medical nosology in this country, and it is an authoritative and standard one generally known and accepted by the medical profession. I am far, however, from regarding it as a satisfactory scientific arrangement. All such classifications are artificial; all abound in difficulties or anomalies inseparable from man's efforts to improve upon Nature—to arrange natural objects or phenomena in unbroken linear series—to draw lines of demarcation where Nature has none! Systematists of all kinds seem either ignorant or forgetful of those obvious *laws* of *gradation of transition*, and *continuity of variation*, that pervade *all* Nature, and are illustrated in *all* her products or phenomena!

I. *Catalogue of Diseases common to Man and other Animals.*[1]

I. *General Diseases.—Group A.*

1. *Smallpox.*—Cow, horse, monkey[2] and ape, cattle,[3] cat, dog (Youatt and Walsh), pig, camel, sheep. There is difference of opinion as to whether the "smallpox" of so many different species and genera is a mere *variety* of that which occurs in man, or differs sufficiently to constitute a separate *species*. The preponderance of opinion, at present, is decidedly in favour of the latter opinion. Hence medical and veterinary writers alike recognise—

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[1] A further list and references will be found appended to the author's paper on "Madness in Animals," 'Journal of Mental Science,' vol. xvii, 1871, p. 97.

[2] The editor of Cassell's 'Popular Natural History' tells me (November 14th, 1873) that "the statement about monkeys and smallpox, which appeared in the first edition . . . . was afterwards discovered to be erroneous, and was expunged in subsequent editions."

[3] I find "cat-pox" mentioned by veterinary writers, and presume a disease analogous to "cow-pox" and "smallpox" is referred to.

(*a*) *Variola humana* = "smallpox" proper.

(*b*) *Variola vaccina* (or *vaccinia*) = "cow-pox." The Royal College of Physicians of London, in its 'Nomenclature of Diseases,' (pp. 3 and 187), classifies it separately; on the other hand, Professor Aitken, of the Army and Navy Medical School at Netley, in his 'Science and Practice of Medicine' (fourth edition, 1866, vol. i), heads p. 271, "smallpox and cowpox identical in their nature," and correctly, as I think.

(*c*) *Variola ovina* = *clavelée* of the French. There are greater difficulties, due to the very different structure and habits of the animal, in regarding this as only a *variety or form* of human smallpox; but these present difficulties probably depend on our comparative ignorance of the disease in the sheep, and especially on the comparative absence of its scientific *experimental* investigation. There are so many points of interest connected with the pathology of *variola ovina* that I must devote a subsequent and separate commentary thereto. Meanwhile I may state that the whole tendency of advancing knowledge of the diseases of other animals, as compared with those of man, is to show that such supposed *species* of disease as variola humana, vaccina, ovina, equina, and others, are but *modifications of the same disease*. Hitherto, in studying the phenomena of the disease in animals differing so widely from man and from each other as the monkey, cow, horse, dog, pig, and sheep, sufficient allowance has not been made for the modifications attributable to structural and functional diversity.

2. *Measles* in the pig is frequently mentioned by veterinary writers; but possibly they may allude, in all cases, to entozoic diseases referable to trichina; or to tapeworm and their cysticerci[1] (*q. v.*). What is called "measled" pork appears always to refer to trichinosis (*q. v.*). There may, however (though I do not remember any authenticated instance thereof), be a disease in the pig or other animals of the character of measles in man. I find, for instance, Principal McCall, of the Glasgow Veterinary College, speaking of "measles" in animals. In all probability he refers to the trichinosis of pork; but there may be another form due to the presence of cysticerci; or there may possibly be a genuine "measles."

3. *Scarlatina*.—Pig.

4. *Dengue* has attacked horses, cattle, and poultry in Madras ('North British Daily Mail' of Glasgow, November 13th, 1872).

5. *Typhus fever*.—Horse, dog (Walsh[2] and Bruckmüller), cow,

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[1] Dr. Edward Smith, in his work on 'Foods' (1873, p. 62), refers to two entozoic diseases of pork:

(1) Measles—due to *Cysticerci;* and
(2) Small worm = *Trichina spiralis.*

[2] Better known as "Stonehenge;" the author of standard works on 'The Dog,' 1859, and 'The Horse,' 1862.

sheep, pig. "Distemper,"[1] described as a *low* form of fever resembling typhus, affects every dog at some period of its life (Walsh). The dog "is peculiarly liable to febrile attacks, which have always a tendency to put on a *low* form" (Walsh on 'The Dog,' p. 364). It does not follow, however, that the forms of dog-fever mentioned by Walsh are referable to typhus, though they seem more appropriately to find place in this category than among the "simple continued fevers."

6. *Enteric* (=*typhoid*) *fever*.—Hare; Pig.

7. *Simple continued fever*, including *febricula*.—Dog ("ephemeral fever," Walsh). All inflammatory disorders (acute and chronic) of the dog are attended with "sympathetic fever" (Walsh). All kinds of intestinal irritation (*e.g.* worms) in the higher animals are apt to be accompanied by "symptomatic fever." The so-called "fever" of the monkey may be mere irritative, secondary, sympathetic, or symptomatic fever from dentition or worms; as are also certain fevers of the horse and other animals. These kinds of fevers belong obviously to the category of *pyrexiæ*, which find no specific place in the College of Physicians' 'Nomenclature.'

8. *Yellow fever*.—Monkey, horse, cattle, dog, cat, sheep, goat, pig, rat, fish, oysters, flies—all at the same time with man, (*e.g.*) in Texas.

9. *Plague* (="black death").—Oxen and pig (Renatus). It is more than doubtful, however, whether this "plague" at Constantinople, in the year 381, was the "plague" of the College of Physicians' 'Nomenclature' (p. 7). The "black death" in Scotland about 1371 affected man, and other animals *e.g.* the pig. "I have seen," says an eye-witness, "two hogs in the street shake with their tusks the rags of a dead body. An hour afterwards they turned and turned and fell—they were dead."

10. *Ague*.—Tertian ague in the dog is mentioned by Darwin, on the authority, apparently, of some American writer ('Descent of Man,' 1871, p. 171, foot-note), as occurring in certain of the United States.

11. *Malignant cholera*.—Horse, cattle, dog, cat, sheep, pig, goat, monkey, zebra, tiger, panther, hare, rabbit, mouse, camel, raccoon, domestic or barn-yard fowls or poultry (ducks, chickens, geese), eagle, peacock, guinea-fowl, fish, and various other animals (especially mammals, and birds). In general terms it may be said to occur in a great variety of animals, both wild and domesticated. It is, perhaps, best known, however, among the lower animals—in the pig. What is known as "hog cholera" not unfrequently ravages the states of Illinois, Indiana, Ohio, and Iowa, in North America. The same uncertainty arises here as in the case of smallpox, rabies, and so many other diseases common to man and other animals, Whether the so-called "cholera" of the pig, dog, cat, mouse, monkey, and

[1] It is obvious that veterinarians apply this term to different diseases, not only in different, but also in the same, species.

other animals, is the same as that of man? Fortunately, in the case of cholera, direct experimentation has proved that *man's* cholera can readily be produced in at least certain animals resembling him in habits, if not also in structure. Pelly, in his 'Journal of a Journey from Persia to India' (1866, p. 80), states that horses in Afghanistan are subject to cholera: and that they are as liable to cramps or muscular spasm—quite as difficult of treatment—as in man.

12. *Diphtheria.*—Horse, ox, pig, fowl.

13. *Hooping cough.*—The so-called "spasmodic cough" of the dog may possibly be referable here.

14. *Mumps* (=parotitis).

15. *Influenza.*—Horse (Youatt[1]), in which animal it constitutes "distemper" (according to 'Chambers's Encyclopædia,' vol. iii, 1862); dog (Walsh). *Epidemic*[2] influenza was extremely fatal to horses in New York and the North American States generally, including Canada, in the autumn of 1872; deer, oxen, dogs, and cats, as well as man, being affected at the same time.

16. *Glanders.*—Horse, ass, mule, sheep.

17. *Farcy.*

18. *Equinia* (="grease").—Horse.

Glanders, farcy, and equinia are classed as three separate diseases in the College of Physicians' 'Nomenclature' (pp. 9 and 187). But there is probably no better reason for so separating them than for separating *Variola humana* from *V. vaccina*, or *Cholera humana* from *C. porcina*, or *Rabies*(= *Hydrophobia*) *humana* from *Rabies canina*. They are simply forms of the same disease, referable, apparently, to a single type.

19. *Malignant pustule* (="anthrax;" furunculoid;"[3] "joint murrain;" "black quarter;" "black leg;" "quarter evil;" charbon, Fr.; sang, Fr.; milzbrand, Ger.).—Oxen, sheep, horse, and man ('Fleming on Rabies,' 1872, p. 298); dog, rabbit, pigeon and other birds, fish and other animals, and generally in herbivora and omnivora among quadrupeds.

20. *Pyæmia.*—Dog (Bruckmüller).

21. *Puerperal fever* (Gamgee, in 'Edinburgh Veterinary Review,' Jan., 1861, p. 3).

Group B.

22. *Rheumatism*, acute (= rheumatic fever).—Cow. The whale is said to be very liable to rheumatism, judging from the many examples

[1] The author of a series of standard works on 'The Dog,' 1845, 'The Horse, 1857, 'The Sheep,' 1856, 'Cattle,' and other veterinary subjects.

[2] Exception has been taken to the application of such a term to the diseases of the lower animals, the objection being based on the etymology of the word. On the other hand, it is absurd to apply a different term to manifestations of the same disease simply because they occur in other animals than man.

[3] *Vide* Laycock in 'Edinb. Med. Journal,' 1856, p. 402.

of *rheumatic ostitis* in whales of different kinds that have been examined by Professor Struthers, of Aberdeen ('British Medical Journal,' December 21, 1872, p. 690). He refers to the "hitherto unexplained regions in pathology" which he had been investigating. So long ago as my student days, however, I remember frequently finding the bones of haddocks and other fish, that had been used at table, the seat of various thickenings or other deformities. But it did not occur to me then, nor does it now, that such morbid growths necessarily presuppose rheumatism, or that they themselves are of the nature of *ostitis*. In other words, I greatly doubt whether rheumatic ostitis is a disease that can be so easily diagnosed from its mere results—whether such a state of the skeleton is necessarily a *sequitur* of rheumatism? The dog, also, is very liable to acute rheumatism from damp kennels (Walsh). Of "Rheumatic Fever in a Cow" a case is given in the 'North British Agriculturist' of July 12, 1871.

23. *Muscular rheumatism:* Lumbago.—Dog (Walsh).

24. *Gout.*—Horse.

25. *Syphilis.*—Horse ('British and Foreign Medico-Chirurgical Review,' July, 1873, p. 91); monkey, rabbit, cat.

26. *Cancer.*—Lion; dog, liable, *e. g.* uterus and vagina (Walsh, Youatt, and Bruckmüller); birds (Buffon). The death of a lion from cancer of the jaw in Mander's Menagerie, at Dumbarton, in June, 1871, was reported at the time in the Glasgow newspapers (*e. g.* 'Daily Herald,' June 16, 1871).

27. *Non-malignant tumours: Fibrous*, including *fibro-cystic.*—To this category probably belong the "encysted tumours" of the dog (Walsh).

28. *Scrofula* with *tubercle* (including especially *phthisis pulmonalis, hæmoptysis,* and *acute miliary tuberculosis*).—Lion; dog (phthisis and hæmoptysis, Youatt, Walsh); monkeys, *e. g.* the *Cebus azaræ* of Paraguay (Rengger); turtle (tuberculosis, Frank Buckland); fowl (Crisp); swallow, parrot, goldfinch, grouse (phthisis). Consumption is not unfrequent in Brazilian monkeys. Monkeys in the Jardin des Plantes, Paris, generally die of phthisis (Sir Jas. Y. Simpson). Poultry are subject to "consumption" (Tegetmeier). "Pulmonary tubercle" was the cause of the sudden death, in Co. Armagh, Ireland, of Lord Lurgan's famous coursing hound, "Master Magrath," in 1871. Miliary tubercle occurs in the cat, according to Bollinger ('Virchow's Archiv,' vol. lv, quoted in 'British Medical Journal,' Mar. 1, 1873, p. 231), in lungs, kidneys, liver, and pancreas. "Microscopic examination showed a complete identity between the tubercles found in the cat and those met with in man."

29. *Rickets.*—Dog (Walsh).

30. *Anæmia.*—Dog (Walsh).

31. *General dropsy* (= anasarca).—Dog (Walsh and Bruckmüller).

II. *Local Diseases.*

32. *Catarrh,* including *coryza* (= nasal catarrh).—Dog (Youatt), horse (Youatt). Rengger (s. 50, p. 12)[1] found the Paraguayan *Cebus azaræ*—a monkey—liable to catarrh, with the same symptoms as in man; which catarrh, when often recurrent, led to "consumption" (= phthisis). Catarrh occurs, also, in other monkeys. Poultry "catch cold" just as man does (Tegetmeier).

33. *Inflammations* of all the ordinary kinds occur (*e. g.*) in the dog (Bruckmüller). Inflammatory disorders are a common result of domesticity or captivity in all animals (Pierquin). To this category may conveniently be referred *hyperæmia*, and *congestion—active and passive*—as they occur, *e. g.* in the dog (Bruckmüller).

34. *Hypertrophy and Atrophy* (of organs) occur in all the higher animals, just as in man.

35. *Degeneration* of tissues also occurs in a similar way.

36. *Parasitic* diseases (including ecto- or epi- and ento-zoa and -phyta) will be considered under the parts of the body affected.

37. *Malformations, injuries, and foreign bodies* occur, also, as in man; so do

38. *Functional* diseases of all the bodily organs, including the *brain*, where one exists.

A. *Diseases of the Nervous System.*

(1) *Brain and its Membranes.*

39. *Encephalitis* (=*cerebritis; phrenitis*).—Sheep (Bertolini), horse (= "mad staggers"—Bertolini), ox (Bertolini).

40. *Apoplexy.*—Horse (Youatt), dog (Walsh), fowls or poultry (Tegetmeier), monkey (*e. g. Cebus azaræ*—Rengger).

41. *Hydrocephalus.*—Dog (Bruckmüller). But I am not aware how far the term, as applied by veterinarians, may refer to the acute form (= tubercular meningitis), or to the chronic form of the College of Physicians' 'Nomenclature,' which are classed separately (p. 33), or to both.

42. *Hydatids* of Brain.—"Sturdy" of sheep (Bertolini); horse (Bertolini), ox (Bertolini), dog (Walsh), goats and sheep (Hippocrates: *Vide* No. 46, Epilepsy). Pepys writes, in his 'Diary,' of the year 1661:—"The herdsmen noticed that there were worms in the heads of the affected animals," viz. horses, oxen, and sheep, attacked with symptoms of phrenitis and vertigo (Fleming, 'Animal Plagues,' 1871, p. 146).

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[1] 'Naturgeschichte der Saügethiere von Paraguay,' 1830.

(2) *Nerves.*

(*a*) *Organic Diseases.*

43. *Paralysis* of various degrees.—Dog, in which it is sometimes so extensive as to deserve the appellation "general paralysis." Youatt ('On the Dog,' p. 139) describes a paralysis in rabies as sometimes approaching "a general paralytic affection." There is paralysis of the muscles of the lower jaw in that form of rabies known as "dumb madness" (Youatt). Partial paralysis—*e. g.* of the hind legs—of the horse occurs from stomach-staggers or other digestive disorders (=sympathetic paralysis, Gamgee); while paralysis of the fore legs is sometimes the result of the presence of intestinal *lumbrici* (*q. v.*).

(*b*) *Functional Diseases.*

44. *Tetanus.*—Horse (Youatt), dog (Walsh).

45. *Rabies* (= *hydrophobia*).—Dog, wolf (Youatt 'On the Dog,' p. 150), horse, ass, sheep, wild jackal (*e. g.* in India), badger, pig, cattle (ox, cow, heifer), rat, rabbit, bear, mule, goat, fox, hyæna, guinea-pig, elephant, raccoon, cat frequently (Youatt, p. 150); poultry (common fowl—cocks, hens, and ducks—Youatt[1] and Fleming). All the higher animals are subject to it (Youatt).

I have no doubt that canine rabies and human hydrophobia, when they are *both genuine*, are the same disease; and there is every reason for believing that it is the same disease that occurs in the many different animals just named. The parallelism, as regards both mental and bodily symptoms, between the rabies of the dog and the so-called "hydrophobia" of man, is complete. But the latter term should be abolished as both unnecessary and mischievous; for it refers simply to a symptom which is far from being common in the genuine disease, either in man or other animals, while it is comparatively common in the *spurious* disease of man. There are, however, so many points of interest connected both with the spurious and genuine disease, as they occur alike in man and the dog, that I propose devoting an entire separate paper to their discussion.[2]

46. *Epilepsy.*—Horse (Youatt), dog (Fleming on 'Rabies,' p. 237), cat (its so-called "fits" are, no doubt, referable here),[3] cattle, pigs, guinea-pigs, crossbill. Frequently a result of hot weather in the pointer and setter (dogs). "The fit almost always occurs just after

[1] Youatt on 'The Dog,' 1845, pp. 148 and 150. *Vide* also Pierquin, 'Traité de la Folie des Animaux,' 1839, vol. ii, p. 94.

[2] Meanwhile the reader will find the subject so far discussed in the author's paper on "Madness in Animals," 'Journal of Mental Science,' vol. xvii, 1872, p. 181.

[3] Epileptic fits in the cat are mentioned in the 'Animal World' for October, 1873, p. 149.

a 'point,' the excitement of which seems to act upon the brain in producing it" (Walsh). Common in dogs and highly-bred pigs, also in cattle; rare in horses, in which it is sometimes mistaken for "megrims;" in dogs a frequent sequel of "distemper" ('Chambers's Encyclopædia,' vol. iv, 1862, p. 95). One of the commonest maladies of captive animals. Monkeys and parrots are particularly liable to it. As in man, it sometimes leads to, or is accompanied by, mania, dementia, and death (Pierquin, vol. i, p. 326, foot-note). Suppression of milk in the bitch from cold (*e. g.* from the use of the cold bath) may determine *cerebral congestion* in the form of epilepsy. A strange instance is given of a litter of puppies becoming epileptic subsequent to the development of epilepsy in the mother (Walsh, 'The Dog,' p. 461)[1]. Hippocrates "observes that goats and sheep are very liable to epilepsy, probably due to hydatids in the brain" (Fleming's 'Animal Plagues,' p. 7). Among the commonest results of the artificial life of the dog—which implies deficient exercise with overfeeding—are "fits" (Blaine). The crossbill (*Loxia curvirostris*) is often attacked with epilepsy (Broderip, 'Zoological Recreations,' 1847, p. 51). Epilepsy was "the first manifestation of brain disease" in Dr. Kane's Arctic dogs (Fleming on 'Rabies,' p. 81).

47. *Vertigo.*—The "megrims" of the horse is a form of vertigo, according to 'Chambers's Encyclopædia' (vol. vi, 1864, p. 391); but it does not appear whether it is of the nature of the "epileptic vertigo" of the College of Physicians' 'Nomenclature' (p. 39).

48. *Convulsions.*—Dog; especially in breeds of high nervous sensibility, from the irritation of dentition or worms, or in the course of "distemper" (*e. g.* in bull-dog, pointer, and greyhound—Youatt and Walsh); horse, cattle, guinea-pigs. "A fearful state of excitation," ending in convulsion, is apt to be produced in the parturient bitch by any drain or exhaustion that increases the high nervous irritability then existing (Walsh, 'The Dog,' p. 459).[2] Instances of convulsions in the dog are given in the 'Animal World,' October, 1873, p. 151. Of a young spaniel that had lost its mother it is said that "for six weeks he refused all consolation and almost all nutriment. He became at length universally *convulsed,* and died of grief" ('Percy Anecdotes,' Timbs' edition of 1868, section on "Instinct," p. 805). Convulsions are rare in horses and cattle, but common in *young* dogs. They are met with in *young* cattle, from simple indigestion—that is, from sympathetic derangement (Gamgee).

49. *Spasm of muscle: e. g.* in the cramps of cholera (*q. v.*) in the horse.

50. *Chorea.*—Dog; especially, like general convulsions, in breeds of high nervous sensibility; a usual sequel of "distemper;" some-

[1] *Vide* paragraph on Hereditary Transmission of Disease, in present paper.
[2] *Vide* Disorders of Parturition, in present paper.

times symptomatic of worms (Walsh); very common among dogs generally as a sequel of "distemper" ('The Field').

51. *Hysteria.*

52. *Catalepsy.*—Confined to the pointer and setter in the dog (Walsh). It is said that native jugglers in Egypt, by pressing with their fingers the nape of the neck of the aspic—an Egyptian snake (= *Naja haje*)—can throw it into a state of catalepsy (Dr. Baird, 'Cyclopædia of the Natural Sciences').

53. *Syncope.*—Dr. Leith Adams states (in his 'Field and Forest Rambles,' 1873, p. 91, foot-note) that the young moose of New Brunswick, "when irritated by dogs . . . . . has been known to *drop dead* through *paralysis of the heart.* . . . . . A dog rushed suddenly on a calf-moose, which *fainted and expired immediately*"—a fatality that befel another when startled by a loud sound. These phenomena may, perhaps, be more fitly considered under the head of *heart* disease, though there is no such condition mentioned in the College of Physicians' 'Nomenclature' as "*paralysis*" of the heart. The sudden deaths from *fright* in captured animals, *e.g.* small birds; and from *exhaustion* in hunted animals, *e.g.* hares —are, no doubt, referable here—in part, at least.

54. *Neuralgia,* including *Pleurodynia.*

55. *Hyperæsthesia* and *Anæsthesia.*—It is well known, for instance, that bees "can be rendered peaceable by smoking them." A peculiar condition of partial anæsthesia is the result, in which "you can do with them almost anything you like." (Figuier, 'Insect World,' 1872.)

56. *Hypochondriasis.*

Disorders of the Intellect (= *Intellectual Insanity*).[1]

57. *Delirium* arises in the course of many diseases (*e.g.* rabies), and is frequently, for the time, the most prominent feature of the disease. It is often not easily distinguishable from mania, and is apt to be confounded with certain other diseases or morbid symptoms. Thus, Walsh speaks (though not very correctly) of "raving" delirium in the dog as easily mistaken for "hydrophobia" (= rabies). The cat seems specially subject to delirium, and next to it the dog. The only sort of "delirium" that finds a place in the College of Physicians' 'Nomenclature' is *D. tremens* or *D. alcoholicum* (pp. 180-81). This also probably occurs in animals under the influence of *alcohol* (*q. v.*), of which certain of them are very fond, and in which they indulge to excess.

58. *Mania,* acute.—Frequently, if not generally, described as or confounded with rage, fury, frenzy, or franticness.

[1] *Vide* author's papers already quoted on Insanity (or madness) in the lower animals.

59. *Melancholia*, frequently with *suicidal tendency*.—Apt to be overlooked as mere depression of spirits, or as ascribable to "distemper" or some other bodily illness.

60. *Dementia*, including all the degrees of *mental imbecility or fatuity*, congenital, or developed subsequently to birth. To this is to be ascribed much of the unteachableness, stupidity, and vice of certain domestic animals.

61. *Idiocy, congenital* (=*amentia*).—Horse.

62. *Paralysis of the insane* (=*general paralysis*).—That the lower animals suffer from general paralysis has already been shown; that this paralysis is sometimes associated with insanity has, however, yet to be proved. But I object to the use of such terms as the headings above quoted from the College of Physicians' 'Nomenclature' (p. 41). In man there are various combinations—various in kind and degree—of insanity with paralysis; but I have long held, and frequently published, the opinion[1] that there is *no such separate form, variety, or species of insanity as the "general paralysis of the insane;"* that the said term is a misnomer and its use mischievous; and that the endeavour to establish such a special form of insanity is simply an illustration of man's persistent ingenuity and arrogance in the futile attempt to differentiate insanity from sanity, the insane from the sane, diseases of the brain from those of other parts of the nervous system and of other bodily organs!

The presence of *monomania* cannot be proved in the lower animals in the same way in which it can be shown to exist in man. We have not speech and writing to assist us. But I have, nevertheless, no doubt of its presence in such animals as the dog and horse, though this is not the proper place to set forth the grounds of my belief.

In the College of Physicians' 'Nomenclature' (p. 41), I take exception to the arbitrariness of a classification that *ex*cludes "hypochondriasis" from "disorders of the intellect," while it *in*cludes "paralysis of the insane" and "congenital imbecility," both of which are *un*necessary refinements of nosology.

Diseases of the Eye.

63. *Conjunctivitis* (=*ophthalmia*).—Dog (Youatt and Walsh).

64. *Opacity of cornea* (=*leucoma*).—Birds and reptiles frequently (Crisp[2]).

65. *Amaurosis*.—Dog (Walsh).

66. *Impaired vision:* and *Muscæ volitantes*, depending, probably, on disease of the *choroid* and *retina*.—Horse.

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[1] *E.g.* in the Medical Reports of the Murray Royal Institution for the Insane (Perth), 31st, 1858, p. 12; and 32nd, 1859, p. 16.

[2] Dr. Edwards Crisp, of London.

67. *Albinism.*—Occurs in the following birds of New Brunswick, according to Dr. Leith Adams ('Field and Forest Rambles') :—Snow bunting; ruffed grouse; migratory thrush, or robin; rusty grackle (p. 76); pigeon hawk (p. 121); barn swallow (p. 150); bobolin (p. 156); and in many other animals (index, p. 323).

68. *Cataract.*—Monkey (Rengger); not very common among monkeys (Crisp, at a meeting of the Pathological Society of London on May 16th, 1871, as reported in the 'Brit. Med. Journal' of June 17th, 1871). Marsupials, more or less common (Crisp). Lemur, bear, dog, horse (Crisp). Dog (Walsh). Lion and leopard (Sir Jas. Y. Simpson[1]). An *old* cat belonging to a relative of my own has double cataract, and I have no reason to believe such an affection to be uncommon in *old* cats or dogs.

Diseases of the Ear.

69. *Inflammation* (=*otitis*).—The "canker" of the dog (Walsh). It does not appear, however, whether this "canker" is inflammation of the external meatus or internal ear, or whether it is not rather what the College of Physicians' 'Nomenclature' designates "cancer" (p. 55).

Diseases of the Circulatory System.

A. *Diseases of the Blood*

do not find a place at all in the College of Physicians' 'Nomenclature,' while they are infinitely more important than scores of the so-called "diseases" that occupy its 326 pages! In fact, a large proportion of the "diseases" therein catalogued are partly mere repetitions of name, partly mere symptoms. Now, in the lower animals, as in man, the condition of the blood, both as to *quantity, quality, and distribution*, is of the highest importance; and it is the cause both of many diseases to which specific names have been given, and of others which puzzle the physician to give them any decided place in a nosology. The only condition, however, to which I give a separate place here[2] is the interesting one, recently discovered, of the existence in the blood, both of man and other animals, of various entozoa and entophyta.

70. *Entozoa.*—*Nematoids* in blood of man and dog, field-mouse, mole, and frog (=*hæmatozoa*); also as *filariæ* in the hæmaturia and chylous urine of man, according to Gruby, Delafond, and Lewis (in 'Brit. Med. Journal,' February 8th, 1873, p. 147). Dr. Webb, Assistant-Professor of Pathology in the Army and Navy Medical

[1] Mentioned in his letters from Paris contained in his 'Memoir,' 1873, by Prof. Duns.

[2] *Septicæmia*, no doubt, occurs among the lower animals just as in man, though it finds no place in the College of Physicians' 'Nomenclature.' Reference may be made under this head (the Blood) to *pyæmia, hyperæmia, anæmia.*

School, Netley, gave "a description of the Thread-worm (= *Filaria immitis*) occasionally infesting the vascular system of the dog, and remarks on the same relative to Hæmatozoa in general and the Filariæ in the human blood," in the 'Monthly Microscopical Journal' of October, 1873.

71. *Entophyta. Sarcina* (*q. v.*).

B. *The Heart and its Membranes.*

The dog, according to Bruckmüller,[1] is liable to "heart disease," but it is not stated to what particular forms thereof.

72. *Pericarditis.*—Birds.

73. *Hypertrophy.*—In hunted hares, probably the result partly of undue muscular effort, partly of *mental* excitement; just as undue effort in boating, cricket, or football, produces similar conditions in man (*e. g.* at Oxford or Cambridge, Eton or Rugby).

C. *The Arteris.*

74. *Aneurism.*—"Traumatic aneurism" in a bird was the subject of a paper by Dr. Crisp at the Pathological Society of London on November 18, 1873.

D. *The Veins.*

75. *Phlebitis.*—Horse (Youatt).

Diseases of Ductless Glands.

The Thyroid Gland.

76. *Bronchocele* (=*goitre*).—Very common in pet dogs (Walsh); horse, mule, cow, sheep, goat, pig.[2] Goitre occurs in oxen in Switzerland (Dr. Browne, 'Stories about Idiots,' 1873, p. 10). In the same work (p. 11) he speaks of "a cat with a goitre," as represented pictorially by Gottfried Kund—"the cat Raphael"—himself, curiously enough, a cretin.

Diseases of the Respiratory System.

A. *Not strictly local.*

77. *Croup.*—Dog (Bruckmüller), pig, ducks, gallinaceous and other birds.

B. *Nostrils and Larynx.*

78. *Coryza* (=*nasal catarrh*).—*Vide* "Catarrh," classified among

[1] Dr. Bruckmüller, of the Veterinary Institute of Vienna, as quoted in Fleming's 'Rabies,' p. 288.

[2] *Vide* Dr. Foot "On Goitre in Animals" ('Proceedings of Natural History Society of Dublin,' vol. vi, 1871).

"Local Diseases" in College of Physicians' 'Nomenclature' (p. 29).

76. *Laryngitis.*—Dog (Walsh).

c. *Bronchi.*

77. *Bronchitis.*—Horse (Youatt), dog (Walsh). Constitutes "distemper" in the dog, according to Chambers's 'Encyclopædia' (vol. iii, 1862, p. 593); but other works describe the "distemper" of the dog as a "catarrhal fever." This may or may not mean influenza, which is said to constitute the "distemper" of the horse. It is at least awkward that veterinarians apply the same term "distemper" to very different diseases in different animal species or genera. The 'Animal World' of October, 1873 (pp. 148-9), speaks of severe bronchitis in the cat, and describes that animal as very liable to bronchitis.

78. *Asthma.*—Especially in captive animals (Pierquin); dog ("spasmodic asthma," Walsh [1]); horse.

d. *Lungs.*

79. *Pneumonia.*—Cattle (="peripneumonia," and in them highly contagious); horse (Youatt), dog (Walsh), hippopotamus. In hunted hares death sometimes occurs from "double pneumonia" in tuberculous lungs, probably the "acute pneumonic phthisis" of the College of Physicians' 'Nomenclature,' p. 77.[2]

80. *Œdema pulmonum.*—Dog (Bruckmüller).

e. *Pleura.*

81. *Pleurisy.*—Dog (Walsh), horse (Youatt), monkey.

82. *Pleuro-pneumonia.*—The "distemper" of cattle, according to Chambers's 'Encyclopædia' (vol. iii, 1862, p. 593).

83. *Hydrothorax.*

Diseases of the Digestive System.

a. *Mouth, Tongue, and Fauces.*

84. *Thrush* (=*aphtha*).—Horse (Youatt). To this seems referable the "aphtha epizootica" or "murrain"[3] of the cow and pig; which, however, has also been referred, in part at least, to diphtheria (*q. v.*).

85. *Teething* and *toothache.*—Of *Cebus azaræ*, a Paraguayan

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[1] *Vide* "Spasmodic cough," under head of "Hooping cough."

[2] *Vide* "Scrofula" among the "General Diseases" of the College of Physician's 'Nomenclature' (p. 25).

[3] "Murrain" is another term applied by veterinarians to very different disorders in different animal species or genera.

monkey, Rengger says (s. 50, p. 12), "The younger ones, when shedding their milk-teeth, often died of fever" (="dentition fever")[1]

86. *Glossitis.*

87. *Quinsy* (=*cynanche tonsillaris*).—To this probably belongs the so-called "angina" or "sore throat" of the dog (Youatt).

B. *Stomach.*

88. *Gastritis.*—Horse (Youatt), dog (Walsh).

89. *Ulceration.*—Dog (Magna).

90. *Entophyta—Sarcina ventriculi* (Goodsir).—In stomach of ape, dog, and rabbit; in cæcum and fæces of fowls; in blood both of man and various lower animals, *e.g.* dog, cat, sheep, ox, rabbit, frog, according to Professor Ferrier ('Brit. Med. Journal,' Jan. 27th, 1872, p. 98). *Sarcina* illustrates the arbitrariness of that kind of classification which arranges parasites, animal or vegetable, under the organs they are supposed peculiarly to affect. There are other instances in which the progress of investigation has shown the same parasite to occur in two or more different parts of the body, either in the same individual or in different individuals or hosts of the same species (*e.g. Eustrongylus gigas, Distoma lanceolatum, Pentastoma denticulatum, Oidium albicans, Torula cerevisiæ, Chionyphe Carteri*). There can be no doubt this category will yet be largely added to, while it may ultimately be shown that no parasite of man or other animals is absolutely confined to one organ or tissue.

91. *Dyspepsia.*—Very common in sporting and pet dogs, from insufficient exercise, and food improper as to quantity or quality (Walsh); poultry (Tegetmeier).

92. *Vomiting,* including *nausea,* though the latter finds no place in the College of Physicians' 'Nomenclature;'[2] dog ("nausea," Walsh).

92*a*. *Nausea.*—In the course of a voyage across from Hamburg to Hull in May, 1873, during which 200 cattle and five horses were on board, Capt. Barron, of Gee and Co.'s Hull and Hamburg steamers, who has had a very ample experience in cattle traffic by sea, informed me that pigs are liable to sea-sickness, but not cattle or horses. C. T. Romanes (in 'Nature,' March 27, 1873, p. 411) gives the case of a collie dog suffering much from sea-sickness between Oban and Greenock. The familiar effect of tartar emetic, or other emetics, may be cited as instances of *artificial* or *medicinal nausea* (*q. v.*).

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[1] *Vide* "Simple continued fevers."

[2] No doubt it is only a symptom or condition, but it has quite as good or as bad a title to a place in that singular 'Nomenclature' as scores of other mere conditions or symptoms of disease.

c. *Intestines.*

93. *Gastro-enteritis.*

94. *Enteritis.*(="inflammation of the bowels").—Horse (Youatt), dog (Walsh and Bruckmüller), *Cebus azaræ* (a Paraguayan monkey—Rengger), and other monkeys.

95. *Dysentery.*—Dog (Walsh).

96. *Tympanites.*

97. *Intus-susception.*—Dog (Walsh).

98. *Diarrhœa.*—Dog (Walsh), cat.

99. *Colic* (="spasmodic colic").—Horse (Youatt). In dog sometimes causes loud howling from pain, and occasionally leads to intus-susception, *q. v.* (Walsh).

100. *Entozoa* (="*worms*").

(*a*) *Tapeworms.*—Dog (Bruckmüller; tape and other worms, Cobbold). Pig; but I am not aware to what genus or species its tapeworm or worms are to be referred.

(*b*) Dr. Cobbold, in a letter on "Canine Epidemics," in 'The Field,' December 7, 1872, p. 560), says, "The symptoms produced by lumbricoid entozoa are those of cerebral irritation. . . . . A single worm of this description has been known to cause *lunacy;* which, however, was completely *cured* by expulsion of the parasite. . . . . Uncertainty of movement; apparent bewilderment; cerebral disturbance; convulsive twitchings; deafness; dumbness; amaurosis; imbecility; and mania itself, have been caused by many nmatode parasites." One of his students cited the case of two spaniel puppies with paralysis of the fore legs, caused by the presence of *lumbrici,* and disappearing on evacuation of the worms by an aperient. "Many a poor dog, or valuable puppy, is ruthlessly destroyed because the unfortunate creature displays either cerebral or paralytic symptoms, and appears inclined to bite any one who may chance to approach;" that is to say, "dogs whose only crime is that they happen to harbour lumbricoid entozoa." A correspondent of the 'Animal World' (vol. ii, 1871, p. 179), who signs himself "Tuck Fisher," writing of rabies in the dog, says, "Most dogs that are killed for *mad* dogs are *not mad.* They suffer from worms; the worms irritate the intestines, act upon the brain, and produce fits." The cat also is liable to worms; of what kind, however, does not appear ('Animal World,' October, 1873, p. 149).

(1) *Tænia solium,* L.—Dog (Walsh). The reader may compare the drawings of its ova in man, after Leuckart, as given in Professor Aitken's 'Science and Practice of Medicine' (second edition, vol. ii, p. 85), with those figured by myself as occurring in the cholera evacuations of the

dog in the plate at p. 741 of the 'Edin. Med. Journal' for the first half year of 1856; which plate illustrates a paper on the microscopical and chemical characters of the "Cholera Evacuations in Man and the Lower Animals."

(2) *Tænia marginata*—its *Cysticercus* (=*Cysticercus tenuicollis*).—Ruminantia and squirrels (Professor Bennett, in his Introductory Lecture to the Physiology Class, University of Edinburgh, 1855); man (College of Physicians' 'Nomenclature,' p. 233). The said *Cysticercus* is said to be converted into the *Tænia serrata* so common in the dog (Bennett). Possibly this may be an error, unless *T. serrata* is a synonym of *T. marginata*. It has been stated, moreover, that certain *Cysticerci* in the pig, or in pork, are connected with *Tæniæ* in man.[1]

(3) *Bothriocephalus latus* (Bremser).—Dog (Walsh). Dr. Leith Adams ('Field and Forest Rambles,' p. 224) describes *Bothriocephalus* (= the "Broad Tapeworm") as occurring in redfins, chub, dace, sticklebacks, and other *fish*.

(*c*) *Round worm* (*Ascaris lumbricoides*, L.).—Dog (Walsh).

(*d*) *Maw-worm* (*Ascaris vermicularis*).—Dog (Walsh). I am not aware whether this is the *A. mystax*, Rudolphi, of the College of Physicians' 'Nomenclature,' p. 232.

(*e*) *Hairworm* (*Trichocephalus dispar*, Rudolphi).—Pig.

Different species or genera of intestinal worms affect the monkey, fox, pig, various rodents and marsupials; and some of them, at least, are probably transmissible to man just as are various epi- or ecto-zoa (*e. g.* the *ticks*, *q. v.*).

101. *Constipation* (=costiveness).—Dog (Walsh).

D. *Rectum and Anus.*

102. *Hæmorrhoids* (="piles").—Dog (Walsh).

E. *Liver.*

103. *Hepatitis.*—Horse (Youatt); dog ("yellows," Walsh, Youatt, and Bruckmüller).

104. *Enlargement.*—Pig, associated with enlargement also of spleen and kidneys (Bollinger). It is not at all clear whether the "enlargement" of veterinarians is the "simple enlargement" of the College of Physicians' 'Nomenclature,' p. 105, which is ascribed to "congestion of the liver."

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[1] *Vide* Measles (in the pig).

105. *Fatty liver.*—In same pig, with fatty degeneration of kidneys (Bollinger); dog (Magna).

106. *Hydatids* (=the *Echinococcus* of a *Tænia*, *q. v.*).—Dog, sheep, wolf, cattle (*e.g.* in India).

107. *Jaundice.*—Dog.

F. *Spleen.*

108. *Hypertrophy* (="enlargement"), with *leucocythæmia.*—Pig, associated, as in man, with enlargement of liver and kidneys (Bollinger, 'Archiv für Thierheilk.,' 1871); dog ("enlargement of spleen," Bruckmüller).

109. "*Splenic apoplexy*" is not mentioned as such, or under any obvious synonym, in the College of Physicians' 'Nomenclature,' p. 107.

G. *Peritoneum and Mesenteric Glands.*

110.—*Peritonitis.*—Dog (Walsh).

111. *Enlargement* (="hypertrophy") of the mesenteric glands.—Dog (Bruckmüller).

Diseases of the Urinary System.

A. *Kidney.*

112. *Bright's disease,* including *fatty kidney.*—Dog (fatty degeneration from chronic alcoholism, Magna); pig (fatty degeneration, Bollinger).

113. *Nephritis.*—Horse (Youatt). This may not be the "suppurative nephritis" of the College of Physicians' 'Nomenclature' (p. 111), but a form of Bright's disease. "Renal inflammation" of the dog (Walsh) is also probably referable to Bright's disease, acute or chronic.

114. *Hypertrophy.*—Pig ("enlargement" of kidneys, Bollinger). Perhaps a concomitant of fatty degeneration, and referable therefore to Bright's disease.

115. *Calculus.*—Dog.

116. *Kidney worm* (*Eustrongylus gigas*).—Horse, dog, fox, wolf, racoon, glutton, bull, and other animals. In man occurs also in the intestines, according to the College of Physicians' 'Nomenclature' (p. 232). It does not appear whether, in the lower animals, it is confined to the kidneys.

117. *Hæmaturia.*—Dog (Walsh), horse. May be either renal or vesical. The so-called "hæmo-albuminuria" probably belongs to Bright's disease.

B. *Bladder and its Outlets.*

118. *Cystitis.*—Horse (Youatt), dog (Walsh).
119. *Gonorrhœa.*—Dog (Fleming), ox.

Diseases of the Generative System.

A. *Uterus.*

120. *Cancer*—involving the vagina, in bitch, sometimes produces morbid or untimely "heat" by the incessant local irritation (Walsh).
121. *Inversion.*

B. *Udder.*

122. *Mammitis.*

C. *Parturition.*

In the dog the irritability of the nervous system is manifested when it is subjected to any strain, *e. g.* that of parturition, which renders it in the bitch "liable to be excited and deranged by causes that would otherwise be harmless." (*Vide* Convulsions.) Death in parturition in the bitch is frequently caused by her association with dogs larger than herself; in other words, she pays the physiological penalty of the unnatural copulation.

123. *Puerperal convulsions.*—Bitch. (*Vide* also Convulsions.)

Diseases of Bones.

124. *Ostitis.* (*Vide* Rheumatism.)
125. *Caries.*—Horse.
126. *Mollities ossium* (*=osteo-malacia; osteo-porosis*). Is "now affecting thorough-bred horses in South Australia;" and occurs also in ox and sheep ('British and Foreign Medico-Chirurgical Review,' July, 1873, p. 84). In man is chiefly met with among the insane.[1]

Diseases of the Muscles.

127. *Entozoa.*

(*a*) *Trichina spiralis* (Owen).—Pig, dog, badger, ox, and certain other of the lower animals, constituting the disease known as *trichinosis* (or *trichiniasis*), more familiar as the "measles" (*q. v.*) of the pig or of pork. *Trichina* occurs in the muscles of man and some of the lower animals (Baird).

(*b*) *Bot* (*= Œstrus*).—One species deposits its eggs in human flesh, according to Bates in his 'Naturalist on the Amazons.' According to 'Chambers's Encyclopædia' (vol. vii, 1865, p. 43), "each insect"—which means, I presume, each species—is "limited to a particular kind of quadruped," the habit, and site occupied, being different in each species.

[1] *Vide* paper by the author in 'Edinb. Med. Journal,' November, 1870.

Diseases of the Cellular Tissue.

128. *Abscess.*—Dog (Walsh, Bruckmüller, and Pierquin).

Diseases of the Cutaneous System.

129. *Herpes.*—Horse, ox.

130. *Psoriasis.*—Dog (= "foul mange," Walsh). One of its many diseases that are *hereditary*.

131. *Eczema.*—Cow (*E. epizootica* = "vesicular murrain").

132. *Dermitis.*—Finds no place in the College of Physicians' 'Nomenclature.'

133. *Ulcers.*—Dog (Bruckmüller).

134. *Ectophytes*—

(*a*) *Tinea tonsurans* (= *ringworm*).—Cattle (calf, ox), cat. It does not appear, however, to what species of *Tinea* of the College of Physicians' 'Nomenclature' (pp. 174, 175) should be referred the *porrigo* of the dog, which constitutes a form of "mange," and which is said to be caused by the growth of a vegetable parasite (Walsh). It may be referable either to *T. decalvans* or *T. favosa*, or to neither. The College of Physicians' 'Nomenclature' (pp. 173, 174) ascribes five different species of *Tinea* to three *genera* and five *species* of micro-fungi. I have not myself had proper opportunities of examining these parasites; but the whole tendency of my studies equally in Cryptogamic Botany[1] and in Comparative Pathology is to render it much more likely that the same parasite is modified in its form on different hosts, and according to the parts of their bodies affected, than that different species and genera of micro-fungi produce or accompany similar diseases in the same animal-species.

(*b*) *T. polonica* (= *plica polonica*).—Horse, cow, wolf, sheep, fox, dog (Fleming on 'Rabies,' p. 238).

(*c*) *T. favosa* (= *favus*).—Dog, rabbit, mouse, and other domestic animals (Saint-Cyr).

135. *Ectozoa*—

(*a*) *Scabies* (= *itch*, caused in man, according to the College of Physicians' 'Nomenclature,' by the presence of the *Sarcoptes* (= *Acarus*) *scabiei*).—The itch—or an itch—that equally affects man and the cow, is ascribed by veterinarians to *Sarcoptes setosus*. The "psora" or "mange" of the dog (Walsh) is ascribed to an *Acarus*. What is the "mange" of the cat ('Animal World,' vol. i, 1870, p. 57) I am not aware.

[1] As illustrated by my 'Memoirs on the Spermogones and Pycnides of Lichens,' published in 1859 and 1872, the "General Index" to which was issued in 1873.

Other irritative inflammations of the skin in the dog are produced by fleas, lice, and ticks (Walsh); and in that and many other animals by "wasps, bees, and other stinging insects." There may be different species of *Sarcoptes* affecting different species of animals; or it may yet prove that different forms of the same species of *Sarcoptes*[1] cause itch or "mange" in very different species of the higher animals. The itch of fowls[2] has been assigned to *Sarcoceps* (= *Sarcoptes*?) *nutans;* but I am not aware what insect is considered the cause or accompaniment of itch in the lion, horse, cat, mouse, sheep, hyæna, bear, camel and dog.

(*b*) *Pediculi* (= *lice*); which, just as in the case of the *Sarcoptes* (= *Acarus*), may consist of several different species, or of forms of one species. The College of Physicians' 'Nomenclature' gives two genera, *Pediculus* and *Phthirius;* while it bases the species of *Pediculus* simply on the parts of the body or dress which they affect. It is, however, contrary to all probability to suppose that one species is confined to the head; a second to the eyelids; a third to the clothing; and a fourth to persons of low vital power!

(*c*) *Demodex folliculorum* (Owen).—Horse, dog.

(*d*) *Tick*—referable to various genera of *Acarides*, and more particularly of *Ixodidæ*, *e. g.*—

(1) *Dog tick* = *Ixodes plumbeus;* which, according to 'Chambers's Encyclopædia' (vol. ix, 1867, p. 432), common in Britain, attaches itself "to dogs, oxen, and other animals, sometimes even to man."

(2) "*Carapata*, of Brazil, affect the horse, ox, or other quadruped which comes in contact with them. . . . . Whole herd sof cattle sometimes perish from the exhaustion which they cause. . . . . Travellers in the interior of Brazil are sometimes obliged to pick hundreds off their own bodies before retiring to rest for the night" ('Chambers's Encyclopædia,' vol. ix, p. 431).

Conditions not necessarily associated with general or local disease.

136. *Old age*; and

137. *General debility*—have a marked influence on the development of certain forms of mental disorder.

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[1] This would appear to be the view taken by Prof. John Gamgee. *Vide* his paper "On *Acarus Scabiei* in Man and Animals:" reprint from the 'Veterinarian,' 1856.

[2] Compare paper on "Scabies in Fowls," by Dr. Moxon, in 'Brit. Med. Journal,' January 11th, 1873, p. 49.

Poisons.

Under which head may also be included the action of *Medicines*.

Mutatis mutandis, Poisons and Medicines act on animals in the same way as on man;[1] in illustration of which statement may be specially cited—

138. *Alcohol.*—Drunkenness is by no means infrequent in certain animals, such as the monkey, elephant, horse, dog, rat, fowls and several other birds. They readily acquire a taste for ardent spirits, and are as apt as man to commit excesses and to suffer from the natural results. The general phenomena of *Alcoholism* in the lower animals are precisely the same as in man.

139. *Chloroform*, strychnia, laburnum, and yew, furnish other more familiar examples.

140. *Cocculus Indicus.*—The seeds of *Menispermum cocculus*—a well-known adulterant of British malt liquors—are used for the *intoxication of fish* by the Antis Indians of South America. They thus poison the streams; the fish "float belly-up, and are easily captured" (Dr. Brown, 'Races of Mankind,' vol. i, 1873, p. 297). The same substance is used in India for "*stupefying fish*, that they may be taken by the hand" (Article "Cocculus Indicus," in 'Chambers's Encyclopædia,' vol. iii, 1862, p. 100). The result in all these cases is, no doubt, due to the active principle of the seeds—*Picrotoxine*.

140*a*. *Tobacco.*—The smoke of tobacco acts as a *narcotic* on cage birds—such as the nightingale—causing them sometimes to fall off their perch *stupefied*. The same result is produced artificially and intentionally when it is man's object to secure the contents of the hive without the risk of injury from the honey-bee.

141. *Toot* plant and poison of New Zealand (=*Coriaria tutu*, Linds.), by which many lives, both of men, children, cattle, and sheep, have been sacrificed, is unknown in this country;[2] but is a good *type* of a class of vegetable poisons to be met with in almost every part of the world.

142. Poisonous *milk*—whether the cause in the mother has been (*a*) purely mental, as from anger or passion; or (*b*) purely physical, as from feeding on poisonous plants or suffering from bodily disease; or (*c*) partly physical, partly mental.

143. Among *gaseous poisons* perhaps the most familiar is *Carbonic acid*, as its powers are illustrated in the show or sensation experiments made to tourists in the Grotta del Cane, near Naples.

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[1] "The effects of *Remedies* on the Dog are nearly the same as on Man" (Walsh, p. 360). "*Medicines* produced the same effect as on us"—on the *Cebus azaræ* of Paraguay (Darwin, 'Descent,' vol. ii, p. 12).

[2] *Vide* author's papers in 'Brit. and For. Med.-Chirurg. Review,' July, 1865, and October, 1868.

144. *Poisoned wounds* bring us back to the *stings and bites* of animals, healthy or diseased, such as those of certain snakes, insects, dog and cat.

But there are certain singular *exceptions* to the general rule that man and other animals alike are subject in the same way to the action of the same poisons or medicines. It has been conclusively shown, for instance, that—

(*a*) Certain animals eat with impunity substances as food that would poison man.

(*b*) The flesh or viscera of certain animals—or of certain animals fed on particular foods—is poisonous to man. A familiar example is that of poisonous *fish* and *shell-fish*. Of the *Diodon hystrix*—the sea porcupine—Dr. Baird ('Cyclopædia of the Natural Sciences') says: "The flesh is dangerous to eat, owing, it is stated, to the gall possessing poisonous properties." Some species of the genus *Tetraodon* are poisonous. "A few years ago two sailors were poisoned at the Cape of Good Hope by eating the liver of *Tetraodon*, and died from the effects thereof in less than half an hour after eating it." Some of the foreign species of the *Cevaux* fish—of which the scad, or horse-mackrel, is a British representative—are also poisonous.

(*c*) Certain drugs that in certain doses poison man are inoperative on certain animals, as I long ago showed in regard to opium[1] and its salts. That laudanum "rarely does harm" to the dog, as Walsh says, is supported by my own experience. Professor Weir Mitchell in America also pointed out some years ago that pigeons and fowls are insusceptible to the action of *opium*.

(*d*) The same *poisons* act very differently on different genera and species of the lower animals themselves. The 'Athenæum' of October 4, 1873, p. 434, in reporting Professor Arthur Gamgee's paper in Section D of the British Association meeting at Bradford in September, 1873, remarks—"One of the most curious facts with regard to *poisons* is that a substance which acts as a deadly poison on one species of animal has no injurious effect whatever on another. Thus, morphia has no effect on pigeons. The explanation of the difference of action is not always possible. Dr. Fraser gave the section an account of some experiments with two poisons derived from the monk's-hood, viz. aconitia and pseudo-aconitia, which act with different toxic effects on rabbits and on frogs. The explanation of the difference was known, in this case, to be due to the fact that

[1] 'Association Medical Journal,' June 9th, 1854; in regard to the non-susceptibility of the dog to the influence of certain poisons.

one of these poisons paralyses the respiratory muscles, as well as the heart, and hence is more fatal to the lung-breathing rabbit than to the skin-breathing frog."

General Injuries

produce the same effect on other animals as on man; such as—

144. *Burns and scalds*, as illustrated in burning stables and byres in the conflagrations of American cities and villages.

145. *Lightning-stroke*, as illustrated in the numerous deaths of cattle and horses during thunder-storms in this and other countries.

146. *Asphyxia*, from drowning, strangulation, or overlying the young.

147. *Privation of food*, or *starvation*.

148. *Exposure to cold* and, it should also be added, to *heat*, if in either case it is prolonged or excessive.

149. *Neglect*, one of the vaguest terms used in the exceedingly confused and confusing 'Nomenclature' of the College of Physicians (p. 189).

Local Injuries,

"whether accidental, judicial, murderous,[1] self-inflicted, or in battle" (p. 191); such as—

150. *Wounds* (including those which are "perforating" or "penetrating").—Contusions, sprains, concussions, fractures, lacerations, dislocations, foreign bodies, ruptures, fistulæ, also produce similar effects to those in man, and require similar surgical or other treatment. In many cases the animals themselves feel the necessity of submitting themselves to treatment, seek man's aid, show the utmost confidence in his skill and power, and behave themselves with an intelligence, patience, and fortitude which are admirable; and, what does not always follow in the case of man, manifest a vivid memory of and gratitude for the benefits conferred by the surgeon or physician!

Animals are subject, moreover, to many, at least, of the

Congenital Malformations

of man, as they are described at pages 237—245 of the 'Nomenclature.'

There are certain diseases of the lower animals, also occurring in man, that do not find a place in the 'Nomenclature' of the College of Physicians. These include, for instance—

151. "*Foot and mouth* disease."—Cow, cat, man. The 'North British Agriculturist' of December 27th, 1871, gives a case amongst

[1] It is obviously necessary to substitute this word for "homicidal," as more comprehensive, and more applicable to the lower animals.

children; while the 'Elgin Courant' of January 26th, 1872, quotes an example in ten cats in Forres from the use of cow's *milk*.

152. *Anders* (= Endai, French) of cattle.

153. *Rinderpest*, "*the* cattle plague," *par excellence*.

II. *Diseases communicable from the Lower Animals to Man.*[1]

1. *Rabies*.—From dog, cat, and all the numerous animals that have already been specified as subject to rabies.[2] It is also transmissible from one species or genus to another among the lower animals themselves, *e. g.*—

(*a*) To the sheep from the ox, horse, ass, hen, and duck (Youatt).

(*b*) To the rabbit from the dog (Youatt, p. 149).

(*c*) To the fowl from the cow (Youatt, p. 150).

2. *Glanders*.—From the horse.

3. *Equinia mitis* (= "*grease*").—From the horse, according to the College of Physicians' 'Nomenclature' (p. 9).

4. *Farcy*.—From the horse affected with glanders or farcy, according to the College of Physicians' 'Nomenclature' (p. 9).

5. *Smallpox*.

6. *Cow-pox*.—From the cow (= vaccination). In the horse it is the "grease" of farriers; which, again, is the *Equinia* of modern veterinarians.

7. *Sheep-pox* (= variola ovina).—From the sheep; doubtful, requiring confirmation.

8. *Malignant pustule*.

9. *Aphtha epizootica*.—By cows' milk.

10. *Eczema epizootica*.—By cows' milk.

11. *Trichinosis*.—From "measled" pork. I have seen it stated that "measled" pork produces the tapeworm in man; but this must be a mistake, or there must be different kinds of "measles" in pork. Other writers simply state that—

12. *Tapeworm* is communicated by the pig to man.

13. *Brain hydatids* = *Sturdy*.

14. *Liver hydatids*.

15. *Itch* (= *scabies*):

(*a*) From dog to man, sheep, cow, and camel.

(*b*) From lion to man, horse, hyæna, and bear.

(*c*) From horse to man.

16. *Ringworm*.—From cattle.

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[1] Dr. Stein, of New York, has published a paper on "Animal Diseases transmissible to Man" in 'Brit. Med. Journal,' July 20th, 1872, p. 72.

[2] A case of hydrophobia in man from the bite of a rat is given in the 'Anima World' (vol. iv, 1873, p. 29).

17. *Favus* (= *tinea favosa*) of domestic animals—to man, according to M. E. Saint-Cyr (Professor in the Lyons Veterinary School; 'Veterinarian,' vol. for 1872, p. 49).
18. *Tick.*
19. *Herpes.*
20. *Foot and mouth* disease.—To man and cat.
21. *Anders.*
22. *Pneumonia.*—From cattle.

III. *Diseases communicable from Man to the Lower Animals.*[1]

1. *Syphilis*—to monkey.
2. *Smallpox*—to monkey or ape, cow, horse, dog, pig.
3. *Cholera*—to dog, cat, pig, mouse (Thiersch, Lindsay, Sanderson).
4. *Favus*—from the child to the cat, according to Professor St. Cyr, in 'Veterinarian,' November, 1871; quoted in 'British Medical Journal,' November 18, 1871, p. 591).
5. *Hydrophobia* (=*rabies*)—to the guinea-pig, and to sheep (Youatt on 'Dog,' p. 149); and generally to all warm-blooded animals (Fleming on 'Rabies,' p. 140).
6. *Trichinosis* (= *measles*).—Pig, from feeding on the tapeworm of man.
7. *Plague.*—To the pig.
8. *Phthisis.*

IV. *Diseases Re-transmissible.*

A. *From man to other animals.*

1. *Glanders.*—Back to horse and ass (vide 'Aitken,' vol. i, p. 686).
2. *Cow-pox.*—Back to cow (heifer or calf).
3. *Hydrophobia.*—Back to dog.
4. *Malignant pustule.*—Back to cattle, and to dog and rabbit.

B. *From the Lower Animals to Man.*

1. *Syphilis.*—Back from the monkey and other animals.

V. *Human diseases artificially producible*[2] *in other Animals.*

1. *Epilepsy.*—In guinea-pig, dog, cat. "It is capable of being induced by numerous methods of centric and excentric irritation,

[1] *Vide* paper by the author "On the Transmission of Diseases between Man and the Lower Animals," 'Edinburgh Veterinary Review and Annals of Comparative Pathology,' July, 1858.

[2] "Not only can the phenomena of disease be produced by artificial means in the lower animals; but they can, by the same means, be made to disappear" (Bernard).

both in the indirect experiments of injury and disease; and as the result of direct experiment, such as

(*a*) Blows on the head (Westphal); or

(*b*) Injuries to nerve-trunks or the spinal cord (Brown-Séquard):"[1] to which has now to be added

(*c*) Electrical excitation, by Faradisation (Ferrier).

Moreover that it "may be established as an *hereditary* tendency" has been conclusively shown by Brown-Séquard. The "artificial production of epilepsy in guinea-pigs" is the subject of a paper by Professor Westphal, of Berlin (in the 'Berliner Klinische Wochsenschrift,' 1871, p. 39; quoted in 'Brit. Med. Journal,' vol. i, for 1872, p. 399). He confirms the observations of Brown-Séquard. His experiments showed that an epileptiform condition is *inherited* by young guinea-pigs.

2. *Chorea.*—Ferrier speaks of the "induction of an artificial chorea" in the lower animals (p. 92).

3. *Convulsions*, of all degrees, as well as epilepsy and chorea, can be produced by direct irritation of the brain by electricity (Ferrier, p. 45 et seq.). *Convulsions* of a genenal character were readily produced in guinea-pigs in Professor Westphal's experiments ('Brit. Med. Journal,' vol. i, for 1872, p. 399).

4. *Rabies.*—The guinea-pig can be artificially inoculated with the saliva of a hydrophobic man, while the fowl may be inoculated with saliva from the cow (Youatt on 'Dog,' 1845, pp. 149 and 150)[2] dog, rabbit, sheep.

5. *Cholera*[3]—

(*a*) By inhalation from fomites (Lindsay).

(*b*) By feeding on rice-water evacuations (Thiersch, Sanderson).

6. *Smallpox*
7. *Cow-pox* } in cow (heifer or calf), monkey.

8. *Malignant pustule.*—In cattle, dog and rabbit.

9. *Malignant growths* (or tumours) of various kinds have been successfully transmitted to certain animals by Folkin and Goujon in France; but the experiments by Dr. Wickham Legg in this country ('Brit. Med. Journal,' Sept. 20, 1873, p. 344), on the "Inoculability of Epithelioma" from man to guinea-pigs and white rats, was unsuccessful.

10. *Syphilis.*—In monkey.

11. *Favus.*—In cat.

12. *Glanders.*—In horse and ass.

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[1] Prof. Ferrier in vol. iii of the 'Medical Reports of the Wakefield Asylum,' 1873, pp. 90, 91.

[2] *Vide* the experiments of Magendie and Breschet in 1813; or Breschet, "Sur quelques Recherches Expérimentales sur la Raye," in 'L'Expérience' of October 8th, 1840.

[3] *Vide* the author's paper on "Choleraization in Animals," 'Lancet,' December 1st, 1866, p, 600.

13. *Phthisis.*—Is communicable to the lower animals by inoculation, according to Dr. Lawson Tait, of Birmingham ('Science Gossip,' January, 1868).

14. *Alcoholism.*—Has been artificially produced in the dog by long-continued doses of alcohol, according to M. Magna, of Paris, in 1872. Dr. Binz, of Bonn, has also studied the action of alcohol on warm-blooded animals ('Athenæum,' October 4, 1873).

15. *Cachexies or fevers,* caused by the inhalations of putrid effluvia, by the late Dr. Barker, of Bedford. What is called "putrid fever" (and which may or may not have been pyæmia) was artificially produced in various animals by Dr. Binz, of Bonn, as described by him at the British Association meeting at Bradford, in 1873 ('Athenæum,' October 4, 1873, p. 434).

16. *Pericarditis* by the injection of lactic acid; and other diseases similarly produced, by Dr. Richardson, of London.

17. *Nausea and vomiting.*—An effectual way of getting rid of the annoyance of monkeys is by capturing a few young ones, painting them over with a mixture of treacle and *tartar emetic,* and then turning them loose. Their parents, in their joy at the recovery of their offspring, and, perhaps, attracted also by their coating, lick the whole surface of their restored young. The result of this *sad lesson* of experience may be more readily conceived than described! (Cassell's 'Popular Natural History,' vol. i, "On Mammalia," p. 6.)

The foregoing Catalogues of Disease serve to illustrate, in part at least, the following Propositions connected with the Natural History of Disease in the Lower Animals:

1. The diseases of the lower animals, mental as well as bodily, are producible by the same kinds of *causes* as those of man: in other words, their *etiology* is the same. Among the leading causes both of general ill health, or lowered vitality,[1] and of specific disease in the lower animals as in man, are, for instance, the following:

(*a*) Exposure to cold, heat, or wet (=weather; atmospheric changes).
(*b*) Privation of food (=starvation).
(*c*) Deficient exercise or work, *e.g.* as a result of
  (1) Domestication,[2] or
  (2) Confinement.

[1] This low state of vitality, connected as it necessarily is with loss of nervous tone, however produced, is, as in man, fertile in the production of sub-specific diseases, such as, for instance, *parasitic and ulcerous* affections of the *skin.*

[2] This of itself is a fertile source and powerful cause of disease, organic and functional, involving as it does so many of the other causes of ill-health now tabulated. At a meeting of the Pathological Society of London in May, 1860, a conversation took place "on the influence of *domestication* upon the production of disease amongst animals" ('Lancet,' May 19th, 1860).

(*d*) Unwholesome food or water.
(*e*) Parturition, Lactation, Menstruation.
(*f*) Age.
(*g*) Over-eating (=engorgement with food); including prize feeding, a common cause of *fatty degeneration*.
(*h*) Over-work; physical exhaustion.
(*i*) Climacteric changes.
(*j*) Insolation (= sunstroke).
(*k*) Physical ill-usage (*e.g.*, blows on head).
(*l*) Deficient ventilation (foul air).
(*m*) Overcrowding.
(*n*) Bodily filth (neglect of bathing).
(*o*) Deprivation of light (=darkness).
(*p*) Deficient sleep (or rest).
(*q*) Breeding in-and-in.

Thus, we are told, *cold*, *wet*, and *old age* are the usual causes of death in wasps. Birds at Kinsale, Ireland, are sometimes so enfeebled by *cold* in frosty weather "that the village boys captured them with the hand, or knocked them over with stones" (Dr. Leith Adams, 'Field and Forest Rambles,' p. 133). In adult cattle acute symptoms of brain-disease, or other sympathetic derangements of the brain or nervous system, result from simple indigestion. Delicate, highly bred, artificially reared varieties of the dog, and young animals of these varieties, are more liable to "distemper," which is attended by various symptoms of nervous disturbance, such as epilepsy, chorea, and convulsions. The life of the domestic dog is, like that of his master, wholly or in a great measure artificial, and many at least of his habits equally unhealthy. Hence it need not surprise us to learn from Blaine[1] (p. 2) that the diseases of the dog "very nearly resemble" those of man, in causation, appearance (= symptomatology), effect, number, and variety. Pierquin (vol. i, p. 326) points out the influence of *domestication*, or *captivity*, in inducing such diseases as epilepsy, asthma, itch, cancer, inflammatory disorders, and abscesses. Poultry, like ourselves, as Tegetmeier points out in his 'Poultry Book,' suffer from *damp*, *bad air*, and *defective drainage*. A writer in 'Chambers's Edinburgh Journal' (vol. v, from January to June, 1846, p. 398(, in "Notes on Natural History," thus discoursed of the diseases of the lower animals nearly thirty years ago :—"It is a mistake to suppose that animals in a state of nature are exempt from diseases. All organic beings are liable to interruptions of their functions, and even derangements of their structure; though, on the whole, healthy action is the rule and disease the exception. . . . They suffer from *atmospheric changes*,

[1] 'Canine Pathology,' 1841.

either affecting their bodies directly or the substances on which they feed. They are annoyed and often seriously afflicted by *parasites*, which live on and within their bodies; and occasionally by derangements and malformations of organic structure in the mechanism of their own frames. Thus, it has been well ascertained that *epidemics* occasionally produce great havoc among gregarious quadrupeds and birds. Dr. Richardson[1] mentions that on some occasions great mortalities take place among the beavers of North America. . . . Lewis and Clark mention having shot, from among the herds of buffalo in the Rocky Mountains, individuals that were so diseased and emaciated as to be unfit for use. In our zoological gardens may frequently be seen the bilious and half-blind tiger; the paralytic fox with twinkling half-shut eye, and lifeless trembling limb; the phthisical monkey; and the skin-diseased, drooping bird. All this, to be sure, is the effect of *confinement, irregular and improper feeding, and impure air;* and is so far an illustration of the melancholy effect of such practices as are self-imposed upon man in society: but it, at the same time, shows that even the inferior animals have all the same predispositions to disease if the same baneful influences surround them, and if reason, or rather unreason, is allowed to interfere with their natural impulses and habits."[2] The importance of (*a*) the ventilation of stables, byres, and kennels; (*b*) cleanliness of skin; and (*c*), proper food, was long ago pointed out by Professor John Gamgee, in his essay on the "Diseases of Domestic Animals in Kinkardineshire" ('Highland Society Trans.,' October, 1857). *Confinement* is a very common cause of disease among dogs, telling much more severely on them than on man, the dog's life being naturally one of constant activity, mental and bodily (Blaire). *In-and-in breeding* affects deleteriously the temperament and whole constitution, and leads to degeneracy. It multiplies the susceptibility to certain diseases, *e. g.* apoplexy, digestive and respiratory disorders (Low, 'Domesticated Animals of the British Islands,' 1845, Introduction, p. cxv). The *etiology* of disease in the lower animals, however, is a subject so extensive and important that it requires a special paper for its illustration.

2. The *symptomatology* of disease[3] in the lower animals is essentially the same as in man. There are, for instance, the same kinds of *motor, sensory,* and *mental* phenomena, manifested separately, or in various combinations.

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[1] Doubtless Sir John Richardson, the well-known Arctic traveller, and author of the 'Fauna Boreali-Americana.'

[2] *Vide* also article in same Journal and volume, p. 401, on the "Effects of Habitat on Animals."

[3] The Etiology of Disease in the lower animals, however, is a subject so extensive and important that it requires a special paper for its illustration.

3. Disease in the lower animals is produced, or accompanied, by the same kind of *organic lesions* as in man.

4. The lower animals are subject to *epizootics*,[1] which, as regards the extent or pecuniary importance of their devastations, are quite comparable with the epidemics of man. Such, for instance, are the cattle plague, the horse influenza, the hog cholera, or the grouse disease; which latter form I understand Dr. Cobbold to ascribe to the presence of intestinal worms.

5. Further, there is frequently, if not generally, a remarkable *coincidence*, as regards time as well as symptoms, between *epizootics and epidemics*, tending to show that man and other animals are equally susceptible to the influence of atmospheric poisons, including the so-called "epidemic constitution" of the atmosphere.[2] Thus, in 1849, in Ferrara (Italy), cattle were the subject of destructive epizootics, while cholera, variola, influenza, parotitis, and malignant pustule were epidemic (in man).[3] On other occasions, the same epidemic influence, such as cholera or plague, has, at the same time, and equally, affected man in common with both wild and domestic animals, such as cattle, the horse, dog, pig, sheep, donkey, goat, rabbit, hare, poultry and game birds, geese, ducks, grouse, blackbirds, crows, sparrows, rooks, swallows and other birds, fish, crabs, and leeches.

6. The laws and phenomena of *contagion* are the same as in man. Thus Cl. Bernard points out that the peri-pneumonia of horned cattle is undoubtedly contagious, as was proved by the experimental establishment of a communication between two cow-houses, the one containing healthy, the other diseased animals.

7. As a general rule, which has, however, its exceptions, the diseases of the lower animals require the same kind of *treatment*—surgical or medical, medicinal or moral—as in man.

8. The lower animals are subject to the same kind of *endemic* influences with man (*e. g.* malaria), and are subject, therefore, to the same kind of endemic diseases (*e. g.* bronchocele).

9. In the lower animals there is the same *hereditary transmission* of—

(*a*) *Tendencies or predispositions to disease*, such as the

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[1] *Vide* author's "Clinical Notes on Cholera," 'Association Med. Journal,' 1854, pp. 1110 and 1111—'Epizootics in Domestic and Wild Animals.'

[2] *Vide* author's (1) "Clinical Notes on Cholera," 'Association Med. Journal,' 1854:—

(*a*) Page 1110, "Natural Influence of Cholera on the Lower Animals;"

(*b*) Page 1111, "Diseases of the Lower Animals during Epidemic Cholera;" and

(2) "Suggestions for Observations on the Influence of Cholera and other Epidemic Poisons on the Lower Animals," 'Edinb. Med. Journal,' July, 1857.

[3] The inter-relation of the different epidemic poisons on such occasions is much in need of special study by the epidemiologist.

various neuroses, including the *insane neurosis:* and various diatheses, such as the strumous or rheumatic.

(*b*) *Structural peculiarities. Vide* Dr. Ogle, "On the Hereditary Transmission of Structural Peculiarities" ('Brit. and For. Medico-Chirur. Review,' April, 1872).

(*c*) *Bodily malformations,* congenital or acquired. Hereditary deformities in the lower animals are quite common. Numerous examples are on record. An instance recently occurred in my own neighbourhood in which a bitch, having had its tail lopped off by accident, bore a succession of tailless pups.

10. It follows, as a corollary from the foregoing propositions, that *experimental pathology*—the artificial production of disease, mental or bodily—in the lower animals, and the careful study of the diseases so produced, promise to be of the utmost importance towards our better knowledge of the diseases of man. In May, 1860, before the Pathological Society of London, Dr. Crisp showed several specimens of pericarditis in birds, "remarking that he believed the observation of such diseases in the lower animals would be found to throw much light upon human pathology."[1] "Not only," says Claude Bernard, "can we succeed in producing morbid symptoms in animals by artificial means, but even actual diseases with their complete chain of results. Pathology, regarded from this point of view, combines the resources of physiology with those derived from clinical observation" (p. 56). Regarding *experiment* on the lower animals many interesting questions suggest themselves as worthy of discussion, *e. g.*—

(*a*) The ethics of vivisection.

(*b*) The various modes of operating for different ends.

(*c*) The various species to be selected for special purposes; including, for instance, the actions of poisons and medicines on the animal economy.

It would be quite out of place to enter upon such discussion here, but I may refer the reader to the admirable lectures on "Experimental Pathology and Physiology" by Professor Claude Bernard, of Paris, in the 'Medical Times' for 1860 (January 7, pp. 5, 6; January 21, pp. 55, 56; January 28, p. 84; February 25, p. 183). There are certain exceptional difficulties which should specially command the student's attention. For instance, Bernard says (p. 56), "Nothing is more difficult than to produce, through the agency of the nervous system, eruptive diseases in animals, the *vitality of the skin* of which is *essentially different* from that of man." An equally doubtful statement is this (also on p. 56):—"Man, in himself, presents a greater number of *special diseases* than all the other animals

[1] 'Lancet,' May 19th, 1860, p. 496.

taken together." Facts seem to me to contradict these assertions of the famous Parisian pathologist and physiologist; but all statements of his deserve the most careful investigation before they can be pronounced fallacious or erroneous.

11. The student of disease in the lower animals may profitably devote himself to cataloguing the affections of *different genera and species*. Among other features of interest, such a classification would bring out—

(*a*) The comparatively large number of disorders that affect such animals as the horse and dog, or other domestic animals, or those animals most nearly approaching man either in structure and function, or in habits of life.

(*b*) The comparatively small number of disorders that affect the lower animals most remote from man in structure and habits.

In this connection it will be most interesting to determine *how low* in the animal scale *distinct diseases* make their appearance. It is already well known that certain specific lesions occur in many fish, insects, and crustacea—for instance, salmon or haddocks, flies, crabs,[1] oysters, leeches:—but so far as I am aware, it has yet to be determined how low in the animal scale disease makes its appearance and what is the character of that primitive disease. Parasitism is very common on or in the lower forms of animal life: but it is doubtful at least whether or when this is to be regarded as a result or concomitant of depressed or depraved vitality—a disease in any sense or degree.

12. It is of the utmost importance—in connection with the large number of cases of so-called "rabies" and "hydrophobia," that are presumably or undoubtedly *spurious*—to study the exact effects of the *bites of animals*, in health and disease, when excited or calm. The 'Dundee Advertiser' of October 14, 1873, records the death of a child at Liverpool from *mania*, the result of the bite of a *cat*; while the 'North British Daily Mail' of same date reports the fatal issue of a case of *hydrophobia* from the bite of a *rat* in a lady in Detroit, United States. In neither case is there anything like scientific assurance that the result of the bite was the disease assigned as the cause of death.

13. Yet another interesting puzzle for the student is the investigation of the question of *species* versus *varieties* of disease in such cases as *variola*, *cholera*, *rabies*, and *equinia*.

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[1] Crabs are said to have their "shell" much infested with ecto- or epi-phytes of various kinds.

II.—Uræmia and the Nervous Symptoms of Fever.

By T. J. Maclagan, M.D., Dundee.

That the poison which gives rise to the common infectious and epidemic diseases is organized may be accepted as proved. Being organized it must be animal or vegetable.

In a paper which appeared in the 'Lancet' of 29th of March, 1873; and in another read at the last meeting of the British Medical Association, and published in the 'British Medical Journal' for October 4th, 1873, I endeavoured to show that the propagation in the system of an animal organism, an organism which in its growth consumes oxygen, nitrogen and water, is competent, by its mere propagation, to the production of the essential phenomena of idiopathic fever.[1] I then expressed the opinion that the wasting of the nitrogenous tissues was mainly due to the consumption by these organisms of the nitrogen destined for their nutrition; that the thirst, the dryness of the skin, the constipation of the bowels, and the scanty urine resulted from the appropriation by the same organisms of the water required by the system; and that the preternatural heat resulted from the formation from these sources of the protoplasm of the contagium particles. This theory I believe to be capable of explaining all the phenomena of idiopathic fever. The object of the present paper is to apply it to the explanation of the nervous symptoms.

These are rigors, headache, delirium, convulsions and coma.

1. *Rigors.*—The first symptom of the onset of the stage of invasion of fever, the first intimation of the presence of the contagium in the body, is the occurrence of rigors and headache.

Rigors essentially consist in a feeling of cold: this, be it remarked, is a mere feeling, for while the patient is shivering the temperature of the body is really above the normal standard. How is this brought about? How is the feeling of cold produced? And how can such a decided sensation be accompanied by an actual rise of temperature in the part which feels cold?

When a substance having a lower temperature than the body comes in contact with any part of its surface, caloric passes from the body to this substance, producing in the former a loss of heat, and consequent sensation of cold at the point of contact. Here there are two factors at work; first, the external agent or cold body, second, the internal change produced by contact therewith. What is the nature of the latter? It is something quite apart from the ordinary sense; and Brown-Séquard holds that there are special

[1] Those interested in the subject of this essay are requested to read these papers in conjunction with the present one.

thermic nerves for the transmission of such impressions as those which result in the sensations of heat and cold. Be that as it may, be the mode of transmission to the nervous centres of these impressions by special nerves or not, there can be no doubt that the internal local change produced in any part of the body by contact with a cold substance essentially consists in contraction of the minute arteries of the part in which the sensation is experienced. The contraction of these vessels, the transmission of the resulting impression to the nervous centres, and the passage back to the cold part of the resulting sensation are so instantaneous that no appreciable interval elapses between the application of the cold body and the resulting sensation. Nevertheless all these changes do take place.

The internal change which gives rise to the feeling of cold under ordinary circumstances essentially consists in contraction of the minute arteries of the skin, and this in its turn results from stimulation of the nervous apparatus which controls the movements of these vessels, the vaso-motor system of nerves. The ultimate internal cause of the sensation of cold is thus abnormal excitation of that part of the vaso-motor system which excites to contraction the muscular coat of the minute arteries. Such excitation is usually due to the application of some external agent. If, however, there existed in the system any agency capable of giving rise to the same abnormal contraction of the minute arteries, it is most probable that the sensation of cold would be produced thereby without the intervention of any external agent, and without any actual loss of temperature on the part of the body. That there is at work in the system at the commencement of the stage of invasion of idiopathic fever an agency capable of giving rise to unusual contraction of these vessels, and that the rigors which mark the onset of that stage are really due to such contraction, it shall now be my endeavour to show.

The period of incubation of fever corresponds to the time which elapses between the reception of the contagium into the system and the first symptoms of its action. Notwithstanding the absence of symptoms, the contagium is not dormant during that period: its growth and propagation commence as soon as it gains entrance to a susceptible system, and only when its propagation has gone so far as to cause disturbance does the period of incubation end and the stage of invasion commence; the commencement of the latter only marking the attainment of a certain stage in a process which had been going on during the whole period of the continuance of the former.

According to the theory which I have advanced as to the causation of fever, its essential phenomena are the necessary result of the propagation in the system of an animal organism, an organism which

has wants and demands identical in many respects with those of the tissues, and which lays hold of the material essential for their nutrition at the moment at which it is about to be appropriated by them. The propagation of an animal organism in the tissues thus necessarily leads to increased demand for blood in them, and yet to coincident diminution of the material necessary for their nutrition. There is an increased demand for blood because the contagium particles require the same materials as the tissues; there is diminution of nutrient material because the contagium particles appropriate what is destined for the tissues. There results from this a quickening of the circulation through the capillaries, increased retrograde tissue change, and yet diminished formation of tissue. Such derangement of the circulation, of the whole process of nu trition, and of the normal tissue changes, cannot fail to make itself felt in that part of the nervous system which presides over the muscular elements of the minute arteries whose duty it is to regulate the supply of blood to the tissues. These vessels, by increase or diminution of whose calibre the blood supply to a given part is increased or diminished, are accordingly excited to increased contraction with the object of checking the abnormal haste and waste, and of bringing matters to a more natural state. Contraction of the minute arteries thus becomes the first stage in the production of the stage of invasion, and symptoms referable thereto the first subjective phenomena of fever. As the cause which gives rise to this, the propagation of the contagium, is confined to no particular part of the body, but acts with equal force wherever the blood penetrates, it follows that the resulting contraction of the minute arteries is also general. It is this general contraction of the minute arteries of the skin which gives rise to the general feeling of cold which ushers in the febrile attack, and it is the difference of the exciting cause which imparts to this sensation the features by which it is distinguished from a similar sensation produced by external agencies. In the latter case the feeling of cold is most felt at the point of contact with the cold body; in the former it is at no point predominant. Ask a man suffering from a rigor where he feels cold, and his answer is "all over;" he cannot point to any one part in which the sensation predominates, simply because the contracted state of the vessels which gives rise to the sensation exists in an equal degree all over the body.

It is thus that I would explain the occurrence of the shiverings which mark the onset of the stage of invasion of idiopathic fever. They are due to a general contraction of the minute arteries of the skin, resulting from the effort which is made to control and stay the too rapid flow of blood through the capillaries, consequent on the propagation of the contagium in the system.

But if the sensation of cold which marks the onset of the stage of invasion of fever be due to a contraction of the minute arteries similar

to that which results from the application of a cold body to the surface, how comes it that this subjective phenomenon is accompanied by an actual rise of temperature in the part which feels cold? It happens thus. The contagium, at the time at which the rigor occurs, is being largely and rapidly formed in the system. According to the theory advanced as to the causation of the essential phenomena of fever, the preternatural heat which forms the most striking of these phenomena, is the result of the action which necessarily attends the formation of the protoplasm of the contagium particles; there being no reason why the conversion into this substance of the oxygen, nitrogen, and water requisite to its formation should not be accompanied by the same evolution of heat which attends the formation from the same source of the normal tissues and organs of the body. Such being the case, it of necessity follows that the quantity of contagium reproduced up to the time of the occurrence of the rigors must have a considerable effect in raising the temperature, so that when the rigor occurs the feeling of cold is accompanied by an actual increase of body heat, the result not so much of excessive tissue action, as of that very similar action which results in the formation of the protoplasm of the contagium particles. Not, in short, till the propagation of the contagium particles has gone so far as to cause derangement of the nutrition of the tissues, increased rapidity of the capillary blood-flow, and *increased production of heat*, does it make its presence felt in such a way as to cause contraction of the minute arteries.[1]

2. *Headache.*—The contraction of the minute arteries is, of course, not confined to the vessels of the skin, but affects those of the whole body. We accordingly find that the feeling of cold which ushers in

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[1] The symptoms of the cold stage of fever were ascribed by Bellini and Boerhaave to viscidity of the blood, leading to its stagnation in the minute vessels. This doctrine was maintained by all the followers of Boerhaave for a considerable time. Van Swieten, Whytt, and Hoffman rejected or greatly modified the notion of Boerhaave, and regarded the cold fit as due to an affection of the nervous system.

After Hoffman the doctrine of spasm of the extreme vessels taking place in the beginning of fevers became almost universally entertained.

Cullen adopted it, but enters into an argument as to the cause of the "spasm;" and instead of regarding it as being due in some way to the remote causes of fever (Hoffman's notion), he looks upon the spasm as a part of the "vis medicatrix naturæ."

"It is therefore presumed that such a cold fit and spasm at the beginning of the fever is a part of the operation of the vis medicatrix; but, at the same time, it seems to me probable that during the whole course of fever there is an atony subsisting in the extreme vessels, and that the relaxation of the spasm requires the restoring of the tone and action of these." ('First Lines of Practice of Physic,' "Pyrexiæ.")

For this historical summary I am indebted to my distinguished friend Dr. Warburton Begbie.

More recently rigors have been attributed by Dr. George Johnson to anæmia (spasm of the minute arteries) of the spinal cord.

My theory is a combination of those of Hoffman and of Cullen.

the febrile attack is accompanied by other symptoms referable to anæmia of this or that organ.

The headache, which is the most constant of these symptoms, is usually attributed either to the action of the morbid poison on the brain, or to the circulation through it of impure blood. It is really due to anæmia of the brain resulting from contraction of the minute cerebral arteries, produced in the same way and by the same cause as the contraction of the same vessels in the skin and other organs of the body.

That cerebral anæmia is a frequent cause of nervous symptoms, and that even the convulsions of epilepsy are often due to contraction of the minute arteries of the nervous centres, is an established fact in the pathology of nervous diseases. The headache of the early days of a febrile attack is due to the same cause. The anæmia which produces it is due to a diminution of the calibre of the minute arteries of all parts of the brain. The cause which gives rise to this acts with equal force on all parts of the organ, and first makes itself felt by producing a hastening of the blood-flow through the capillaries; it declares its presence, not by a morbid action, but by an increase of a natural action. The contraction of the minute arteries to which it gives rise is, therefore, due, not to an effort to exclude a morbid agency, but to an effort to bring under control the excessive action which is going on in the tissues, to a desire only to moderate the too rapid flow through the capillaries. The minute arteries are excited to contraction, not so much because there is a morbid agency circulation in the blood as because this morbid agency pervades all the tissues of the body, takes up from the blood the same materials as they do, and gives rise in each to exactly the same hastening of the blood-current, and the same impression on the nervous centres which preside over the muscular elements of the minute arteries, as would result from excessive tissue action. The contraction of the vessels being equable and equally distributed, it follows that the symptoms resulting therefrom are general, and in no organ necessarily predominant. Those referable to the skin and nervous system are most prominent, not because these organs are most affected, but because they are more sensitive and impressionable than the organs generally, and consequently give subjective evidence of derangement in a more decided manner. But the other organs also suffer from the general contraction of the minute arteries. To anæmia of the muscles thus produced are to be ascribed the muscular tremors which, superadded to the sensation of cold, constitute true rigors. So a similarly induced contraction of the same vessels in the spinal cord, heart, lungs, and digestive organs are to be attributed the aching of the limbs, lassitude, malaise, feeble pulse, oppressed breathing, and loss of appetite, which are to be noted at the early part of an attack of fever.

The analogy between the condition which gives rise to the convulsions of epilepsy and that which causes the headache of the early days of a febrile attack is still further evidenced by the fact that it happens occasionally in the adult, and frequently in childhood (when the nervous system is particularly active and susceptible), that the headache of the stage of invasion is replaced by well-marked convulsions. The convulsions in such cases are due to the same cause which gives rise to the convulsions of epilepsy and to the headache which usually ushers in the febrile attack, cerebral anæmia resulting from contraction of the minute arteries of the brain.

3. *Delirium.*—After continuing for a few days the headache passes off, and is replaced by other symptoms referable to deranged action of the sensorium—wandering and delirium. These symptoms are usually attributed to the action on the nervous centres of retained urea. The grounds on which this opinion is founded seem to me quite insufficient; for, in the first place, there is little evidence to show that urea is capable of giving rise to such symptoms, but a good deal of evidence to the contrary; and, in the second place, there is little evidence that urea is retained in any quantity, but a good deal of evidence to the contrary. That urea is formed in more than the usual quantity is true, but then (unless there is previous disease of the kidneys) it is also eliminated in unusual quantity. When there is not *excessive* formation of urea, and when the kidneys are not affected, it is probable that the whole of the urea formed is excreted, and that no excess of it exists in the blood. When, for any reason, the kidneys fail to excrete what is formed, other and more serious symptoms than delirium appear. These we shall consider presently. Meantime we have to consider why it is that the headache is lost in delirium.

To what is this change in the nervous symptoms due? The headache, we have seen, results from cerebral anæmia due indirectly to the propagation of the contagium, directly to contraction of the minute cerebral arteries. But when the headache is merged in delirium this propagation does not cease; on the contrary, the contagium continues to be formed in increased quantity, and there is a corresponding and consequent increase in the capillary blood-flow and in the retrograde tissue changes. Thus we have, in an exaggerated degree, the same changes which led to contraction of the minute arteries at the onset of the stage of invasion. What, then, is the state of these vessels now that the feeling of cold is replaced by a sensation of heat, and the headache gives place to delirium? Does the contraction cease, while the cause which gave rise to it is still in full operation? That the contraction does give way, and that the flow of blood through the capillaries is greatly increased and accelerated after the first few days of the stage of invasion have passed, there can be no doubt; the essential phenomena of fever, subjective and objective, afford sufficient evidence of this.

How is this change in the condition of the minute arteries produced? Exhausted by their efforts to restrain and moderate the excessive blood-flow, and overcome by the great demand for blood consequent on the increased propagation of the contagium in the tissues (a demand which, be it remarked, is not distinguishable from that which would result from a like increase in the natural wants of the tissues themselves), the minute arteries, regulators of the blood supply, gradually relax, and permit of the passage to the tissues of what they so urgently call for. As the urgency of this call increases, and the circulation through the tissues becomes more rapid, these vessels pass from a state of abnormal contraction to one of abnormal relaxation. This they do, not suddenly, but in a manner which bears a direct relation to the rapidity with which the contagium is reproduced. In a severe attack of fever the onset of the rigors and headache is more abrupt, their severity greater, and their decline less tardy than in a mild case, in which, coming on more gradually, they do not attain the same degree of severity, and do not so speedily give place to the more advanced symptoms of the stage of maturation. Their onset is more marked in the severe case because the propagation of the contagium is more rapid and its effects on the system more quickly produced; their decline is more rapid because, for the same reason, the condition which causes contraction of the minute arteries is more speedily merged in that which leads to the opposite condition of these vessels. We accordingly find that, after a few days, the chilliness and headache pass off and are replaced, the one by a sensation of increased heat, the other by wandering and delirium. The time at which this change in the symptoms takes place marks the period at which the abnormal contraction of the minute arteries gives place to relaxation.

Is it, then, the increased flow of blood through the cerebral tissue which gives rise to the change in the nervous symptoms? By no means. The change which takes place is due neither to relaxation of the minute arteries nor to any direct result of the altered condition of these vessels, but is to be ascribed to the same cause which produces this relaxation. The latter results from the excessive demand for blood consequent on the greatly increased growth of the contagium in the tissues; the former (the change in the nervous symptoms) results from the excessive consumption of the essential constituents of the blood (oxygen, nitrogen, and water) by the contagium, and the consequent malnutrition of the brain tissue. Increased propagation of the contagium is thus the cause both of the arterial relaxation and of the coincident change in the nervous symptoms. In the production of this change there are various agencies at work, all referable to that one cause. There is increased consumption of oxygen, nitrogen, and water; there is a consequent hastening of the blood-flow, an unusually high temperature, and

diminished nutrition of the brain tissue, without corresponding diminution in its retrograde changes. There is, in short, going on in the brain exactly the same action which in the muscles leads to the wasting characteristic of fever. Blood is supplied in more than ample quantity, but the parasite with which it is charged seizes on the essential nutritive elements of that fluid as they are about to pass from it to the brain tissue, which is thus deprived of the elements necessary for its nutrition and for the continued performance of its functions as effectually as if the blood-flow were arrested in the minute arteries. The mode of deprivation in the two cases, however, is very different. When due to contraction of the minute arteries the flow of blood through the brain tissue is diminished, and there is a corresponding diminution in all the tissue changes, constructive and retrogressive. When due to consumption by the contagium particles of the essential elements of the blood there is increased rapidity of the circulation through the brain; but the constructive changes which lead to the renewal of the cerebral tissue are, nevertheless, practically in abeyance, and are replaced to a greater or less extent by those which result in the formation of the protoplasm of the contagium particles; the retrograde changes, however, take place to even a greater extent than in health. Such deranged nutrition must give rise, in so delicate an organ as the brain, to marked derangement of function. We accordingly find its development accompanied by wandering and delirium, symptoms whose severity is, *cæteris paribus*, directly as the extent to which the contagium is reproduced. In mild cases of fever, in which comparatively little contagium is formed, the nutrition of the brain is not so much interfered with, and there may be no more than a tendency to wander at night; in severe cases, in which there is a large reproduction of the contagium and greatly impaired cerebral nutrition, the delirium is constant and often most violent.

4. *Convulsions.*—Convulsions of cerebral origin, occurring independently of inflammation, hæmorrhage, tumour, or other physical change in the intra-cranial contents, may be classed under the three varieties of anæmic, hyperæmic, and toxæmic—those due to defective nutrition of the brain, those due to congestion of the cerebral vessels, and those due to the circulation through the brain of blood charged with some noxious agency. The convulsions which at times occur in the course of idiopathic fever (other than those due to renal complications in scarlatina) have been attributed by some to the second of these causes, cerebral congestion; but by most they are regarded as due to the third, to the presence in the blood of a morbid agency, to the direct action of the poison which produces the fever, or to the retention in the blood of excretory products, the results of tissue metamorphosis. They have never, so far as I am aware, been regarded as of anæmic origin. I believe, however, that anæmia has much to do with their production.

Convulsions occurring in the course of idiopathic fever may make their appearance at two different stages of the disease—at its onset and at its height. We shall consider each separately.

The convulsions of the stage of invasion are almost peculiar to childhood, and generally pass off without bad effects. In childhood the nervous system is particularly delicate and susceptible, and consequently suffers more severely than that of the adult from any disturbing cause. When considering the cause of the rigors and headache which usually usher in the stage of invasion, we found that these were due to anæmia resulting from contraction of the minute arteries of the skin and brain. That cerebral anæmia is a potent cause of convulsions we know. That cerebral anæmia, resulting from contraction of the minute arteries of the brain, exists at the onset of the stage of invasion of idiopathic fever, and gives rise to one of its most prominent symptoms, has already been shown. The contraction of the cerebral arteries, which in the adult gives rise only to headache, may, in the highly susceptible nervous system of the child, cause well-marked convulsions, which, however alarming in appearance, are rarely a source of danger; they pass off without bad effect so soon as the disease is fully developed and so soon as the minute arteries pass from a state of contraction to one of relaxation. The convulsions of the stage of invasion, instead of being (as they are usually supposed to be) the direct result of the action on the brain of a morbid poison, are really due to cerebral anæmia, similar in character to that which, in the adult, gives rise only to headache, lassitude, and malaise.

The convulsions of the fully developed disease are much more serious, and form one of the gravest complications of idiopathic fever. They are generally regarded as of uræmic origin, as being due to the retention of urea in the blood, and as secondary to and consequent on local changes in the kidneys. Of the presence in the blood of those suffering from this form of convulsions of an increase of urea there can be no doubt: (*a*) it is formed in fever in more than the usual quantity; (*b*) in cases with such marked head symptoms there is scanty elimination; (*c*) the blood and other fluids have frequently been found to contain an excess of urea; and (*d*) the kidneys of those who die of convulsions present morbid appearances.

The existence of uræmia, therefore, we do not call in question, but accept as an ascertained fact. The points which present themselves for consideration are its mode of production and its connection with convulsions.

The mode of production of uræmia.—Excess of urea in the blood is due either to increased formation, or defective elimination, or to the combination of these two causes. In fever there is increased formation of urea, but there is, as a rule, a corresponding increase in the quantity eliminated, so that undue retention in the blood is not

very common. Cases do occur, however, in which, while there is no reason to suppose that there is lessened formation, there is positive evidence that urea is eliminated in very small and insufficient quantity. The occurrence in such cases of albuminuria, the frequent detection in the urine of casts of the renal tubes, and the post-mortem evidence of morbid change in the kidneys, have naturally led to the conclusion that the serious head symptoms with which they are so frequently complicated are caused by uræmia, consequent on defective active action of the kidneys, the result of morbid changes in these organs. But whence these morbid changes? and how are they produced? We know that in the vast majority of such cases the kidneys are perfectly healthy at the commencement of the febrile attack; that in those which recover the urinary secretion again quickly becomes normal after the decline of the fever; and that in those which prove fatal the morbid appearances presented by the kidneys are recent, consisting chiefly of congestion of their substance and loading of their tubes with epithelium. In 23 cases of typhus, in which death was caused by this form of convulsions, and in all of which the kidneys were examined by Murchison, "the morbid appearances were evidently recent and secondary to the fever" in 16; in the remaining 7 there was old-standing disease. Fever occurring in one who is the subject of renal disease is most likely to be complicated with serious head symptoms. But with such cases we are not now dealing. We are considering only those in which the renal affection is secondary to the fever, and these form by far the largest number of cases in which uræmic symptoms occur.

According to the theory of fever which I advocate, all the phenomena of that state are the result of the propagation in the system of a minute animal organism. The greater the quantity of that organism produced, the more marked will the febrile symptoms be. The best means of gauging the height of the fever is the thermometer. Now it is an ascertained clinical fact, that in idiopathic fever the highest temperature occurs in those cases which prove fatal by acute head symptoms, and in which there is partial or total suppression of urine. The high temperature, according to my theory, is simply the result of the excessive propagation of the contagium in the system. It shall now be my endeavour to show that the renal complications and the head symptoms are due to the same causes.

First, as to the renal complications.

The chief ingredients of the urine are water and urea. Marked diminution in the quantity of each excreted is a prominent feature of the class of cases which we are considering.

Diminished excretion of water in fever is due to the consumption by the contagium particles of the large quantity which is requisite to the formation of their protoplasm. The urine is scanty for the same reason that the skin is dry and the bowels constipated, because

the water requisite for its formation is consumed by the contagium. The greater the quantity of contagium produced, the greater is the amount of water consumed in the system, and the less that eliminated. The extreme scantiness, or even total absence of the water which should normally be eliminated by the kidneys is due to the same cause as the very high temperature which is invariably found in such cases—that cause is excessive propagation of the contagium. Another symptom of such cases is great frequency of the cardiac action and marked rapidity of the circulation. This, too, is due to the same cause. The contagium is rapidly growing all over the body, and is appropriating *in* the tissues the nitrogen of the constructive albumen as it is about to pass to and be incorporated in their substance. The constructive tissue changes thus prove abortive, but the retrogressive continue, and lead to the formation of urea and other excretory substances. The increased rate of the blood-flow through the capillaries necessarily leads to the formation of an unusual quantity of urea. We thus have, along with a greatly diminished urinary excretion, an increased formation of urea, and consequent loading of the blood with that substance. Now what must be the effect of this on the kidneys? They are structurally sound, and have presented to them in the blood, which is flowing through them with unwonted rapidity, a large quantity of that substance which it is their duty and function to eliminate; this duty, however, they are incapable of performing, partly because the quantity of water requisite to the solution and elimination of the urea is not to be had, and partly because the consumption by the contagium of the elements of the blood which are requisite for the nutrition and continued usefulness of the various organs leads to impoverishment of that fluid and consequent loss of function on the part of the deprived organs. The glandular apparatus of the kidneys suffers equally with the other organs, and is equally unfit for duty.

The circumstances which we have to consider, then, are—(1) that there is a great and increasing excess of urea in the blood; (2) that the quantity of water necessary to its elimination by the kidneys is not to be had; and (3) that, even if it were, the nutrition of these organs is so impaired in consequence of the impoverished state of the blood that they are incompetent to perform their functions aright.

Now, it is evident that this unusual quantity of urea cannot circulate, and continue to circulate through the kidneys, with no possibility of elimination, without seriously irritating these glands. The action of urea on the nervous system is still a matter of discussion and some uncertainty. But of its action on the kidneys there is no doubt. It is decidedly a stimulant to these organs, as is evidenced by its normal action on them, and by the fact that its injection into the circulation gives rise to diuresis. It is obvious

that if this stimulation be excessive, irritation and even inflammation may result; and this is actually what does occur in those cases of fever in which excessive propagation of the contagium leads at once to excessive formation of urea, increased consumption of water, and starvation of renal tissue. The uræmia of idiopathic fever, therefore, is not secondary to the morbid changes which take place in the kidneys; but these changes and the evidences of renal mischief which, as a consequence of them, are noted in the urine during the patient's lifetime, are the result of the uræmia, and the consequent presence in the kidneys of an excessive quantity of their natural stimulant, which, for reasons already given, they are unable to eliminate. The ultimate cause of both the uræmia and the renal symptoms is the excessive propagation of the contagium. The appearances presented by the kidneys bear out this view. Referring to typhus fever, Murchison says, "If death occur before the fourteenth day the organs are usually hyperæmic and hypertrophied, while the tubes are gorged with granular epithelium and sometimes contain blood. Occasionally they present the appearances of acute nephritis, as intensely developed as in any case of scarlatina." (Murchison, 2nd ed., p. 265.) The urine secreted by such a kidney must be albuminous, and contain tube casts, and sometimes blood. The appearances thus described by Murchison are exactly those which would be produced by the circulation through the kidneys of something which would be stimulant or irritant, according as it existed in greater or less quantity. Is not urea the substance which, if unduly retained in the circulation, would be most likely to produce such an action? Is it not the case that urea is unduly retained and does circulate in undue quantity through the kidneys in cases in which uræmic symptoms are marked? And is it not the case that we do not know of the existence in the blood of any other agency capable of producing this action on the kidneys? And, finally, is not the view which I have advanced as to the pathology of the renal changes occurring in the course of idiopathic fever the necessary and logical inference to be drawn from such an exposition of the facts as has been given?

When the quantity of contagium produced in the system is not too great the amount of urea formed is not above that which the kidneys are capable of excreting. There is increased formation of urea, but there is also increased elimination. When, however, the propagation of the contagium passes a certain limit there is produced, as a consequence of the greatly increased rapidity of the capillary blood-flow, more urea than the kidneys can excrete; at the same time the augmented demand for water and defective nutrition of the glandular apparatus of the kidneys render these organs unfit to excrete more than a portion of what ought to be eliminated. It is thus that the uræmia is produced; and it is the continued circulation through and

presence in the kidneys of an excess of their normal stimulant which gives rise to irritation, and, may be, even to inflammation of these organs, and leads to the symptoms and morbid appearances presented by the urine and kidneys of those cases of fever in which convulsions occur. The kidney affection, therefore, is secondary to the uræmia.

What is the connection between the uræmia and the convulsions?—Excess of urea in the blood has long been regarded as a cause of convulsions, but that it really is so is by no means certain. The main argument in support of this view of their pathology is the fact that convulsions are not an uncommon consequence of interference with the excretory function of the kidneys; but against it, on the other hand, there is the very strong objection that urea may exist in considerable excess in the blood, and may even be injected into the circulation, without producing any effect on the nervous system.

Frerichs believes that the real toxic agent is carbonate of ammonia produced by decomposition of urea in the blood. In favour of this view is the similarity in chemical composition of the two substances, and consequent facility for the formation of the one from the other. Against it are the facts that the presence of carbonate of ammonia in the blood of those suffering from convulsions is not proved, and that it is by no means certain that its presence, even if proved, would suffice to give rise to the phenomena in question.

Oppler believes that uræmic symptoms are caused neither by urea nor by carbonate of ammonia, because the artificial introduction of these substances into the circulation does not give rise to such symptoms. "He observed that when the functions of the kidneys were arrested, products of retrograde metamorphosis (kreatine and leucine) were formed and accumulated largely in the muscles, and that the extracted matters of the blood were greatly increased. He concludes that a similar increased metamorphosis occurs in the central organs of the nervous system, and that this chemical change accounts for the symptoms of uræmia." ('Virchow's Archiv, Bd. xxi, Heft 3; and Murchison, second edition, p. 17.)

Rosenstein, on the other hand, maintains that the introduction of carbonate of ammonia into the circulation gives rise to phenomena resembling those of epilepsy and of uræmia. He holds that the convulsions thus caused are of cerebral origin, and probably result from the direct action of the carbonate of ammonia on the brain tissue. He further believes that the essential difference between the action of carbonate of ammonia and of urea is that the former gives rise only to epileptiform symptoms, whilst the latter may produce various phenomena—coma, convulsions, and delirium. In cases in which convulsions are caused by uræmia, and in which carbonate of ammonia is also found in the blood, he thinks that they should not

be attributed to the latter, because it is not always found in such cases, and because the quantity detected bears no relation to the severity of the epileptiform symptoms. ('Virchow's Archiv für Pathol. Anat.,' Bd. lvi, Heft. 3; and 'Gazette Hebdom.,' Oct. 3rd, 1873, p. 642.)

Such are the most recently expressed views on the subject. It cannot with certainty be said that the circulation in the blood of an excess of either urea or carbonate of ammonia is the cause of the convulsions, neither can it be positively asserted that such a cause is incapable of producing them; and thus the question stands at present. To my mind the balance of evidence is against the view that they are due either to urea or carbonate of ammonia. Oppler's views are worthy of consideration, but it has yet to be shown that the cause to which he attributes the uræmic symptoms is capable of producing such phenomena.

The position in which we find ourselves placed is this:—We must either accept, as the cause of the convulsions, an agency whose power to produce such symptoms is at the best very doubtful, or we must find some other and more satisfactory explanation of their occurrence. To this latter task we shall now devote ourselves.

It has already been remarked that convulsions of cerebral origin occurring independently of physical change in the intracranial contents are due to anæmia, hyperæmia, or toxæmia.

Toxæmia, which in this case means *uræmia*, we have just considered, and have discarded as being too doubtful an agency for us to accept without first searching for some other.

Hyperæmia.—There is certainly a greater flow of blood than normal through the cerebral arteries, but, as there is no local lesion in the brain and no venous obstruction, there is a corresponding increase in the venous reflux; hyperæmia, therefore, does not exist. Post-mortem examination of fatal cases does not indicate that the head symptoms are due to this cause.

Anæmia.—Cerebral anæmia is a most potent cause of serious nervous symptoms, and one regarding whose competence to produce convulsions there is no doubt. It has already been shown that the convulsions which in childhood sometimes usher in an attack of idiopathic fever are due to such anæmia consequent on contraction of the minute cerebral arteries.

Such contraction is the most common cause of anæmic convulsions, but it is by no means the only one. Any cause capable of giving rise to rapid impairment of the nutrition of the brain may also induce convulsions. It is thus that are induced those whose mode of production we are now considering.

We have already seen that the contraction of the minute arteries which exists at the commencement of all cases of fever gives

place to relaxation when the symptoms are fully developed. We have also seen that the headache which characterises the stage of invasion is replaced by delirium about the time at which this change in the condition of the minute arteries of the brain takes place. The change in the condition of the vessels is due to the greatly increased demand for blood in the tissues, consequent, not on increase of their own wants, but on the greatly increased growth of the contagium. The same cause gives rise to excessive consumption of those ingredients of the blood which are essential to the nutrition of the cerebral tissue—oxygen, nitrogen, and water. There is thus produced a deterioration in the quality of the blood which is directly as the extent to which the contagium is formed. When little is formed there is little interference with the nutrition of the brain, and the nervous symptoms are correspondingly slight; when much is produced there is marked impairment of its nutrition, and delirium is constant and even violent; when the contagium is produced in excessive quantity there is excessive consumption of the oxygen, nitrogen, and water destined for the brain; there is a corresponding impairment of its nutrition, and a proportionate increase in the violence of the nervous symptoms, which may even culminate in well-marked convulsions. The convulsions, then, which occasionally complicate the advanced stages of idiopathic fever, are due to an excess of the same cause which gives rise to the delirium common to ordinary cases. They result from malnutrition of the brain, consequent on the consumption by the contagium particles of the oxygen, nitrogen, and water requisite for its nutrition. They are, therefore, as truly anæmic in nature as those which result from contraction of the minute cerebral arteries.

The chief bond of connection between the uræmia and such convulsions is their common causation.

Coma.—In cases in which death is referable to the head symptoms the fatal event, preceded or not by convulsions, is brought about by coma. Post-mortem examination of the brain in such cases discovers no local lesion competent to the production of such symptoms, or such a result. There may in some cases be an appearance of congestion of the pia mater, or rather more than the usual quantity of subarachnoid fluid; but these appearances are far from general, and are never so marked as alone to offer an explanation either of the nervous symptoms observed during life or of the occurrence of death. The true cause of the coma I believe to be that which has just been offered in explanation of the occurrence of convulsions—cerebral anæmia resulting from impoverishment of the blood, consequent on the excessive consumption by the contagium of the elements requisite for the nutrition of the brain.

The typhoid symptoms own a similar origin. The muttering delirium, the dry brown tongue, the sordes-coated lips, the feeble flickering

pulse, and the generally depressed and sunken aspect of one suffering from such symptoms, sufficiently indicate their adynamic nature. To the presence in the blood of an excess of the products of tissue metamorphosis they are usually attributed; first, because very similar symptoms are noticed in the advanced stages of Bright's disease; and second, and perhaps chiefly, because no other explanation is forthcoming. The explanation which I now offer—that they are really due to the consumption by the contagium of the oxygen, nitrogen, and water destined for the nutrition of the brain, heart, kidneys, and all the organs of the body—seems to me to afford a much more satisfactory explanation of their occurrence. There is no symptom presented by one suffering from that aggregate of phenomena to which the term typhoid symptoms is applied which may not thus be satisfactorily explained.

While thus holding that all those symptoms which in the course of idiopathic fever are usually attributed to uræmia are really due to anæmia, and chiefly to malnutrition of the nervous centres, I by no means wish to assert that the presence in the blood of an excess of urea and other products of retrograde tissue metamorphosis exercises no injurious influence. Such retention must lead to some derangement of the economy. I do think, however, that too great a direct influence has been attributed to it in the production of those symptoms to which the term uræmic is usually applied. This has been especially the case in febrile ailments, and the object of this paper is to give such an explanation of the causation of the nervous symptoms of fever as appears to me to be free from the many objections which may be urged against the uræmic theory, and to be better calculated to explain the phenomena which we have been considering.

But the subject of uræmia and its connection with nervous symptoms cannot be dismissed without some reference to the mode of production of the serious head symptoms which frequently occur in disease of the kidneys. It is the marked existence of nervous symptoms in such cases that has led to the rooted belief that similar symptoms in other maladies, associated with defective excretion of urea, are due to the action on the nervous centres of this or some other product of retrograde tissue metamorphosis.

We know that in the case of advanced renal disease the presence of an excess of urea in the blood is often associated with the occurrence of convulsions, coma, and other serious nervous symptoms, which can scarcely be distinguished from those which characterise bad cases of fever. We know, too, that in such cases of fever there is an excess of urea in the blood; and why, then, it may be asked, not attribute the convulsions in both cases to the same cause? If uræmia can produce such serious head symptoms in renal disease, why may it not do so in fever also? My answer is that I

do attribute them to the same cause, but that neither in the one case nor the other do I regard the nervous symptoms as directly due to uræmia. It is not proved that excess of urea in the blood is capable of producing such symptoms; indeed, there is very strong evidence to the contrary. We must therefore search for some other cause regarding whose competency to produce such symptoms there is no such doubt. The most common and potent cause of such head symptoms as those whose causation we are investigating is cerebral anæmia. I think that a careful consideration of the conditions which precede and lead up to these symptoms in diseases of the kidneys affords strong evidence that in them, as in fever, this is the true cause of their occurrence. But how is the anæmia brought about in kidney disease? And what evidence is there of its existence? It is produced in exactly the same way as that which gives rise to true epilepsy and that which causes the convulsions which occasionally usher in an attack of fever in children—by contraction of the minute cerebral arteries. To what is this contraction due? Clearly to the presence in the blood of those products of retrograde tissue metamorphosis which the kidneys ought, but are unable, to eliminate. The contraction of these vessels is simply an effort to exclude such products from the brain. That the impure state of the blood which exists in chronic renal disease gives rise to contraction, and, in time, to hypertrophy of the muscular coat of the minute arteries, is an established fact in the pathology of such ailments. It is in the kidneys themselves that this hypertrophy is most marked, because it is the kidneys themselves which most suffer from the presence in the blood of more of their natural stimulant than they are capable of eliminating; and because, therefore, it is in their minute arteries that the greatest effort is made to exclude the excess of urea. But this contraction of the muscular coat of the minute arteries is not confined to the vessels of the kidneys; it takes place in all the organs of the body if the urea exist in sufficient excess. The anæmia of the various organs thus induced is the probable cause of many of the symptoms of derangement of this and that organ which are frequently noted in the course of chronic disease of the kidneys. To anæmia of the brain thus caused should be ascribed those nervous symptoms which are usually attributed to the direct action of urea or of carbonate of ammonia on the nervous centres.

This I believe to be the explanation of the great similarity which is so frequently noted to exist between the typhoid symptoms of fever and the symptoms of advanced renal disease. These can at times scarcely be distinguished from each other, not because they are in both cases due to *uræmia*, but because they are in both cases the result of *anæmia*—the most potent and unquestioned cause of serious nervous symptoms. The mode of production of the anæmia

in the two cases is different, but the result is the same. In the case of idiopathic fever it is due to the direct action of the contagium particles on the blood, and the consumption by them of the ingredients requisite for the nutrition of the brain. In advanced renal disease it is due to defective supply resulting from undue contraction of those vessels whose duty it is to regulate the supply. In the one case it is the quality, in the other it is mainly the quantity, that is deficient.

But, it may be asked, if the presence of an excess of urea in the blood in renal disease causes contraction of the minute arteries, how comes it that, with the same excess, there is in those cases of fever which we have been considering an opposite condition of these vessels? That after the stage of invasion is over the minute arteries are in a state of relaxation has already been noted. It has been explained, too, that it is to the great increase of the *vis à fronte*, to the great demand for blood in the tissues, resulting from the propagation in them of the contagium, that this relaxation is due. The continuance of this force more than counterbalances any tendency to contraction of the minute arteries to which excess of urea might give rise. It is to be noted, too, that not only the mode of production but the period of formation of the excess of urea is very different in the two cases. In fever there is excess of urea formation from the commencement of the disease, but, as a rule, the kidneys are structurally sound and competent to its elimination; there is therefore, as a rule, no retention in the system, no uræmia. In some cases, however, the amount formed is more than the kidneys can excrete (for reasons already given), and then there is uræmia. It is quite possible that the presence of this excess of urea in the blood may here, as in chronic renal disease, cause some contraction of the minute arteries, and so aid the already existing cause of anæmia. I am disposed to think, however, that in the presence of such a potent cause of arterial relaxation as we have in the excessive demand for blood in the tissues, the urea could not well produce any contraction.

In kidney disease the march of events is very different. The kidneys are diseased and unfit to excrete the proper quantity of urea; this gradually accumulates in the blood and gives rise to those changes in the muscular coat of the minute arteries which have been noted. There is no excessive formation of urea, however, and no agency capable of counteracting the effect of the urea on the vessels. The difference in the march of events in the two cases is, therefore, very marked. In fever the cerebral anæmia which gives rise to the head-symptoms is primary to, and independent of, the uræmia. In kidney disease it is secondary to, and consequent on, that condition of the blood.

III.—Recent Official Correspondence relating to Leprosy.

Communicated to the Editor.

Since the publication of the report by the College of Physicians in 1867, the subject of leprosy has continued to excite much interest in many foreign and distant lands, as well as in this country. This has been shown by the numerous references made to it, not only in medical writings and lectures, but also in biblical and general literature. There is every prospect, too, that this interest will not soon abate. At the present time there is known to be more than one work in preparation for the press, in relation to Jewish leprosy in particular; and a still more significant fact is that the India Office has recently commissioned so able a man as Dr. V. Carter to investigate the disease as it occurs in Norway, with the understood intention that he is subsequently to extend his researches to the East Indies, where the malady is widely endemic among diverse tribes of that enormous population. It is to be remembered that the recent inquiry instituted by the Colonial Office was limited to only a few of our West Indian possessions. There still remain numerous colonies in the Pacific and Indian Oceans to be visited, such as the Cape of Good Hope, Mauritius, Ceylon, &c., in all of which leprosy more or less extensively exists, not to mention the foreign islands of Madagascar, Java, and the Philippines.

As yet we are only at the threshold of the scientific investigation of the subject, and are, therefore, as a matter of course, still in uncertainty, if not in absolute darkness, as to the real truth on many points respecting this obscure and formidable disease. Some light may have been cast on a few of the many problems at issue, but our knowledge at best is imperfect and requires confirmation, more especially on the cardinal questions of its genesis or origin, and of its treatment, preventive as well as curative.

In this state of things it cannot but be profitable to the profession to be made cognisant of the official communications that have passed of late years between the Colonial Office and the College of Physicians, whose attention has not ceased to be directed to the consideration of the subject, since the appeal that was made to its services by the Secretary of State ten years ago. The following communications are now published with the sanction of Dr. Burrows, th eesteemed President of the College.

In February, 1872, the Earl of Kimberley requested the opinion of the College in respect of a correspondence which had recently taken place between Dr. Meicklejohn, Surgeon of Her Majesty's ship 'Forte,' and the Governor of Mauritius, relative to two alleged instances of the propagation of leprosy by contagion, and particu-

larly by sexual intercourse, which occurred at the Leper Asylum in the island of Curieuse, one of the Seychelles group, under the government of Mauritius. The reply was as follows:

"The College, with all the facts before it, has no hesitation in saying that the particulars relative to the two cases of alleged contagion of leprosy have not been obtained with sufficient precision to be regarded as furnishing evidence in proof, or in disproof, of the contagiousness of leprosy, nor do they afford any ground in themselves of leading the College to modify the views expressed in the Leprosy Report as to this important matter."

During the summer of that year, 1872, a communication was addressed by a Fellow of the College to the Secretary for the Colonies, inviting his lordship's attention to several printed documents relating to the contagiousness of leprosy, and more particularly to the presumed inoculability of the malady by the direct transference of the discharge from a leprous sore to a healthy person. All the documents were reprints of matter which had been before the public for several years; but as many men in as well as out of the profession, and abroad as well as at home, continued to entertain grave doubts as to the complete non-communicability of leprosy by contact or proximity with the diseased—apart, of course, and distinct from its transmissibility by hereditary descent, a point which no one questions — the present was deemed a favorable opportunity of reconsidering the general question so far, at least, as fresh documentary evidence was adduced. This will appear from the following report:

"The College, in framing a reply to the question propounded to it by the Earl of Kimberley, in reference to the asserted contagiousness of leprosy, begs leave to state that it has given its best consideration to the contents of the documents sent to it by his lordship, on the ground, as the College understands, of their being supposed to contain new facts bearing on the matter.

"The College is asked 'whether their report (par. 10, p. lxix), 1867, will admit of the construction that leprosy, although not contagious in the sense of being communicable by mere contact, may yet be communicated by inoculation or contact with an abraded skin.'

"The paragraph or conclusion No. 10 of the leprosy report of the College referred to runs thus:—'The all but unanimous conviction of the most experienced observers in different parts of the world is quite opposed to the belief that leprosy is contagious or communicable by proximity or contact with the diseased. The evidence derived from the experience of the attendants in leper asylums is especially conclusive upon this point. The few instances that have been reported in a contrary sense either rest on imperfect

observation or they are recorded with so little attention to the necessary details as not to affect the above conclusion.'

"The documents submitted to the College by the Earl of Kimberley for its consideration are as follows:

"*Firstly*, an extract of a letter from Dr. Hillebrand, of Honolulu, addressed to Mr. Macnamara, of Calcutta, in 1866, and published by that gentleman in his pamphlet on leprosy, printed in that year. The letter deals with the origin and spread of leprosy in Honolulu.

"*Secondly*, a review which appeared in the 'Journal of Cutaneous Medicine' of a French pamphlet, entitled 'De la Contagion, seule cause de la propagation de la Lèpre,' published in 1869 in Paris, by Dr. Drognat Landré, containing an account of the supposed first appearance of leprosy, and the increase of the disease in later years, in Surinam.

"*Thirdly* and *Fourthly*, two critical notices of the leprosy report of the College, which appeared in one of the weekly medical journals ('Lancet,' Jan. 12 and Feb. 9, 1867).

"Dr. Hillebrand in his letter states that he recollects first seeing leprosy in Honolulu in 1853, that as far as he can learn it did not exist in the place before 1848, that in 1859 he brought the existence of the disease 'to the notice of Government and of the public,' and that a recent census shows that the number of lepers was 230 out of a population of 67,000 natives, or about $3\frac{1}{2}$ per 1000. Dr. Hillebrand concludes that the disease was introduced about 1848, or thereabouts, into Honolulu, 'into a clean nation,' and spread rapidly in the island by contagion; and his reason for thinking so appears to be based upon the fact of his having discovered, by personal inquiry, that about one fourth of the leprous patients who have come under his observation avowed contact with other lepers as the cause of their own malady.

"Supposing the statements made by Dr. Hillebrand could be established as true, they might lend a seeming support to the idea of the contagiousness of leprosy. But the College has to observe that many of the statements made by Dr. Hillebrand are so lacking in precision, as well as deficient in details, whilst others are based on mere hearsay evidence, that the College is compelled to receive them with very great reserve.

"As regards the introduction of the disease into Honolulu, it is only surmised by Dr. Hillebrand that it might have been introduced by the Chinese about 1848, and it is not proved that leprosy, although not seen by Dr. Hillebrand before 1853 (and he had then been only two years in the place), did not exist, even extensively, in the island before 1848. The apparent rapid increase of leprosy began to be noticed, too, coincidently in point of time with the establishment of the Queen's Hospital and Dispensary, the number of lepers who applied for relief at the hospital augmenting year by

year. The truth may be that the presence of the leprous amongst the population at large was only more clearly perceived on account of their seeking relief in greater number at the hospital as this became better known.

"The main facts in Dr. Hillebrand's letter referred to above bear only indirectly upon the question of the inoculability of leprosy; but Dr. Hillebrand does not, however, adduce any evidence based upon personal observation in proof of the transmission of the disease by inoculation.

"Dr. Drognat Landré's pamphlet, as before observed, deals with the origin and spread of leprosy in Surinam, and recounts chiefly the opinions and views entertained by the father of the author, who practised a long time in Surinam. There is great similarity in the general character of the statements made, and the object held in view, in the letter of Dr. Hillebrand and the pamphlet of Dr. Landré respectively, only that the locality concerned is different in the two cases. The criticisms passed upon the former communication may with equal justice be applied to the other; and with respect to the inferences deduced by Dr. Landré from the past history of the Dutch colony of Surinam, and from the meagre and unauthenticated details of the nine cases cited in support of the contagion of leprosy, the College feels that the evidence on which these inferences rest is quite insufficient for the solution of any scientific question.

"With regard to the third and fourth documents, it would appear that the object of the anonymous writer is not to impugn the former conclusion at which the College, after careful inquiry, arrived, as to the contagiousness of leprosy, for he admits that the conclusion 'is justified by the evidence they actually received,' but to point out that the particular question of the possible inoculability of leprosy cannot be regarded as having been scientifically investigated and settled.

"The College, however, having carefully considered the point submitted to it, as regards the inoculability of the disease, is of opinion that no satisfactory positive evidence sufficient to prove the occurrence of such an event has as yet been produced.

"The College is, therefore, not prepared to admit 'that leprosy, although not contagious in the sense of being communicable by mere contact, may yet be communicated by inoculation or contact with an abraded skin,' and it does not desire that paragraph No. 10, p. 69 of its report, should be regarded as bearing such a construction.

"In conclusion, the College desires to point out the paramount necessity, in all investigations relating to the origin and spread of diseases, of having minute and accurate details from the local observers, including dates and localities of the occurrences. Without such details, it is impossible for the College to afford the

Government the assistance required in the solution of these and similar questions.

"(*Signed*) GEORGE BURROWS,
"*December*, 1872. *President.*"

In the summer of 1873 the College received from the Colonial Office a copy of the official report, addressed to the Governor of British Guiana, of Dr. Manget, surgeon-general of the colony, and of Dr. Shier, the inspector of estates' hospitals there, respecting the results of the Beauperthuy treatment in the patients located at Kaow island, on the Massaruni river, after the treatment had been continued for nearly two years; and also a copy of a despatch which the Secretary of State proposed to send to the governors of our West India colonies, in reference to the 'Report on Leprosy and Yaws' by Dr. Milroy, recently printed and presented to Parliament.

Although the College was not requested by Lord Kimberley to offer any observations on the former of these documents, the committee to which it was referred considered that its contents were of so much professional interest that they prepared a short report upon it, to be submitted to the College, and the College subsequently adopted it. As this report has already been made public ('Lancet,' Sept. 6, 1873), it is unnecessary to reproduce it here in full. The conclusions of Drs. Manget and Shier entirely coincide with the opinions expressed by Dr. Milroy from his repeated examinations of the patients on the spot, towards the close of 1872, and after six or eight months' use of the treatment instituted by the late Dr. Beauperthuy ('Report on Leprosy and Yaws,' p. 45). Although little can be said very encouraging as to the *curative* results obtained, the good effects of the system, in the way of prevention or arrest and mitigation, are pointedly referred to, both by Drs. Manget and Shier and by the committee of the College, as will be seen by the following remarks from their respective communications:

"In conclusion, we are of opinion that, if the incipient cases of leprosy were at once removed to Kaow island, with its present hygienic regulations adhered to, the disease would in most instances be arrested, and that many of the inmates would be returned to their families—we do not say cured, but so much relieved as to become again useful members of society.[1]

"The committee are of opinion that the investigations which have been made of late as regards the condition and the medical treatment

[1] "There is a unanimous accord of opinion that the greatest benefit is derived from the adoption of hygienic measures, and that, by improving the general conditions, physical and moral, of the leprous poor, very much may be done to retard or arrest the malady in its early stages, and also to mitigate its severity when more fully developed."—*Report of the College*, p. lxxi.

of the leper are such as to give special encouragement to communities amongst whom lepers exist to properly house, clothe, and feed them, and to provide them with proper medical treatment, with the certainty that much of their disease will be arrested or mitigated, and their naturally miserable existence rendered much more endurable."

In respect of the proposed circular despatch from Downing Street to the governors of the West India colonies, the College, in their reply, August 16, 1873, observed :—"The College . . . . . cordially approves of the despatch as a whole. The recommendations are judicious, and not only in accord with the suggestions of Dr. Milroy, who has recently made himself personally acquainted with the wants of the districts to which the despatch refers as regards their leprous populations, but are also based upon a rational and scientific method of dealing with the disease. The College has no further remark to make, except to call attention to a point not specially referred to in the proposed despatch, but which Lord Kimberley may not deem a convenient subject to be dealt with at present, namely, the hereditary transmission of leprosy. The College thinks it very desirable that, on all occasions, the hereditary character of the disease should be kept steadily in view. In the majority of cases leprosy is an hereditary transmission. How far, however, it may be possible or right, politically and socially, to prevent the transmission of leprosy from parent to child, is a question that should not be lost sight of."

In consequence, doubtless, of these closing remarks, the two last sentences in the following despatch appear to have been added to the manuscript copy as it came before the College.

"CIRCULAR.

"DOWNING STREET,
"*4th September*, 1873.

"SIR,—In my circular despatch of the 28th of December, 1870, I invited your Government, in common with those of other colonies, to contribute to the expense of sending Dr. Gavin Milroy to the West Indies, in order to investigate the treatment of leprosy, which was then being pursued by the late Dr. Beauperthuy, and which had attracted wide attention both there and in Europe.

"2. The colonies responded liberally to this invitation, and Dr. Milroy, who was thus enabled to pursue his inquiry with the deliberation which its importance deserved, has submitted to me a report narrating his proceedings, and setting forth the conclusions at which he has arrived on the questions referred for his consideration. Copies of that report have already been supplied to you from this department, and I have now to convey to you the observations and instructions which it has suggested to me.

"3. Dr. Beauperthuy died shortly after Dr. Milroy's arrival at

Kaow Island, in British Guiana, and by this untimely event Dr. Milroy lost the advantage of observing the course of Dr. Beauperthuy's treatment as conducted by himself. You will observe with regret that Dr. Milroy's report does not record any instance of the success of Dr. Beauperthuy's treatment in effecting the actual cure of leprosy.

"4. The value of Dr. Beauperthuy's treatment is a question for the medical profession, and I have at present no further instructions to give you respecting it, than that you should place the information which Dr. Milroy's report affords in the possession of the medical men practising in the colony under your Government, for which purpose you shall either be supplied with additional copies of the report or with extracts of it reprinted in a pamphlet form, as may be hereafter decided.

"5. You may be aware that Dr. Milroy was a member of the committee appointed by the Royal College of Physicians in 1863 to investigate the subject of leprosy. In their report (published in 1867) that committee expressed a very decided opinion, adverse to the popular belief that leprosy was contagious. Dr. Milroy's recent researches appear to have strongly confirmed him in the opinion which he expressed as one of the committee; and I hope that his report (which contains in an appendix a reprint of the conclusions of the committee) may tend to reassure those who entertain apprehensions on the subject.

"6. He rejects the theory that leprosy is the result of a communicable blood-poison like syphilis, and defines it as 'A constitutional cachexy or an unhealthy condition, not of any one part or texture of the body, but of its whole framework or system' (p. 37); and he indicates, as the chief promoting causes of this cachexy, malaria, and insufficient and unwholesome food.

"7. The people in the West Indies, through ignorance, neglect the use of the vegetables which the resources of the country supply. They also do not use cereals and rice; the price of these articles, however, in some degree explains their neglect. Fresh meat is not sold at prices which bring it within their reach, and their only nitrogenized food is salt meat or salt fish, which they appear to prefer in a state of putrescence.

"8. In some colonies the tariff may be so arranged that the people are tempted to abandon the more nutritious for the less nutritious kinds of food. Any fiscal advantages which involved such consequences would be dearly bought; and it will be your duty to consider whether the tariff of your colony is free from objection in this respect.

"9. Beyond readjusting the tariff upon sound principles (if such should be necessary), the Government of a colony cannot directly deal with the question of the food of the people; but it may

properly call the attention of employers to the subject, and suggest co-operation amongst themselves for the improvement of the diet of persons employed by them. It is obvious that they have a deep interest in the question, and their position enables them to exercise an important influence upon the population generally in this matter.

"10. In a despatch which Dr. Milroy has printed as an appendix, the Governor of Trinidad has suggested the introduction of goat's flesh as an article of food. The use of this meat and of Australian preserved meat in the public institutions, which Government controls, might tend in time to diffuse a wholesome demand amongst the general population for these articles of food. The sale of putrescent fish could, no doubt, be prevented by law, but I am not at present prepared to express an opinion in favour of such a measure. If the popular taste for food in an advanced stage of decomposition is as inveterate as it is represented to be, the people would defeat the law by keeping until deteriorated provisions which they had purchased when fresh. I should be glad to be favoured with any observations you may be able to offer on the whole question.

"11. I have to request your special attention to the remarks of Dr. Milroy on the various leper asylums which he visited. The Governor of the colony, in which each of these asylums is situated, is responsible for taking early measures for removing the particular evils which Dr. Milroy has pointed out as existing in the asylum of his colony; but you will perceive that, besides drawing attention to deficiencies in particular institutions, Dr. Milroy has indicated fully what, in his opinion, are the requirements of such institutions.

"12. They should be not merely asylums, but hospitals in the full sense of the term, having an organized staff of nurses commensurate with their scale, and having at command the services of one or more medical officers attending with frequency and regularity. They should be large enough to admit of their atmosphere being kept pure and wholesome, and they should be in a situation free from malaria.

"13. The diet should be ample, and as salt provisions are deemed to be amongst the exciting causes of the disease, these should be systematically excluded, as in Trinidad, from the diet.

"14. With regard to the internal discipline of the asylums, the males should be kept as far as practicable separate from the females, and the youths from the men; and as idleness has an injurious and depressing effect upon the patients, all who are not bed-ridden or totally disabled should be provided with occupation according to their capacity for work.

"15. You will ascertain and report to me how far the asylum

in the colony under your Government satisfies the requirements here indicated, and, if it falls short in any particulars, what measures you propose for remedying its deficiencies.

"16. The disease of yaws, which is described in the latter part of Dr. Milroy's report, appears to be entirely distinct from leprosy. It has in a great measure disappeared since emancipation, but has a tendency to reappear in an epidemic form from time to time. In its nature it appears to run a regular course, to be curable, and to be more or less contagious.

"17. You will observe that Dr. Milroy is not inclined to agree with the view that leprosy may be propagated by means of vaccine lymph, even when blood has been mixed with the lymph. However, as the success of a system of vaccination must largely depend upon the views prevailing amongst the public on the subject, it will be always as well to use lymph which is beyond suspicion in this respect.

The fact that leprosy is transmitted from parent to child is indisputable, and as leprosy by descent is often, through a natural error, mistaken for leprosy by contagion (the members of one family being naturally in contact), it is important that this fact should be borne in mind. It is a fact which points also to the expediency of placing asylums for females at a distance from asylums for males when circumstances permit, and when the numbers are such as to justify separate establishments.

"I have the honour to be,
"Sir,
"Your most obedient humble servant,
"KIMBERLEY.

"The Officer Administering
"the Government of ."

Chronicle of Medical Science.

REPORT ON OTOLOGY.

(*Continued from April*, 1873.)

By J. Hinton,
Aural Surgeon to Guy's Hospital.

Foreign Bodies in the Ear, and a certain and harmless way of removing them.—Dr. Löwenberg ('Berlinir Klinischen Wochenschrift,' No. 9, 1872) reports two cases in which, after injury had been done by attempts at extraction, he succeeded by the use of an adhesive substance.

Good glue dissolved in as little water as possible is the best; if the preparations can be made the day before, it is very advisable to mix the glue with a small quantity of cold water, and just before using it to warm it in a water-bath till it is nearly solid. Just previously a very fine brush is prepared by rolling a strip of old linen around a little rod and leaving a projecting end of about a millimetre. This point is now dipped in the glue without covering the sides, and the point is rather allowed to fall as carefully and lightly as possible on the foreign body than pressed against it. The patient should lay his head comfortably before the operation on the back of a couch or arm-chair, and remain lying quietly for three-quarters of an hour. It will bear a good deal of force, and should be repeated if it fails. If moisture is present, warm air dried over chloride of calcium may be driven into the meatus, or gypsum used. He reports a case in which syringing forced a body through a perforation in the membrane, and advises the adhesive plan in preference to syringing whenever perforation is present. In one case also in which a small stone had entered the tympanum, he saw the orifice diminish in size until it became less than the diameter of the stone. Facial paralysis was present. An incision was made by another surgeon; a month after the stone fell out, and the paralysis disappeared.

[No one who witnesses the amount of evil still done by attempts at extraction of foreign bodies from the ear will think Dr. Löwenberg's proposals even in their most elaborate form unreasonable.]

Dr. E. H. Clarke ('Trans. of Amer. Otol. Soc.,' 1872), under like circumstances, passed a thread through a small square of adhesive plaster, and bringing the latter by means of a fine tube into contact with the outer surface of the body, concentrated sunlight upon it with a lens until it softened and adhered, and then extracted it easily.

Gruber ('Monatschrift,' 1871, No. 8) reports a case in which a

stone was put into the meatus, and after repeated attempts at removal the membrane was mostly destroyed and the stone encysted in the tympanum; failing in attempts to remove it, the child was kept under observation for some months, with no ill effects.

The great difficulty of making a permanent opening in closure of the external meatus gives interest to the following case of

Operation for Atresia of left Meatus by the Galvanic Cautery and restoration of the passage, by F. Weber ('Monats.,' April, 1871).—The patient received a severe wound from a chassepot bullet, which entering in the right infra-orbital region, passed out behind the left ear. He lost much blood, and was unconscious for some time; but after much suppuration, and removal of several pieces of bone from the wounds, as well as from the left meatus, and nose and mouth, healing gradually took place. About three months after, when Weber saw him, there was complete facial paralysis and loss of taste on the left side, but movements of speech, &c., unimpaired. The facial muscles did not act on galvanism. A deep cicatricial depression was present behind the left ear; the auricle, however, was uninjured, but the meatus, about two lines from the entrance, was completely closed by an obstruction covered with skin. This obstruction felt somewhat elastic. Examination with a probe and with a fine knife met a firm resistance. Hearing not destroyed; Eustachian tube pervious. The galvanic cautery was made use of to re-open the tube. Weber tried to pass a pointed heated instrument through the cicatricial tissues for some time without success, it meeting firm resistance; but at last it passed in a direction upwards and backwards for about an inch, appearing then to have got through the obstruction, and to be close to the membrane. A good deal of pain was caused; a fine laminaria bougie was passed into the opening, and cold water dressing applied. The opening was gradually dilated by larger laminaria bougies and charpie wedges; and after some days, when it was as wide as a quill, discharge of sanious offensive pus took place from it. The patient now could hear his watch an inch from the ear. The treatment was continued for some time, until the newly-formed passage had skinned over, and finally a thin india-rubber tube inserted to prevent the passage from again contracting. The hearing remained without further alteration.

Dr. Engelmanns ('Archiv f. Ohr.,' B. vi H. ii) relates a case that may throw some light on the mode in which complete occlusion of the meatus may take place. In a case of long standing deafness, with ulceration of left meatus and polypoid growths, a string of spongy granulations formed across the meatus, connecting two of the polypi, one from the upper, the other from the lower wall of the meatus, like a bridge. This gradually dried and contracted, and finally ruptured below, and then hung down as a thin greyish-white string from the upper swelling. After treatment for some days it, with the polypoid growths, disappeared.

Heterologous formation of Cysts—Kasiloff ('Virchow's Archiv,' xlviii.)—A polypus, which completely filled the meatus, was removed from the membrana tympani, to which it was attached by three roots

(the membrane was not perforated), and on section showed cavities of different form and size, with mucous contents. The roots of the polypus appeared like young granulative tissue, with numerous bloodvessels; its substance was more fibrous, with abundance of round cells and a few spindle-cells scattered about. The upper surface was plainly papillary, with numerous deep fissures between the papillæ. Kasiloff, concluded that the hollow spaces in the polypus were formed from changes in the blood-vessels, and describes the polypus as a cystic myxoma, with heterologous mucous cysts formed from the blood-vessels.

Steudener (Archiv B. v H. iii) thinks the several layers of squamous epithelium lining these cysts render this origin of the cysts improbable, as cysts which arise from *dilatation* of blood-vessels are lined with epithelium similar to that of the vessels, and so with a single layer of smooth epithelial cells: nor are there yet sufficient facts to prove that the colourless blood-corpuscles have the power of changing into true epithelium.

On Blue Otorrhœa.—Dr. E. Taufal (Archiv Ohrenheilk, f. Bd. vi) draws the following conclusions:

1. In otorrhœa, as in wounds, "blue pus" occurs, the dressing being coloured and deep blue. 2. It has the reaction of litmus. 3. Quantities of *bacteria Termo* are found. 4. This blue suppuration can be artificially transferred to other individuals suffering with otorrhœa. 5. In all cases it disappeared spontaneously. 6. In one, after its disappearance, aspergillus was found in the meatus.

Pathology and Treatment of Abnormal Tension of Membrana Tympani and Ossicula. Politzer ('Allgem. Wiener Med. Zeitung,' No. 47).—After the membrana tympani has been long forced inwards through occlusion of the Eustachian tube, its fibres are not only stretched, but also separated from each other and atrophied, so that after the tube has been made pervious the membrana tympani remains lax, and flaps in and out like a film of collodion on slight changes of atmospheric pressure in the tympanum.

A membrane thus relaxed, and with it the chain of ossicula, is always forced inwards, as the atmospheric pressure within the tympanum is always less than that outside. Secondary retraction of the tendon of the tensor tympani also may follow.

By the bulging in of the membrana tympani the point of insertion of the tendon is approximated to the inner wall of the tympanum and the whole tendon rendered lax. The result of this relaxation is retraction and shortening of the tendon, and thus the membrane and ossicula are drawn inwards and kept stretched. The great improvement in hearing which in such a case follows inflation of the tympanum disappears after a few seconds. Permanent shortening of the tendon may also arise from shrivelling of its sheath, resulting from chronic inflammation of the lining membrane of the tympanum.

The more the handle of the malleus is inclined inwards, the more tensely will the folds of the membrana tympani, which extend from the short process to the external meatus be stretched; and thus

two forces act upon the handle of the malleus to keep it fixed, and so retard the conduction of the waves of sound, viz., the tendon of the tensor tympani muscle and the tightly-stretched folds of membrane.

Treatment.—When, after the tube has been rendered patent and the catarrh subsided, the membrana tympani, partly through traction of the tensor tympani, partly as the result of relaxation of its fibres, is again drawn inwards, *air-tight obturation* of the external meatus is attended by better results than are generally known. By means of the manometer Politzer has shown that by obturation of the external meatus the effect of the atmospheric pressure on the membrana tympani is obviated, and its sinking back inwards prevented.

Cotton made up into the form of a cork about the size of a hazelnut, with ointment so as to render it air-tight, is best for closing the meatus. It should be inserted with gentle pressure until the external part of the cartilaginous meatus only is filled by it. This may be left to the patient to do before going to bed, and should be continued for several nights, and then an interval. The meatus is closed when the ticking of a watch is not heard, and loudly-spoken words only at a little distance.

Where the membrana tympani is atrophied the above methods do not succeed, and incision of the membrana tympani here has, in many cases, given good results. This is made with a double-edged lance-shaped needle, bent on a handle, midway between the handle of the malleus and the periphery of the membrana tympani, often repeated (four or five times at intervals of two or three days). This incision should be about $\frac{1}{2}$ to $1'''$ long: as a rule it heals in twenty-four hours. Suppurative inflammation of the membrana tympani never results. The improvement after inflation is thus made more lasting, and probably is due to slight adhesive inflammation in the neighbourhood of the incision, by which the tissue of the membrane gains consistency and firmness.

In cases where the malleus is fixed and its vibrations thus impeded by the strong traction of the tendon of the tensor tympani on the one side, and the tensely-stretched folds of membrane on the other, as above mentioned, and inflation and injections into the tympanum produce no effect, Politzer has incised the posterior fold of membrane. For this purpose he uses a small knife, rounded at the point, sharp-edged, bent at an angle on the handle, and make the incision perpendicular to the long direction of the fold, from above downwards or inversely, midway between the short process and the peripheral end of the fold. Generally the incision produces a cracking noise, and the edges of the wound separate, indicating great tension of the fold. The bleeding is very slight, and the incision heals after a day or so. The result depends on the amount of changes within the tympanum.

Cicatrices sometimes, even apart from deeper changes, affect the tension of the membrane and impair the hearing. This may be assumed in cases where no catarrhal secretions are present, and where the improvement after inflation disappears again on the

sinking in of the cicatrix. One or repeated incisions of the cicatrix with the double-edged lance-shaped needle, often give good results in such cases. Slight inflammation is set up, which tends to thicken the cicatrical tissue, and thus increase the tension of the previously relaxed parts, and so restore the vibratory power. In many cases the sunk-in cicatrix becomes flatter; in others, after some weeks, it resumes its previous appearance without any loss of the improvement.

In adhesions of the membrane Politzer advises division only when prominent fibrous bands are visible on the outer surface of the cicatrix, stretching between the handle of the malleus and the periphery of the membrane, or between the handle and the articulation of stapes and incus, and so impeding the mobility of these bones. In some such cases he has, after division of the bands, seen considerable improvement. In other forms of adhesion he has not succeeded in preventing their reunion.

Dr. Prout[1] reports a case in which an extensive adhesion of the membrane to the promontory was divided by him with good success. The patient was becoming worse, with unbearable tinnitus. Dr. Prout cut round the promontory, and made an opening in the membrane about $1\frac{1}{2}$ lines in diameter, with immediate great improvement. A slight purulent discharge lasted for about a week. After twelve months there was still an opening, and the improvement was almost fully maintained. [The knife used by Dr. Prout is very similar to one introduced by the late Mr. Toynbee for the same purpose; but the results attained by him were not of much importance, most probably because the use of Politzer's bag had not then been introduced.]

(*a*) *Abnormal Tension of Membrana Tympani.*—Dr. Gruber (Monatschr. für Ohrenheilk, 1871.)—From the very complicated mode of its attachments, the normal conducting power of the membrana tympani is easily interfered with, and the more because of its connection with the ossicuala.

(*b*) *Relaxation.*—The healthy membrane, on account of its very elastic elements, can be stretched to a considerable extent. Experiments on isolated portions of the membrane without the malleus, as well as on the whole membrane with the malleus attached, removed from the body, partly by traction with forceps, and partly by attaching weights, and also by methodical pressure on membranes left attached to the meatus, showed that the membrane could be stretched at least a fifth, and in some cases even a third larger than its original size, assuming, of course, that stretching took place at all points at the same time.

A membrane with the malleus attached was removed from the body in a narrow ring of bone, and being fitted into a ring of cork placed in a glass of alcohol. Pressure was then made upon it by a small shot for twenty-four hours, and increased, one shot daily, for four days. After this a conical leaden weight of two ounces was sus-

[1] 'Tarns. of Med. Soc. of State of New York,' 1872.

pended over it by a string, and its weight allowed gradually more and more to press upon the membrane for twenty-eight days, when the membrane had stretched to the above-mentioned extent. On slight pressure, or on blowing rather forcibly on it, the membrane bulged out much behind and at the side of the malleus.

On the last day of pressure, the lower end of the malleus was separated considerably from the membrane, as is sometimes also seen as a morbid condition; and on the next day, when the entire weight acted upon the membrane it suddenly tore in the front of the malleus.

The relaxation will be greater the less the membrane is thickened: if it be both relaxed and in a thickened condition, the relaxation must either have occurred before the thickening, or must have required a much longer time. Cicatrices and other thinned portions generally become stretched and relaxed more easily and to a greater extent than the normal membranes. Relaxation will only arise with difficulty in swelling of the whole tympanic mucous membrane. For apart from the membrana tympani being itself thickened at the same time and so less extensible, the swollen mucous membrane will sooner arrest its movements.

But the pressure continuing when the membrane has come in contact with the stapedio-incudal articulation, occasionally a sub-luxation or even dislocation is produced from the stretching of the capsular ligament. The articulating end of the incus is thus generally driven inwards above the head of the stapes, and the latter appears nearer than the former. The membrane then is deeply driven in on each side of the stapes and comes in contact with the tendon of the stapedius. The attachment and other conditions of the malleus also influence the stretching of the membrane, especially the variations in the attachment of the malleo-incudal articulation to the roof of the tympanum and the rest of the temporal bone, the distance between the head of the malleus and the latter varying so much.

Increased pressure within the tympanum, though less frequently, may also produce relaxation of the membrane, and here in recent times the much misused air-douche plays a sad part. In any normal ear the membrane may be seen to move outwards on simple inflation by Valsalva's process, but especially the posterior superior quadrant which is opposite the opening of the Eustachian tube and so receives the full force of the stream. By frequent repetition of the inflation this part may become seriously stretched. The fold of mucous membrane which forms the inner margin of the posterior pocket seems to Gruber to be a protection to this portion of the membrane, and the descending fibres of the membrana propria, which are most abundant here, seem also to act in the same way.

Cases are not unfrequent in which excessive relaxation of the above-mentioned part of the membrane has occurred from Valsalva's process simply. It often occurs in people subject to cold in the head, who are obliged to blow their nose very often. In such a case, if the tympanum has not recently been inflated, the portion of the membrane in question looks at first sight sunken in, and, if the relaxation

be very great, and has been produced very gradually, thinned, so that before inflation it might be mistaken for a perforation. The ventilation of the tympanum hardly seems to be sufficiently explained. The opening of the Eustachian tube during swallowing does not quite coincide with the contraction of the soft palate, but follows it though quickly. Meyer's view, that the tensor tympani acted at the same time with those external muscles of the middle ear which open the Eustachian tube seems probable. Ventilation of the tympanum appears to take place much more easily when, by contraction of the tensor tympani, the membrane is somewhat drawn inwards.

The contraction of the tensor tympani may perhaps not follow every act of swallowing, but only when the tension of the air in the tympanum renders it necessary, but that it follows several such acts Gruber has no doubt.

Whether this contraction is indispensable, or whether exchange of air can take place in the tympanum without it, in any case relaxation of the membrane will render ventilation difficult or impossible; for, in the first place, on contraction of the muscle, the relaxed membrane remains without movement, its position being further inwards than the action of the muscle will take it, and in the other case, if the membrane be much relaxed and drawn in, the very slight pressure under which the air enters may not be enough to drive it outwards. In many cases where the membrane is fallen in simply from relaxation, it is falsely ascribed to closure of the Eustachian tube. Further, displacements of the ossicles, and vascular engorgement of the lining membrane result. All these secondary changes in the tympanum affect the labyrinth. One of the most constant symptoms is a blowing tinnitus.

Some patients try to restore the position of the relaxed membrane, and thus relieve the deeper structures of its pressure by inserting a finger air-tight into the corresponding meatus, and by its sudden withdrawal producing more or less exhaustion of the air, and consequent movement outwards of the membrane. Others attempt the same object by quickly raising and depressing the lower jaws, which also affects the tension of the air in the external meatus.

In some cases, when a relaxed membrane is combined with a free Eustachian tube but obstructed nasal meatus, peculiar sensations occur in the ear during respiration, sensations connected with movement of the membrane and the entrance and escape of air from the tympanum. The movement of the membrane can be observed. A case was seen by Gruber in which not only the movements of the membrane during respiration were perceived by the patient, but also the noise of the exit and entrance of air, and the respiratory movements could be followed by auscultating with the otoscope.

The diagnosis, when the relaxation is considerable, is not difficult. The anterior segment of the membrane shows a long plainly-marked cone of light, often streaked lengthwise, while the posterior segment, as the more frequently stretched, is folded or depressed mostly in its upper quadrant, but sometimes in its whole extent. Sometimes a fold appears near the posterior superior edge of the meatus: if the

free edge of this be directed outwards, it forms a yellowish portion distinct in appearance from the membrane as well as from the meatus: if it be directed inwards towards the tympanum, a depression corresponding in form and extent to this fold is seen.

The causes are mostly chronic catarrh. For treatment Gruber advises, first, local astringents externally or internally, by means of Weber's koniantron, a minute spray-producer, introduced into the tympanum: solutions of alum or tannin, half a drachm to half an ounce of water, applying one or two drops to the inner surface of the membrane, and at the same time or afterwards apply the same to the outer surface. If the reaction be not too strong, this is done twice a day, in other cases only each second or third day, when the symptoms of the previous application have subsided.

Where stronger measures are necessary, especially when the membrane is more thickened or the relaxation is very great, Gruber uses either at first or in the course of the treatment solution of nitrate of silver ʒss to ʒj of water; no lotions to the meatus.

In many cases where this treatment has failed artificial perforation of the membrane and its partial abscission will succeed. In 1863 Gruber cut out a cicatrix from the posterior superior quadrant of the membrane which was extremely relaxed, lying upon the incus and stapes, and produced subjective symptoms. The result was excellent and the improvement continued after the opening had closed. As it is quite without danger this operation should always be performed where other treatment has failed.

Even when there is deeper disease the condition of the membrane should be remedied if possible, since that itself produces and increases the labyrinthine disease, or the abnormal position of the ossicula, &c.

Excessive tension as well as relaxation may affect the whole membrane or only parts of it. It often precedes relaxation, which is easily understood from the long stretching which the elements of the membrane must suffer till they become permanently relaxed.

Excessive tension can in many cases be cured by the diligent use of the air-douche alone, but the treatment always requires to be long continued and then the opposite condition, viz., relaxation, may very easily be produced.

When this fails, myringotomy succeeds in the majority of cases. As a rule the improvement is immediate and only seldom diminishes much after the wound has healed, provided of course the operation be performed in those spots that are the most tense.

The formation of Bladders and Exudation Cysts in the Membrana Tympani.—Dr. Politzer ('Wiener Medizin Wochenschrift'). These uncommon conditions of the membrana tympani result mostly from acute inflammation of the tympanum extending to the membrane. Their usual position is behind the handle of the malleus where they are seen as roundish, tense, and glistening, yellowish transparent bladders, or greyish yellow, dull, bag-like, bulgings, hanging down from the posterior part of the membrane like cysts.

The exudation cavity in the membrana tympani is either closed on all sides or communicates with the tympanum. The first form often occurs in children during a catarrh with severe otalgia. The bladders only last a short time, the contents being either absorbed or evacuated into the tympanum or frequently into the external meatus. In the latter case a watery serous fluid escapes from the ear and the membrana tympani where the bladder was, is seen flattened, covered with a greyish layer of epidermis, the vessels of the malleus injected and at times ecchymoses around the bladder.

The hearing is not altered in proportion to the size of the bladder; does not increase after its rupture, sometimes even it diminishes. On inflation after the disappearance of the bladder the hearing is increased. In other cases after subsidence of the bladder without escape externally Politzer has seen a bladder-like bulging of the membrana tympani filled with air occur in the same position after inflation. It must be assumed in such cases that the contents escaped into the tympanum and that air was thus forced into the cavity in the membrane.

The usual course is as follows:—In a previously healthy ear, pricking, tearing pain suddenly occurs. On the first day there is much congestion of the vessels of the handle of the malleus which itself is indistinct. The epidermic layer of the membrana tympani is œdematous. Below the handle of the malleus is a sharply defined roundish transparent bladder rather larger than a hempseed. Its brilliancy and transparency give it the appearance of a pearl. The hearing is only slightly affected.

The next day the bladder has disappeared, the hyperæmia diminished, but there are visible now around the position of the bladder as well as the handle of the malleus small ecchymoses. The hearing is normal, and after some days the membrana tympani, apart from a few darkish vascular patches, presents its normal appearance.

Such cases are plainly due to inflammation of the dermoid layer of the membrana tympani, with serous exudation under the epidermis partially separating it. The absence of deafness shows that the tympanum is not affected.

Bladder formations in the membrana tympani have been frequently reported in subacute and chronic affections of the middle ear with serous or thick mucous secretion, the cavities in the membrana tympani usually communicating with the tympanum.

Purse-like exudation cysts also hang down from the posterior periphery of the membrana tympani, these are large and not transparent but of a greenish or yellowish grey colour and containing purulent or thick mucous fluid. They are frequent in adults; often developing very quickly with symptoms of acute inflammation of the tympanum. In rare cases of acute suppurative tympanic catarrh, a greenish-yellow dependent loose abscess forms before rupture, on the posterior superior quadrant of the membrane. These are different from the bulgings which form there in chronic catarrh of the tympanum.

No doubt in many cases these bladders and cysts arise from a

circumscribed interstitial exudation into the tissue of the membrana tympani, the tissue elements thus becoming separated and a cavity formed. This may either remain closed, or an opening may form on the inner surface of the membrane and communicate with the tympanum, or it may empty itself externally into the meatus. They may arise however from exudation from the tympanum passing into the tissue of the membrane, and with rare exceptions when due to this cause they occur at its posterior superior portion. This part is less tense and thick, and so easily yields to the pressure of the exudation in the tympanum, and either is driven outwards as a whole or the fibres of the substantia propria are separated from one another and the exudation forced through the fissure into the tissue of the membrane.

Dr. Orne Green ('Transactions of the American Otological Society,' 1872) reports six cases of rupture and other injuries of the membrane by concussions of the ear from explosions, and four of rupture from blows. In five of the cases there was proof of previous disease of the tympanum. Purulent inflammation followed in only one case. In one, the explosion having forced the thin and relaxed cicatrices of old perforations inwards against the wall of the promontory, the moist surfaces adhered, causing the feeling of closure in the ears. On one side the cicatrix freed itself, and the disagreeable symptoms were relieved; on the other, it remained in contact till forced outward by the air driven in behind it.

Dr. Pomeroy (ibid.) gives a description of a new Eustachian catheter to be introduced through the fauces: a stream of spray is projected from a small orifice close to the end of the catheter in an oblique direction, and by it either the tympanum may be inflated or the outer portion of the tube cauterized with great exactness.

Dr. Pomeroy also reports that of 200 cases of impacted cerumen, he found the hearing perfectly normal after removal in only twenty-seven.

Dr. Roosa reports two cases of rather sudden rupture of the membrane attended with hæmorrhage in inflammatory attacks in the tympanum; renal disease was not present: a good recovery took place. He thinks they favour early incision.

Dr. Roosa (ibid.) also reports a case in which full doses of quinine were at once followed repeatedly by attacks of inflammation of the tympanum and meatus; a result of the drug much less frequent (but he thinks no less real) than an affection of the nerve. In the same case a collection of hardened cerumen visibly followed a state of vascular irritation of the meatus.

Weber ('Otitis Intermittens,' Monatsschr. B. II. No. 11), on the other hand, reports two cases in which catarrhal inflammation of the tympanum, with vascularity of the membrane, preceded by closure of the tube, were attended with intermittent paroxysms resembling ague, and only yielded satisfactorily after quinine in gramme doses.

3. *Traumatic Ruptures of the Membrane with special Relation to Forensic Practice*, by Dr. A. Politzer (Wittelshofer's Wien Med. Wochenschr.,' 1872, Nos. 35, 36).—Two questions may come before

the surgeon: a box on the ears is the most frequent of these injuries, the immediate cause being the sudden condensation of the air in the meatus. In some cases a violent clap is felt in the ear at the moment; in others severe pain and often giddiness and tinnitus, which may last for some days, with numbness of the head. The appearance of the membrane is characteristic. The rupture usually gapes, forming a hole through which the inner wall of the tympanum can be easily seen. The margins are sharply defined, covered more or less with blood-clot; the rest of the membrane not altered, but the veins of the handle of the malleus somewhat congested. The inner wall of the tympanum appears as a yellowish, moist, glistening surface without visible vessels. The degree of deafness varies according to the amount of concussion the labyrinth has suffered. When the membrane is uninjured, the cases are the most unfavorable, for the force, not exhausted in the membrane, by suddenly driving-in the ossicula produces concussion of the terminal expansions of the nerves.

The auscultation sound on inflation aids in distinguishing between a perforation the result of disease and one from injury: in the first, even where it is large, the air only passes through when force is used and with a sharp hissing noise, there being a varying amount of obstruction in the Eustachian tube, &c., from swelling of the mucous membrane; but in the latter, where the ear is otherwise normal, the air streams out with a loud deep noise and only little force is needed.

The rupture usually heals without any striking reaction—outgrowth sometimes taking place from all the layers of the membrane, but generally from the inner layer alone—and after some weeks there is no sign of the cicatrix to be seen. Less frequently inflammation of the membrane and lining of the tympanum with suppuration occurs, usually from improper treatment, such as injections of irritating oils and other medicated lotions; but this does not prevent complete healing. Sometimes, however, the process becomes chronic, a permanent opening may remain, or adhesions between the membrane and promontory. If the nerve is unaffected the hearing returns; and Politzer has known it improve even in cases of injury to the nerve without rupture of the membrane. It is best to avoid local treatment. In concussion of the labyrinth galvanism has seemed to do good.

For medico-legal purposes the patient should be seen soon after the injury; for after cicatrization has taken place it is impossible to say whether the perforation and the disturbance of function were of traumatic origin. When suppuration is present at the first examination, it is also impossible to distinguish between a traumatic injury and primary suppuration of the tympanum, as the condition of the membrane is not different in the two cases. The medico-jurist can then only assert that a rupture is traumatic if, besides the above characteristic condition of the membrane, cicatrization takes place under his observation, even after a long interval. The latter is specially important, as perhaps from previous suppuration a permanent opening may remain, which from its sharp edges and the

appearance of the membrane might be mistaken for a traumatic rupture. This mistake cannot arise if the physician remember that a rupture arising from suppuration, as soon as its edges have skinned over (which generally takes place soon after discharge has ceased), never heals. Traumatic ruptures, on the other hand, have only two terminations—cicatrization in the first week, or less frequently after suppurative inflammation. [This is a distinction challenging long and careful observation to sustain or overthrow.]

Numerous examinations for at least three months are necessary to determine the precise amount of the disturbance produced, for in time even a labyrinthine affection may disappear, or the suppuration cease with restoration of the hearing. It should always be borne in mind that an old tympanic or labyrinthine affection may be made use of by the apparently injured plaintiff to establish his cause; and if a short time after the alleged injury the physician finds calcifications or cicatrices on the membrane, he may be certain of some chronic affection, as such changes require a longer time than a few days for their development.

On the favorable results of Ruptures of Thin Cicatrices of the Membrana Tympani, produced by Atmospheric Pressure. By Dr. Adam Politzer ('Wiener Med. Press,' Nos. 1, 2, 4, and 5, 1868.—Closure of a perforation in the membrana tympani by newly-formed cicatricial tissue is not so rare as was previously supposed. It occurs not only after the termination of otorrhœa which has lasted only a short time, but also in membranes which have been perforated for many years, as the result of suppurative catarrh of the tympanum.

The development of these cicatrices can be accurately followed in some cases. Greyish-yellow plasma is effused on the edges of the perforation, either uniformly over the whole periphery of the opening, or principally in certain spots, and by this the opening is gradually diminished and finally closed. The cicatrix is chiefly formed by the mucous layer, and a slight depression is seen in the position of the previous perforation, the floor of which is the newly-formed, not yet perfectly developed, cicatricial tissues, and the margins of which are formed by the still sharply-defined "substantia propria" and cutis. When the cicatrix which fills up the opening, which may even include nearly the whole of the membrane, has become completely organised, it presents a peculiar structure: the cicatrix appears much thinner, and consists of fibrous connective tissue in which elastic elements are only sparingly met with. The elements of the "substantia propria" either are entirely wanting, or project here and there into the periphery.

Similar conditions to those represented as cicatrices of the membrane are often seen where no perforation of the membrane has existed, after repeated attacks of acute or chronic catarrh. The extent of disturbance of function produced by cicatrices, or the atrophied spots on the membrana tympani is very different. Sometimes comparatively good hearing is found with extensive cicatrices, and in such cases it must be assumed, that in spite of the deficiency of elas-

tic fibres in the cicatrix, its degree of tension stands in such favorable relationship to the rest of the membrane tissue, that notes of the most varied vibration and intensity can pass it. In other cases, a cicatrix will interfere considerably with the conduction of sound if, *e.g.*, it lies on the promontory, and thereby prevents the vibration of the whole membrane, or if its tension is so slight that irregular nodes are formed. From the deficiency of the cicatrix in elastic elements its power of resistance also against the varying conditions of atmospheric pressure in the external meatus and in the tympanum are much smaller than that of the normal membrana tympani; and therefore the cicatrices as a rule, are driven much further inwards by the external atmospheric pressure which even under normal conditions is stronger than the atmospheric pressure within the tympanum. Owing to the less resistance of a cicatrix, on blowing a stream of air suddenly through the Eustachian tube, rupture of it often ensues; and this is not only followed by no injurious results, but in all cases hitherto reported by a favorable effect on the hearing.

But the resistance of the tissue of the membrana tympani appears at times diminished by other pathological processes; as by acute inflammatory processes in the tympanum, or in the membrane itself, which often result in inflammatory softening of certain spots; further, in certain rare cases of calcification of the membrane where, as the result of atrophy of the elastic fibres in the neighbourhood of the calcified parts rupture was observed from sudden increase of atmospheric pressure within. Rupture is more likely to occur if the Eustachian tube is not narrowed. In two cases reported by Pagenstecher, a fissure-like rent occurred in the membrana tympani on the margin of a calcified patch while blowing air into the tympanum by the bag, which however in both cases after some days healed without farther bad results, with moderate reactionary symptoms. In one case a considerable increase in the hearing distance occurred immediately after the rupture, which however after some time again returned to its previous degree.

Of a third case Pagenstecher writes as follows:—I had previously already seen a similar case during quite careful catheterization, in which rupture near a calcified patch occurred. To the cases reported by Pagenstecher, Politzer adds three more, in which, on the use of an india-rubber bag measuring scarcely four inches in transverse diameter, a rupture of the membrana tympani, atrophied and thinned of course, occurred to the extent of the eighth of an inch with a loud report. Adhesions existing at the same time within the tympanum were separated, and the function was lastingly improved, although the rupture healed. In four other cases the result was doubtful.

Weeden ('Monatschr.,' 1872) reports a case of rupture, painless, and without bleeding or removal of secretion, during the use of Weber's tympanic catheter. Great improvement followed and remained; the watch being heard 60′ instead of on contact.

On Paracentesis of the Membrana Tympani—Schwartze, 'Arch. f.

Ohr.,' vol. 6, part 2; returns to this subject.—As indications of collections of secretion in tympanum (in Arch. Bd. ii, p. 246) he originally mentioned convex, or, in a higher degree, sacculated bulgings of the membrana tympani. At the same time generally injection and increased size of radiating vessels; a yellowish reflection behind the membrana tympani wider below and pointed above.

Later (Arch. Bd. iv, p. 241) he showed from post-mortem examination that abundant collection of secretion may be present in the tympanum and the condition of the membrane be quite different, *e.g.*, abnormally concave if the mucus be of much tenacity and in not large quantity; or completely flat with the tympanum, full of mucopurulent exudation. One cause of this is the condition of the membrane before the effusion and the degree to which it participates in the inflammation. It is only when the membrana tympani is transparent that from ocular examination alone diagnosis of secretion can be safely made. When opaque or thickened, auscultation and in one-sided affections the tuning fork also must assist. The varieties in hearing and in the sensations of the patient produced by changed positions of the head are aids to diagnosis; and the moist sound on inflation. Sometimes, however, inflation gives no sound.

Schwartze deprecates removal of the fluid by suction through a very small catheter introduced into the tympanum as irritating; also by exhausting the air in the tympanum the congestion of the mucous membrane is increased and increased secretion follows. Besides, the secretion is generally tenacious.

If atrophied spots of the membrana tympani, which result in similar bladder-like bulgings after forcing air through the external tympanum, do not subside after swallowing with mouth and nostril closed, the presence of secretion in the tympanum may be assumed. Small convex bulgings on the posterior half of the membrana tympani occur also in subacute inflammation of the membrana tympani with inflammatory thickening of the cutis layer, a disappearance of handle of malleus, which might deceive. This occurs especially in early tuberculosis.

The subjective conditions are very slight—a sensation of stoppage the ear; little or no pain; only at times a pulsating sound. Deafness moderate. Afterwards, injection of whole cutis layer and the membrana tympani has a yellowish-red colour with the above-mentioned prominences. This appearance lasts only a few weeks: perforation occurs and suppuration from the whole surface of the membrana tympani.

The most common conditions in abundant collection of thick mucous secretion in the tympanum is abnormal *concavity* with radiating vascularity; a yellowish reflection from the membrane, generally wider at the lower part and pointed upwards. The yellowish colour of the lower part contrasts strongly with the bluish-grey colour of the upper air-containing part of the membrane.

The upper boundary line does not show that change of position or changed position of head so characteristic of *serous* exudation, first noticed by Politzer. Variations in the boundary line, however

occur at the moment of swallowing, when the tube is pervious. Sometimes the promontory is so plainly visible, that it may easily be mistaken for a yellowish exudation shining through. Inflation will distinguish a very opaque and thick membrana tympani, and where no noise of air entering is audible on the air-douche from the complete filling of the tympanum with thick tenacious exudation, the diagnosis can with certainty be made only by puncture of the membrane. By careful separation of the margins of the wound a view of the inside of the tympanum can easily be obtained.

If in chronic cases the secretion is very abundant, and the improvement from the air-douche does not last twenty-four hours, or at least two or three days, Schwartze considers paracentesis necessary. He uses a simple curved lance-shaped needle. Some few drops of the secretion generally ooze at once from the orifice, provided its consistency is not too gelatinous. The ill effects noticed have been :—

1. Vomiting ; only seen in acute cases. Explained by irritation of auricular branch of vagus.
2. Fainting ; only in very susceptible patients. Effects may last the whole day.
3. Bleeding ; usually only a few drops of blood mixed with secretion ; but in inflammation and thickening of the membrana tympani it may trickle from the ear for some time after the incision.
4. Injury to labyrinth wall is indicated by continued pain and effusion of blood into tympanum.
5. Difficulty or impossibility of sufficiently removing thick tympanic contents through the incision.

The serous effusion, blowing in air always sufficient, and also in many acute cases of sero-mucous contents. The thicker and more consistent the secretion the less this succeeds.

After this Schwartze tried exhausting the air in the external meatus. By Siëgle's speculum he sees the masses of secretion protruding from the incision and sink back again. Now he uses injections of lukewarm salt water through the nose. If this be done with some force the water escapes through the Eustachian tube and tympanum, and the incision in the membrana, and carries the thick masses of mucus with it ; so that these generally hang down from the external opening of the meatus. It can of course only be done when both ears are affected and operated on. In one-sided affections the catheter must be used.

The quantity removed in this way in many cases is surprising. The masses of mucus, at times hanging from the meatus as low as the shoulder, cannot possibly come from the tympanum alone, as they would require a much larger space. Even supposing the Eustachian tube quite filled, the whole space would not be sufficient to contain the masses removed. A large part therefore comes probably from the spaces adjacent to the tympanum. If a kind of reservoir were not provided here, where large quantities of thick secretion could remain without injuring the convex bladder-like bulgings of the membrane, chronic catarrhs would be much

more frequent than they actually are. It might be supposed that part comes from the naso-pharyngeal space; but this is improbable, on account of the narrowness of the isthmus of the tube and the tenacity of the secretion; and besides, before the operation the nose and naso-pharyngeal space were cleared from all secretion by the nasal douche.

The thickness and tenacity of the secretion is so great, that frequently in post-mortem examinations forceps and scalpel are required to remove it from the ossicula below the tegumen tympani.

The membrane and labyrinth wall may be so firmly connected together by the secretion, that the scalpel is required to expose the tympanic structures.

Politzer, in 220 cases, has never seen inflammation follow; but Schwartze has found some reaction in every fifth case. It has been as frequent when the salt and water was not used. The irritation is often confined to the membrane: this is at first œdematous; later, the cutis layer is bare and vividly reddened. At times obstinate suppuration from the whole surface of the membrane follows. Sometimes there has been phlegmonous inflammation of ureters, erysipelatous swelling of ossicula, or suppuration of the tympanum. Polypoid granulations may occur in the edges of the wound, or in the meatus; usually they are developed on both sides symmetrically. Also, without any local irritation, he has seen, on the third day, fever with frequent vomiting, in a child, without any other apparent cause.

Prognosis.—The greater the momentary improvement after the air-douche, the more marked result is to be looked for from operating. Even with atrophied membrana tympani, if the secretion be completely removed, the hearing may become and remain very good. If thickened and relaxed, cutting like soft leather, the result may be very satisfactory. But if, on incision, the membrane is completely dense, cartilaginous, and much thickened, the improvement is slight, even when much secretion has been removed.

While in chronic cases, as a rule, the improvement is immediate after the masses of secretion have been removed, in acute cases it may be that the primary effect is to increase the diagnosis.

Out of 163 cases, only 5 remained quite unimproved, and 87 were "completely cured." The incision was repeated in 47 cases only. In 16 cases the treatment lasted only eight days, and only in 23 cases did it extend over four weeks: showing a great advantage in point of brevity. The operation was repeated twelve times in one case, with use of various solvents, with no benefit, but without ill effect.

Weber ('Monatschrift,' ii, 1872) gives an account of the reasons that led him to the operations of tenotomy of the tensor tympani. Not only the membrana tympani and ossicula, with their ligaments, but also the labyrinth, are normally kept under a certain degree of permanent tension by the tensor tympani, and so abnormally strong contraction of the muscles not only causes hypertension of the membrane, and relaxes the tension of the ossicula, but also increases the pressure upon the labyrinth.

A continued increase of tympanic and intratympanic pressure, especially in impeded tubal ventilation, &c., leads to alteration of the intratympanic circulation, and to labyrinthine disturbance also. This is seen in cases where the tympanum is exposed, and only the stapes remains. If more pressure be made upon this with a probe, tinnitus is produced, and if any considerable congestion be present, glddiness ; anchylosis also may probably ensue.

On the other hand, post-mortem examination proves, that the tensor tympani, when entirely without action, undergoes atrophy ; and that in ulceration within the tympanum, the end of its tendon may be completely destroyed, and hearing sufficient for all ordinary purposes be retained, provided the stapes remain and be moveable. Weber divides the tendon by means of a small rotating curved knife introduced above it through an incision in front of the malleus ; but other operators use simpler knives, and D. J. Green makes the incision posteriorly.

Traumatic inflammation of the tympanum also is readily controlled by turpentine internally. Accordingly he proposes this operation in all cases of increasing deafness, in which, besides violent subjective tinnitus (a sign of intra labyrinthine pressure and disturbed circulation) with or without giddiness, a high degree of deafness is present ; and where all methods of treatment have shown themselves useless, a total loss of hearing is to be expected. Also in cases where the malleus is much drawn back, fixed, and rotated on its axis, so that the front part of the membrane is strikingly fallen back behind the sharply prominent edge of the malleus, and is immoveable.

As the above or similar conditions of the membrane may arise independently, or may result from other tympanic or intratympanic changes, *e. g.* adhesions near or around the tensor tendon ; so, on the other hand, the above subjective symptoms may also be due to other anatomical changes than retraction of the tendon, *e. g.* primary or secondary central or peripheral neuroses of the middle ear, of the trigeminal, vagus, glossopharyngeal, facial, and sympathetic peripheral or central lesions of the auditory nerves, prevention of the passage of air into the tympanum by insufficiency of the tubal muscles dependent on inflammation of its lining membrane ; adhesions also, especially those affecting the stapes, &c. But division of the tendon may also act beneficially indirectly where there is no retraction of it, as in chronic increased pressure in the labyrinth from paralysis of the vaso-motor nerves, the tympanic structures being relatively sound, for the "over-filled" labyrinth would be temporarily freed from the continuous pressure exerted upon it, and from the sound waves through the fenestra ovalis, and opportunity given for an easier compensatory movement of the labyrinth membranes.

Other circumstances might contribute to its beneficial effect, as in the operation for strabismus, results previously described as "dynamic" (because not understood in their neuro-anatomic relations), and, *à priori*, not expected. Also (Weber) thinks, in the

disturbed reflex relations of the tympanic nerves the mere fact of a section in an organ supplied by them might rather be an advantage than an injury, considering the results which threaten complete deafness, and probably the most distressing tinnitus.

The cases most promising for the operation are those in which any diagnostic manipulation which is opposed to abnormally increased tensor contraction, *e. g.* forcible but careful exhaustion of the air in the meatus (to draw outwards the membrane and ossicula) produces positive, though only momentary improvement of the subjective symptoms. From this it would appear, that the indrawing and tension of the membrane, and the pressure which in consequence the ossicula through the stapes must exert on the labyrinth is the chief cause of the subjective symptoms, there being no reason to suppose any advanced intratympanic or intralabyrinthine changes.

REPORT ON PHYSIOLOGY AND HISTOLOGY.

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Blood.—Circulation.

1. Mr. A. H. Smee. *On the Physical Nature of the Coagulation of the Blood.* (Humphry and Turner's 'Journal of Anatomy and Physiology,' vol. vii, p. 210, and pamphlet.)
2. James Blake, M.D. *On the Action of Inorganic Substances when introduced into the Blood.* ('Journal of Anatomy and Physiology,' June, 1873.)
3. Dr. Paul Langerhans. *Zur Histologie des Herzen.* ('Virchow's Archiv,' Band lviii, Heft 1, p. 65.)
4. A. H. Garrod. *On the Law which regulates the Frequency of the Pulse.* ('Humphry and Turner's 'Journal of Anatomy,' 1873, No. xii, p. 219, June.)
5. Dr. Paul Heger. *Expériences sur la Circulation du Sang dans des Organes isolés.* (Thèse, Bruxelles, 1873.)
6. Kolisko. *Ueber das Verhalten der Action des Herz Ventrikels zur Puls-wellen-bildung in der Arterie.* ('Stricker's Medizinische Jahrbücher,' 1873, Heft 1, p. 95.)
7. Ed. Albert and S. Stricker. *Untersuchungen ueber die Warmökonomie des Herzens und der Lungen.* ('Stricker's Medizinische Jahrbücher,' 1873, Heft 1, p. 30.)

Mr. Smee, after reviewing the principal theories of the nature of the coagulation of the blood held by physiologists, observes that—"From a careful review of all the circumstances of the case we may fairly consider that the coagulation of the blood takes place in obedience to a purely physical law, namely, the power of soluble colloid matter, whether organic or inorganic, to pectize, or, in other words, spontaneously to coagulate."

He then refers to Graham's observations on colloids, and adduces various experiments he has himself made to show the manner in which fibrine pectizes. The following is one of these experiments:—

"On the addition of an equal quantity of a solution of sulphate of soda to fresh-drawn blood coagulation will not take place, and the blood will remain fluid an indefinite time. The blood-cells, however, will gradually subside, leaving the liquor sanguinis containing the uncoagulated fibrine bright and clear. If some of this liquor sanguinis is placed in a dialyser, and then the dialyser placed in distilled water, in the course of a few hours the sulphate of soda will dialyse out of the liquor sanguinis, and a thin gelatinous film of fibrine will be formed at first, in direct contact with the parchment paper of the dialyser. This film of fibrine will gradually extend and become thicker as the sulphate of soda slowly dialyses out of the solution; and after the lapse of ten or twelve hours the whole will have become one uniform structureless clot. This clot will, after some days, contract, squeeze out the liquor sanguinis, lose its structureless appearance, and crush up into fibres."

He then points out the analogy between fibrine and silica, and concludes by saying that—

"The considerations of the causes of the coagulation of the blood-fibrine he has advanced may be thus briefly summed up:—1st. That the coagulation of fibrine is a physical act, and cannot be considered to be in any way identified with a vital property, such as the contraction of muscular fibre. 2nd. The coagulation of fibrine depends upon and is regulated by the same laws which cause all soluble colloid substances, whether organic or inorganic, to become pectorous. 3rd. That the soluble or fluid form of fibrine ought to be regarded as its allotropic form; and, as in the case of its colloidal analogue, silicic acid, its presence in the blood in the fluid condition depends upon the physical conditions under which fibrine is found in the living body."

2. In this paper Dr. Blake adduces some experiments showing the action of the salts of soda, lithia, cæsium, rubidium, thallium, and silver, when introduced directly into the blood. These substances possess certain isomorphous relations. They are all lung poisons. They all kill when injected into the veins, either by directly arresting the pulmonary circulation or by causing changes in the lung-tissue, which rapidly prevent the aeration of the blood. Notwithstanding the marked changes they cause in the blood, they do not at all diminish the irritability of the heart, but, contrariwise, rather appear to increase it, so that these continue to contract longer without the stimulus of arterialized blood. With the exception of cæsium they exert no direct influence on the nervous system. The mechanism of the arrest of the pulmonary circulation may rather be that the pressure of these substances in the blood gives rise, either directly or through reflex action, to contraction of the smaller pulmonary arteries, or they may arrest the passage of the blood through the capillaries by the changes they make in the shape of the blood-corpuscles.

3. Dr. Paul Langerhans observes that our present views in regard to the structure of the heart dates from Weismann's work on the subject which appeared in 'Müller's Archiv' in 1861. Weismann first showed that the well-known branched muscular fasciculi of the heart of vertebrate animals were composed of solitary elements which in frogs and amphibia were represented by long uni-nucleated fusiform fibre-cells. In birds and mammals Weismann was only able to convince himself of the existence of separate cells in the embryonic stage, the muscular fasciculi of adults splitting up into small fragments in which several nuclei were apparent. On this account Weismann admitted a fusion between the originally separate cells. Eberth first described the process by which (with nitrate of silver and concentrated alkali) the muscular fasciculi of the heart of birds and mammals could be broken up into short uni-nucleated fragments. Langerhans admitting that the cardiac fasciculi of all vertebrata agree in being composed of uni-nucleated cells, maintains that they can be divided into two well-marked groups according to the form and mode of grouping of the cells, for whilst in fish and amphibia the fibre cells are elongated and give off many processes, in reptiles, birds, and mammals, they are short and broad, and possess fewer processes. Langerhans describes and illustrates in a plate which accompanies the paper some remarkable forms of the fasciculi, and especially some from the human fœtus in which the primary cell appears to have undergone partial differentiation into striated fibrils which enclose the nucleus in a frame as it were, whilst a part remains diaphanous and amorphous.

The ultimate distribution of the nerves to the cardiac musculature is shown by Langerhans to consist of a fine plexus of fibres with nuclei at the points of intersection, the fibres being of comparatively large size and running obliquely to the direction of the muscular fasciculi. They are best seen in the lower groups of animals and in the auricular septum, especially when it has been kept for two days in a 20-per cent. solution of nitric acid.

4. Mr. Garrod discusses the theory of Marey in regard to the causes of the variations in the frequency of the pulse, which was based chiefly on the variations in arterial resistance, and which he expressed as follows:—1. The heart beats so much the more frequently as it experiences less difficulty in emptying itself. 2. The frequency of the pulse varies inversely as the arterial tension. M. Garrod shows, by an analogy drawn from the phenomena of electricity, that the blood pressure need not depend on the arterial resistance, but if the pressure does not vary the pulse rate must do so. He then proceeds to consider (1) whether the pulse rate is related to the capillary resistance; and (2) whether the pulse rate depends on the pressure of the blood in the arteries. To determine the former he exposed the surface of the body to the influence of different temperatures, and his experiments show that *the rapidity of the pulse varies inversely as the resistance to the flow of blood from the arteries.* To determine the latter, blood was withdrawn from animals, and the results showed that variations in the amount of blood in circulation do not vary the

rapidity of the pulse, and, consequently, that the pulse rate is *not* dependent on the blood pressure as Marey supposed.

5. The plan adopted by M. Heger in his experiments consists in rapidly removing some organ, as the liver, lungs, kidney, or testicle, from the body of an animal immediately after death, and continuing the circulation, by means of a proper apparatus, through its vessels. He thus hopes to maintain the performance of its functions, which can then be studied in an isolated state. The changes of pressure and of rapidity of the flow of blood in different parts may be examined, and the alterations in the composition of the blood after it has traversed the vessels may be followed out. From his experiments on the lungs he finds that, *cæteris paribus*, the rapidity of the current of blood traversing the lungs is proportionate to the pressure of the blood in the pulmonary artery. 2. That with the same pressure in the pulmonary artery, the quantity of blood traversing the lungs is considerable in proportion as they are dilated by the inspiratory action of the diaphragm. 3. That, on the contrary, with the same pressure in the pulmonary artery, the quantity of blood which traverses the lungs is smaller in proportion as they are more extended by means of insufflation through the trachea. If this be very considerable the circulation may be altogether arrested. 4. That the blood is drawn into the pulmonary vessels during inspiration. 5. That the blood is pressed out of the vessels of the lungs during expiration. Lastly. That the mechanical movements of respiration facilitate the performance of the pulmonary circulation and the interchange of gases between the air and the blood. M. Heger gives, also, some interesting results of his experiments upon the liver.

Nutrition—Digestion.

1. Pettenkofer and Voit. *Ueber die Zersetzungsvorgänge im Thierkörper bei Fütterung mit Fleisch und Fett*, in the 'Zeitschrift für Biologie,' Band ix, 1873.
2. Dr. J. P. Hougkeest van Braam. *On the Peristaltic movements of the Intestines*, in 'Pflüger's Archiv,' 1873, Heft vi.
3. Dr. A. Röhrig. *Experimentelle Untersuchungen über die Physiologie der Gallenabsondering*, in 'Stricker's Medicinische Jahrbücher,' 1873, p. 240.
4. M. Defresne. *Sur les Secrétions Biliaires et Pancréatiques chez les Omnivores*, in 'Bulletin de l'Académie des Sciences,' Séance du 23 Déc., 1872.
5. M. L. De Sinety. *Etat du Foie chez les femelles en lactation*, in idem and 'Archives générales de Médecine,' Fév., 1873.
6. Byasson. *Etude sur les causes de la Réaction Acide de l'Urine normale chez l'homme et de sa variation*, in Robin's 'Journal de l'Anatomie,' 1872, pp. 383—396.

1. MM. Pettenkofer and Voit state that their earlier researches have shown that on a diet of pure fat the oxidation of the adipose tissue, &c., of the body is entirely arrested, and fat is even deposited, whilst albumen continues to undergo disintegration; that, on the other hand, on the addition of flesh to the diet, in gradually in-

creasing proportion, both the albumen and the adipose tissue, &c., of the body are less and less drawn upon until the latter is completely preserved, or fat may be absolutely laid down from the decomposition of the albumen. It is the object of their present paper to show what becomes of fat when it is added to meat. The influence of fat on the decomposition and future of albumen has already been reported on by Voit. The experiments from which the conclusions are drawn were the old ones of 1861—1862, conducted on their favorite old dog. Successive diets were given for varying periods, as lean meat 400, fat 200, water 578. In another, meat 880, fat 350, water 453. In another, meat 1800, fat 350, water 1470, and so on. The following table gives a summary of their results.

Food.		Alteration in the Body.				Oxygen.	
Lean meat.	Fat meat.	Meat disintegrated.	Flesh in body.	Fat disintegrated.	Fat in body.	Taken up.	Necessary.
400	200	450	— 50	159	+ 41	—	586
500	100	491	+ 9	66	+ 34	375	323
500	200	517	— 17	109	+ 91	317	394
800	350	635	+165	136	+214	—	584
1500	30	1457	+ 43	0	+ 32	438	480
1500	60	1501	— 1	21	+ 39	503	486
1500	100	1402	+ 98	9	+ 91	456	479
1500	100	1451	+ 49	0	+109	397	442
1500	150	1455	+ 45	14	+136	521	493

From the facts they have accumulated they draw the following conclusions:—That fat is absorbed in large quantities from the intestine. Thus during the long experiment in which 500 grammes of meat and 200 of fat (3rd June to 31st July) were given, 14·7 grammes of dry fæces containing 4·6 of fat were evacuated, showing that in twenty-four hours 195·4 grammes of fat had been absorbed in the intestine. In feeding with 800 grammes of meat and 350 of fat, 344 grammes were taken up, so that the more fat is added to the food the more is absorbed, within certain limits at least, for it was found that after protracted feeding on large quantities of fat, in consequence of which the animal became much fatter, somewhat less fat was absorbed by the intestines, and the fæces became richer in fat. Thus, with fifty-eight days' experiment on 500 grammes of meat and 200 of fat, the quantity of fat in the fæces rose gradually from 24·9 per cent. to 32·1, and ultimately to 37·6.

Another point made out is that the fat of the food can be to a very considerable extent disintegrated in the body; but the amount of fat decomposed cannot be explained on the old view that it is a respiratory food, and undergoes oxidation in accordance with the number and depth of the respirations, whilst the albuminous con-

stituents are broken up with great difficulty, so that abundant fat in the food spares the albumen. On the contrary, MM. Voit and Pettenkofer's experiments show that fat breaks up in the organism with greater difficulty than albumen, as the experiment with 1500 grammes of meat and 30 to 150 of fat shows, in which the albumen of the food underwent almost complete disintegration, whilst the fat was almost wholly stored up in the body.

In order to comprehend the variations in the deposition of fat, it must be remembered that fat belongs to the products of disintegration of albumen. Thus if, as their previous experiments show, albumen yields 51 per cent. of fat the disintegration of 1500 grammes of meat (= 328 grammes of albumen) will furnish 168 of fat.

From these experiments they believe they are capable of drawing conclusions as to the absolute quantity of fat that can undergo disintegration in place of a certain quantity of albumen, and thus demonstrate how much fat proceeds from the albumen. The results show that albumen can supply 55 per cent. of its weight of fat, and it appears to be of little consequence, in view of the nutrition of the body, whether the fat is absorbed directly from the intestine or originates in the abdomen.

Many circumstances influence the storing up of fat in the body, as the size of the organs (or number of active cells) and quantity of the juices, the relations of these to one another, the amount of mechanical work done, the quality of the food, &c. With a larger proportion of fat in the food, providing the albumen be not too abundant, more fat is taken up, as already shown, than with small quantities. A well-fattened animal disintegrates, *cæteris paribus*, more of the fat ingested than a thin one. If the body be poor in fat, the fat given with the food, or proceeding from the decomposition of the albumen, is easily stored up ; but if much fat is stored up great hindrances stand in the way of any more being stored up. In the former case there is an excess of fat in the fluids of the body, in the latter in the organs.

The greater the quantity of albumen that is disintegrated, and the more fat that results from its decomposition, the less fat is taken up from the food. The former fat must always be reckoned as nutritive fat.

The relation of the albumen of the tissues (organ-eiweiss) to the albumen circulating in the fluids of the body determines the rapidity of the disintegration of the fat. If we desire to obtain an abundant deposit of fat in the body we must prevent an accumulation of albumen in the circulating fluids. In a fat body the albumen entering it in the way of food becomes much more easily converted into tissue-albumen than in a lean one, where it at once unites with the mass of the circulating albumen, and is in great part immediately destroyed. Conversely, more of the fat which has been stored up in a fat body undergoes disintegration if much circulating albumen be present, as occurs, for example, in an animal fed on pure flesh diet ; no further fat is then deposited, but that already present is partly destroyed, as is well shown by the results of Banting's system.

Muscular exertion enormously increases the amount of fat which undergoes disintegration.

2. Dr. Hougkeest van Braam adopted Sander's method of observing the peristaltic movements of the intestines, which consists in plunging the animal into a solution containing 6-10ths per cent. of common salt at 99·5° Fahr., and opening the abdomen beneath the surface. He has arrived at the conclusion that the pneumogastric nerve is the motor nerve of the stomach, but that it can call forth no movement in the small intestine. When movements of the intestine appear to have been caused by excitation of the vagus, it is due, he believes, to the propulsion of part of the contents of the stomach into the intestine. The vagus has no influence upon the large intestine, nor upon the uterus. The splanchnic nerves are the vaso-motor nerves of the intestine, and they constitute at the same time inhibitory nerves for the intestinal movements and for the movements of the stomach. The movements of the intestines are in a high degree dependent on the quality of the blood and the fulness of the blood-vessels. Anti-peristaltic movements never occur under normal conditions.

3. In this paper Dr. A. Röhrig gives an account of a series of experiments he has made in conjunction with Professor Stricker on the circumstances influencing the secretion of bile. The rabbits and dogs used for experiment were completely paralysed with woorara, which was found superior to opium, chloroform, and hydrali of chloral. A canula was introduced into the ductus communis choledochus, from which depended a flexible caoutchouc tube ending in a mouthpiece that was kept on the same plane as the liver, so that there should be no variations attributable to differences of height. The experiment showed that all circumstances causing hyperæmia of the blood-vessels of the liver increase the secretion of bile, whilst, on the contrary, all circumstances producing anæmia cause diminution. Hence the secretion fails in fasting animals, whilst it augments after food has been taken. Water introduced into the stomach causes a slight but transient increase. The ingestion of purgative medicines, as croton oil, colocynth, jalap, calomel, Epsom salts, &c., materially increases the secretion of bile. It is at once stopped by ligature or compression of the vena portæ, either with or without compression of the arteria hepatica. Compression of the arteria hepatica alone caused slight diminution. Ligature of the aorta at the diaphragm greatly diminished the secretion, but did not entirely stop it: ligature below the origin of the cœliac artery augmented it. Ligature of the vena cava ascendens immediately arrested the flow of bile. All circumstances causing contraction of the vessels diminished the amount of secretion, as, for example, irritation of an exposed nerve, division of the spinal cord just below the medulla oblongata, and injection of strychnia. The rate of flow was in all instances determined by the number of seconds which elapsed between successive drops.

4. M. Defresne arrives at the following conclusions :— (1) The alkalinity of the bile causes it to play an important part in the

process of pancreatic digestion, which, without this alkalinity, would be rendered less alkaline to the extent of one third. (2) Bile emulsionises fatty bodies by the aid of a peculiar organic acid which only acts when it is free; but it is rendered free by all acids—a condition that is present throughout the whole length of the small intestine. (3) Fat thus emulsionised remains neutral and undergoes no other modification. (4) The pancreatic juice converts all forms of albumen into albuminose, uncoagulable by heat and soluble in alcohol. Starch it converts into glycose; the fats are decomposed into glycerine and fat acids. These last emulsionise spontaneously and cause other ordinary fats to emulsionize.

5. M. De Sinety has obtained the following results from observations made on the liver of the female in lactation of man, the dog, rabbit, and hare:—(1) A fatty condition of the liver, independent of gestation, is developed contemporaneously with lactation, continues as long as lactation exists and disappears when it ceases. (2) The distribution of the fat in the lobules of the liver in females during lactation is entirely different from that in which it is met with in other fatty conditions of the liver, as in infiltration, degeneration, artificial fattening, since it is found especially near the centre and rarely at the periphery. On the human female and in the bitch it is more limited than in the herbivora.

6. M. Byasson finds the acidity of the urine is due primarily to the uric acid it contains, then to the carbonic acid, and, lastly, and least, to the hippuric acid. His experiments lead him to believe that in ordinary urine the uric acid does not exist exclusively in the free state, but that it is also combined with the alkaline phosphates to form an acid and soluble substance.

Nerves.

1. M. Vulpian. *On the Function of the Lingual and Chorda Tympani Nerves.* ('Séance de l'Academie des Sciences, Jan. 20, 1873.)
2. Dr. Dentschenko. *On the Innervation of the Lachrymal Gland.* ('Pfluger's Archiv,' Sept., 1272.)
3. Professor H. Nothnagel. *Experimentelle Untersuchungen über die Functionen des Gehirns.* ('Virchow's Archiv,' 1873, lvii, p. 184.)

1. The lingual branch of the fifth pair of nerves has always been regarded as a purely sensory nerve. It has lately been shown, however, that, after section of the hypoglossal or proper motor nerve of the tongue stimulation of the lingual causes movements of the tongue. M. Vulpian, however, in his paper, states that he has satisfied himself that, although some of the fibres of the chorda tympani nerve terminate in the submaxillary gland, others are certainly distributed to the tongue. He ascribes to the latter branches the singular motor power which the lingual appears to acquire after the section of the hypoglossal. He is still of opinion that the lingual is a purely sensory nerve, but he is unable to explain why the fibres of the

chorda should apparently acquire a motor power after the section of the hypoglossal.

2. In Dr. Dentschenko's experiments, dogs, cats, and rabbits were rendered insensible by morphia. The stimulus applied was an induced current of electricity. The quantity of fluid secreted by the glands when irritated was estimated by the number of square centimètres of blotting-paper that were moistened. Some differences in the mode of experimenting were found to be required in the different animals. In the dog and cat the lachrymal nerve could be reached from the orbit, but in the rabbit the skull had to be opened. D. Dentschenko found that no influence upon the activity of the lachrymal gland was exerted by the temporo-motor branch of the fifth, but the secretion was augmented by irritation of the sympathetic nerve. Irritation of this nerve renders the conjunctiva moister, even when the lachrymal gland has previously been excited. The increased flow of tears which follows irritation of various cranial nerves, such as the frontal, infra-orbital, nasal, lingual, glosso-pharyngeal, and pneumogastric, is not interfered with by section of the sympathetic, but is immediately checked by section of the lachrymal nerves. Chloroform narcotisation does not prevent the manifestation of this reflex action. The secretion presents some differences, according to whether the sympathetic or the fifth nerve is irritated, being cloudy in the former case, limpid, clear, and abundant in the latter. The sympathetic nerve seems to maintain the normal degree of moisture of the eye, whilst the fifth governs the flow of tears, since, in cases of paralysis of the latter nerve the conjunctiva remains moist, but the power of shedding tears is lost. Ligature of the carotid artery materially diminishes, whilst ligature of the jugular vein augments, the flow of tears following irritation of the lachrymal nerve. All conditions producing dyspnœa lead to increased flow of tears.

Generation.

1. Dr. H. Kundrat. *Untersuchungen über die Uterusschleimhaut.* (In Stricker's 'Med. Jahrbucher,' 1873, Heft ii, p. 135.)
2. Dr. Schlesinger. *Ueber Reflexbewegungen des Uterus.* (In idem, 1873, Heft i, p. 1.)
3. Dr. Hermann Beigel. *Ueber das Verhältniss der Menstruation zur Ovulation.* (Pamphlet, Wien, 1873.)
4. F. M. Balfour. *The Development and Growth of the Layers of the Blastoderm.* (In 'Studies from the Physiological Laboratory in the University of Cambridge,' 1873.)

1. Kundrat gives a very full and carefully worked out account of his examination of the uterine mucous membrane obtained from the bodies of a large number of women in health, and inclusive of about 200 who were either menstruating or had recently discharged a fœtus. The uterine mucous membrane of the non-menstruating healthy woman is characterised by the richly-celled connective-tissue forming its matrix, and by the absence of a submucosa. It is soft, smooth, and greyish-red, and cannot be made to slide over the sub-

jacent tissue on account of the absence of a submucosa. It is about one mm. thick at the fundus, diminishing somewhat towards the collum and the openings of the tubes. Vertical sections of adult uteri examined with a hand lens show white lines, which are the tubular glands opening at the surface. The glands are sometimes divided. They do not appear to have a basement-membrane, but are composed of epithelial. Kundrat then gives a detailed account of the changes the uterus undergoes in pregnancy. During the first month he found the mucous membrane highly vascular and strongly folded as in menstruation. The ovum was found lodged in a small sacculus, but not in the mouth of a gland, and here the membrane was thinner and smoother than elsewhere. The margins of the sacculus almost completely covered the ovum, terminating by a thin edge near its free pole. The microscopical appearances were similar to those seen in menstruation, the abundance of cells and the increase in the glands being only still more marked. It is a remarkable feature about the portion of the membrane that rises to enclose the ovum, and which forms a part of the decidua vera, that the glands run for the most part longitudinally through it, or as seen in section, radially from the pole of the ovum, but open on both sides, that turned towards the ovum as well as that turned towards the cavity of the uterus. The decidua serotina, or bed on which the ovum rests, exhibits tubes lined with ciliated epithelial cells. The interglandular tissue is composed in young and virgin uteri of a plexus of fine fibres, in the meshes of which are closely packed, fusiform, or roundish cells. Kundrat was unable to obtain any evidence of the presence of muscular tissue in the stroma. In older uteri the cells are rounded, and often have many processes. No glands are discernible in the fœtus of seven months old. They appear as slight depressions in the uteri of children of three or four years of age, and from this period onwards progressively develop till the grand climacteric when they begin to atrophy. During menstruation the membrane is reddened and injected, swollen, from 3—6 mm. thick, relaxed, very soft, and covered with whitish cloudy and bloody mucus. The stroma under the microscope in the upper half, and especially in the upper third, is more richly infiltrated with round cells. The glands are three, or even four times as wide as in the quiescent condition, except just at their orifices. These conditions appear some time before menstruation sets in, and disappear slowly after the menstrual period; there is thus an extraordinarily great development of the glands. The chorion is attached very loosely to the maternal tissues, but there are projections and depressions mutually interlocking both from the chorion and the decidua. There is no continuous layer of epithelial cells over the villi. In the second and third months the ovum by no means fills the cavity of the uterus, but a space exists below filled with a troubled fluid. The decidua vera presented rugæ, and the mucous membrane was here nearly 6 mm. thick; the reflexa was from 1—2 mm. thick. The radiating or many-stalked (vielgestaltigen) cells of the decidua vera had increased in size and number, and formed a dense layer in the superficial part. The intercellular trabeculæ had also increased

in thickness. The remainder of the paper gives a minute description of the alterations in the decidua and membranes of the ovum too long for insertion here.

2. Dr. Schlesinger has continued and extended his observations on the reflex movements of the uterus and shows that electrical excitation of the centric extremity of a spinal nerve induces violent movements of the uterus, in from five to fifteen seconds. If in a curarized rabbit on which tracheotomy has been performed, the artificial respiration necessary for maintaining life be intermitted, the organ at once passes into a state of violent contraction, and the same thing happens if the central end of the median, crural or other nerve be electrically excited. The conduction of this reflex action, to which also the contraction of the uterus by irritation of the nipples is allied, does not take place through the spinal cord as a centre, for if the cord be divided in a rabbit prepared as above described, irritation of a nerve trunk for forty seconds produces no effect. Further experiments showed that the nervous plexus surrounding the aorta was one, but not the only course, by which the reflex influence was conveyed.

4. Mr. Balfour gives an account of the changes that occur in the cells of the blastoderm of the hen's egg during the first thirty or forty hours of incubation. As hardening agents he has used chromic acid, gold chloride and silver nitrate. He agrees in his account of the earliest changes with Peremeschko, Oellacher, and Klein. He describes the blastoderm at the fourth, sixth, or eighth hour as forming three layers, an external epiblast, a mesoblast, and an internal hypoblast. To form the latter, the spherical non-nucleated cells of the blastoderm become flattened and nucleated. The mesoblastic layer is partly formed of cells that originally belonged to the lower layer, and partly of free formative cells, both of which undergo free cell formation, and give rise to the primitive streak. Along this line a kind of fusion takes place, and now the primitive groove appears about the twelfth hour. By its growth the mesoblast comes to form the most important layer of the blastoderm, and its growth is effected by means of the formative cells. The growth of the hypoblast takes place by a direct conversion cell for cell of the white yolk and plume into hypoblast cells. The growth of the epiblast increases entirely by division. In a second paper Mr. Balfour gives an account of the disappearance of the primitive groove in the embryo chick, and in a third the development of the blood-vessels of the chick.

Dr. Benj. Millot. *De la Régénération du Crystallin chez quelques Mammifères.* ("On the Regeneration of the Crystalline Lens some Mammals," in Robin's 'Journal de l'Anatomie et de la Physiologie,' 1872, No 1, p. 1—50.)

M. Millot in his elaborate essay on the regeneration of the crystalline lens in some mammals shows that this can certainly occur, the tubes following in the mode in which they are reproduced the same order that they present during their generation and embryonic evolution. The regeneration can only occur in the cavity of the capsule, and is in direct relation with the thickness of the cortical layers that

are left, especially in the equatorial part, whilst it is in inverse proportion to the age of the animals and the amount of lesion to the capsule. The posterior crystalloid does not seem to take any part in the process of regeneration. The first traces of the regeneration appear about the end of the second week after the operation, and it is not complete until some time between the fifth and the twelfth month, or even later, when the animals are old. The new lens never exceeds one half the size of the natural or old one (Leroy d'Etiolles, Middlemore, and Philippeaux have obtained them of full size). The form and size of the new lens resembles that of the old one, and it can replace the latter physiologically. The lens can even be to some extent replaced a second time. The microscopical structure of the elements resembles that of the normal organ. Slight inflammation of the iris and corpus ciliare exercises no harmful influence over the process of regeneration, on the contrary it rather seems to aid it, panophthalmitis of course prevents it. When neoplastic connective tissue is found in the cavity of the crystalloid it is derived from exudation poured forth by the iris or vitreous tumour.

M. U. Gayon. *On Spontaneous Decomposition in Eggs.* (In the 'Comptes Rendus' for the 27 Janvier, 1873.)

M. U. Gayon states that the subject of the putrefaction of eggs has been the subject of numerous important results, which have, however, sometimes led to contradictory results. He proceeds to point out that it is generally admitted that eggs not shaken neither ferment nor putrefy, whilst eggs shaken undergo these alterations within a month; and that in no case where putrefaction has taken place, are the least traces of organised beings, either of an animal or of a vegetable nature, discoverable. M. Pasteur accordingly maintains, that these facts are opposed to the proposition, that the destruction of organised matter and its return to the mineral kingdom are acts correlated to the development and multiplication of organised beings. M. Gayon, struck with the exceptional character of the abovementioned phenomena, determined to undertake some fresh experiments to elucidate the *spontaneous* putrefaction of eggs, and has obtained results that are opposed to the abovementioned propositions. He finds that when eggs, some of which had been shaken and others not, are exposed to ordinary air at a temperature of about 25° C., whilst some putrefy, others remain perfectly sweet. On the other hand, amongst a number of eggs that have been shaken, some do and some do not putrefy, in the latter case remaining good for several months. On examining the eggs that remained sweet, no trace of any organism was discoverable in them; whilst, on the contrary, in every instance in which putrefaction occurred, numerous microscopic organisms of the family of vibrios, as well as various kinds of mould, were found. As to the origin of these organisms, he thinks it reasonable to conclude that, as some of the eggs undergo putrefaction whether they have been shaken or kept at rest, and others do not, the germs of the organism that accompany the process of putrefaction pre-exist, and in such eggs alone, the others being free from them; and further, that these germs must gain entrance during the passage of the ova down the oviduct.

REPORT ON TOXICOLOGY, FORENSIC MEDICINE, AND HYGIENE.

By Benjamin W. Richardson. M.D., F.R.S.

Toxicological action of Atropa Mandragora.—We have ourselves made some new observations on the action of mandragora, a substance the study of which has been untouched for many hundred years, but which once, and indeed, through many hundred years, in a still remoter time, was more experimented with and observed upon than perhaps any other poison or medicine. Dioscorides tells us of a draught that may be given to human beings before they have to undergo the pain of the surgeon's knife, or the cautery, and, later, Pliny gives us the formula for such a draught, which not only had the repute of a power to annul pain, but was believed to possess the property of causing a sleep so long and deep that in the borrowed likeness of death life might yet be existing. The physician, the poet, and the historian, alike dwell on this potion. Juliet drinks it.

The substance that was thus potently employed was the root of the Atropa Mandragora a solanaceous plant growing in the isles of Greece, in the Levant, in Spain, and in Italy.

Dioscorides, in his description of this plant, says:

"Some persons boil the root in wine down to a third part, and preserve the decoction, of which they administer a cyathus (rather more than an ounce and a half) in want of sleep, or severe pains of any part, and also before operations with the knife, or the actual cautery, that they may not be felt." (Ante sectiones ustionesve, ut ne sentiantur.) Further on he says: "A wine is prepared from the bark of the root without boiling, and three pounds of it are put into a cadus (about 18 gallons) of sweet wine, and three cyathi of this are given to those who require to be cut or cauterized, when, being thrown into a deep sleep, they do not feel any pain." Dioscorides adds, referring to a kind of mandragora called Morion, that a drachm of it, being taken as a draught, or eaten in a cake or other food, causes infatuation and takes away the use of reason. The person sleeps without sense, in the attitude in which he ate it, for three or four hours afterwards. Medical men also use it when they have to resort to cutting or burning. Pliny remarks that the juice of the leaves of the Mandragora is more powerful than the preparations made from the root, and that some persons even die from a considerable draught, and that it has the power of causing sleep in those who take it. The dose is, he says, half a cyathus (six drachms). It is taken against serpents, and before cuttings and puncturings, lest they be felt. For these purposes it is sufficient for some persons to have sought sleep from the smell of the medicine. Speaking on the same subject, Apuleius says, that if any one is to have a limb mutilated, burnt, or sawn, he may drink half an ounce with wine, and whilst he sleeps the member may be cut off without pain or sense."

Down to the twelfth century the wine of mandrake continued in use. It was called mandragorites, and persons who took it were called mandrakes. It was believed that on recovery from its effects there was wildness of the senses and fear: hence the meaning of the saying shrieking like mandrakes—

> "And shrieks like mandrakes torn out of the earth.
> That living mortals, hearing them, run mad."

With the revival of letters this use and application of mandragora passed away. The substance enters into none of our Pharmacopœias; even the Persian medicine books do not retain it. Its ally, Belladonna, gains and retains its place; Mandragora is lost. We thought it might be worth the trouble to investigate, or rather to re-investigate, the action of Mandragora.

For the first specimen of the root of the plant we were indebted to our friend Mr. Daniel Hanbury.

On obtaining the mandragora from Mr. Hanbury we made with it a tincture, but the first essays were so negative we were inclined to consider the substance inert. The error was our own. We had used, as after-experiment proved, too strong an alcohol. The active principle of the substance is most soluble in water, as is the atropine of belladonna. The ancients made an infusion or decoction, and afterwards added wine, by which the solution was preserved, and in this procedure they were scientifically correct.

After a time we made a tincture with weak spirit, letting the root, rubbed first into fine powder, remain in contact with the spirit solution several weeks. In this way a powerful tincture was obtained.

A series of experiments were now carried out, every one of which confirmed the ancient observations. The results may be briefly condensed.

The tincture, when administered either by the mouth or by subcutaneous injection is a narcotic. In birds it produces a deep sleep and insensibility, very much as chloral does. When the tincture is made from a good root five minims of it, subcutaneously administered, are sufficient to produce the sleep. The sleep lasts for an hour, and is broken by short and peculiar excitement and wildness, which lasts several seconds. The animal will now fall back again into a disturbed sleep, and then gradually recover. Ten minims of the tincture administered by the mouth produce similar effects. In large rabbits the dose required to produce an effect must be considerable—three drachms by measure. In them it induces very gentle sleep, which may extend over an hour, the awakening also being attended with some excitement, as if from a dream. If the tincture be given in a very large dose the sleep passes into death. The death is due to congestion of lung and condensation of fluid in the bronchial tubes. The heart is scarcely influenced by the first failure of the respiration, and will continue to beat several minutes —in one instance it beat seven minutes—after the respiration has ceased altogether.

The muscular irritability remains long after death. We have excited it so long as an hour afterwards.

On the human subject the agent has a very potent action. The tincture benumbs the tongue when a little is placed upon it, and the taste of the substance, with the peculiar sensation that is induced by it, lasts for many hours. We found a dose of twenty minims insufficient to produce comatose symptoms, but exceedingly potent in effect. It caused a desire for sleep, a sense of fulness in the vessels of the brain, a peculiarly enlarged confused vision, an exaggeration of sounds, and a curious restless excitability, akin to hysteria, perhaps, we might say, essentially hysterical. These symptoms were not removed for a day, and they left some lingering uneasiness and coldness longer. We noticed that, as after atropine, there was dilatation of the pupil from mandragora.

There are yet many new facts to be ascertained in respect to this old physiological agent. It has yet to be discovered whether its effects are remedial in cases of poisoning by opium—whether an alkaloid can be obtained from it, and if so, whether such alkaloid differs or does not differ from atropine. We have as yet been unable to make these inquiries, but we think it certain that the historical repute of mandragora for good or for evil is maintained. The action of the agent in producing deep and prolonged sleep, and in creating a kind of delirium which gave to it the character of

> "The insane root
> That makes the reason prisoner."

is most definite.—*Original Report*, Dec., 1873.

Researches on Solanine and Solanidiné.—Professor Francesco Selmi has presented to the Academy of Sciences at Bologna a description of his method of demostrating the presence of solanine and solanidine in cases of poisoning by the first named substance, so likely to be caused from the use of rotten or germinating potatoes. He states that solanine, in acid solution above the ordinary temperature, partially separates itself in twenty-four hours into solanidine and other products, an effect which would occur with almost a certainty in the intestines, and he therefore concludes that having made the research for the first agent it is necessary to turn to that of the second. He has studied what were all the most characteristic reactions for the discovery of solanine and solanidine, and has observed that, although toxicologists already know something of solanine, they are almost ignorant of the methods of recognising its derivative. He proposes to determine the reactions of solanidine upon a plate of glass at a given temperature and condition, so as not to base the changes produced by the different degrees of heat and other causes, to examine with the microscope the products of these reactions, working so as to get safe results from small quantities, corresponding to fractions of milligrammes of the poisonous substance. He shows that when solanine is distilled for thirty-six hours with gastric juice it separates itself into parts, generating its derivative. He extracted both the one and the other by means of alcohol and ether. He sought and found new special indications with which to develope them, and arrived at the following conclusions:

The principal reactions by which solanine may be recognised are:

1. The violet colour, which is generated by the action of brominated hydrobromic acid. 2. The red violet colour, produced by diluted sulphuric acid during concentration at a gentle heat. 3. The yellow cedar colour, produced by nitric acid and an alkali. 4. The red colour, caused by the successive addition of sulphuric, arsenic, or phosphoric acids. 5. The purple colour, which developes with traces of chloride of platinum. 6. A similar colour, which is rendered manifest with phosphoric acid and traces of molybdic acid. 7. The formation of needle-shaped, long, stellated crystals, with brominated hydrobromic acid, after desiccation and treatment with water.

Solanidine may be revealed:—

1. By the special form of the crystals of its hydrochlorate. 2. By the crystals of its hydrobromate. 3. By the warm yellow colour made evident by nitric acid and a caustic alkali. 4. By the red colour produced by phosphoric acid and traces of molybdic acid. 5. By the yellow orange colour, which is caused by the action of brominated hydrobromic acid upon evaporation to dryness.

The professor states that with due care it would be possible to detect minimum quantities of either substance.—*Annali di Chimica*, No. 2, Agosto, 1873.

[Solanine, discovered by Desfosses, has been obtained from the berries of the *Solanum nigrum*, *Solanum dulcamara*, and from the fruit of the potato, especially after the potato has been allowed to germinate. It forms salts with acids, but they crystallize with difficulty. It is an active poison, producing, before death, paralysis. The theory that it may yield a derivative, solanidine, in the stomach is new, and we are not aware as yet what are the toxicological properties of solanidine. This should be determined to complete the research.—B. W. R.]

Remedial Action of Atropia in Poisonings by Opium.—We omitted, in our last report, from want of space, a paper by Dr. H. C. Wood, of Philadelphia, on the above subject. Dr. Wood rather objects to the use of the term antagonism in cases where one alkaloid modifies the physiological action of another, and speaks, in preference, of the medical or remedial process of the antidote. In this we agree with him entirely. He is of opinion that the medical value of atropia in opium poisoning is a completely established fact. Opium, he thinks, kills by its influence on the respiratory centres, and it is a proven fact that in large doses atropia is a most powerful, and, as far as he (Dr. Wood) knows, the only direct stimulant to the respiratory centres, and when it has been used in opium poisoning it has been very commonly noted that improvement in the respiration is among the first results. Further, in this connection, it must be borne in mind that very probably the excess of carbonic acid in the blood in opium narcosis is often an important factor in the production of the stupor. To these observations Dr. Wood adds a series of observations and of cases, some of which are of great value, though they ared estly put forward as corroborative rather than original facts. Three of these cases we report in full, because, in the treat-

ment pursued, the simple remedy was alone employed, and in each case with success. The first case was under the care of Dr. Garretson, the second and third under the care of Dr. Knight.

Case 1.—A young man took by mistake six grains of the acetate of morphia and three grains of opium, when retiring to bed for the night. At five o'clock the next morning he was seen by Dr. Garretson, who found the man in a state of profound coma, from which he could not be aroused. Without pursuing any other treatment whatever, Dr. Garretson gave in divided doses within half an hour two and a half teaspoonfuls of the officinal tincture of belladonna. In one hour the patient was semi-conscious; in four hours completely conscious. He made a good recovery.

Case 2.—A man aged forty-five years, intemperate, drank with suicidal intent six fluid drachms of laudanum, U. S. P. About an hour afterwards Dr. Knight found him narcotized and failed to induce vomiting by means of large doses of ipecacuanha, sulphate of zinc, &c. No stomach-pump was at hand. An hour and a half after the ingestion of the poison the symptoms of narcotism were complete, and the respirations had fallen to from six to eight per minute. About viij grains of the extract of belladonna rubbed up in some water were given in divided doses by the stomach during the next four hours. During this period respirations were only kept up by the use of cold douche, &c. At the end of the time the pupils began to dilate and the respirations became more natural, also there were signs of returning consciousness. He now vomited freely, and after this recovered rapidly.

Case 3.—Mr. ——, aged thirty-three years, took for severe pain a fʒss of Tinctura Opii, obtained at a country store and of unknown strength. He was seen by Dr. Knight an hour afterwards, and as he was still suffering he received at once, hypodermically, a quarter grain of morphia, which dose was repeated in ten minutes. Almost at once the patient dropped into a sound sleep, and some hours afterwards the doctor was recalled. The pupils at this time were firmly contracted; the pulse very weak, 150 per minute; the respiration was almost suspended, so that it was necessary to constantly dash cold water on his face, or to shake him violently to keep him breathing. It was almost impossible to arouse him at all. One grain of the extract of belladonna was ordered every twenty minutes, and two grains were injected at once into the calf of the leg, and in the next three hours he received between six and eight grains of belladonna extract. At the end of this time the pupils began to dilate, the respirations to become more frequent and regular, and it became more easy to arouse the patient, who henceforth convalesced without further treatment. There was no emesis at any time.—*American Journal of the Medical Sciences*, April, 1873.

Toxicology of Salts of Calcium.—M. Rabuteau has suggested that metals are more poisonous in their effects as their atomic weight increases; thus calcium having an atomic weight equal to 40, and potassium an atomic weight of 39, it is probable that the soluble combinations of calcium ought to act with nearly the same intensity

as those of potassium. Experience has shown this to be the case. 1·50 grains of chloride of calcium injected into the veins of a dog kills the animal by arresting the action of the heart. If chloride of potassium be used, the same effects are observed when quantities of this salt, holding equal weights of potassium to the weight of calcium contained in the chloride of this latter metal, are injected. Thus, one grain of chloride of potassium injected into the veins of a dog kills the animal by stopping the action of the heart. But chloride of potassium is KCl, while chloride of calcium is $CaCl_2$, so that one grain of chloride of potassium contains as much potassium as 1·476 grains of chloride of calcium contains of calcium.

Death is produced in both cases by stopping the action of the heart, which is found (on rapidly opening the animal) completely at repose, in diastole. This result demonstrates that the salts of calcium, as well as the salts of potassium, and of all metals used in sufficient quantities, those of sodium and lithium excepted, are muscular poisons.—*Comptes rendus de l'Acad. des Sciences*, Feb., 1873, and *Révue des Sciences Médicales*, tome 1, No. 2, 1873.

II.—Forensic Medicine.

Idiopathic Tetanus.—Dr. Fish reports a singular case of idiopathic tetanus in a young man, aged nineteen, who had taken severe cold, and who had been accustomed to administer to himself morphine by hypodermic injection. The patient complained first of stiffness of muscles of the neck, pain between the shoulders, and inability to open the mouth fully, or to turn the head from side to side. He had been drawing water from a well, night and morning, for several days, and thought he had taken cold by exposure when perspiring freely from the exercise. These first symptoms occurred on September 18th. He was ordered a hot foot-bath, with a liniment for the neck and shoulders, and eight grains of Dover's powder. On September 19th he slept but little through the night, and now had all the symptoms of tetanus: well-marked trismus, irregular and spasmodic movements of the limbs, inability to open the mouth, and constant tendency to opisthotonos whenever the spasmodic actions recurred. Dr. Fish ordered Potass. Bromid. ten grains every hour, and Ol. Ricini one ounce to be taken at once.

In the evening he was visited again, and the symptoms of the morning were found present and in increasing severity. It was learned from the patient's friends that he had been in the habit, for eight months or a year past, of using morphine subcutaneously, and that he had administered to himself, on an average, from ten to eighteen hypodermic injections every twenty-four hours during all that time, each injection averaging from twenty to thirty drops of Majendie's solution. One drachm of morphine in this way was consumed every five or six days.

His mother had for a number of years past been suffering from a very painful disorder, for which she had been accustomed to use morphine by hypodermic injection of the solution, sometimes administering it to herself, and at others of having the operation per-

formed by her son, R. H—. Out of mere curiosity the lad on one occasion, about a year ago, secretly administered a small subcutaneous injection of Majendie's solution of morphine to himself, and finding the resulting intoxication pleasant, he after an interval repeated it, and gradually got in the habit of its daily use. None of the family even suspected this, although his health was evidently suffering from some cause; and he succeeded in keeping the practice a secret for some months. When the cause of his declining strength was discovered, he was already confirmed in the opium habit, and had too late discovered the overmastering power of the enemy he had introduced into the citadel of his life. A determined, and for a short time successful, effort was made by his friends to break him of the habit, before the case seemed hopeless. He was for some days on the verge of delirium tremens, but finally recovered, and seemed in a fair way to succeed in being permanently freed from his slavery to the drug; but the case was only in this respect a repetition of the old story. He indulged again "just once," and soon the lethal habit held bim in full control.

On an inspection of his person, Dr. Fish found that the muscular portion of his arms and legs, and even other parts of his body, bore numerous marks of the use of the hypodermic syringe; in fact it was difficult to find any sound integument on those portions of his body.

As it seemed impossible to withdraw the accustomed stimulus of morphine without producing distressing, if not fatal, results, it was continued in slightly reduced quantity by the stomach. He was directed to have beef and egg-nog regularly, as much as the stomach would bear, a stimulating liniment was applied to the spine and neck, and the bromide of potassium was increased to twenty grains every hour. This treatment was continued till the morning of the 21st of September without any alleviation of the distressing symptoms. The use of the hypodermic syringe was occasionally resorted to, to allay the terrible nervous excitement, and with some temporary relief. As the bromide seemed to have no effect, it was discontinued, and chloral hydrate substituted, ten grains every hour, and the brandy, beef-tea, and milk punch continued.

In the evening Dr. Bamford, of Brooklyn, and Dr. Cushman, of Oakland, saw the patient in consultation.

As the chloral had only caused a kind of broken sleep, frequently interrupted by distressing spasmodic action of the limbs and body, it was deemed advisable to increase it to twenty grains, or even thirty, and to continue with each dose a drachm of Majendie's solution. The hypodermic use of morphine was interdicted. The use of nourishment continued as before. On September 22nd there had been heavy sleep, but the tetanic spasms continued. In the evening an attempt was made to administer chloroform by inhalation, but the vapour produced dyspnœa and spasm of the glottis, so it was discontinued. The morphia and chloral were continued to the 24th, when one-eighth of a grain of extract of calabar bean was added, but had to be withdrawn after three doses, as it caused mental

excitement. On the 26th quinine was substituted for the chloral. Death occurred on the 26th suddenly, and without spasm, as if from nervous exhaustion.—*Western Lancet*, vol. i, No. 10. pp. 588—592.

III.—Hygiene.

Active Principles of Smoke of Tobacco.—Dr. G. Le Bon urges that, although the effects of tobacco have been studied by various experimenters, and although its injurious results are well known, yet there is no unison of opinion as regards action. All inquirers into this subject attribute the pernicious effects of the tobacco to the nicotine, but in order to justify this hypothesis it should be ascertained —(1) if tobacco smoke contains nicotine; (2) if it does not contain other active principles as well as this substance; and (3) if these various principles are absorbed, and in what quantities they can be absorbed in the various circumstances in which a smoker may be placed.

Many experimentalists in their researches have selected the first of these questions for their inquiries, and Molsens specially. Having collected 4500 grammes of tobacco smoke in a bottle, he was enabled to extract 30 grammes of nicotine from the fumes it produced. The fact of the presence of nicotine in tobacco smoke being thus demonstrated, it is necessary to examine—(1) if the nicotine be really absorbed; (2) in what proportions it is absorbed; and (3) if the smoke may not contain other active principles besides the nicotine.

The absorption of the nicotine by the smoker is evident. The effects of the fumes upon the organism would suffice to demonstrate that, were there not other results which establish the reality of this absorption. Nicotine being an alkaloid, is soluble in water, and in the liquids which moisten the mucous membrane; when condensed during combustion, it mixes itself with a certain quantity of water, and becomes consequently greatly diluted, and in the best conditions possible for being absorbed. As regards the proportion of nicotine which may be absorbed by the smoker, science is perfectly silent. This subject presents, however, great practical as well as scientific interest. It is important to smokers to ascertain which, among the various methods in use, is the least injurious for inhaling this pernicious substance; and it is interesting to persons who do not smoke to know whether they really absorb nicotine when near a smoker.

Tobacco contains other active principles besides nicotine. Dr. le Bon has succeeded in proving that the smoke which condenses in the mouth and lungs of the smoker contains a very considerable proportion of ammonia, the effects of which are added to those of the nicotine. The various circumstances under which smokers, and those who are in an atmosphere laden with tobacco fumes, absorb the active principles, are the following:—(1) Tobacco smoked in the open air in the forms of cigars or cigarettes; (2) tobacco smoked in the same form, but in a closed apartment; (3) tobacco smoked as cigars or cigarettes in a closed apartment, the smoker inhaling the

smoke; (4) tobacco smoked in a pipe with a short tube in the open air, the smoker not inhaling the smoke; (5) tobacco smoked in the same manner, but in a closed pipe; (6) tobacco smoked in a pipe with a short tube, but the smoker inhaling the smoke; (7) tobacco smoked in a pipe, with a long tube, in the open air; (8) tobacco smoked in the same way, but with a closed pipe; (9) tobacco smoked as in the preceding cases, the smoker inhaling the smoke; (10) tobacco smoked in a Persian pipe, or one in which the smoke, before arriving at the mouth, passes through a receptacle full of water; (11) a person not smoking, but being with one or more smokers, as might be the case in a café or in a carriage.

During the combustion of the first piece of a cigar the various principles contained in the tobacco (water, resin, nicotine, ammoniacal salt), carried to an elevated temperature by vicinity to the incandescent part, are reduced to vapour. A portion of this vapour condenses in the cold upper strata of the tobacco, whence it is attracted by the aspiratory movement of the smoker; the other comes into the mouth, in contact with the cold and damp surface of the mucous fluid of the mouth. It condenses partially, and the condensed products mingle with the saliva, to be in the end absorbed. That which escapes condensation is given off into the atmosphere.

The combustion of the cigar continuing, the stratum of tobacco which the smoke must pass through to arrive at the mouth being gradually smaller, the condensation becomes less perfect, and the fume always reaches the mouth more laden with the active principles. In fact, when the cigars are almost finished the smoke which comes into the smoker's mouth is not only not despoiled, by the condensation of a part of its principles, but contains the preceding materials condensed in the previous strata of the tobacco, and which, carried by the combustion to an elevated temperature, becomes volatilised afresh. This explains a fact well known to smokers, that the last part of a cigar has a much stronger taste than the first part. Those who are unaccustomed to tobacco have much difficulty in smoking a cigar without a feeling of nausea, and they constantly resort to spitting (the saliva being charged with active principles), a custom not resorted to by experienced smokers.

From the preceding explanation it will be seen that when smoking cigars and cigarettes almost the whole of the active principle of the smoke passes into the mouth, especially if the entire cigar be consumed, which occurs when cigar-holders are used. Hence the proportion of nicotine, and of other active principles absorbed, must be more increased.

In the above case it is supposed that the smoker is in the open air, and does not inhale the smoke; he can, therefore, only absorb the materials which condense upon the relatively restricted superficies of the mouth.

Should the same individual smoke in a closed apartment instead of in the open air, he would then be breathing an atmosphere more or less saturated with smoke, and consequently with the active principles it contains. This atmosphere, filled with smoke, passes and

repasses into the lungs, and every time frees itself of a portion of the condensable principles it contains. The smoker will now be absorbing not only the constituents which condense in his mouth while he inspires the smoke of his cigar, but also those which arise from the smoke he casts into the atmosphere. The absorption will then be increased in proportion to the increase of the smokers in the same space.

If the same smoker of cigars or cigarettes were to be placed in the conditions previously indicated, and if he were, moreover, according to a custom common in some countries, to inhale the smoke of the cigar before exhaling it through his nose or mouth, the absorption would be far more considerable than under the circumstances already examined. The smoke which had not, as in the preceding hypotheses, time to cool itself in the atmosphere, would arrive in the lungs without having lost more of its active elements than it was able to condense in the mouth, and in contact with the vast surface of the pulmonary mucous membrane it would rid itself of a fresh proportion of the materials which it contains (vapour of water, nicotine, ammonia, resin). All physiologists know with what rapidity absorption through the superficies of the pulmonary mucous membrane is produced.

The reasoning applied to the three preceding cases, *smoking in the open air, smoking in closed rooms, and inhaling the smoke*, are as applicable to smokers of pipes as to smokers of cigars. The quantity of the constituents absorbed by pipe smokers is, nevertheless, very different from that absorbed by cigar or cigarette smokers.

The smoker who uses a pipe with a short tube resembles, as regards the quantity of the elements absorbed, the cigar or cigarette smoker; he always, however, absorbs less material than the last, as the smoke before going into his mouth passes through a cold tube, where it partly condenses. These condensed elements constitute the semi-liquid substance found in the tubes of pipes.

It is easy to foresee that the longer the tube of the pipe the greater will be the condensation of the active principles of the smoke, and the more purified it will reach the mouth and lungs. Pipes with long tubes lessen the danger.

Moreover, whatever superiority a pipe with a long tube may possess over a pipe with a short tube, and particularly over a cigar or cigarette, it is still greatly inferior to an oriental pipe. In this latter instrument the smoke does not reach the mouth until after it has passed through a vessel filled with water, and also through a very long tube. It then arrives in contact with the surface of the palate, not altogether free from its principles, since experience has shown that three washings are insufficient to get rid of them entirely, but at least infinitely less imbued with the active materials than in the ordinary pipe. This easily explains how it is Orientalists are able to smoke whole days without suffering inconvenience.

Having successively considered the various circumstances in which a smoker may be placed, Dr. le Bon mentions the cases of individuals who do not smoke, but who frequent places the atmosphere of which contains the smoke of tobacco.

It is, he says, an error to imagine the possibility of being safe from the injurious effects of tobacco when placed within reach of its influence. A man breathes about eighteen times in a minute, and at every fresh inspiration about half a litre of air reaches his lungs. He absorbs, therefore, nearly nine litres of air per minute.

This air carries to the lungs the elements which it contains. He who finds himself near to a smoker inhales and exhales a volume of air containg a smoke which condenses itself partially over the vast surface which the mucous membrane of the mouth, the trachea, and the lungs presents. He absorbs less of the elements than the smoker himself; nevertheless he imbibes a noticeable proportion. On the question, whether smoking in the open air without inhaling the smoke be less injurious than remaining for a long time in an atmosphere saturated with fumes of tobacco, Dr. le Bon gives an affirmative opinion.—(*La Santé Publique*, Février 8, p. 490.)

Influence of Diet, Climate, and long Voyages on the Health and Diseases of Seamen.—Dr. Rattray treats very ably in the essay before us on the food best suited for seamen making long voyages, especially in the tropics. He inveighs strongly against the continued use of salted meat.

"The sustenance (he says) which nature liberally supplies mankind in every habitable region, and even in some which are barely so, is always found in the *fresh* and never in the *salt* state. The latter is not only an artificial form of food, but that which departs more than any other both in structure and chemical composition from the primitive character of what she provides; and, like all substitutes for original productions, it is not only faulty and inefficient as a life-sustainer, but injurious. If, therefore, in sending our vessels to sea in any latitude, but more especially in the tropics, we attempt to keep their crews in health (a more important indication towards preserving their efficiency than physical training) by giving them aliment which yields not only too much animal and fatty and too little vegetable matter, and the former in a condition which experience has long and amply proved to be unfit for the proper reconstruction of the ever-wasting fabric, even in temperate latitudes, and still more in warm ones, need we be surprised at the large percentage of sickness which prevails under the present diet-system, especially during tropical service, or the high ratio of hospital, invaliding, and fatal cases? Though climate and injudicious dieting are in themselves fruitful sources of disease, it is ailments which have a compound character, and are partly climatic and partly dietetic, which constitute by far the largest proportion of the affections peculiar to warm latitudes, and especially those from which sailors often suffer so severely. In our etiological inquiries we are too ready to refer disease, and especially tropical ailments, to extraneous and often obscure if not fanciful sources, while we overlook or condemn such as are simpler, more obvious, and closer at hand, and especially one of internal origin, viz. diet; and we are especially apt to ignore or despise the influence of salt meat as a debilitating medium, both on healthy and sick subjects. Food, though long, is

not yet sufficiently recognised as an active instrument in the causation of disease, as it also is in its cure and prevention. And climate, though an important morbific agent, both predisposing and exciting, especially in the tropics, gets far more blame than it really deserves, and is often reproached when other causes merit equal if not greater censure.

A brief chemico-physiological cons ideration of the former doubtfully injurious and latter decidedly deleterious effects of tropical climate and diet will also materially aid our investigation. In these agencies it is evident that seamen have two insidious foes that sicken and slay far more than the open enemies against which they have sometimes to contend. We already know well enough when and where they act; and if we can ascertain how they operate, and which of the many vulnerable points of the system they attack, it may enable us to direct our opposing or reparative efforts with some prospect of success, and thus realise for the sailor results which he cannot accomplish for himself.

"The principal effect of the first and greatest of these, viz. excessive warmth on the system, long since pointed out by Copland, is chiefly to diminish the changes produced by respiration on the blood, from which there follows a long train of secondary phenomena. The carbon, imperfectly discharged by the lungs, accumulates in the blood, to be excreted either by the liver, skin, or intestinal canal. An exaggerated function in these organs and a compensating pulmonary decrease succeed. And so long as they sustain this revolution, health is enjoyed. But if impeded in action, the noxious elements which ought to be thus eliminated, necessarily augment and vitiate the all-important vital fluid, and ultimately both body and brain. It is to this that we largely if not principally owe the lessening weight, the daily weakening system, and sensibly failing health which befall a large majority of every ship's company; as well as the hepatic, intestinal, and febrile disorders which attack many; and the mortality which often saddens their comparatively limited stay in passing through or serving a commission in a tropical climate. And to this also is due the attenuated and enervated frames, modified constitution and temperament, frequent ailments, premature decay, brief lives, physically and mentally degenerate offspring, and ultimate extinction of race which result from the longer sojourn of more permanent European residents.

"The diet which nature provides for the tropics is such as suits both the system and the clime. There the body needs no additional external or internal caloric as in arctic and to a certain extent in temperate regions. Nor does it require so much muscle-yielding material as the frame of the more active inhabitants of colder latitudes. Hence the carbonaceous and nitrogenous elements correspond to the limited demand, while the hydro-carbonaceous constituents are proportionately large. It is this diet which Europeans ought to adopt in tropical regions, and which is best adapted for our seamen when sent thither."—(*Reprint from Statistical Report of the Health of the Navy for* 1866, London, 1873.)

IV.—Summary.

On Burial, Embalmment, and Cremation. By Professor Polli, M.D. ('Annali di Chimica,' Nov., 1873).

Dr. Polli, in this article, comments on a paper by Professor Silvestro Zinno, who is opposed to cremation. Polli defends the process of cremation, urging that when it is properly performed it is open to no serious objections, and, as a hygienic measure, is one of the most important of advances.

The Question of Quarantine. By Alfred S. Carroll, M.D. Separate pamphlet. New York, F. Leypoldt, 1872.

Dr. Carroll insists that communicable diseases depend upon material organic poisons, and that they do not arise spontaneously. Quarantine of observation should, he thinks, in all instances, apply to living beings in whom contagion may remain latent, rather than to inanimate substances, which may be at once disinfected.

Official Sanitary Report of Milan for the Year 1870-71. By Dr. Cav. Luigi Bono.

This is an official report addressed by Dr. Bono, Medical Officer of Health of Milan, to the municipality of that city. It includes the report of his administration for the official year 1870-71, and contains a very instructive table of the deaths from pulmonary consumption occurring in persons of different callings and professions in 1870. Of 803 deaths amongst the Milanese community from the disease named, no less than 271 of those who died were tailors or sempstresses, 69 were agriculturists, 53 were domestics, 51 were labourers, 36 were industrials, 21 were students and men of letters, and 77 were of no certified calling. The months in which the mortality from the disease was the greatest ran in the following order:—January (110), May (77), October (76), April (67) July (66), August (63), February (62), June (60), September (59), March (56), December (55), and November (52).

The Medicine of the Future.—By Dr. Brunetti. Separate pamphlet. Constantinople, 1873.

This pamphlet deals with the subject of fermentation—"fermentation physiologique," "la zymopathie," "la thérapie zymologique," and "pharmacologie zymologique." The essay is of an argumentative rather than of a demonstrative character, and supports the views of Pasteur.

Contribution to the Toxicoloyy of Bi-nitro-benzol and Nitro-glycerine. By Dr. Starkow ('Journal de Médecine de Belgique, tome 35, p. 329).

The author says that the action of nitro-glycerine is analogous to that of the nitro-benzine, the toxicological properties of the two agents being nearly the same: but the latter is most active, notwithstanding its feeble solubility.

REPORT ON PATHOLOGY AND PRINCIPLES AND PRACTICE OF MEDICINE.

By Francis C. Webb, M.D., F.L.S.,
Fellow of the Royal College of Physicians, Physician to the Great Northern Hospital.

On the Transmissibility of Tuberculosis by the Digestive Canal.—A number of interesting experiments on this subject have recently been performed in France and Germany. The first experimenter was Chauveau, who communicated the results of his experiments to the Congrès de Lyon, which body appointed a Commission to examine the bodies of four calves selected for experiment, and to report on the same. The Commission reported that in the animals submitted to experiment there were found considerable tubercular lesions, so numerous and important, that it was impossible to suppose them independent of the ingestion of tubercular matter to which the animals had been subjected. In animals kept for comparison, however, the Commission had found lesions infinitely less, but still evident and clearly of tubercular nature. The question of the origin of these lesions in the animals kept for comparison, was investigated by the Commission, and it was found that in the absence of Prof. Chauveau, they had been fed out of vessels which had been used for feeding the animals experimented on, and it had frequently happened that a healthy calf had been fed from a bottle of milk which had been begun by an infected one. In some cases it seemed possible that pharyngeal mucosity from an animal presenting advanced lesions of the pharynx, had, through the medium of the feeding utensils been administered to a healthy calf. The Commission arrived at the following results:—1. It was most probable that the tuberculosis of the animals submitted to the Commission was not hereditary. 2. It appeared incontestable that ingestion of tuberculous matter had a determining influence on the very numerous and considerable lesions of the animals submitted to experiment. 3. It is most probable that the animals kept for comparison were infected through the digestive passages by eating from the same buckets as the sick animals, and so eating or drinking contaminated matters. Experiments on the same question have also been performed by many German veterinarians. Gerlach and Klebs have experimented on the effects of milk from phthisical cows. Klebs observed tuberculosis in the dog following the ingestion of milk from a cow in the last stage of phthisis. Klebs thinks that the activity of the milk of a tuberculous animal in producing the disease is proportionate to the period of the disease. He finds the serum of the milk is as infectious as the milk itself. He does not find that ordinary boiling destroys the infectious principle of the milk, but tuberculous matters lose their influence under the action of alcohol. Bollinger fed dogs with masses of tubercular lung warm from a freshly killed bullock with negative results. A sheep made to swallow from 5 to 8 grammes of the same lung exhibited a doubtful swelling of the glands. A

goat fed with tuberculous ox lung became cachectic and died fifty-one days after the first ingestion. After death there were found flat ulcers on the surface of the tongue; notable tumefaction, and commencing caseification in the superior cervical glands; miliary tubercles in the lungs; increase of volume, and commencing caseification in the bronchial glands; tumefaction and miliary tuberculosis of the mesaraic and epigastric glands with some points of caseification; tubercles in the peritoneum and epiploon. Microscopical examination of the peritoneal and pulmonary tubercles showed caseification in the centre, and the absence of any parasite. Some small pneumonic patches in the neighbourhood of the tubercles in the lungs were due to the presence of entozoa (strongyli). Another goat fed with the same tuberculous lung, died sixty-five days after the first ingestion, and the body exhibited similar lesions—hypertrophy of the bronchial glands with caseous points, miliary tubercles in the lungs with pneumonic patches caused by the presence of strongyli, tumefaction of the mesenteric glands, a section of the glands showing miliary tubercle with partial caseification; ulcerations of the large and small intestine. A third goat, by way of comparison, was made to swallow a mixture of milk and of caseous pus from an encysted abscess in the spleen of a pig. No particular symptom followed, and the animal was killed fifty-nine days afterwards. There was only a "pneumonie vermineuse" of the upper part of the left lung. The digestive tube and glandular apparatus were perfectly healthy. A sheep was fed with tuberculous ox lung, and was killed sixty-seven days after the first ingestion. Isolated tubercles were found in the lungs and peritoneum; hyperplasia of the mesenteric glands, with partial caseification and ulceration of the small intestine. The animal thus treated became thin and anæmic. *Gazette Médicale de Paris*, Nov. 22, 1873.

Case of Tumour of the Brain without Functional Disturbance.—By Dr. de Cruz Cabral.—The subject of this observation was a man aged 34, of deteriorated constitution, and probable syphilitic antecedents. He suffered from frontal headache, which was considered an osteocopic pain, and was treated by narcotic applications. The patient succumbed to a condition of wasting brought on by the suppuration of numerous cold abscesses. At the autopsy the lungs, the pleuræ and the peritoneum were found tuberculous, the liver and the kidneys cirrhosed, and in the left hemisphere of the brain there was a tumour of the size of a hen's egg, of an irregular ovoid shape, and of a hard and resisting consistence, surrounded by a bed of softened cerebral matter. The tumour occupied the place exactly of the corpus striatum and left optic thalamus. Tubercular cells were discovered in it on microscopical examination. During life the patient had been treated with cod liver oil and iodide of potassium. *Gazette Médicale de Paris*, Nov. 22, 1873.

On The Variations of Hæmoglobine in Disease.—By M. Quinquaud. —The amount of hæmoglobine in a robust person determined by the amount of oxygen absorbed by the blood is from 125 to 130 grammes to the 1,000 grammes of blood. In some subjects it may

be 115 grammes without any clear pathological conditions resulting. In disease the variations of the hæmoglobine are numerous, and their study leads to certain deductions which may be of service in diagnosis and prognosis. 1. Cancer, chlorosis, and at times tubercular phthisis in its third stage, are the diseases in which the amount of hæmoglobine falls lowest. 2. The amount of hæmoglobine is a weighty element in the diagnosis, between a case of typhoid fever and one of acute granulation; in typhoid fever, on the twelfth day, the hæmoglobine does not descend much below 115, whilst at the same period in acute granulation it is at 90. 3. In the case of certain visceral tumours the hæmoglobine may also serve as a diagnostic. In carcinoma it falls to 40 or even to 38; whilst in other tumours (as cysts, fibrous tumours) it remains at about 80. 4. When in a female we hesitate to decide between chlorosis and the first stage of tuberculosis, the amount of hæmoglobine may enable us to decide; in chlorosis hæmoglobine descends to 57, and in tuberculosis to about 100. 5. When in typhoid supervening in a tolerably healthy subject, the hæmoglobine falls to 96, the prognosis is grave.—*Gazette Médicale de Paris,* Sept. 6, 1873.

On The Lesions of the Medulla of Bone in Smallpox. By C. Golgi. —The Author's observations support the theory of Bizzozero and and Neumann on the hæmato-poietic function of the marrow of the bones. His researches were made on 25 subjects who died from hæmorrhagic variola, and on 5 of pustular variola at the period of suppuration. The autopsies revealed constant differences according as the tissue was obtained from a subject attacked by one or other of these affections. In hæmorrhagic variola diffuse hæmorrhages were found in all the medullary spaces (ribs, bodies of the vertebræ); there was a considerable diminution of the white medullary cells, and a fatty degeneration of the remainder; whence the relative increase of the latter, a notable increase of red globules with nuclei, and a great scarcity of globuliferous cells. In pustulous variola, on the contrary, there is an enormous augmentation of white cells and of giant cells, whose nuclei are in process of multiplying by gemmation. The hæmato-poietic function of the marrow explains, according to the author, all these differences. In the first of these varieties of variola, the suppurative process calls to the skin all the white globules of the economy, which then organise or undergo further changes. The younger white cells of the marrow endowed with protoplasmic activity emigrate in quantity, and the older of the cells only are found in the medullary spaces, whose migratory powers have been destroyed by fatty degeneration. Diminution in the contents of the medullary spaces decreases extra vascular pressure, and so becomes the cause of suffusions of blood. This poverty of the medullary tissue is of great importance in anatomical diagnosis, because in typhoid fever (which is difficult to distinguish from hæmorrhagic variola when the pustules are few and resemble petechiæ), there are always a large number of cells containing red globules. The frequent appearance of nucleated red globules at a somewhat advanced period of hæmorrhagic variola (8th, 10th day) is explained

by the reparatory process of which the hæmato-poietic organ is the seat. In pustulous variola, the increase of the white cells of the marrow is in relation to the abundance and multiplicity of suppurations to which the marrow of the bone, like other vascular glands, furnishes leucocytes. The numerical increase of giant cells is a proof of this hyper-activity of the marrow. These elements, according to Bizzozero and Neumann, produce white globules by gemmation. These variations in the medullary tissue correspond to variations in the tissue of the spleen. In hæmorrhagic variola, the spleen is small, compact, the trabeculæ are distinct, the pulp not abundant; white globules few, for the most part degenerated; nucleated red globules in large quantities, no giant cells, no effusions of blood. In pustulous variola the spleen is voluminous, soft, the pulp abundant with numerous white globules and plenty of giant cells, few globuliferous cells, and nucleated red globules. Golgi has found in the blood of smallpox patients granules either isolated or massed, they are more frequent in the pustular than in the hæmorrhagic varieties, in the severe forms than in the benign. These granules do not resist re-agents as do the the lower vegetable organisms. In the blood of variolous patients also there is an increase of the white globules which attain to one-fifth the number of the red. This fact is in relation with his researches on the spleen and the marrow of bone in variola.—*La Revista Clinica*, 1873, and *Hayem's Révue des Sciences Médicales*, tome ii, No. 2, p. 600.

On Inflammation of the Thoracic Duct. By Dr. H. Choupe.—The author has collected six observations in which pus has been found in the thoracic duct, but in three only was inflammation of the duct clearly proved. He has produced inflammation of the duct by injecting with Pravoz' syringe irritating fluid into the receptaculum chyli of the dog. As a result he has found evident inflammation of the canal with obliteration of the subclavian vein, and the production of infarctus in one lung. In all these cases there has been the admixture of a certain quantity of pus in the blood. In the case where microscopic examination of the blood was made, no alteration of the red globules was found, but the white globules were very abundant. To this admixture of pus in the blood is to be attributed the general typhoid phenomena which have been observed in all these cases. From the chemical account of the cases the author draws the following conclusions:—1. The possibility of primary inflammation of the thoracic duct is beyond doubt; when this inflammation makes rapid progress it is accompanied by an abundant production of pus of which a portion is carried by the subclavian into the general circulation. 2. The general symptoms have, in all cases hitherto observed, been accompanied by local manifestations of which it is impossible to find the connection with the primary affection, and which have presented great variety. None of these manifestations has appeared to have a real diagnostic importance, and it is only by their diversity they may aid in furnishing deductions. (In the early stages abdominal or lumbar pain has been experienced, and in the after stages supervening on fever, ac-

companied by grave typhoid symptoms, œdema and inflammations of the articular and tendinous synovial membranes have occurred).—*G. Hayem's Révue des Sciences Médicales.*—Tome 2, No. 2, p. 604.

On Unilateral Pulmonary Apoplexy in Relation with Cerebral Hæmorrhage. By Dr. Aug. Ollivier.—M. Ollivier quotes several instances in which, under the influence of cerebral hæmorrhage there has been developed in the lung corresponding to the hemiplegia, that is, on the opposite side to the cerebral lesion, more or less congestion, with considerable sub-pleural effusions of blood, or true apoplectic foci which may invade almost the whole organ, or only be found at certain points. Occasionally also hypostatic pneumonia is observed on the opposite side to the cerebral lesion. The author notes in his observations several important particulars. 1. The existence of lesions in the left hemisphere. 2. The large amount of effusion compressing the base of the encephalon. 3. The penetration of blood under the arachnoid and into the nervous and vascular meshes of the pia mater. He thinks that these two last conditions played a considerable part in the production of the apoplexy and of the unilateral congestion, so that it is probable that other cerebral affections, ramollisements, tumours presenting the same characters of seat and extent, may produce similar pulmonary alterations. In this way may be explained two cases of tubercles in the encephalon reported by Fleischmann, in which in the lung opposite to the affected hemisphere, were found small hæmorrhagic foci, varying in size from the head of a pin to that of a lentil. Congestion and pulmonary apoplexy of encephalic origin follows rapidly the attack of cerebral apoplexy; M. Ollivier observes that the lungs are frequently the seat of effusions of blood consequent on section of the pneumogastric in animals. Brown-Séquard's experiments also have demonstrated the almost constant occurrence of true hæmorrhage in the thoracic and abdominal viscera (lungs, heart, pleura, pericardium, supra-renal capsules, kidneys), as a consequence of lesion of different parts of the base of the encephalon and of certain points of the encephalon itself. Rupture of the capillaries he attributes to irritation of the nerves of the blood vessels, following lesion of the pons and of other parts at the base of the brain. Renal apoplexy has been noted on the paralysed side in a case of cerebral hæmorrhage. Ollivier also has called attention to the supervention of dropsy limited to the paralysed side in certain cerebral affections.—*Archives Générales de Médecine*, Août, 1873; *G. Hayem's Revue des Sciences Médicales*, tome ii, No. 2, p. 618.

Alteration of the Elastic Fibres of the Lung.—M. Cornil has observed in the lung of a syphilitic subject who had died from catarrhal pneumonia, that the elastic fibres had undergone a change resembling that presented by the elastic lamellæ in arterial atheroma. The fasciculi of elastic fibres in the alveoli were thick, refracting, vitreous, rigid, very friable, and presented numerous breaks. The fibres shaken with water separated into round molecules, cubic or prismatic. Some fasciculi presented less alteration, and were continued in the same alveolus with neighbouring and healthy fasciculi,

corresponding to a permeable vascular network; but, in the completely altered alveolar walls, the vessels had disappeared.—*Gaz. Méd.*, p. 185, 1873, and *G. Hayem's Révue*, tome 2, No. 2, p. 624.

On the Temperature in Cholera.—Dr. H. Zorn has instituted careful and prolonged experiments on the temperature in ninety-eight cases of cholera. The following are his general conclusions:—1. The axillary temperature in the algide stage is generally normal, or almost normal, often lowered, rarely raised. The temperature in the rectum is also most frequently normal, or almost normal, but it is often raised, and sometimes attains a high elevation—41°; on the contrary, it is very seldom lowered in the algide stage. 2. In the algide stage there is generally a very noticeable difference between the axillary and rectal temperatures; it is generally more than half a degree, and may be 2°2. 3. In the algide stage the temperature of the axilla is not to be depended on to determine the real heat of the body; it is surely and exactly indicated by the rectal temperature. But in the period of reaction and convalescence, and in typhoid cholera, the axillary temperature may be equally used. 4. Very high or very low rectal temperatures in the algide stage are prognostics of bad augury. 5. The temperature of the body in the algide stage appeared to be influenced by the intestinal phenomena, and especially by the stools; vomiting did not appear to influence it. The temperature falls after repeated and violent evacuations; it rises when the evacuations are arrested. 4. In the stage of reaction the heat of the body is almost always normal, or nearly normal, and there is rarely much difference between the rectal and axillary temperature. The lowered temperatures of the algide stage rise, the raised temperatures fall to normal. If during the algide stage the axillary temperature was below and the rectal temperature above the normal, both will attain during reaction their normal or almost normal degree. 7. In convalescence the temperatures of the rectum and the axilla are almost always normal, and very rarely offer notable differences. Elevations of temperature without appreciable cause sometimes supervene in convalescence. 8. In incomplete reaction, and when the patient passes into a typhoid state, there is a fall of temperature. 9. In typhoid cholera (of uræmic origin) the axillary and rectal temperatures, in grave and fatal cases, are so lowered, as to be the lowest temperatures which the living organism can present. In slight cases the axillary and rectal temperatures remain habitually normal, or almost normal, very rarely elevated or notably lowered. —*St. Petersburger Medicinische Zeitschrift*, 1872, and *Hayem's Revue des Sciences Méd.*, tome ii, No. 2, p. 654.

On Trigeminal Neuralgia. By Dr. H. C. Wood, jun.—In a clinical lecture on trigeminal neuralgia Dr. Wood advanced the opinion that clavus and migraine are identical with that affection. He considers that there are five varieties of neuralgia of the trigeminal—the rheumatic, occurring in rheumatic patients, and due to exposure to cold or wet; the malarial, which may assume the quotidian, tertian, or quartan type; migraine, unilateral pain affecting especially the supra-orbital focus, of paroxysmal character, generally accompanied by

sickness which does not relieve, and corresponds to the period of lowest depression. Migraine always develops itself about the age of puberty, and is generally hereditary. Clavus, more limited than migraine to a simple focus, generally to one of the parietal bones. The fifth variety is tic-douloureux, the most serious, often incurable, and generally associated with atheromatous disease, thickened arteries, arcus senilis. In a case of migraine related by the author, a fetid odour of the breath preceded the attack. It was brought on by fatigue, and the breath speedily became fetid: as the attack subsided the odour disappeared, and any gold about her person became blackened or tarnished at such times, showing the presence in the perspiration as well as in the breath of hydrogen sulphide, or other sulphur compound. Migraine is sometimes accompanied by peculiar alterations in the appendages of the skin; the hair may become hypertrophied or atrophied, or may lose its colour. Eruptions may be associated with migraine, *e. g.* acne almost exclusively confined to the side of the face in which the neuralgia is seated.—*Philadelphia Med. Times*, Aug. 23, 1873.

Abscess of the Liver opening into the Ascending Cavd.—Dr. Leon Colin records a case in which an abscess of the liver had burst into the ascending cava, and there were secondary purulent collections in the pulmonary parenchyma. During life these purulent collections had opened into a bronchus, and the pus was expectorated. It was supposed that the abscess of the liver had opened through the diaphragm into the bronchi.—*L'Union Médicale*, Aug. 5, 1870, and *Amer. Jour. Med. Science*, Oct., 1873.

The Pathological Anatomy of the Liver. By Winiwarter.—In four cases of acute yellow atrophy of the liver which have been investigated by the author there was one in which death occurred so rapidly that the essential modifications had not time to be marked by secondary alterations. A man, æt. 24, died twelve hours after the invasion of jaundice. Whilst the left part of the liver was already notably atrophied, the right lobe presented the pathological process in its commencement. It was not diminished in volume; the hepatic-cells were intact. But the interstitial cellular tissue between and in the lobules had undergone a considerable hyper-genesis, characterised by the presence of numerous small round cells resembling leucocytes, abundant fusiform cells, and an increase of fibrillar tissue. This latter character served to distinguish it clearly from lymphomata and leucæmic alterations of the liver. By degrees this hypergenesis of the connective tissue invades the deep regions, compresses the hepatic cells and the vessels, and ends by transforming the part into a kind of detritus formed entirely of proteic granules. In the end, on section, the vessels only are seen which form projections between the débris of hepatic cells and the mass of bile pigment. The author remarks that this state cannot be confounded with that met with in cirrhosis. In poisoning by phosphorus the interstitial tissue is only slightly increased, and always only between the lobules and not in their interior. Moreover, this alteration is only observed when the hepatic cells have already

undergone considerable alterations. These lesions the author has found six hours after the action of the phosphorus. Moreover, the hepatic cells had undergone fatty change, and their nuclei had gone. The same alterations were seen in fatty degeneration. When the resorption of the fat cells is complete, the capillary network of blood-vessels is only seen in the middle of the lobules, which is not dilated as in the preceding case. The author maintains, contrary to the opinion of Rokitansky, that yellow acute atrophy and phosphorus degeneration are two processes essentially different.—*Wien. Med. Jahrb.*, 1872. *G. Hayem's Révue des Sciences Médicales*, Juillet, 1873, p. 101.

Symptomatology of Myelogenic Leukæmia.—Professor Mosler has recorded a case of leukæmia in which was found after death an affection of the marrow as if from purulent osteomyelitis, extending over the entire skeleton. The history of the case would lead to the supposition that the primary disease was not one of the bones, but of the spleen. A labourer, æt. 44, suffered from intermittent for a long time, followed at last by pains in the left side, where also a tumour was observed. The leukæmia seems to have started as the result of an injury in the region of the spleen. The injury, a blow, induced an inflammatory condition of the spleen, and this was followed by leukæmia. At the time of admission he presented a typical case of splenic leukæmia. The splenic tumour filled more than half the abdominal cavity. The lymphatic glands were not enlarged. The blood microscopically examined contained more than one-third white corpuscles. The reaction of the blood was alkaline. There was fever of a high grade, with pains in the splenic region. There was great tenderness over the sternum, so that the least movement gave rise to pain. Death took place suddenly from hæmorrhage from follicular ulceration of the mucous membrane of the stomach. At the autopsy, in opening the thorax, the sternum was broken near the manubrium, and a yellow substance looking like pus poured out from the broken surfaces. When the sternum was sawn through the interior presented a dirty greyish white hue, and in the body of the bone were found cavities, some of the size of a pea. Towards the lower end was one of the size of an almond, which gave the impression of an abscess in the bone. The cortical portion of the bone was intact over all the cavities. The marrow of a vertebra from the lumbar region, and also that of a femur, presented the same dirty yellow colour as that of the sternum. The vessels of the marrow were in some places found crowded with white blood corpuscles. The external part of the bone and the periosteum were normal. A more accurate examination revealed a hyperplasia of the entire marrow of the bones. The corpuscles in a state of transition from white to red, described by Neumann, could not be found. The spleen presented the usual characters of leukæmic tumor of that organ; it was very hard, had grown fast to the abdominal walls, and contained numerous spots which had been centres of inflammation. The lymphatic glands presented no anomalies. The case was one of leukæmia with secondary involvment of the marrow of the bones,

of which the marked tenderness over the sternum gave indication during life.—*Virchow's Archiv.*, 1873, and *Philadelphia Med. Times*, Nov. 15, 1873.

Researches on the State of the Biliary Canals in Cirrhosis.—M. Cornil has recently made a communication to the Société de Biologie on this subject. The extra-lobular network of the biliary canals is alone perfectly known; the intra-lobular network yet presents some uncertainties, especially in man, in whom the examination can never be made until twenty-four hours after death. Nevertheless, on the sides of hepatic cells may be observed a notch, which, opposite a similar notch of a neighbouring cell, would form together a narrow biliary canal of from one to two millièmes of a millimètre in diameter. Is such a canal lined with epithelium? Some authors describe a simple non-isolable cuticle adhering to the hepatic cells; others describe cells which may be brought into view by silver nitrate, and which are analogous, although more elongated, to the cubic cells of the extra-lobular canals. What becomes of these canaliculi in the alterations of cirrhosis? Three years ago the author described the lesions observed with the microscope in a case of acute yellow atrophy of the liver. Almost the whole of the hepatic cells had disappeared, and there was seen at the circumference of the extra-lobular network canals which anastomising one with the other formed a network which took the place of the destroyed cells. In very advanced cirrhosis, when the newly-formed connective tissue has made the parenchyma of the gland disappear the microscope reveals a condition analogous to that above described. The lobules are atrophied, and from the extra-lobular canals, branches detach themselves and form by coming together new canals. They have an identical structure with the extra-lobular canals; like them, they have a limiting membrane covered with cubic cells, perhaps a little more elongated and pavemental than the finer portions of the network. What is the origin of this network? Is it from budding of the extra-lobular canals, or rather is it a pre-existent network become visible in consequence of the destruction of the cell? The latter hypothesis seems the more probable. — *Gaz. Hebdom. de Méd. et de Chirurg.*, Nov. 21, 1873.

Whooping Cough as a Cause of Spinal Caries.—Dr. Benjamin Lee records five cases in which symptoms of spinal caries were developed during convalescence from whooping cough. The author thinks that they afford evidence of a peculiar type of spinal deformity resulting from inflammation produced by the violent succussion of the intervertebral discs from the muscular contraction in the spasmodic cough of pertussis, aided, perhaps, by dyscrasia resulting from the combined action of the poison in the blood and its deterioration in consequence of the impairment of nutrition from the rejection of food. The author suggests that the convalescence of whooping cough should be carefully watched with reference to the spine, and that, if necessary, some simple support should be furnished.—*Trans. of Med. Soc. of Philadelphia*, 1873.

The Temperature in Cerebro-Spinal Fever.—In the course of a valuable paper on Cerebro-Spinal Fever as observed in the recent epidemic in New York, Dr. J. Lewis Smith notices that before the days of clinical thermometry, several observers have asserted that the temperature was not increased. He continues:—"I have no doubt from the nature of Cerebro-Spinal Fever, and from thermometric observations which I have made now in more than fifty cases, that there is always an elevation of the internal temperature above the normal standard during the active period of the disease. He has never observed a temperature of less than 99½ if the examination were made within the first fourteen days. The reason this has been denied by observers, is because they have taken the temperature of the cutaneous surface which is very fluctuating, and often below that of the blood. It should be ascertained per rectum. The internal temperature, although uniformly elevated, undergoes greater and more sudden variations than occur in any other febrile or inflammatory disease. These fluctuations which correspond with similar changes in the pulse, are observed during the different hours of the same day. I have, in the statistics of my practice, 146 observations of the temperature in 35 patients taken before the close of the second week. The highest in the commencement 107⅖° fell a little subsequently, but rose again on the third day to 107° when the child died. In two other cases the temperature was 106° on the first day, and it did not afterwards reach so high an elevation. One of them died on the ninth day, and the other in the 9th week. The next highest temperature was 105⅘° also on the first day in an infant of eight months, who died on the ninth day. Wunderlich records a temperature of 110° in one or two cases. The external temperature undergoes greater fluctuations, rising above and falling below the normal standard several times in the day. Similar fluctuations occur in sporadic meningitis, but less pronounced. The more grave the case in those not comatose, the greater these variations.—*Amer. Jour. Med. Sciences*, Oct., 1873.

Echinococcus of the Spleen.—Drs. Rosenstein and Sanger record the case of a woman, æt. 37, who began to suffer pain in the left side two years and a half before; this became steadily worse, and a tumour made its appearance at the painful spot. The tumour was in connection with the spleen, and reached down seven centim. below the umbilicus, and formed a curvature upwards towards the right, the extremity being at the xiphoid cartilage. The tumour fluctuated and was painful. Exploratory punctures were made and fluid evacuated, on the first occasion albuminous, afterwards purulent, but no hooks were found. The increasing pain and size of the tumour made its extirpation necessary, which was successfully performed. The cyst proved to be an echinococcus sac, in which several cysts, from the size of a pea to that of a hazel nut were found. Scolices or elements of these could not be discovered, so the case was an instance of so-called acephalocyst.—From *Berliner Klin. Wochenschrift*, No. 20, and the *Amer. Journ. Med. Sci.*, Oct., 1873.

On The Ambulative or Grave Apyretic Form of Typhoid Fever.—Dr. Vallia has recorded two cases. The first was that of a young man æt. 24, admitted at the Val de Grâce on 22nd May, having been ill five days. Up to June 1st he continued in an ill-defined state of indisposition, which did not prevent his rising some hours each day. The morning and evening temperature oscillated some tenths of a degree below and above 37°, but it never exceeded 37·4°. From the night of the 1st to the 2nd of June, there were abundant melænic stools; the temperature for a fortnight rose to 39°; there was a slough on the sacrum; finally recovery. The second patient, æt. 36, felt ill on the 15th November. From the 1st to the 13th of December his weakness increased little by little; he left off work, but was up the greater part of the day; he had no appetite; there was diarrhœa at times. On the 14th there was feebleness, white tongue, complete anorexia, slight bronchitis with some cough, without expectoration; urine contained a considerable quantity of albumen; on the following day there was diarrhœa; the patient got up each day at meal-time; on the 19th he went out of the hospital for some hours, from the 14th to the 19th the temperature oscillated between 37° and 37·5°. On the 21st in the afternoon, the patient, who had had a restless night, writhed in the bed, complaining of violent colic, the belly was retracted, there was abundant diarrhœa; no vomiting; the skin hot and dry 38·4°. The following day the face was drawn; tongue very dry; there was vesical tenesmus and dysuria. He died in the afternoon. Autopsy: infarctus seated at the lower third of the two recti muscles; reddened ecchymosis on the parietal peritoneum, the muscular tissue of the two recti softened to the extent of four centimetres. The microscope showed absence of structure, vitreous appearance, unequal enlargement of a large number of fibres alternating with other fibres equally granular; commencing multiplication and proliferation. The ileo-cœcal valve was covered on both surfaces with ulcerations; the small intestine presented numerous ulcerations of Peyer's patches; at corresponding points the peritoneum was darker and covered a layer of pus, but there was no perforation. Liver healthy; spleen diffluent, 13 centimetres in length; lungs healthy, kidneys congested, general catarrhal nephritis, heart flabby and pale, fibres granular but without proliferation. The chief point in these cases is the apyrexia—in the first case up to the occurrence of the intestinal hæmorrhage, in the second, up to the time of the peritonitis. In the latter case the muscular degeneration without elevated temperature is to be remarked.—*Archives Générales*, Nov. 1873. *Gaz. Méd. de Paris*, Dec. 13, 1873.

In Memoriam.—Since this report was in type, our valued friend and contributor has been overtaken by death, and his career of usefulness abruptly closed. For many years he has been an esteemed contributor to the pages of this Review. His work has always been marked by much carefulness, wide reading and thought, and of such

a character as to commend itself to the attention of the reader. He has ceased from his labours, but the usefulness of his work will not be forgotten.

BOOKS, PAMPHLETS, &c., RECEIVED FOR REVIEW.

The Principles and Practice of Surgery. By William Pirrie. Third Edition. Illustrated by 490 engravings on wood. London, Churchills. 1873. pp. 977.

Handbook for Inspectors of Nuisances. By Edward Smith, M.D. London, Knight and Co. 1873.

Outlines of Natural History for Beginners. By J. Alleyne Nicholson, M.D., &c. Edinburgh and London, Blackwoods. 1873. pp. 113.

St. George's Hospital Reports. Edited by J. W. Ogle, M.D., and Timothy Holmes. Vol. VI. 1873. London, Churchills. pp. 433.

A Treatise on the Principles and Practice of Medicine. By Austin Flint, M.D. Fourth Edition, carefully revised. Philadelphia, H. C. Lea. London, Trübner and Co. 1873.

Lectures on Dermatology, delivered in the Royal College of Surgeons of England in 1871, 1872, 1873, including Eczema, Scabies, Urticaria, Herpes, Furunculus, Dermato-Syphilis, Elephantiasis, and Lepra. By Erasmus Wilson, F.R.S., &c. London, Churchills. 1873. pp. 295.

The Convolutions of the Human Brain. By Alexander Ecker. Translated by J. C. Galton, M.A., &c. Smith, Elder, and Co. 1873. pp. 70.

Quantitative Chemical Analysis. By T. E. Thorpe, PhD. London, Longmans. 1873. pp. 387.

Heart Diseases in Australia, with Observations on Aneurism of the Aorta. By C. E. Reeves, M.D. Melbourne, J. Brooks. 1873. pp. 188.

The Science and Art of Nursing the Sick. By Æneas Munro. Glasgow, J. Muclehose. 1873. pp. 331.

General Report on Lunatic Asylums, Vaccination, and Dispensaries in the Bengal Presidency for the Year 1871. Compiled by K. McLeod, M.D. Calcutta. 1873. pp. 203.

Lectures on the Clinical Uses of Electricity. By W. G. Smith, M.D. Dublin, Fannin and Co. 1873. pp. 51.

Instructions for Midwives. Waterford, N. Harvey. 1873. pp. 85.

Statistical Report of the Health of the Navy for the Year 1871. Ordered to be printed July, 1873.

The Student's Guide to Surgical Anatomy; an Introduction to Operative Surgery. By E. Bellamy, F.R.C.S. London, Churchills. 1873. pp. 297.

Surgical Inquiries; a Presidential Address, June, 1873. With Illustrations. London, Churchills. 1873. pp. 28.

Cholera, how to Avoid and Treat it. Popular and Practical Notes. By Henry Blane, M.D. London, H. S. King and Co. 1873. pp. 76.

A Manual of Practical Hygiene, intended especially for Medical Officers of the Army and for Civil Medical Officers of Health. By E. A. Parkes, M.D., F.R.S. Fourth Edition. London, Churchills. 1873. pp. 672.

A Treatise on Medical Electricity, Theoretical and Practical, and its Use in the Treatment of Paralysis, &c. By J. Althaus, M.D. Third Edition, enlarged and revised. With 147 Illustrations. London, Longmans. 1873. pp. 729.

Mind and Body; the Theories of their Relation. By Alexander Bain, LLD. Second Edition. London, H. S. King and Co. 1873. pp. 196.

The Bible and the Doctrine of Evolution; being a complete Synthesis of their Truth, &c. By W. Woods Smyth. General (or outline) Synthesis. London, H. K. Lewis. 1873. pp. 390.

Egypt as a Health Resort, with Medical and other Hints for Travellers in Syria. By A. Dunbar Walker, M.D. London, Churchills. 1873. pp. 139.

A Manual of the Operations of Surgery, for the Use of Senior Students, House Surgeons, and Junior Practitioners. Illustrated. By Joseph Bell, F.R.C.S. Third Edition, revised and enlarged. Edinburgh, Maclachlan and Stewart. 1874. pp. 295.

A Phrenologist amongst the Todas, or the Study of a Primitive Tribe in South India. By Lieut.-Col. W. E. Marshall. With Illustrations. London, Longmans. 1873.

Lectures on Bright's Disease, with especial reference to Pathology, Diagnosis, and Treatment. By George Johnson, M.D., F.R.S. London, Smith, Elder, and Co. 1873. pp. 152.

Sketch of Cannes and its Climate. By Th. de Valcourt, M.D. Second Edition, enlarged. London, Churchills. 1873. pp. 64.

A Treatise on the Continued Fevers of Great Britain. By Charles Murchison,

M.D., F.R.S. Second Edition. London, Longmans. 1873. pp. 729.

Foods. By Edward Smith, M.D., F.R.S. Second Edition. London, H. S. King and Co. 1873. pp. 485.

Bericht der K. K. Krankenanstalt Rudolph-Stiftung in Wien. Von Jahre, 1871. Vienna. 1873. pp. 265.

Veterinary Medicines; their Actions and Uses. By Finlay Dun. Fourth Edition. Edinburgh, Edmonston and Douglas. 1873. pp. 576.

A Practical Treatise on the Diseases of the Ear, including the Anatomy of the Organ. By D. B. St. John Roosa, M.D. Illustrated. New York, W. Wood and Co. 1873. pp. 535.

Manual of Lunacy: a Handbook relating to the Legal Care and Treatment of the Insane in Asylums. By Lyttleton S. Winslow, M.B., D.C.L., &c. With a Preface by Forbes Winslow, M.D., D.C.L. London, Smith, Elder, and Co. 1874. pp. 446.

A Handbook of the Theory and Practice of Medicine. By Frederick T. Roberts, M.D. London, H. K. Lewis. 1873. pp. 1043.

Photographic Clinique of the British Hospital for Diseases of the Skin. Edited by Balmanno Squire, M.B. London. Published by subscription.

Report of the Cholera Epidemic of 1872 in Northern India. By J. M. Cunningham, M.D. Calcutta. 1873. pp. 150.

Transactions of the Pathological Society of London. Vol. XXIV. London. 1873. pp. 399.

Manual of Comparative Anatomy and Physiology. By S. M. Bradley. Second Edition. London, Simpkin, Marshall, and Co. 1874. pp. 272.

Lectures on the Clinical Uses of Electricity. By J. Russell Reynolds, M.D., F.R.S. Second Edition. London, Churchills. 1873. pp. 116.

Typhoid Fever: its Nature, Mode of Spreading, and Prevention. By William Budd, M.D., F.R.S. London, Longmans. 1873. pp. 193.

The Simplicity of Life, an Introductory Chapter to Pathology. By Ralph Richardson, M.D., &c. London, H. K. Lewis. 1873. pp. 118.

The Indian Annals of Medical Science. Edited by Joseph Ewart, M.D. No. XXXI. Calcutta. 1873. pp. 326.

The Anatomy of the Lymphatic System. By E. Klein, M.D. 1. The Serous Membranes. London, Smith, Elder, and Co. 1873. pp. 98.

Report of the Board of Health of the City and Port of Philadelphia, for the year 1872. Philadelphia. 1873. pp. 135.

Clinical Researches in Electro-Surgery. By A. D. Rockwell, M.D., and G. M. Beard, M.D. New York, W. Wood and Co. 1873. pp. 72.

The Conservation of Energy, being an Elementary Treatise on Energy and its Laws. By Balfour Stewart, M.A., F.R.S. With 14 Illustrations. London, H. S. King and Co. 1873. pp. 180.

A Clinical History of the Medical and Surgical Diseases of Women. By Robert Barnes, M.D. London. 1873. pp. 916.

Du Traitement des Rétrécissements de l'Urèthre par la dilatation progressive. Par T. B. Curtis. Paris, J. B. Baillière et fils. 1873. pp. 111.

De la Régénération des Organes et des Tissus en Physiologie et en Chirurgie. Par J. N. Demarquay. Avec quatre planches. Paris, J. B. Baillière et fils. 1874. pp. 328.

Origine de la Syphilis. Par E. Bassereau, M.D. Paris, J. B. Baillière et fils. 1873. pp. 49.

Du Massage des Frictions et Manipulations appliqués à la guérison de quelques maladies. Par N. Laisné. Paris, J. B. Baillière et fils. 1873. pp. 176.

Traité pratique d'Auscultation appliquée au diagnostique des Maladies des organes respiratoires. Par le Dr. L. Maillot. Paris, J. B. Baillière et fils. 1874. pp. 543.

Annali Clinici dello Ospedale dei Pelligrini di Napoli. Vol. II. December, 1872. Napoli. 1873. pp. 302.

Handbuch der Systematischen Anatomie des Menschen. Von J. Henle. In drei Banden. Dritter Band. Zweite Abtheilung. Nervenlehre. Braunschweig, F. Vieweg und Sohn. 1873.

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Excision of the Thyroid Gland. By P. H. Watson, M.D. Edinburgh. 1873.

Modern Surgery, its Progress and Tendencies. Introductory Address, 1873. By J. E. Erichsen.

On the Granular Cell found in Ovarian Fluid. By T. M. Drysdale, M.D. Philadelphia. 1873.

Lessons from the Lives of Irish Surgeons. An Address. By E. D. Mapother, M.D. Dublin. 1873.

Ophthalmic Contributions:—1. Dermoid Fungi of Cornea. 2. Determination of Astigmatism. 3. Cyst of Iris removed by Operation. By G. Strawbridge, M.D. Philadelphia. 1873.

Journal of the Scottish Meteorological Society. Edinburgh. July, 1873.

An Examination of the Medical Evidence in the Trial of Mr. E. G. Wharton. By S. C. Chew, M.D. New York. 1873.

On the Value of Certain Signs observed in Cases of Death from Suffocation, and on Death from Hæmorrhage in the New-born. By David Page, M.D. Edinburgh, Blackwood. 1873.

Statistics relating to the Births, Deaths, and Marriages in Philadelphia. By J. Stockton Hough, M.D. 1873.

The Laws of Transmission of Resemblance from Parents to their Children. By J. Stockton Hough, M.D.

Administrative Areas for Sanitary Purposes. By Alfred Carpenter, M.D. 1873.

Infant Diet: a Paper read before the Public Health Association of New York. By A. Jacobi, M.D. 1873.

Introductory Address, delivered at the Edinburgh Medical School, 1873. By G. W. Balfour, M.D.

Reports of H.M. Inspectors of Factories. 1873.

Seventeenth Annual Report of the Medical Officer of Health for Westminster. By E. Lankester, M.D. 1873.

Reports of County and other Asylums, Aberdeen.

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La Cremation des Morts en Italie. Par Dr. P. de Pietra Santa. Paris. 1873.

Nosogenesis Pansperim ved Prof. Dr. F. C. Faye. Christiania. 1873.

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The Indian Medical Gazette (Monthly). August, September, October.

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Canada Medical and Surgical Journal. Montreal. September and October.

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Monatsbericht für Ohrenheilkunde. August to November.

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Medizinische Jahrbücher. Von S. Stricker. September, 1873.

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Gazette Hebdomadaire de Médecine et de Chirurgie. September to December.

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Recueil d'Ophthalmologie (Quarterly). 2nd Series. Paris. October, 1873.

Le Mouvement Médical (Weekly). September to December.

Révue des Sciences Médicales. Dirigé par G. Hayem. Tome II. No. 2. 1873. Paris, Masson.

Bulletin de Thérapeutique. September to November.

Gazette Médicale de Paris. October, 1873.

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O Correio Medico de Lisboa. August to October.

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THE

BRITISH AND FOREIGN

MEDICO-CHIRURGICAL REVIEW.

APRIL, 1874.

Analytical and Critical Reviews.

I.—Recent Advances in Physiology.[1]

The progress of physiology during the last few years has been steady, and in every respect satisfactory. It is not so much that any very large or important series of researches have been undertaken, or that results of extraordinary value and importance have been obtained—anything, for instance, that might compare with Bell's investigations upon the functions of the roots of the nerves, or with Bernard's upon the functions of the liver—but there has been a general and continuous advance in all the departments of the subject, in histology, in physiological chemistry, and in experimental physiology. The great universities both at home and abroad have now almost all physiological laboratories attached to them, many possessing excellent teachers and every appliance that the student can require, and large and still increasing numbers of young men yearly enter with the object of thoroughly following out one or other of these branches, and thus fitting themselves to become precise and accurate scientific observers.

Of the importance of such preliminary education for the prac-

[1] 1. *Text-book of Physiology, General, Special, and Practical.* By John Hughes Bennett, Professor of Physiology in the University of Edinburgh, &c., with Twenty-one Photo-lithographic Plates; Edinburgh, 1872, p. 606.

2. *Lehrbuch der Physiologie des Menschen.* Von Dr. Wilhelm Wundt, Prof. an der Universität zu Heidelberg. 3te Auflage. Mit 164 Holzschnitten. Erlangen, 1873, p. 790.

3. *Cours de Physiologie d'après l'Enseignement du Professeur Küss*, publié par Dr. Mathias Duval, 2nd Edit., avec 152 figures intercalées dans le texte. Paris; Baillière, 1873.

4. *Lehrbuch der Physiologie für Akademische Vorlesungen und zum Selbst Studium.* Von Dr. Otto Funke, Prof. der Physiologie an der Universität zu Freiburg. 5te Auflage, Erster Band, p. 336. Leipzig, 1869—1870.

tical physician there can be but one opinion, and it is greatly to the credit of Claude Bernard, one of the best experimenters of modern times, that he has always clearly recognised and insisted upon the value of experimental physiology to the student in medicine. Every physician, he observes in one of his introductory lectures, who wishes to co-operate in the establishment of experimental medicine, ought to be a practised physiological experimentalist. He ought to be able to conceive, to institute, and to execute such physiological experiments as may be calculated to resolve a particular pathological problem, or to explain a given morbid condition.

However imperfect physiological experimentation may still be, it has undergone wonderful extension and improvement of late years concurrently with the development of the various branches of physics, and with the adoption of the singularly ingenious apparatus invented by Ludwig, Dubois-Reymond, Helmholtz, Marey, and others. In fact, it may be said that every improvement in the delicacy and accuracy of our instruments has been, as also it will surely hereafter be, followed by a corresponding advance in our knowledge of the functions of the body. Were it requisite to supply an instance of the dependence of physiological knowledge upon the perfection of the means of investigation, it would only be necessary to compare our information respecting the objects and uses of the several parts of the eye with that which we possess respecting those of the ear. The laws of optics are well known, those of acoustics are exceedingly imperfectly known; and we find accordingly, that whilst the functions of each part of the eye are fairly understood, with the exception of the part played by the rods in the ultimate change of light or heat into nerve force, we are singularly ignorant of the functions of the different parts of the ear. It is still a moot point whether sounds are conducted through the air of the tympanic cavity as well as through the chain of bones, and almost all the statements respecting the functions of the labyrinth are conjectural.

The introduction of so a large number of instruments, many of them of a very complicated nature, and requiring much practice in their use, as means of research, however, has practically revolutionised the teaching of physiology. No man can become *permanently* attached to any of the great laboratories with the slightest idea of practising medicine and surgery. The teacher of physiology must henceforth be a physiologist and no other thing. His days and nights must be spent in his workshop. A medical education is indeed advantageous, partly in order that he may see the bearings of his experiments upon the phenomena of disease, and that he may read the experiments which nature herself performs for him, but chiefly because the ordinary medi-

cal curriculum is still in England the only one that permits the student to take up easily the collateral branches of physical science, and supplies him with that general knowledge which is indispensable for all who follow a special pursuit.

In accordance with the superior attainments of the teachers, we find that there has been a manifest improvement in the character of the teaching. Practical now occupies a more prominent position than theoretical work, and students are now not only shown, but are made to assist in the performance of the more important physiological experiments, the use of the microscope, the mounting of specimens, &c.

We find a reflex of this in the text-books intended for the use of students that have recently been issued; few are now published which do not contain a full and accurate description of the principal instruments used in physiological demonstrations, and of the mode in which they are applied. We have recently had occasion to notice the admirable 'Handbook for the Physiological Laboratory;' and in the work which stands at the head of our list, we have an endeavour on the part of the accomplished author, not only to give the ordinary facts of physiology, but to describe in full detail the means by which these facts have been established, and by which, also, if he so please, the student may test their accuracy.

Amongst the unsatisfactory results of this great extension of the practice of experimentation is the conflict of evidence that is now of daily occurrence. A statement is made by a learned professor, a man of acknowledged ability, involving some material change in our views on some important point, or throwing light on some peculiar phenomena. It is immediately accepted, finds its way into all the text-books published about the period of its promulgation, and for a time seems to be perfectly established. A year or so elapses, and another professor, or possibly some young candidate writing a thesis for his degree, declares he has repeated the Professor's experiments, and finds that many errors have crept in, that the conclusions are not warranted by the experiments, that they admit of another explanation, and, in fact, differs from our learned Professor *toto cælo*.

If the subject happen to be interesting a score of papers soon appear in the different journals, and he must, indeed, possess superhuman sagacity who can draw any definite conclusions from the discrepant results obtained by the several experimenters; and it is to be observed that many of these papers, though apparently emanating from mere students, and which might otherwise be regarded as comparatively valueless, are really of great weight, since they have been performed

under the immediate superintendence of a master, whose time is exclusively devoted to such work, and who, in many instances, not only suggests the experiments, but aids in their performance, and draws up the report.

To give one instance that may exemplify what we have stated above, and at the same time serve to show how every subject increases in complexity as more research is expended upon it. Let us consider the history of our knowledge of the peristaltic movements of the intestines. Though given very curtly in most of our text-books, it cannot be regarded as an unimportant subject, since these movements are the means by which the food is propelled along the alimentary canal, and any interruption to their proper action is followed by intense pain, and even by death, whilst they present the best instance that can be found of the mode of action of involuntary or unstriated muscular fibre, and of reflex action without sensation. Without going back to the older works, let us open one or two of those text-books from which most of the older men now engaged in practice acquired their knowledge of physiology.

In Richerand's 'Physiology,' translated by Dr. Copland, and published in 1829, it is stated that—

"The peristaltic contractions, by the assistance of which the alimentary mass is sent along the whole course of the small intestines, do not occur in a regular and uninterrupted succession from the stomach to the cæcum. This undulatory and vermicular motion manifests itself at once in several points of the length of the tube, whose curvatures straighten themselves at intervals. In this action the intestinal curves are decomposed into a great number of short straight lines, which meet so as to form obtuse angles. The peristaltic motion which affects the muscular fibres of the intestines is caused by the irritation of the alimentary substances on the sentient parietes of the canal along which it descends towards the great intestines."

The absence of any reference to the nervous system is here very noticeable.

In Bostock's 'Physiology, published in 1844, a good book in its day, little or nothing is said about the peristaltic actions. Even in that grand work, Müller's 'Physiology' (1844) scarcely anything worthy of notice is written respecting them.

"The vermicular or peristaltic movements of the intestines," he says, "like those of the stomach, appear to be generally very feeble during life; it is only in a nervous state of the system, in dyspepsia, in spasmodic action of their muscular coats, and particularly in intestinal irritation or diarrhœa, that the action of the intestines becomes more rapid. When an animal is opened during life, the peristaltic motions are at first scarcely perceptible, but by exposure

to the air they are soon increased in force, and become extremely energetic; the intestines rise and fall, and propel onwards their contents, generally in the direction of the rectum. If a stimulant, whether mechanical or chemical, or the galvanic influence, is applied to any part of the intestines, contraction takes place, and the intestine by degrees becomes very narrow at that point, the greatest degree of contraction not ensuing until after the action of the stimulus has ceased; the subsequent relaxation is likewise gradual. A strong galvanic shock applied to the splanchnic nerve insulated on a plate of glass, or to the cæliac ganglion, gives rise to a generally increased activity of the peristaltic movements, while division neither of the vagus nor of the sympathetic nerve puts a stop to them; they continue even after the intestine is removed from the body."

Here we see the first dawn of the conception that the nervous system excited an influence upon the intestinal movements, and that conception, according to most modern experimenters, was erroneous.

In the first edition of Kirkes' 'Physiology,' 1848, a decided addition to the previous knowledge appears. The movements are described as peristaltic or vermicular, and as being effected by the alternate contractions and dilatations of successive portions of the intestinal coats. The longitudinal muscles are said to contract first, or more than the circular, drawing a portion of intestines upwards or, as it were, backwards, over the substance to be propelled, and then the circular fibres of the same portion contracting in succession from above downwards or, as it were, from behind forwards, press on the substance into the portion next below, in which at once the same succession of actions next ensues. The movements of the intestines are said to be sometimes retrograde or anti-peristaltic. Then it is stated that—

"The intestinal canal is under the direct influence of the sympathetic or ganglionic system, and indirectly, or more distantly, is subject to the influence of the brain and spinal cord. Experimental irritation of the brain or cord produces no constant or evident effect on the movements of the intestines; yet, in consequence of certain conditions of the mind, the movements are accelerated or retarded, and in paraplegia the intestines appear, after a time, much weakened in their power, and costiveness and tympanitis ensue. Irritation of the ganglia of the sympathetic connected with any portion of intestine may excite contraction of that portion; and if a small portion of intestine be irritated, the consequent movement is extensive, slow, regular, and orderly, like all that ensue when an irritation, before it acts on muscular fibres, is conveyed to a nervous centre, such as a ganglion, and thence reflected."

Some years before this, however, was written, Budge (1841),

Valentin, Schiff, and others had maintained that the intestinal movements could be excited by stimulating the corpora quadrigemina, optic thalami, corpora striata, and other parts of the encephalon, though the results were admittedly, as Longet observed, so inconstant, that little reliance could be placed upon them; and, moreover, though Kirkes did not mention it, Budge had stated[1] that movements of the small intestines could be excited by irritation of the vagi. If, at this period, a physiologist had been asked what brought about the peristaltic movements of the intestines, he would have replied that it was either owing to the direct stimulus of the intestinal contents upon the muscular fibres, causing them to contract, or that it was a reflex action taking place through the sympathetic ganglia on the vertebral, column, or through the vagus medulla oblongata and spinal cord. But now came the observation of Schiff,[2] showing that, quite independently of the nervous system, the supply of blood to the intestines exercised an important influence; since, if in living animals, when the intestines were quiescent, sudden pressure were applied to the aorta, peristaltic movements might generally be observed.

In 1856 Pflüger made the important observation, which was in opposition to all previous statements, that the intestinal movements could be arrested by irritation of the splanchnics.

Wolf (1857), adopting Pflüger's view, went a step farther, and maintained that a similar inhibitory effect could be produced by excitation of the peripheric extremity of the divided pneumogastric. It would occupy too much space to describe in detail how very different, if not exactly opposite, conclusions were drawn by Schiff from similar experiments, to the effect, namely, that all the phenomena presented by the so-called inhibitory nerves are due to their great excitability, and to their being readily exhausted; how Kupffer and Ludwig endeavoured to reconcile the old theory with Pflüger's inhibitory doctrine, and how the successive discoveries by Auerbach and Meissner in the coats of the intestine of the plexuses that bear their name, still further complicated the question.

We must not omit to allude to those other conditions which have been shown to exercise so powerful an influence on the results of nervous irritation—the fulness of the bloodvessels and the *temperature*. The former point, well known to Schiff and Bernard many years ago, has more recently been investigated by Nasse (1865), Mayer and v. Basch (1869), whilst the importance of attending to the latter has been the subject of an

[1] 'Froriep's Notizen,' 1846.
[2] 'Froriep's Tagesbericht,' 1851, No. 32.

interesting paper published within the last few months by Prof. Horvath. The complexity of the problem as to the cause of the peristaltic movements can now be understood, simple as it at first sight appears, to be very great indeed.

In any given case, it may be asked, is the movement observed due to direct stimulation of the muscular fibres, or to reflex action through sensory nerves distributed in the mucous membrane and the ganglionic plexuses found between the coats of the intestines; or has the sensory impulse travelled to the larger ganglia of the sympathetic, and been reflected thence upon the intestines through sympathetic fibres; or has it affected the spinal cord and medulla oblongata, and been reflected by those centres upon the intestines through the vagus; and in each case how far has it been influenced by the supply of blood, by its oxygenated or non-oxygenated quality, and by the surrounding temperature; and, finally, if an inhibitory system of nerves really exist, how far has the occurrence of movement been influenced by the increase or suppression of that influence?

The subject receives no notice at the hands of Dr. Bennett, and it seems to be omitted in Funke's 'Physiology,' though, perhaps, it may be taken up in one of the remaining parts, if these ever see the light. Two years and more have elapsed since the last part, containing only about 130 pages, appeared, and we hear nothing of another; in fact, digressing for a moment, we think it is really time to call attention to the disgracefully irregular manner in which many foreign works are issued. Whose fault is it? We would strongly recommend our readers not to purchase Erster Theiles or Lieferungs, or Bands, for there is a high probability that they will never see the second and subsequent parts. Both German and French seem to be equal offenders. To give an instance. Allured by the exquisite beauty and finish of the plates we commenced the purchase of Emile Blanchard's 'Règne Animal.' The plates and letterpress were published in the most higgledy-piggledy fashion; but, at length, the greater number, if not all, of those belonging to the Arachnida were issued, yet so much of the letterpress is wanting for even this one class, that it is impossible to bind it up, and the work is practically useless.

We commenced the purchase of Liegois' 'Physiology;' two parts were published, and there it has stopped.

We invested in Bromis' 'Classes of the Animal Kingdom,' which was brought out during his life with commendable regularity. Keferstein continued it at uncertain intervals. Keferstein died, and we believe Gerstaecker has the duty of editing it upon his shoulders. He, more ambitious than his

predecessors, attempted to publish parts of each of the great divisions simultaneously, and has to all appearances given it up as a bad job. Carus, again, published the second volume of his work on the 'Animal Kingdom' to begin with, and then the first half of the first volume, at which point it sticks, and we suppose ever will stick. Surely, we English, with all our stolidity are not so bad as this; most books advertised to appear do really make their appearance in due time. We are even sanguine enough, so genuine is our confidence in English integrity, to believe that the third part of Todd and Bowman's 'Physiology' will appear when the distinguished physician in whose hands it now is, can spare time to complete it.

However, to revert to the subject of the peristaltic movements of the intestines, and to show how well Professor Wundt has done his work, we shall give a translation of his section on this subject, which will put our readers in possession of the latest investigations made (except those of Horvath, which have been published since the date of Wundt's treatise):

"The normal movements of the intestine consist of a series of progressive contractions, extending from above downwards, which commence with the escape of the food that has undergone digestion in the stomach, into the small intestine, from two to six hours after it has been taken. On opening the abdominal cavity, these movements become in most animals more strongly marked, and at the same time somewhat irregular. They then appear as annular constrictions, which advance in opposite directions, and of a movement of the several sections of the intestines towards one another, so that the relative position of the convolutions undergoes considerable change. The constrictions are observed in both the larger and small intestines, and result from the contraction of the circular muscular fibres, whilst the peristaltic movements, which are chiefly seen in the small intestine, are due to the longitudinal fibres.

"The peristaltic movements are called forth or strengthened by direct mechanical or chemical irritation, by access of air or oxygen, whilst they are inhibited, according to Nasse, by carbonic acid and by rapid variations of temperature. The supply of blood is a matter of great importance. Schiff has shown that both hyperæmia of the intestine and the arrest of its supply by compression of the aorta act as stimuli. Perhaps the normal peristaltic movements which occur on the entrance of food into the intestine are likewise caused by the congestion of the blood-vessels, consequent upon the activity of the digestive apparatus. Disturbance of the respiratory process, as, for example, by compression of the trachea, almost immediately induces acceleration of the peristaltic movements, the intestinal blood-vessels becoming at the same time filled with dark blood. On the other hand, active peristalsis occurs in animals bled to death. A series of poisons introduced into the blood, and thus affecting the intestines, excite these movements. Thus Nicotin, and in a less

degree Atropine, Digitalin, Morphia, and others (Nasse, Keuchel), as well as the action of most laxatives (Senna, Croton oil, and the like), cause an increase in the rapidity and energy of the peristaltic movements (Radziejewsky). The period of excitement is usually followed by diminished irritability, or, when large doses have been used, by a paralysis of the movements.

"The intestinal movements are influenced by three sets of nerves; first, the ganglionic plexuses between the muscular layers of the intestinal wall (Auerbach's plexus); secondly, by the vagus; and thirdly, by the sympathetic, which last receives its active fibres from the spinal cord. Such movements as excised portions of the intestine exhibit, and such as follow from the irritation mentioned above, are referable to the reflex action of the intestinal ganglia, though they may also to some extent result from the direct irritation of the smooth muscular fibres themselves. The movements thus excited by the nervous apparatus of the intestine proper, are capable of being influenced and modified by the brain, through fibres running in the vagus, and by the spinal cord through fibres running in the splanchnics.

"Irritation of the vagus usually accelerates the peristaltic movements. Irritation of the splanchnics has usually the opposite effect. If these nerves are strongly irritated in the living animal immediately after the opening of the abdomen, arrest of the peristaltic movements of the whole or part of the intestine is constantly observed; but when some time has elapsed after exposure of the intestine, or after death, irritation of the splanchnics is followed by increased activity of movement. No satisfactory explanation of this has been advanced. The above-mentioned poisons, nicotin, atropin, &c., will as a rule abolish both the action of the splanchnics and of the spinal cord.

"The arresting influence of the splanchnics, when irritated, upon the intestinal movements was discovered by Pflüger. He termed these nerves inhibitory nerves, and compared their action on the intestines with that of the vagus on the heart. But that this nerve can also excite contractions was first observed by Ludwig, who has been corroborated by many experimenters. I have myself frequently observed the truth of Lister's statement, that weak electrical currents applied to the splanchnics excite movement, whilst strong ones inhibit them.

"As a means of explaining the different effects of stimulating the splanchnics in living and dead animals, Nasse suggests that they contain both motor and inhibitory fibres, of which the latter die earlier than the former. According to Mayer and v. Basch, the splanchnics are motor nerves, and their inhibitory influence on the intestinal movements is attributable to contraction of the small arteries interfering with the supply of blood. But it is to be observed, that the inhibitory action takes place without any obvious alteration in the amount of blood contained in the intestinal vessels; whilst in opposition to their view, if the aorta be compressed, the intestines become pale and at once exhibit stormy contractions. It

is noticeable, also, that disturbances of the circulation of every kind, perhaps in consequence of the accumulation of irritating products of disintegration, act excitingly upon the motor ganglia of the intestine. But if the action of the splanchnics on the blood-vessels fails, the existence of direct inhibitory fibres proceeding from the spinal cord must be admitted. In favour of this view is the almost constant arrest of the movements observed when the cord is irritated, for this occurs not only on electric stimulation of the cord, which is of less importance, because of the likelihood of induced currents, but because when reflex convulsions occur, in consequence of strychnine poisoning, the peristaltic movements are arrested. I am, therefore, of opinion, it is still most reasonable to believe that the splanchnics contain both inhibitory and motor fibres for the intestine; that the two kinds of nerve fibres do not die with differing degrees of rapidity, but that the intermediate inhibitory apparatus (the ganglia) of the coats of the intestine soon lose their capacity for acting when the intestine is exposed, so that the action of the motor apparatus alone remains operative. Various facts supporting this view will be detailed in the chapters on the physiology of the heart and respiration. Irritation of the vagus is likewise not followed by any constant results. Sometimes, whilst the stomach is thrown into active contraction, the intestines remain nearly quiescent. Indeed, according to Mayer and Basch, irritation of the vagus will sometimes arrest peristalsis. This is true, however, only when the vagus is irritated in the neck, when the effect is modified by the influence exerted upon the heart. If, therefore, it be sought to determine the action of the vagus proper on the intestines, the abdominal branches of the nerve should alone be irritated, and this, its motor power, is scarcely ever absent.

"Engelmann has pointed out, that if direct irritation be applied to the intestine, the contraction produced extends in both directions, peristaltically and antiperistaltically, the former to an ending at the ileo-cæcal valve, the latter at the pyloric orifice of the stomach. As other membranes which contract in a similar manner, as, for example, the ureter, have no ganglionic plexus. Engelmann is of opinion that the wave is propagated, not by the reflex action of the plexus of Auerbach, but by the continuous contraction of the probably directly anastomosing muscular fibre cells. If this view may to some extent be held, Engelmann at the same time goes too far when he denies that the plexus of the mucosa has any influence on peristalsis. The fact that normally the wave of contraction only passes from above downward, in itself makes the existence of a co-ordinating nervous apparatus probable."

This seems to us to be a very excellent account of a difficult subject. It gives the views of various experiments succinctly, states the author's own opinion, and is altogether up to the most recent researches. It only remains to be added that Horvath has shown that at temperatures between 32° Fahr.

and 65° Fahr. the intestines are absolutely quiescent, and do not respond to any irritation of either vagus or spinal cord.

One of the best points of M. Wundt's work seems to us to be, as the foregoing extract indicates, the admirable manner in which the relations of the nervous system to the several special organs and their functions is given.

M. Wundt is well known as having published an elaborate work on medical physics, and, as may be conjectured, this part of physiology, too much neglected in our English works, finds a capital exposition in his present treatise.

The chapter on the chemical composition of the body is a remarkable one, going, however, in our opinion, far too deeply into the subject for an ordinary physiological student; in fact, we doubt whether there is a single physiological teacher in England who could feel himself qualified to do more than refer to the complicated formulæ given in pp. 58 and 59 and pp. 74—78; nor can we believe that German students are so much in advance of our own as such teaching would seem to imply; it is, therefore, practically, waste paper, and might have advantageously given place to other more properly physiological subjects. To justify our strictures we will take one formula only. Professor Wundt gives half a page of compound carbamid combinations, the last of which is (p. 75)—

"Malonyl urea (barbituric acid).

$$\overline{\text{C}''\text{O}} \cdot \underline{(\text{N}'''\text{H})_2} \cdot \overline{\text{C}''\text{H}_2} \cdot \underline{(\text{C}''\text{O}'')_2} = \text{C}_4\text{H}_4\text{N}_2\text{O}_3 =$$

(Alloxan — H_2O), Carbamid, in which 2H is replaced by the dibasic radical of malonic acid $\text{CH}_2\,(\text{CO})_2$.

Kühne or Hoppe-Seyler may retain these matters in their memory, but Heaven protect us from being the patients of the physician who knows them.

In the section on digestion, to which sixty-four pages are devoted, M. Wundt gives a useful table, drawn from various sources, of the composition of the different kinds of food usually consumed by man, including eggs, meat, poultry, fish, liver, and the cereals. Some of the numbers, however, are not very correctly given, as on casting up the figures representing the composition of eggs, reckoned to 1000 parts, the aggregate is 1060, which is not easily explicable on any supposition of a misprint. The chapter is fairly worked up to the present time, but presents no peculiarities of arrangement. The same remarks hold good for the chapters on Respiration, Animal Heat, the Special Senses, and Generation. All seem to have been worked at *con amore* and the latest observations given.

Professor Bennett's work is divided into three parts—General Physiology, Special Physiology, and Practical Physiology.

The general physiology is subdivided into—1. The chemistry of the tissues. 2. General histology. 3. The physical and vital properties of the tissues.

The special physiology into—1. Nutrition. 2. Innervation. 3. Reproduction. 4. Death.

The practical physiology into—1. Practical chemical physiology. 2. Practical histological physiology. 3. Practical experimental physiology.

The introductory chapter on the Chemistry of the Body is concise but clear. The division adopted is into albuminous compounds, fatty compounds, and their allies the amyloid substances and sugars; mineral substances and pigmentary principles. The last-named are rarely collected into a separate class in physiological works, though they are now very numerous, and may very conveniently be considered together.

Under the head of Albuminous Principles we observe that casein is inscribed, though this is now usually regarded as a compound of albumen and potash, not holding the same rank as fibrin and syntonin. On the other hand, peptone, which presents well-marked specific properties, is omitted, and no notice is taken of lecithin.

We are scarcely prepared to assent to Dr. Bennett's peculiar views upon the histology of the tissues and their development from molecules. They are certainly propounded with a faith on the part of the author that deserves to obtain credence for them on the part of his readers. He describes histological molecules as minute bodies seen under high magnifying powers, in all organic fluids, varying in size from 1-4000th to less than 1-20,000th of an inch in diameter, and capable of classification into—1. Albuminous. 2. Fatty. 3. Mineral. 4. Pigmentary compounds. He describes them as being formed either by precipitation in fluids or semi-solid substances, being then *histogenetic*, or by the disintegration of previously formed tissues, being then *histolytic*.

These particles possess independent physical and vital properties, which enable them to unite and arrange themselves so as to produce higher forms. Amongst these are nuclei, cells, fibres, and membranes, all of which may be produced directly from molecules. The development and growth of organic tissues is owing to the successive formation of histogenetic and histolytic molecules. The breaking down or solution of one substance is often the necessary step to the formation of another, so that the histolytic or disintegrative molecules of one period become the histogenetic or formative molecules of another.

It is curious to contrast all this with the observation which occurs in almost the first page of M. Küss's work—"La Physiologie dans son essence ne peut plus être aujourd'hui *que cellulaire*," and though it is stated less explicitly, it is easy to see that Professor Wundt is a firm supporter of Virchow's doctrine of "omnis cellula è cellulâ."

Without entering into a full discussion of this theory, which, indeed, would require a volume, it may be observed that some of the evidence adduced by Dr. Bennett in favour of the molecular origin of cells is very weak. For example, to take one case only, he gives (Pl. II, fig, 2) a drawing of the deposition of fat-molecules from an alcoholic solution, which is evidently intended to foreshadow and illustrate the formation of cells, and he describes the figures as exhibiting nucleolus, nucleus, and cell-mass; but surely this cannot be regarded as even remotely approximating the mode of formation of cells. How does Mr. Bennett know that these were not really cells which have undergone changes from the action of the spirit. At any rate we should regard with great distrust any theory framed on the phenomena presented by a precipitate from an old alcoholic preparation of areolar tissue.

The chief objection to the general plan of Dr. Bennett's work is, that it causes many subjects to be treated in a disjointed fashion. Take, for example, the subject of the bile. The physical characters of this secretion are described, naturally enough, under the head of the Digestive Fluids; but at the close of a very brief account of its character and uses the student is referred to the chemistry of the tissues, on turning to which we find the biliary acids described on pp. 12 and 13; taurin, glycocol, &c., on pp. 16 and 17; cholesterine on p. 19; and the colouring matters on pp. 32 and 33. Then, at the end of the first-named paragraph, reference is made to a subsequent section on the Excretion from the Liver, which we find on p. 250; and finally there is the section on the Analysis of the Bile in the Practical Physiological part. As a matter of necessity there is a good deal of repetition in these several accounts, whilst it is more than doubtful whether one student in twenty ever turns to the different pages referred to, and, consequently, as one part only is read—that, namely, which is found under the title of Digestive Fluids—a very imperfect idea of the whole is obtained. The subject "Blood" affords another instance in point.

The Chapter upon General Physiology is on the whole fairly written, though certainly not up to the present day. Take, for example, the account of Muscle. In this Dr. Bennett maintains that the development of both the striated and unstriated forms of muscular tissue is from the molecular coales-

cence of minute particles, either with or without the aid and agency of nuclei or cells. He then gives an account of the striation of muscle, which is almost limited to the statements that there are fibres and fibrils, a bundle of the latter being enclosed in a sarcolemma to make the former, and that both present a series of light and dark striæ, the credit of observing which in the fibrils is given to Dr. Dobie, of Cheshire (1849), than whom no later author is quoted. Has Dr. Bennett taken no interest in the controversy in which Hensen, Krause, Merkel, and others have taken a part? Has he no reliance on Brücke's observations, which have been admitted by all the best German authorities? Nothing to say of Rouget's views, who, as one of the best microscopists in France, is at least entitled to be mentioned?

Then comes a paragraph on the "Structure of Muscle," which, however, might as well have been left out, seeing that it is only nine lines long, and contains no information on the subject that is not to be found in the preceding paragraph.

In the part of Dr. Bennett's work that treats of digestion, we notice the absence of any account of the development of the teeth, yet that of the nose is given in the section on development, are the teeth less important than the nose? Dr. Bennett says the function of the chorda tympani is unknown. This is too broad a statement, or, at least, if a little doubt still rest upon it, the effects of its irritation in augmenting the flow of saliva from the submaxillary gland should have been mentioned. The subjects of gastric and intestinal digestion are very well and clearly given. That of leucocythæmia, though permissible to Dr. Bennett, whose large share in the discovery of the precise nature of the disease is interestingly given, belongs rather to pathology than physiology. There is a capital section embodying the results of the Edinburgh Committee, of which Dr. Bennett was a member, on the action of mercury on the secretion of bile, and showing that the drug has no power of increasing the quantity secreted in the dog. It is obvious, however, that this does not settle the question as regards man.

In the chapter on the circulation we should have liked to see some account of innervation of the heart, for though this is partially given under the head of the Vagus Nerve, many points are omitted, such, for instance, as the indirect influence of splanchnics demonstrated by Ludwig. On the other hand, the account of the peculiarities of the circulation in the brain, with a criticism of Abercrombie's, Kellie's, and Burrow's results, is excellent.

The chapter on Respiration is too short, and contains some inaccuracies. On p. 228 we read that "the amount of air

inspired varies; in health ranging from 20 to 25 cubic inches." On p. 235 it is stated that "an adult man inspires and expires, during tranquil respiration, 30 cubic inches of air every respiration."

At p. 232 Dr. Bennett quotes the observation of Davy, that "the temperature of arterial blood is one or two degrees higher than venous blood." This, however, is a statement that requires qualification, since it only holds good in the case of the blood going to and returning from the extremities; it is not correct as applied to the hepatic venous blood and arterial blood generally.

Dr. Bennett states that some of the divers of Ceylon have been known to remain immersed and actively picking up oysters three or four minutes. Is not this a great exaggeration? Habit or practice will do much, but we doubt the capability of any man to remain under water for more than two minutes.

The section on the Nervous System is fairly given, considering its brevity, but some account of the convolutions of the brain might with advantage have been given.

The subject of Development, and especially of the early stages, is much behind the day.

The long account of the Development of the Tapeworm, though quite correct and very interesting, is yet, we venture to think, out of place in a text-book on 'Human Physiology,' especially as there is no account of the changes of the ovum, and is otherwise not sufficiently germane to the subject of human development; and we should take the same objection to the account of the development of coral-forming polypes, of bees, and of aphides. In none of these cases, in fact, is the development proper given at all.

The section on Practical Physiology, including practical physiological chemistry, practical physiological histology, and practical experimental physiology, each occupying about fifty pages, is the distinguishing feature of Dr. Bennett's work, and renders it a very valuable one to the student whose means will not allow him to purchase the larger handbook lately published by Drs. Sanderson, Klein, Brunton, and Foster.

Amongst the many experiments that are here given the student is taught the mode of analysis of all the principal fluids in the body—the blood, chyle, lymph, saliva, gastric and pancreatic juices, bile, urine, and sweat; the account of the urine being much the best. The qualitative analysis of muscle, bone, connective, and gland tissue, and nerve follows, with a long section on the microscope, an instructive section on

mensuration, and another on the various modes of preparing tissues for microscopic investigation. A section succeeds in which the more important apparatus required in physiological investigations and experiments is described; the construction of batteries, Dubois Reymond's electro-motor apparatus, with Wagner and Neef's hammer, and Helmholtz's modification of it, Dubois Reymond's key, Pohl's commutator, &c., are all so well given that, aided by the plates, into which, by the aid of photo-lithography, a perfectly extraordinary number of highly-complicated drawings are introduced, an intelligent and careful student could find no difficulty in mastering the details so far as to enable him readily to understand the instruments when he sees them in action. The process by which the plates are produced necessarily reduces the size of the lettering to an extent that is rather trying to old eyes, especially when the light is indifferent; but as they are mere copies of much larger drawings it does away with all chances of error in the position of the letters, and having gone over them very carefully, we can testify to their wonderful accuracy.

After the instruments have been described, a series of experiments are given in which these instruments are employed, such, for example, as the mode of showing the presence of an electric current in muscle, the influence on muscle of continuous, interrupted, and induced currents; the various modes in which tetanus can be produced; the effects of electricity on nerve; the construction and mode of employment of the rheocord, and the demonstration of Pflüger's laws of muscular contraction on excitation of nerve with currents of different strength; the myographion, and the means of estimating the rapidity of nerve force. Several experiments on the circulation are then described, with the instruments required; and, finally, some are given in connection with vision and hearing. Amongst the former is an account of the mode of using the ophthalmometer, which is very intelligible, and an account of the phakoscope of Helmholtz. Amongst the latter is a capital description of the apparatus of Appunn. Altogether this is a valuable section, and greatly enhances the value of the work. Its treatment reflects much credit both on Dr. Bennett and Dr. McKendrick, from whom, Dr. Bennett states in the preface, he has received much assistance.

Before parting from Dr. Bennett's work we will just observe that the orthography of proper names is a point that we hope he will attend to in future editions. It offends the eye to see Helmholtz spelt "Helmholz;" Hirsch, "Hirsh;" Maudsley, "Maudesley;" Morel, "Morrell;" Poisseuille, "Poisieulle;" Klaatsch, "Kllaatsch;" Nothnagel, "Northnagel;" Ruete,

"Reute:" Descemet, "Descimet;" Volkmann, "Volkman;" Schultze, "Schulze;" Schrœder, "Schræder," &c.

Very considerable modifications have been made in the present edition of Funke's work. The chapters on the Circulation, Digestion, and Respiration are all materially shortened, the order in which the subjects are considered is at the same time changed, and the voluminous notes which in the fourth edition followed each chapter, are either left out altogether, or are incorporated with the text, the latter being a very decided improvement. In all cases, however, the references remain.

Funke's treatise must be regarded as the most complete work on 'Physiology' published in Germany, and is certainly, in some points of view, a very good one. It is written in a calm and dispassionate style, and gives opposing views and statements with great impartiality; but it exhibits the inveterate habit and fault of the German writers generally, that, namely, of spinning out without materially adding to the intelligibility of a subject. In the sections on the Senses, and especially upon the Eye, it is extraordinarily full, and yet scarcely touches the mathematical aspect. We may perhaps return to it when the remaining parts are issued.

Professor Küss' work seems to us to be amongst the best student's manuals that we have yet seen. It is very short, and yet contains a surprising amount of information very pleasantly given. There is much originality in the manner in which the several subjects are treated.

It may be interesting to our readers if we take some subject and compare the accounts given by the authors quoted at the head of our paper severally, and for this purpose we shall select the description of the movements of the heart.

Professor Wundt, after mentioning the succession of the contractions and their relative duration, describes Marey's and Chauveau's and Landois' apparatus for obtaining graphic delineations of the cardiac movements, and then proceeds as follows:

"*Changes in the Form and Position of the Heart.*—The changes in the form of the heart, in its successive movements, consist in a constant alternation between the form in systole and the form in diastole. Whilst in the heart in diastole the transverse is greater than the antero-posterior diameter, the heart in systole assumes approximatively the form of a cone with round base, the transverse diameter becoming at the same time smaller, and the antero-posterior diameter greater. There is also an inconsiderable amount of shortening in the longitudinal axis when the heart passes from the state of systole into that of diastole; it undergoes a slight change in position, consisting of a certain amount of rotation, both

upon its transverse and upon its longitudinal axis. In consequence of its rotation upon its transverse axis, the apex of the heart moves forwards, whilst, as a result of its rotation on the longitudinal axis, the left ventricle, which in diastole looks backward, is turned forwards.

In consequence of the changes in the form and position of the heart, the thoracic wall on the left side, usually between the fifth and sixth ribs, experiences a succussion which is distinctly perceptible to the finger, and is known as the impulse of the heart. The impulse is coincident in point of time with the systole of the ventricle. The place where it is found corresponds to the apex of the heart, or rather to the surface of the heart, a little above the apex, whence it follows, as Ludwig states, that the impulse depends upon the rotation of the heart on its transverse axis, and especially on the blow of the apex of the heart against the intercostal space; and, further, it appears that the increase of the antero-posterior diameter of the heart causes an extension of the vibration of the thoracic wall from below upwards, as has been pointed out by Arnold and Kiwisch. In some instances this last exceeds in intensity the blow of the apex of the heart."

With all this we should be disposed to agree, excepting only the last remarks in regard to the blow of the apex of the heart. It has, we think, been fairly made out that the heart's apex really never leaves the side of the chest, and that, therefore, no blow, in the proper sense of the word, occurs. Our English term "impulse" expresses the fact much more accurately. The rest of the chapter, and especially the long section upon the "Influence of the Nervous System upon the Movement of the Blood," is equally well done.

M. Küss's account of the same subject is as follows:

"The impulse of the heart consists in a vibration that is felt against the thoracic wall. When the hand is placed over the sixth rib, just internal to the nipple, the impression is given that the heart is thrust at each contraction against this wall like a hammer on an anvil; but, in reality, there is no blow in the proper sense of the term, since the apex of the heart is always in contact with the thoracic wall, and there is never at any time an interval between them. We cannot, indeed, conceive any real separation, as there is nothing to fill the intervening space, not even the lung, since, as a rule, there are four pulsations of the heart to one expansion of the lung. There is consequently, at each apparent blow, nothing more than a firmer pressure applied by the heart to the thoracic wall. To explain this phenomenon a great variety of theories have been invented, of which that which has been most generally admitted is the theory suggested by Hiffelsheim, the theory of recoil or of *choc en retour*. In this the impulse of the heart occurring at the instant when the ventricles expel their contents, is compared to the recoil of a gun at the instant of explosion; but it so happens that the impulse is felt on whichever side the heart is touched, even

when its inferior surface is felt through the diaphragm. This simple experiment refutes the theory of recoil, which cannot possibly act in every direction. It overthrows also the explanation, based on a movement of recovery of position of the arch of the aorta under the influence of the wave of blood, since the impulse of the heart exists in animals that have no arch of the aorta.

"The impulse of the heart can be explained by reference to the changes in the form and consistence that the ventricle undergoes at the moment of systole; from the state of relaxation it passes into that of contraction; it presses firmly on its contents to make them penetrate into the arterial tree, which is already filled with blood, under a positive and tolerably strong pressure. Even when the chest of an animal is opened and the heart is grasped in the hand, a change in the degree of its firmness is felt over its whole surface, which is coincident with the systole. The shock or impulse of the heart is then felt just as it is felt through the thoracic wall when the hand is placed on the parietes of the chest in the living animal. The *displacement*, the *recoil*, and even the *torsion* of the heart enter but slightly into the production of the impulse. This is due essentially to the change of state in the ventricle, which, from being soft and relaxed, becomes hard throughout in the act of expelling its contents."

M. Küss considers the cause of the first sound to be the tension of the auriculo-ventricular valves. Of the second, the tension of the semilunar valves.

Funke says:

"The heart in its action undergoes a series of changes in form and position, the nature and causes of which, as well as their relations to the impulse of the heart, *i. e.* to the periodic projection of the intercostal space close to its apex, and coincident with the ventricular systole, have been the subject of an extraordinary amount of discussion. The *changes in form* of the several chambers of the heart in its transition from diastole into systole, are essentially caused by the arrangement and disposition of the muscular fibres, which give it a determinate form, so far as their action is not interfered with by external resistance. The form of the relaxed heart is more dependent upon these external conditions than that of the contracted. The only changes of form that are of physiological interest are those which occur in the natural position of the heart in the thorax. The direct observation of the exposed normally acting heart does not, on account of the rapidity of its movements, allow any certain observations to be made. The systolic contraction of the auricle proceeds from the veins, and extends to the ventricular margin. The contraction is least in the longitudinal direction (Kürschner). The auricular appendices become flattened. The contraction of the chambers appears to commence simultaneously from all sides. The form of the contracted ventricle is that of a regular cone with approximating circular base and apex standing vertically over its centre. This

conical form results, according to Ludwig, from the arrangement of the muscular fibres of the tubercular wa."

Here follows a note in the text, on the direction of the muscular loops, in which Ludwig is followed exclusively, no mention being made of Pettigrew's researches. He then proceeds:

"The changes in the form of the heart which cause the regular cone during the systole, depend upon the forms which the ventricle possesses in diastole, and then again upon the position and upon external agents.

"If the heart rests with its posterior wall upon a horizontal support the base of the relaxed ventricle takes in diastole the form of an ellipse (the longer diameter of which runs from right to left), and the apex is in contact with the support. When during the systole the basis passes from the elliptical into the circular form, the transverse diameter becomes considerably less than the antero-posterior diameter; indeed, the latter may, when the heart is thoroughly flattened, notwithstanding the diminution of the total sectional area, increase to some extent the most anterior forms of the base, bulging forwards. The apex of the heart must, since it is vertically opposite the middle point of the apex, raise itself up from the support, and at the same time, on account of the shortening of the longitudinal axis approximate the base of the heart. Similar relations exist in the natural position of the heart in the thorax, through the external walls of the chest the base of the heart flattens to an ellipse in diastole, and the apex is pressed backwards or downwards towards the vertebral column. In systole the apex strives to place itself vertically to the now circular base, and consequently presses against the thoracic wall, and bulges forwards the yielding intercostal space. This elevation of the cardiac apex is, therefore, the essential cause of the cardiac impulse."

Another note is here introduced into the text, referring to the view attributed to Skoda and Guthrod, that the impulse is due to the recoil of the blood entering the arteries under high pressure against the opposite side of the heart, which Funke appears to think a possible secondary movement in producing the impulse, then follows:

"Besides this tilting of the apex the acting heart exhibits other changes of position. It is certainly established that it undergoes a rotation upon its long axis. During the diastole it rotates slightly from right to left, so that, looking at the heart from before, scarcely anything but the right ventricle is seen, whilst in systole it rotates from left to right, so that, as Harvey and Kürschner have noticed, a part of the left ventricle comes into view. Some, as Skoda and Bamberger, maintain that the heart, as a whole, is pressed downwards during diastole, the apex descending, notwithstanding the diminution of the long diameter; but careful researches (by means of needles stuck into the heart through the chest-walls) have de-

monstrated that the cardiac apex does not in this sense change its place. A descent of the apex can only occur when the ascent, owing to the shortening which occurs in the long axis, is compensated.

No one can, we think, fail to see that the much longer account given by Funke is very inferior in clearness, apart from the question of accuracy than that given by Wundt.

The subject of the movements of the heart is indifferently given by Dr. Bennett, all that we can find being that in systole, the ventricle "contracts, but more slowly than the auricles, so that the apex becomes shorter and rounder," and that in the production of the impulse of the heart, "the tilting forward of the cardiac apex is caused by the peculiar spiral arrangement of its contractile fibres, as clearly shown by John Reid;" and he then refers to Pettigrew's dissections.

The general account of the nervous system is remarkably well given by M. Küss. The size of the work, and its adaptation to the requirements of the student, necessarily preclude the introduction of any minute details, but it gives in a very concise form nearly all that need be known. M. Küss commences with a brief description of the structure, nerve cells, and cords, in which he accepts the statements of Ranvier recently published, to the effect that the nerve tubes are composed of cells attached end to end. The membrane of Schwann is not continuous, as has hitherto been generally admitted, but presents constrictions at regular intervals. These annular constrictions, placed at distances which vary with the size of the tubes, limit the so-called interannular segments. Each segment appears to represent a cell, and upon the inner surface of the membrane of Schwann, and about midway between two constrictions is a nucleus. The *myeline*, or white substance of Schwann, is analogous to the fat of a cell of adipose tissue, and is likewise limited by the constriction. The cylinder axis, however, runs uninterruptedly along the whole length of the fibre, and its general morphological signification cannot as yet be positively stated. M. Küss then proceeds to compare nerve with muscle in regard to its nutrition, and points out that, whilst the materials used up by muscle in performing its function are chiefly hydrocarbonaceous, as the sugars and fats, with comparatively little albumen, the materials required and consumed by the nervous substance are the albuminous, the products of the decomposition of which appear in the urine and in the secretion of the liver. In support of this he cites the observations of M. Byasson, who some years ago (1868) showed that considerable variations in the excretion of urea occurred, according to whether the activity of the cerebral functions was nil, moderate, or very great, being represented by 20 in the first instance, 22 in the second, and 23

in the third. Additional evidence, though to our minds of a very unsatisfactory nature, is derived from the experiments of M. Oscar Liebreich, who, making animals die from pain, after having divided the sensory roots of the spinal nerves on one side of the spinal cord, found that on this side (reduced to inertia) the quantity of protagon had diminished much less than on the opposite side. In like manner fluid experiments show that the amount of cholesterine, which seems to be a product of the disintegration of protagon excreted, is directly dependent upon the degree of antecedent activity that has existed in the cerebro-spinal system.

The simple reflex actions are next considered, in the course of the account of which occasion is taken to allude to the nature of nervous stimuli, and the rapidity of nervous impulses. A rough but ingenious diagram of the cerebro-spinal system is given, in which the ganglionic centres are shown as composed of cells, and the rest of the system as of fibres. The functions of the several cerebral and spinal nerves are given in a manner that requires no comment. The spinal cord is next taken up; its structure is given in accordance with the views of Stilling, Brown-Séquard, Vulpian, and others, and the subject of reflex movements is again discussed, and it is shown how sneezing, the movements of respiration, of the heart, and even of locomotion come under this category. The localisation of the several nerve centres in the cord, and its prolongation upwards, is next attempted; that of the genito-spinal centre of Budge is, he thinks, ill-defined, and its very existence contestable; the limits of the cilio-spinal region of Budge and Waller is equally uncertain, though it may be broadly placed in the cervical and upper part of the dorsal region. Above this point the position of the several centres from below upwards, or rather from behind forwards, have been more exactly determined, though they become progressively more and more complex in their function. These centres may be classed as (1) motor, (2) secretory, (3) inhibitory, (4) perceptive, (5) mnemonic, and (6) volitional. At the level of the medulla oblongata, in the grey substance which forms the floor of the fourth ventricle, and which is the continuation of the grey substance of the spinal cord, but exposed upon the surface instead of being disposed around a central canal, are found the centre of deglutition—the centre of the movements of mastication; of mimetic expression; of speech (the olivary bodies according to Schrœder v. d. Kolk, and Duchenne, of Boulogne, and it is here that the cause of the singular paralysis known as the labio-glosso-laryngeal is to be sought); the centre of the respiratory movement, which is composed of a small mass of grey matter near

the point of the calamus scriptorius, constituting the *point* or *nœud vital* of Flourens and Longet, so-named because its lesion produces instant death in all warm-blooded animals, exclusively in consequence of arrest of the respiration; the centre for the movements of the heart (inhibitory fibres of the vagus); a part of the vaso-motor centres at the level of the pons, and still ascending towards the cerebral peduncle, is a further portion of the vaso-motor centres (Tcheschichin); the centres for the innervation of the movements of locomotion. * * * Finally, the pons and the cerebral peduncles contain the motor centres for the movements of the globe of the eye.

M. Küss then proceeds to give a classification of the reflex action into those affecting the cerebro-spinal, and those acting through the sympathetic system, and those which act through both systems. Of the former, those, namely, which follow cerebro-spinal nerves exclusively, examples may be given in sneezing, coughing, deglutition. Of the second he gives as examples the sympathy which unites the various parts of the body ministering to the generative functions, especially in the females; the dilatation of the pupil of the eye in consequence of the presence of worms in the intestines. The third class he subdivides into those in which the centripetal impulse is conducted along a sensory cerebro-spinal nerve, and the centrifugal along a sympathetic nerve, most frequently a vaso-motor, as occurs in those reflex actions which occasion secretion, and which determine redness or paleness of the skin erection; certain movements of the iris, certain modifications in the action of the heart, and in pathology a large number of phenomena termed metastatic for want of a better term to explain the mechanism of their production, such as various forms of ophthalmiæ, orchitis, and coryza, which are reflex hyperæmiæ; whilst, on the other hand, certain cases of amaurosis, paralysis, and paraplegia may be regarded as examples of reflex anæmiæ. Secondly, those in which the centripetal impulse is conducted through sympathetic, and the centrifugal through cerebro-spinal motor nerves, most of which cases belong to the domain of pathology, as those of convulsions induced by visceral irritation from the presence of worms, reflex eclampsia, hysteria, &c. As an example of a normal phenomenon of this nature we may cite the respiratory acts, since the impression that the respiratory surface sends to the bulb is transmitted by the pneumogastric, which, under many of its relations, is analogous to the great sympathetic, or, at least, constitute a physiological transition between the branches of the sympathetic and those of the cerebro-spinal system.

The laws of reflex actions are next given. These are stated to be five in number, and are thus described—

"1. *The Law of Unilateral Action.*—When a sensory irritation induces a reflex phenomenon this last, which is usually a movement of some kind, is subject in its intensity and its anatomical position to certain well-defined rules, that Pflüger first established from experiments on frogs (laws of Pflüger), and which have since been established by Chauveau in the case of the larger mammals. Thus a feeble irritation applied to the skin of the lower extremity (on the right side, for example) produces a reflex movement in the muscles of the same limb, that is to say in the muscles of which the motor nerves issue from the spinal cord, on the same side and on the same plan as the sensory fibres which have been excited.

"2. *The Law of Symmetry.*—If the excitation be more intense the motor reaction manifests itself in the corresponding member of the opposite side; that is to say, by the symmetrical motor nerves.

"3. *The Law of Intensity.*—And this limb, the left in the case before us, always presents less vigorous movements than that to which the stimulus has been applied.

"4. *The Law of Irradiation.*—If the irritation be still more violent the motor reaction will extend to the centrifugal fibres emanating from another place, but always affecting that part of the cord which is superior or anterior; that is to say, it passes from the caudal towards the encephalic portion of the cerebro-spinal nervous system.

"5. *The Law of Generalisation.*—Lastly, if the stimulus, and, in consequence, the motor reactions are sufficiently energetic to extend from below to the bulb and the pons, the reaction becomes general, and is propagated in all directions, even from above downwards, so that all the muscles in the body are affected, the bulb, forming, so to speak, a general focus from all the reflex movements—irradiate and become generalised."

The progressive character of reflex movements, especially in the lower animals, is dwelt upon with the circumstances causing variation in their intensity, &c., after which the characters and functions of the encephalon or cerebral cavities are considered.

The whole account of the nervous system, of which we have only given a very short abstract, strikes us as being very sensibly written, no long discussion being introduced, everything being laid down somewhat dogmatically, as is very proper in a book intended for students, whilst the diction is well adapted for their comprehension.

This quotation will, we think, justify us in stating that though M. Küss and Duval's work is intended for students, the subjects are treated in an original and instructive manner, and that the little book will be found very useful to all who are desirous of acquiring familiarity with the French language.

In conclusion, whilst admitting that M. Wundt's treatise is by far the best worked up of those in our list, we think that Dr. Bennett's presents very unusual advantages to the students, and if the physiological part proper, or special physiology, were rewritten to bring it up to the present state of physiology, and especially if, as Professor Rolleston has done in his 'Forms of Animal Life,' references were given by which the student might, if he chose, extend his reading on all the more important points, it would constitute one of the best text-books of the present day.

II.—Alcoholism.[1]

Many circumstances of recent occurrence, some of them of national importance, seem to render it incumbent upon medical men to inquire into the cause or consequences of certain of our social customs and crimes, and more especially whether intemperance and its concomitants be a disease demanding their cognisance and care. Among the more prominent of such events may be enumerated the number of individuals reported to have died during intoxication; the numbers reported to have succumbed to the moral death of insanity; the great increase of wealth flowing into our national treasury from the sale of stimulants; the efforts made by individuals and communities to restrain the use or abuse, and even the sale, of alcohol and its different combinations, and the fact that our political contests have been, and may yet to a still greater degree, be influenced by the opinions and interests involved in these matters.

The church has spoken out very clearly and articulately as to the remote sources and incentives of dissipation as a vice, and of the social and domestic remedies accessible. Professionally, we are more intimately concerned with a declaration which appeared in the 'British Medical Journal' for 23rd December, 1871, purporting to be sanctioned by nearly 300 physicians and general practitioners, in which it is affirmed

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[1] 1. *Report from the Select Committee on Habitual Drunkards, together with the Proceedings of the Committee, Minutes of Evidence, and Appendix*, 1872.

2. *A Bill for Making Provision for the Care and Treatment of Habitual Drunkards*, 1873.

3. *Report by the Committee on Intemperance for the Lower House of Convocation of the Province of Canterbury*, 1869.

4. *Report of Adelaide Asylum*, 1872.

5. *American Association for the Cure of Inebriates: Account of Proceedings at Meetings in* 1870, 1871, 1872.

6. *Annual Report of State Inebriate Asylum, Binghampton*, 1871.

that "The inconsiderate prescription of large quantities of alcoholic liquids by medical men for their patients has given rise, in many instances to the formation of intemperate habits," "many persons immensely exaggerate the value of alcohol as an article of diet;" secondly, with the Minutes of Evidence before a Parliamentary Committee, which sat in the spring of 1872, and an abortive Bill which emanated from this body; and, thirdly, with a conviction expressed by Lord Houghton in his opening address to the recent meeting of the Social Science Congress at Norwich, "A love for strong drinks is characteristic of the nobler and more energetic populations of the world, it accompanies public and private enterprise, constancy of purpose, liberality of thought, and aptitude for war; it exhibits itself prominently in strong and nervous constitutions, and assumes, in very many instances, the character of a curative instinct," which, from the place where, and the distinguished person by whom it was uttered, might be regarded as a philanthropical aphorism.

While we doubt the policy and prudence of the medical manifesto, while we exonerate the protesters altogether from the self-crimination into which they have been led, perhaps by an exaggerated estimate of the employment of stimulants and narcotics, and assuredly by a benevolent desire and design to check the undue and unscientific recourse to such agents in practice, we, at present, accept their public act exclusively for the purpose of urging that the whole subject should be more fully and more narrowly investigated.

The Blue Book, extending over 235 pages, comprehending the experience and observations of physicians, psychologists, governors of jails and penitentiaries, chiefs of the police force, and other experienced observers, who have been brought, either by official duty or benevolent motives, into direct contact with the moral and physical diseases, with the sorrows and sins, with the poverty, degradation, and ruin, which flow directly or indirectly from drinking and drunkenness, contains a vast amount of most valuable information upon the existing results or what Lord Houghton euphemistically calls "the curative instinct," and upon the punitive, reformatory, or precautionary provisions that have been made, or are proposed, to meet the exigencies of the case. That our legislators, &c., have conceived it expedient to embrace the whole scope of the supposed evil, to search deeply for its hidden and sometimes obscure origin, to trace its course and ravages through the different strata of society, to ascertain whether such consequences should fall within the province of the police or the physician, and to measure how and in what way the impulse, acts, and example of inebriates

affect the general community, might appear to justify a comprehensive view of the connection of our drinking usages with all their bearings on public health. But, as many of these inquiries are of wide range, and would lead to the discussion of arrangements strictly political or philanthropic, we shall confine ourselves to an epitomisation of the principal work before us, and to data strictly medical, with such amplification as our own knowledge may supply. Our main theme will be the causes, the symptoms, and suggested plans of treatment of the various forms of nervous disorder, which precede, accompany, or follow excessive and repeated inebriation. It does not appear that, until the current century, the attention of medical men was specially directed to the poisonous effects of wine and spirits, in permanently suspending or altering the judgment, rousing the passions and animal propensities, enfeebling the memory and will.

Although speculations of a much earlier date would indicate that suspicion, if not a mature opinion, had entered into such enlightened minds as that of Dr. Rush that it was necessary to deal with a specific disease, and not with an outburst of sensuality and folly. In the present day we are called upon to recognise, not merely the temporary suspension of conscience and consciousness during the paroxysm of actual intoxication, on the principle that the frenzy or fatuity then witnessed is in the same relation to responsibility as "Ira brevis est furor," but also to embrace many species of derangement which are admitted by an overwhelming majority of psychologists and philosophers in England, America, France, and elsewhere, to be actual insanity, and which would be universally admitted as such, were the popular views on graduated responsibility more clear, more bold, and, we think, more consistent with human nature, or, at least, with that nature which is granted to our imperfectly educated, impulsive, and excitable classes. These species, although variously named, appear to consist of—1st, delirium tremens, which may immediately follow a debauche, which may be provoked in a moderate drinker by accidents, injuries, or diseases producing prostration, which is of brief duration, which may or may not be characterised by violence, or outrage, but which is generally marked by sleeplessness, feelings of fear, or horror and delusions, coloured by the prevailing emotion, but very often of the presence and persecution of animals; 2nd, mania *à potu*, or a state of madness distinctly traceable to excess, presenting many of the symptoms of ordinary mania, is of short duration, and generally ceasing when abstinence and rest are established; 3rd, monomania of suspicion, which may be regarded as the arrestment of delirium

tremens at a particular stage; 4th, alcoholic dementia, or alcoholismus chronicus, which is continuous stupor, with persistent appetite for stimulants; and, 5th, dypsomania. Such distinctions are broad, but not exhaustive. They form classes of cerebral affections, and the types of aberration most frequently encountered in asylums, inebriate retreats, and penitentiaries, and may include the tipplers, "constant nippers," the impulsive, the chronic, and confirmed drunkards, signalised by some of our countrymen, as well as our transatlantic brethren; but they exclude cases in which weakening and and hebetude of the intellect, imperfection of memory, instability of purpose, and deadening or estrangement of the affections are the only indications of the disease noticed. They equally exclude the ordinary insanity which, although the effect of excess, remains long after abstinence has been established, is generally intractable, and cannot be distinguished from cases originating in totally different causes, and the issue in general paralysis to which they all tend.

Upon the answer to the question, Is dypsomania or uncontrollable insane drunkenness a disease? hinges all subsequent speculation, legislation, and treatment. A reply in the affirmative is given by every witness examined before the committee, or unexamined. It has been philosophically defined an impulsive, irresistible, involuntary indulgence in stimulants. It has been practically described as originating in extreme youth, its invasion being sometimes sudden, as often returning periodically or paroxysmally; as being indulged in secrecy, solitude; as being a habit in opposition to the character, previous tastes, training, tendencies of the individual; that sincere efforts are constantly made to resist or restrain the appetite; that the gratification of the craving appears to have no connection with the nature, flavour, and other tempting qualities of the stimulants; that the morbid propensity is accompanied by a most signal untruthfulness, loss of self-respect, perversion, and degradation of the sentiments and affections, by infirmity of purpose, enfeeblement of intellect, &c. But, while these features may be safely received as a faithful portraiture of typical dypsomania, it must be reollected that all members of the series, of which it is the last, merge into one another, and that the last and most formidable most frequently arises from habitual drunkenness. We are chiefly indebted to the pathologists of America for the slight knowledge which we possess of the physical conditions with which the insatiable desire for indulgence is associated. With hypothetical changes in the liver, kidneys, and brain, although all these may be legitimately regarded as the consequences of inebriety and irregularity;

seeing that they assuredly follow such courses independently of all mental disturbance and ungovernable craving, we shall not here deal. But we do not lack humble though rather sensational attempts to connect alterations in the organization with the moral perversion. Thus, Dr. Peddie speaks of an "elective affinity" between alcohol and the nervous system; of poisoning of nerve tissue by long-continued drinking productive of diminished intelligence and control over the voluntary muscles, passing on to simple frenzy or stupor * * and ultimately establishing the insane craving. Then we have theories of "saturation" as affecting the nutrition of the brain tissues; and Dr. Forbes Winslow asserts that the brain of the habitual drunkard is surcharged with alcohol, that the fluid in the ventricles has been found impregnated with it, and that alcohol has been distilled from the brain, but admits that these facts have not been observed by himself. Mr. Fawcett, p. 125, still more imbued with this humoral pathology, states that drink invariably attacks a man's liver, and that poultices are applied, and wet sheets "to take the drink out of him." These observations may prudently be reserved until confirmed by further investigation.

Not only do all causes which produce the other forms of insanity, and especially those which involve the propensities and sentiments, produce dypsomania, but there are many grounds for supposing it to be congenital. The suddenness of the invasion in early youth (Crichton Browne), in children before they have tasted spirits (Peddie), its development independently of training or temptation where the victims were recognised as virtuous, rational, highly educated, even abstemious and ascetic, or engaged in intellectual labour, abstract reasoning, or while under the dominion of the purest and most elevated sentiments, have all been adduced as evidence of the involuntary origin of the affliction. But a much stronger argument of the same class has been derived from the transmission of the propensity or proclivity, through several generations. The tendency descends from sire to son, and reappears as regularly at certain ages, and under certain circumstances, as gout. In short, it appears to be regulated by the same laws of heredity as the other forms of alienation. We possess the genealogies of families whose "veins run wine," nearly as long as that of "all the blood of all the Howards," but examples are not needed.

It is found, moreover, that the hereditary tendency passes to descendants in the guise of physical deformity, crime, insanity, and idiocy, as well as of intemperance. Dr. Howe, of 300 idiots traced 145 to drunken parents; and Dr. Dodge, of 100 idiots

under his own charge, regarded 50 as owing their mental weakness to the same cause. We are acquainted with a noticeable instance of a moulder, who for ten or fifteen years never retired to bed sober, who had three male children during that time, all of whom were idiots; but who, after an attack of what is called moulder's asthma, rigidly abstained from stimulants, and was rewarded by having three children of strong and sound mind. We must not be tempted, in order to point a moral to wander into ethical regions, but we are necessitated to show the vast breadth of basis from which the group of diseases with which we are dealing take their rise. Neither the etiology, nor management of these affections, can be understood unless we survey the extent of the abuse of drinking customs, the connection between intoxication and offences against the law, that habits of intemperance are increasing, *pari passu*, with the rise of wages and the shortened hours of toil, that the disease, or vice, has gravitated from the higher to the lower ranks, although it still lingers in the former (Dr. Forbes Winslow, p. 75); that our asylums and jails are crowded with those who have been ostracised by their errors, and are now suffering the ruin, or the punishment, which such errors entail. It would appear, according to Dr. Crichton Browne, that there were in 1870 38,441 classed as habitual drunkards; according to Major Greig there were 21,113 cases of drunkenness in Liverpool in 1870; according to Mr. Wetherell, chief constable, Leeds, there were in the same year 1,940 charges of drunkenness in that town; according to Mr. Webster, governor of the prison, Kingston-upon-Hull, in 1861 the convictions for all offences were 1,683, of which 511 were for drunkenness and rioting, and in 1871 there were 2,025 convictions for all offences, of which 1,024 were for drunkenness and rioting; and we learn from Dr. Parrish, p. 163, of the alarming increase in the number of arrests for drunkenness in Boston, Mass., a State in which legal restrictions prevail, as proved by the fact that, during the last 17 years, of the 400,000 arrests, 225,000 were for drunkenness, besides some 28,000 helped home for drunkenness, to say nothing of 23,000 assaults. If to these statistics be added the uncalculated, and we fear incalculable, number of cases of intemperance in various degrees and forms which have not called for legal interference, the amount of social and secret indulgence, no surprise need be felt when Dr. Crichton Browne estimates the proportion of patients coming under his own charge, whose insanity is directly due to drunkenness, at 15 per cent., while a large number are indirectly affected by the same cause; that Dr. Skae, from an examination of all cases admitted into Morningside during thirty years, has come to the conclusion that the ratio is 16 per cent.

of males, 7 per cent. of females, or 11½ per cent. of both sexes; that Mr. Mould, of Cheadle, but speaking chiefly of Lancashire, gives the same ratios; that Commissioner Mitchell states that, of the cases of insanity reported to the Board of Lunacy, Scotland, in 1871, in which the cause was stated, 19 per cent. were attributed to intemperance; that Dr. Kirkbride, of the Pennsylvanian Hospital, Philadelphia, reports, that of 5,796 patients received since the opening of the establishmcnt, 446 became insane from intemperance.

A glance at these facts was required, not solely because drinking and drunkenness are the most prolific factors of the mental conditions under consideration, but because drinking and drunkenness are the stages during which intervention and remedial measures are most available, and afford the greatest promise of success. Such measures, multiform though they have been, may all be arranged under one category, that of prevention. One gentle optimist, adopting the same text as the churchmen, in the face of hereditary transmission, of the innate deterioration of structure from inscrutable causes, and of the turbid and turbulent passions by which such a population as ours is agitated, and even urged forward to great resolves and achievements, rests upon the hope that education, and especially instruction in physiology, or the laws which regulate human health, may lead to self-restraint and abstinence. Such an attempt has been made in America, even in the training of females, but according to Dr. Parrish with little benefit. Until the fruition of that system of compulsory and competitive cultivation at present encouraged in Britain be arrived at, no opinion need be pronounced upon this point. Another, and a far more catholic scheme, has been carried out in the United States, and has been proposed in Britain, under which the sale of intoxicating liquors, or of those of the most deleterious nature, should be prohibited; and that, by various kinds of social machinery, access to stimulants should be rendered difficult, interfered with, or entirely cut off. We have ever regarded teetotallers, good templars, &c., with respect, although, in our opinion, they represent merely the sober portion of the community, and that portion which would have been sober had there been no vows, no pledges, no processions; and we consequently share in what must be their disappointment, that the Maine Law, Permissive Bills, Option Bills, &c., have been tried and found wanting, that their operation has been designated, even by friends and advocates, "a muddle, a failure;" and that either through the inefficacy, or evasion, or bold violation, of these checks, drunkenness is on the increase, even where they have been incorporated with the law of the land.

Mr. Dalrymple, the benevolent originator of the inquiry as to the disposal of habitual drunkards, acknowledges in his evidence that, notwithstanding the stringent enactments in the United States, with the view to impede access to stimulants, "if he may judge from the number of drunkards he saw, these have no effect," and he did not introduce any tantamount restriction into the Bill of which he was the author. Impressed by previous experience, and distrustful as to the power of short sentence of small or even large or cumulative fines to restrain a morbid craving, it has been proposed that all persons who have been thrice (at the very point where Charlemagne inflicted death for the same offence) convicted of drunkenness before a magistrate, shall be confined to a reformatory possessing no punitive or penitential but a curative character, and there be confined until the uncontrollable impulse shall have ceased, and the inmate shall be certified as restored to sanity and self-control. This institution may be connected but not identified with a prison, a workhouse, or an asylum, shall be under some public inspection and regulation; shall have for its great objects detention, abstinence, occupation, moral impressions; and shall, therapeutically, impose such labour as may maintain the inmates, and even contribute to the support of their friends and families, and thus to the relief of the ratepayers. We conceive that we may become over-sensitive and sympathising towards such corrupt communities, considering the materials of which they are composed, considering that many of them have invited, cultivated, the ruin to which they are reduced, that many are voluntary hybrids between vice and disease, that reform and restoration should be the objects in view, irrespective of the pain or humiliation which the process may necessitate.

Moreover, we suspect that the expectations of self-support have been encouraged in forgetfulness that the members of the reformatories thus shadowed forth are at first reduced in bodily vigour, are, in the opinion of Mr. Smith, governor of the prison of Ripon, weak in intellect, and in that of Mr. Webster, of Hull Prison, they are positively insane, or with minds weakened by indulgence, or of the same calibre or grade as those of the criminal class; that they are idle and indolent by temperament and habit; that they have blotted out that honest pride and dignity which impels an Englishman to work for himself, and that loyal and filial affection and kindness which induce him to work for others. Certain doctrinaires have, accordingly, urged that, in addition to employment and other means, there should be introduced into such compulsory retreats the practice, formerly prevalent in Denmark, &c., of condemning drunken soldiers to seclusion, where they were fed to surfeit and sickness on

stimulants until utter disgust, repugnance, and repentance ensued.

When an individual passes from the dominion of judgment and volition to become the sport of a mere animal and dangerous instinct, or where physicians like Sir Robert Christison have the courage and consistency to certificate him as a dypsomaniac, he is placed, very much to his own benefit, but certainly not to that of his companions, in a lunatic asylum. The same step may be taken, in Scotland, by the application of the patient to the Board of Lunacy for permission to enter an asylum as a voluntary, the place and duration of seclusion being left to the petitioner. Dr. Skae, entertaining a wholesome doubt of the utility of such an arrangement, refused to receive any one belonging to the latter class, and wherever they have been admitted evil has ensued. They are to a great degree independent of authority; they may introduce stimulants within the precincts, as has taken place, even in the American hospitals for inebriates; they seek and find ample opportunities for indulgence when on parole, as has likewise happened in America, they bring disgrace and difficulty upon their guardians, and suggest invidious comparisons, and estrangement, and enmity to their co-captives, by their privileges and by the abuse of these privileges. We have distinct proof of the ease with which insane drunkards are converted into criminals by association and by the greater force of character of members of that class, we have the testimony of Dr. Parrish, that the vicious, wicked, vice-bred, and vindictive spirit of a class whom he designates incorrigibles, disturb the harmony and movement of retreats for inebriates, where, notwithstanding the untruthfulness and loss of moral sense and self-respect, known to be characteristic of dypsomaniacs, the population is said to be marked by good humour and unanimity; and we have been convinced by personal knowledge that, in whatever capacity and in whatever name they come, dypsomaniacs are unsuited for the ordinary wards of a lunatic asylum. They lower the tone of all around them, they positively corrupt the innocent and virtuous, and are, when congregated together, much more likely to influence each other than to be influenced by monomaniacs and melancholics with whom they may be in contact.

It will be noted that all the provisions detailed hitherto have been in favour of those who have come under the ban or the protection of the law; but there is a very large class of persons who require and desire treatment, or for whom treatment is desired by friends or guardians, and for these special sanitaria or retreats are recommended by Drs. Peddie, Browne, Mould, Commissioner Mitchell, Drs. Parrish and Dodge.

Although differing in opinion as to the size and situation, the precise mode of government and inspection, and on other particulars, these parties all concur in advising that these houses should be left to private enterprise for affluent patients, but should be endowed and supported for the poorer classes, partly by national and partly by local rates; that while they may be managed by magistrates, directors, or incorporated committees, as the case may be, they should be frequently visited and examined by local as well as general commissioners, such as of the boards of lunacy—1st, that the patients should be admitted when committed before a court of summary jurisdiction; or, 2nd, under a sheriff's warrant, having appeared before a jury, the time of detention to be mentioned in the order; or, 3rd, according to some modification of the Canadian Act, by which the person and property of an habitual drunkard may be placed under control and tutorship, upon application on oath by a relation or guardian, to one of the judges of the superior courts, to the effect that the individual drinks to excess, and to the injury of his health, squanders or mismanages his property, and acts detrimentally to his own interests and those of his family; or, according to the process pursued in America, where a committee of person and estate is appointed by a judge, after receiving the verdict of a jury, who have heard evidence in private chambers, as to the conduct of the drunkard; 4th, that the whole management shall be medical, moral, curative; that the detention shall not be less than twelve months, and shall be prolonged if expedient and that as much liberty shall be conceded as may be safe; that after the expiry of a certain period parole shall be granted, and even the possession of money, in order to test the recuperation of the power to resist temptation; and, 5th, that all means of occupation, amusement, religious and moral re-education, shall be provided, as may be calculated to restore sanity and self-command.

It is obvious that this project, timidly and tentatively advanced by many of its advocates, is a well-devised and well-constructed extension of various experiments, which are or have been proposed or are in operation, but all of which are destitute of that legal power to receive and to retain for periods sufficiently prolonged to secure recovery or amelioration. These experiments have principally consisted in rusticating drunkards or dypsomaniacs with farmers, where they were supposed to be provided with a sufficient amount of comfort as members of the family, where they were protected from their own instincts and temptation, where field operations conduced to the re-establishment of that physical tone conceived to be coincident with moral purity and steadiness of purpose. 2. The domestication of this

class with clergymen, medical practitioners, &c., are expedients very generally resorted to, where the professional skill, or, at all events, the education, character, and influence of the host were added to the benefits which accrue from country life and occupations. 3. Many of these private enterprises were conducted on islands on the West coast of Scotland, and even Iona, sacred to piety and patriotism, became a compulsory but not an ascetic home for inebriates. 4. Where members of this class were associated in groups under the management of the proprietor of the house, whatever his trade might be, with or without the knowledge and visitation of public officers and medical men. 5. It has been romantically proposed that a village should be appropriated to inebriates, who were to live under suitable guardians, lay or medical, enjoy rational liberty, and be subjected to treatment. The plan is evidently the offspring of the exaggerated accounts of Gheel, and no such Utopia has existed, or, we anticipate, ever will exist. 6. Where the sanitarium has been assimilated to a penitentiary, such as the Queensberry House of Refuge, Edinburgh. This very anomalous community is described by its critics, Dr. Crichton Browne, "as a total failure," and Dr. Peddie, as "contrary to law, as having done good, but might have done more good could the period of legal detention be extended;" Commissioner Mitchell, "as containing lunatics and dypsomaniacs whose liberty of action was not above suspicion;" is described by the governor, Mr. Nelson, "as having about 300 inhabitants, crippled in mind, body, or estate, 250 of whom have been, and many still are, drunkards as they may, and do abuse the privilege of parole, and become intoxicated when beyond the walls; as being under the guidance and governance of members of their own class, as being free to go or remain at will, as being apparently under no other treatment than what temporary seclusion may supply." 7. The homes or hospitals in America which have been constituted for the reception of inebriates, whether they enter voluntarily or are committed under a process at law, and which may be regarded as in some measure national or state institutions, sometimes obtaining contributions from public funds, but more frequently supported by private donations and the boards of the inmates. The majority of the latter are under the superintendence of medical men, who all complain that they do not possess the power of detention over the greater and more curable number of their patients, and that their efforts are to a great degree rendered nugatory by the brief sojourn of the patients under their care, and by the confirmed character of the maladies which they are called upon to deal with. In some of these institutions therapeutic treatment is resorted to.

Alcohol, Cayenne pepper, opium, chloral, and bromide of potassium are exhibited during the physical prostration and moral collapse which follow excess, and alteratives and tonics are given according to the subsequent condition and symptoms of the constitution; but the principal reliance is placed upon an abundant, even a luxurious dietary, as dypsomaniacs are "large eaters;" upon the avocations and social recreations to which cultivated men are accustomed; upon reading, literary inquiries, and discussion; upon the latitude conceded, which enables selected patients to participate in extra-mural society, or even to engage in their ordinary business; upon the probationary tests and trials to which they may be subjected; and, above all, upon the duration of the detention, so that sufficient time may be allowed for "their coming to themselves again," for the poison to be neutralized, and the judgment to regain a correct knowledge of their real condition. They are, in fact, comfortable correctional club-houses with a medical officer attached.

This is now, perhaps, the suitable point when it may be inquired what has been accomplished by any, or by all of these experiments. We fully concur with our medical brethren, whose evidence we have analysed, that it would be vain to expect very satisfactory or permanent results from the brief periods of days, weeks, months, during which treatment of any kind is permitted to be carried into effect. Even when eradication of the disease may be hopeless, such places of retirement have these advantages. They may preserve life and reason for the time being; they may arrest or ward off delirium tremens, other forms of mental disease and structural change; they secure, during their continuance, and occasionally for a season beyond, comparative sanity, health, and happiness to the individual, and afford great relief to relatives, guardians, &c.; they place the patient in those circumstances, which are, so far as we know, most favorable to recovery, mitigation, or reformation; in certain cases they present the only accessible protection against continued suspension of the moral sense, even of consciousness, against deterioration and sudden death; but this enumeration appears to us to exhaust the benefits which have been achieved in this country, or can be expected. With one witness, we believe "that all remedial measures have as yet been futile;" with another, "that very few dypsomaniacs recover, because they return to their former habits;" with a third, that "after many years an habitual drunkard is never known to be recovered;" and with a fourth, "that perfect and permanent cures are certainly very rare;" and our own experience has convinced us, that dypsomania and its cognate affections are the most intract-

able and incurable of mental diseases, for of hundreds of patients thus affected whom we have treated, or who have been treated in asylum retreats, or in their own homes, we cannot point to above two or three radical cures. But the shield has a brighter side; Mr. Mould, of Cheadle, who has during the last ten years had 120 voluntary patients of this class, and who, under an indemnity from friends, has detained them, so long as the law of humanity seemed to justify, irrespective of the laws of the land, has obtained 7 per cent. of cures; Dr. Paterson, of Adelaide Asylum, of 14 cases of alcoholic mania sent out 9, cured after a residence of 14 days; while Mr. Dalrymple, and Drs. Parrish and Dodge, quote 34, even 50, per cent. of cures as effected in America. But this is a modest estimate compared with that of Dr. Day and others, who claim 60 per cent., and even a higher rate, as the result of their treatment. (Cited No. 93, vol. 47, of this Journal, January, 1871.) It would be as reasonable to accept the cessation of a fit of gout, or of intermittent fevers, or of epilepsy, as to adduce the disappearance of drunkenness and delirium as equivalent to the cure of dypsomania, and we cannot, accordingly, regard an interval of fourteen days as a sufficient guarantee for subsequent continued sanity and sobriety. We recollect the monody of an antiquated superintendent, over the death of A. M—, as she had regularly twelve relapses of paroxysmal mania in a year, and "stood good for twelve recoveries in the books of the asylum." Yet it is only fair to state that some of the cures described by Drs. Parrish and Dodge have been ascertained subsequently to the dismissal of the patient, by correspondence with himself, friends, guardians, &c., and by public report; and we can only account for the extraordinary contrast and discrepancy between the results of treatment on the two sides of the Atlantic, on the supposition that the diagnosis as to what constitutes dypsomania and the estimate of what constitutes recoveries, or the success of treatment, are totally different in the two countries, or that, like Esquirol's three cases of restoration in 475 of general paralysis, "the patients have passed beyond the sphere of observation." This favorable construction is not, however, attached to these statistics by certain psychologists, for we find Mr. Dalrymple, p. 81, quoting Dr. Kirkbride, of the Pennsylvania Asylum, Philadelphia, and Dr. Ray, two of the most distinguished of the number, "throwing grave doubts upon the permanency and reality of many of the so-called cures; they said, that "those connected with inebriate reformatories dealt in general assertions and flourishes, which diminished greatly when closely examined."

The American publications upon our table are interesting, in so far as they announce the inauguration of a society similar to

that of the medical officers connected with asylums, which is to deal with all matters connected with the care and cure of intemperance. It consists of the officials connected with retreats for inebriates, physicians, clergymen, magistrates, and those engaged in philanthropic undertakings and objects. Besides the minutes of annual meetings, these pamphlets contain in all thirty-eight essays embracing every possible topic, ranging from tables of statistics to the evidence before our parliamentary committee which bear upon the subject. Many of the essays are of considerable merit, but they do not add materially to the very copious observations made by Drs. Parrish and Dodge in the United States in 1872, although they indicate a new phase of controversy as to whether intemperance should be regarded as a disease, or a sin, waged apparently between medical and moral reformers, and upon a question which must have a twofold solution. The contributors unanimously express their conviction in the curability of the depraved and morbid habit, and adhere to the proportion of recoveries given above.

III.—On Megrim, Sick Headache, and some Allied Disorders.[1]

Of recent times it has been said, and said not unreasonably, that medical literature is not what it was in the last generation, and that it is, in fact, deteriorating from year to year. By this is not meant that there is less good work done in the profession,—for more is done in the way of successful special work than at any previous period of our history,—but rather that our work is fragmentary, and has not that unity of conception, that maturity, and that contemplative quality which is required to make a literature.

Papers published here and there in the periodical press, however effective or remarkable they may be from any special point of view, are not literature; nor do such essays, when collected by their authors, make up into volumes claiming any serious literary judgment, unless, as rarely happens, they fall into a natural group, and show something more in their treatment than scientific ability or accuracy.

To inquire how this is—how it is that modern work is not literary, while much of that of our fathers can claim this distinction—would lead us farther than we are at liberty to wander; but we may shortly point out two or three qualities which are notes of literary excellence, and which are present

[1] *On Megrim, Sick Headache, and some Allied Disorders.* By Edward Liveing, M.D. Cantab. London, 1873.

more often in the works of our fathers than in our own. Maturity is one of these, a ripeness which tells plainly that the work is not forced, but has grown leisurely with the seasons, well proportioned in its parts, and sound in its construction. Another of these qualities is breadth, that largeness of view which comes of wide and liberal culture, and which gives colour to the perfected form. Such qualities as these can be had only under certain conditions, and they are, in a sense, independent of the substantial value of the work itself taken in the narrowest sense of its value. Many a book has these literary qualities which is empty enough of any other virtue, and many another has a rude and ill-compacted strength of constitution which owes no grace to art. The conditions requisite for the literary qualities which may be expressed as maturity and breadth are leisure and a liberal education, and it is too easy to say, and to act upon the saying, that these conditions are too hard, and that the result is not worth the expenditure—the play not worth the candle. The forced education of modern physicians, and the neglect of the humaner arts which comes of haste and competition, denies to them that grace which a more generous culture alone can give, and the same causes compel them into the world of print, if not of letters, before their subject matter has assumed that form and consistence of parts with which long cerebration can alone endow it. It is to be regretted not only that universities of modern foundation tend to encourage this neglect of form and maturity, but that the old seats of learning have not, of late years, been wholly free from some meretricious desire to compete with the former in their preference of cheap success to patient scholarship. Still, if Oxford and Cambridge have yielded in some degree to the pressure of their age, it is to them, even yet, that we look for anything like finished work, nor do we look wholly in vain as is well shown in the treatise now before us. Dr. Liveing's treatise is one which has distinctively the literary quality, not over and above the scientific but incorporated with it, the one inter-penetrating the other so as to produce not only a work of acuteness and accuracy, but one which is thoroughly conceived, well expressed and enriched with various culture. Such a treatise is a literary effort and a literary success, and as such is not merely valuable as material for contemporary workers, but will probably survive as a permanent classic. The scholarly instinct which is manifest in Dr. Liveing's writing perhaps led him also to the choice of his subject, one which admitted of classical treatment better than many another would have done. Migraine is a subject upon which a thoughtful and instructed observer might well hope to say, if not the last

word, at any rate so much, and that much so completely, as to secure for his treatise a permanent place.

Migraine is a subject which has been extensively discussed from every possible point of view, and does not depend so exclusively, as do many others, upon that minute anatomy which advances too rapidly to give us a firm standing ground; it is one of those clinical subjects which have always lent themselves so well to literary treatment, and, while limited enough for singleness and simplicity of motive, it has relations wide enough to give occasion to almost any largeness of handling.

In Dr. Liveing's hands the work takes these proportions, and his treatise on 'Migraine' becomes, as he says in his title-page, a contribution to the pathology of nerve storms. We wish he had said to the theory or law of nerve storms, for, as he expressly points out in his latter pages, those movements which in their excess or ill-regulation we may call nerve storms, have, nevertheless, the character of the movements of nerve tissue both in health and disease. There was great room for a masterly handing of phenomena which modern physiologists have shown to belong to a like order with those physical phenomena which have received so complete an interpretation in the modern doctrines of conversion and conservation of force. That the molecular and massive movements in living beings are identical in nature with those of the physical world, that they are mutually convertible with these, and that like them they obey the laws of tension and energy, are facts which have not only been recognised by eminent thinkers, but which have grown almost suddenly into commonplaces. Still, no one, I think, in the clinical domain had taken up his text to apply this knowledge in any broad and familiar form, so that Dr. Liveing, with migraine as his text and the laws of equilibrium as his discourse, has put all nervous actions in such a light that they shall henceforth have no excuse who may deal with them in empirical or fragmentary ways. The arrangement of Dr. Liveing's book is as follows: he first of all justifies his use of the word megrim, defines it and illustrates it. He then, in his second chapter, describes the general features of the disorder, its habits and its conditions. The third chapter sets forth the phenomena of the disorder, and in the fourth he traces its affinities. We then come to the chapter on the pathology of megrim, in which the author deals with previous hypotheses, pronounces judgment upon these and proposes his own views. Chapter the sixth is headed "Symptomatic Megrim," and in its position seems to me to be the least happy of the parts; there is nothing in it which can be spared but the distribution should be somewhat otherwise. The term symp-

tomatic megrim is open to much objection as being either incorrect or platitudinous, and it leads to the discussion of the inferential complaint named "gouty megrim" apart from the chapter on affinities to which it wholly belongs.

The seventh and last chapter is concerned with the treatment of the affection which in the previous chapters has been so thoroughly and judiciously expounded. Nor is this all. The author finds place in an appendix for certain extracts which are useful to the reader; he gives also a synoptical table of cases, and he does not forget to add an index—that modest but valuable part too often forgotten. When we declare, after careful and repeated perusal of this well-designed treatise that it is adequately carried out in all its parts, that these parts are fitly related to each other and to the whole, and that everywhere we find scholarly language and pregnant meaning, the reader will agree with us that such a work will have a likely claim to the place of a permanent medical classic.

This being the case it ceases to be the duty of a reviewer to quote largely from pages which will find a place in every library; we may say, however, that the author finds a specific identity in all those headaches and sensory disorders which have been previously called megrim, sick headache, blind headache, bilious headache, hemicrania, suffusio dimidians and the like. These are either partial and complementary terms or but synonymous, and the partial or complete groups of phenomena which they severally indicate are really identical in nature. What these phenomena are, and how variously they have been interpreted, is, of course, well known to many others besides the members of the medical profession. In Dr. Liveing's opinion they all belong to the region of simple neurosis, and are not essentially dependent upon antecedent disorders in the liver, stomach, uterus or other viscera, although their recurrence may, of course, be modified in time or degree by eccentric interference.

The next question Dr. Liveing has to decide is the kind or mode of neurosis to which megrim and its allied phenomena belong. That megrim is a neurosis has long been held, and chiefly by Dubois Reymond, by Marshall Hall, by Piorry, by Brown-Séquard, by Parry, by Möllendorff in some papers lately published in Virchow's 'Archives' and by Anstie. All these writers agree in classing megrim among the neuroses, but differ in their interpretations of the kind of failure which it signifies. The outcome of Dr. Liveing's careful and impartial survey of the various neurotic doctrines is that there are two main hypotheses which divide opinion at the present time, namely, the vaso-motor hypothesis as somewhat variously given by such writers as Dubois Reymond and Möllendorff, and the nerve-

storm hypothesis which is preferred by Dr. Liveing himself, and which, I think, has been urged in a form substantially the same by Dr. Anstie. I would take this occasion of saying, moreover, that although Dr. Hughlings Jackson has not entered the lists in respect of megrim, yet there is no writer, perhaps, to whom the nerve-storm hypothesis, as applied to other states, owes more in the way of interpretation and of iteration than to him. As regards the vaso-motor hypothesis we have had to say repeatedly in this Review that the field of vaso-motor pathology is at present the favourite exercise-ground of medical obscurantists and sciolists. An all-pervading and hidden agency which may explain anything, and does, therefore, explain everything, is a welcome refuge for reasoners who have been driven by the accuracy of modern fire from all their more exposed positions; and how invaluable it is to them we may read from the papers of Benedikt down to those of Eulenburg and Guttmann which have lately come into our hands.

Dr. Liveing, to whom plausible and intangible arguments are distasteful, takes the surer method of comparing migraine with other neuroses, and of tracing its affinities, not to these only but also to similar nervous processes which occur under the conditions of health—that is, of stable equilibrium—and having done so he finds in them common elements of accumulation and discharge, of intermission and periodicity. As in epilepsy, in asthma, in nocturnal incontinences; as, again, in sneezing, laughter, sobbing and other emotional acts—in all these we find the characters of accumulation during a period of rest, and of maximum tension with paroxysmal discharge when tension is resolved into energy. By legitimate reasoning Dr. Liveing assumes that these similar events have similar modes and own a similarity of causation. In megrim, particularly, he finds phenomena which are explicable on a hypothesis of accumulation, of maximum tension and of discharge in some groups of nerve-cells as yet undetermined. That in megrim this instability is morbid, while in other functions, such as the sexual for example, it is or may be healthy, is merely our way of regarding the usefulness of the result; the processes are identical.

When we call certain explosive paroxysms healthy or morbid, useful or injurious, we open out a still higher inquiry. We admit that instability of this kind is not essential, is not inherent in all nerve-cells, at any rate so far as outward manifestations are concerned. To take a marked instance, the sexual act is healthy or not as we choose to make it. In spite of that pseudo-physiology which forgets or eliminates psychological factors, we may say at once that the sexual act is unhealthy in so far as it is anti-social. In other words, stability of its govern-

ing centres is good at one time, and irritability at another. Yet as, under all circumstances, force must accumulate and tension must gather, how are we to account for the fact that this tension may or not find outward resolution, and that continence and incontinence have equally to be explained as wholesome phenomena according as they are seen in different persons or in the changing social conditions of the same persons? There can be little doubt that the difference cannot consist in altered local activity alone; it must consist in an altered subordination of the local activities to more complex centres, so that superior centres, which have relations to more complex outward conditions are in fact, inhibitory of centres below them, of centres that is, which are concerned with actions and conditions of lesser degrees of complexity. Social health, therefore, like physical health, depends on a due subordination of lower groups of nerve-cells to higher, and this co-ordination may become in-co-ordinate by lack of control anywhere between the centres whose instability is directly manifested, and those whose inhibitory weakness is manifested indirectly.

In making these reflections I would guard my meaning against the apparent meaning of those who too often seem to use the term inhibition, as applied to a higher centre, in the sense of an annihilation of force, whereas it does in truth refer to and must be made to mean a diversion of force in other directions. A healthy continent man does not mean one who betakes himself to the distaff, but one in whom virility, still normal and active, finds its outcome in less immediate gratification. The reader will see the bearing of these remarks, which space prevents our pursuing at any length. I will only allude to an application of them which Dr. Liveing scarcely seems to me to have fully realised. From what has gone before, there is a marked difference between a centre which, by loss of commissural connection with higher centres or by loss of governance in such higher centres, is left to expend its own forces in immediate profusion, becoming itself thereby certainly not the less, and possibly the greater by hypertrophy, and one which, failing in itself, may be said rather to have the worm at its root. My own opinion is that some facts such as the connection of neuralgia and epilepsy with insanity, seem to discountenance Dr. Anstie's hypothesis of atrophy, and to point rather to a loss of control from above. The atrophy has to be sought in a higher region. The well-known conversions of neuroses seem also to point in the same direction. These points at least are certain, if the consent of good observers can make them certain, first, that migraine has a remarkable value as a test of the neurotic habit in all its forms, and it is more easy to suppose that neurotics

are such in virtue of defective control than that they all have a common weak point in the floor of the fourth ventricle; and, secondly, that migraine and trigeminal neuralgia are most commonly caused or aggravated in such persons by strains which more directly implicate the cerebrum. The irritability of the bladder so often seen in cerebral exhaustion is a good instance of an organ which, by loss of cerebral control, is abandoned to the play of reflex activity.

The marvellous value of heredity as a test or organon of pathological reasoning is more and more revealed to us in such a work as the present. As for the zoologist, so for us, heredity is the true key to classification, and until this is thoroughly seen no classification will be founded on abiding and intelligible principles. This I have ventured to urge for many years, and have seen with surprise how little nosologists even now will attempt to frame their classifications upon such a basis. No question has more of the interest which belongs to the detection of an important and half-concealed truth than that of the kinship of gout to migraine. This kinship is one which was forced upon me long ago by experience of their concurrence in more than one of my own friends, and of late years the growing belief of the neurotic origin of gout, and the connection of both gout and migraine with changes in the abdominal viscera, with a loss of harmony, that is, between the regulative and the industrial parts of the system, has enabled me fully to realise the force of Dr. Liveing's remarks on page 404, where he says—

"There can be no question, then, I think, as to the frequent connection of megrim, whether in its blind, sick or simply hemicranial forms, with a gouty diathesis, and its occasional replacement by fits of regular gout. Megrim, however, is far from being the only neurosis which is thus associated with gout; a similar connection may be traced in the cases of asthma, angina pectoris, gastralgic paroxysms and certain forms of transient mental derangement. The consideration suggests an interesting inquiry as to the nature of the relationship between these various neuroses and regular gout." (*Vide* also p. 247.)

As I have said in another periodical, the connection of visceral with definitely nervous disorders in migraine and also in gout must not be overlooked in our new sense of the pre-eminence of the latter. Dr. Liveing, while he reports cases in which jaundice has accompanied migraine—cases which have been reported also by myself and others—scarcely gives full weight to the other phenomena of the same kind. It is certainly true that fulness of the liver may be found by him who looks for it during the attack, in a very large number of migrainous cases, especially in those who are touched also with gout,

and this is a significant fact. Moreover, jaundice is probably a more common event in migraine than Dr. Liveing is disposed to admit. Again, Dr. Liveing is hasty in his scepticism as to the "biliousness" from which migrainous patients are said to suffer.

He says the word is one derived from the humeral pathology which still survives in the nursery, and that no two patients will agree in the meaning they attribute to it. Now, allowance being made for the inability of lay persons to express physiological facts in accurate language, I venture here distinctly to differ from the author. However loosely patients may put it, they show a remarkable consent in this, that they cannot digest fats, or, at any rate, that fats, digested or undigested, disagree with them, and that by biliousness they mean this fear or this experience of the consequences of eating fatty foods, and cooked fats more especially.

Dr. Anstie's argument, that the inability to digest fats is due to the bad medical treatment of their earlier days, is more ingenious than satisfactory. This misfortune could only account for a few cases, whereas the so-called biliousness is undoubtedly a character of the whole class. I have many examples of this kind carefully noted, and find that in persons whose insides have not been irritated by injudicious medication, a small dose of fat, even such fat as pancreatic emulsion, will set up nausea, dizziness and other distressing head symptoms, and that this incapacity afflicts whole families of such people, varying as the degree of neurosis. I am satisfied that this dyspepsia, whether primary or secondary, is an essential factor, and it may be a main cause of nerve starvation. Again, the nutrition of neurotics is rarely normal; they are either spare, or have that fatness which belongs to inactive oxidation; they very rarely have well-knit frames, firm muscles and proper endowment of healthy adiposity. Before leaving the bilious question I would refer to a mark of migraine, and sometimes of other neuroses, not mentioned by Dr. Liveing, which is constantly mistaken for jaundice, but which has no connection with it—I refer to a tanning of the skin of the face, and sometimes of the neck and breast also. It closely resembles sunburning, and this the more as it often ends upon the forehead and temples with a sharp outline, as if corresponding to the hat or bonnet. A little care, however, will show that this correspondence is but apparent, and that the tan marks increase and subside with the state of the health. The dark rings under the eyes are probably of a like nature.

With respect to the cases of "laryngeal epilepsy" described

at p. 217 I may add that a gentleman called upon me a few weeks ago with precisely the symptoms given by Dr. Liveing in the case of Mr. A—. The attacks always occur during sleep in my patient, Mr. S—, whether this be the sleep of night or an after-dinner nap. Like Mr. A— he will suddenly jump up, clutch at his neck and struggle for breath until the spasm relax, when he will gradually become tranquil and pass again into sleep. The recurrence of the attacks in Mr. S— is very uncertain; he may have several consecutively, or intervals longer or shorter may intervene. The fear of an attack, however, was so spoiling his rest that he went to several medical men for advice, and had undergone very various treatment, chiefly of a topical kind. A laryngeal examination, however, showed perfectly healthy parts, and, suspecting the epileptic character of the paroxysms, I put him upon bromide of potassium with complete success; while taking moderate doses of this drug he never has an attack, but they tend to return as soon as he omits the drug. Mr. S— is a big and strong man, but had migraine in younger life, and comes of a decidedly neurotic stock. I would now pass on to another important reflection to which we are led by the perusal of Dr. Liveing's exhaustive analysis of the symptoms belonging to migraine. It may be asked if hemiopia, dizziness, tingling and so forth are signs of migrainous conditions, what are the extreme limits within which we are justified in making a diagnosis of such a state? Taking the lesser manifestations first, it is very important for us to recognise these when accompanied by cephalic pain.

I drew up for one of the meetings of the Yorkshire Branch of the British Medical Association a number of cases of recurrent dizziness, quite dissociated from headache, but sometimes, when extreme, accompanied by vomiting. I suggested that these were cases of larval migraine, but my explanation of them was not published with the records. In a review of my cases in the 'London Medical Record,' Dr. Bradbury did, however, pronounce very decidedly that these cases are of the nature of migraine, as I also had supposed. Now, it is most important to be able to assure sufferers from this alarming malady that it is one which is fraught with no more danger to life than a sick headache, for dizziness often comes on in the later life of those who had migraine when younger, comes on, that is, at a time when cerebral symptoms are viewed with growing uneasiness. Take, again, the case of a lady who consulted me in much trepidation for tinglings which would come on suddenly all over her body and drive her nearly wild, so that she would have to rush upstairs and tear off her clothing from sheer cutaneous intolerance. Fortunately I had then under my care

another lady in whom sick headaches are preceded not only by an hour's blindness, but also by general tingling of a more moderate kind. This case I told to the former patient as the only help to an explanation I could give her. Five weeks later one of these attacks of tingling and intolerance of clothing was followed by the most distressing migraine I ever witnessed, which lasted two days and a half. This patient is a highly nervous person, but had not been very subject to sick headache before.

Again, I remember being much disconcerted by the occurrence of hemiopia in my own person about fifteen years ago. I was then scarcely aware of its relation to migraine and feared some serious bodily calamity. On inquiry I came across the proper history of the symptoms, and have disregarded my few subsequent attacks. My father had migraine severely up to middle life, but myself am and have been wholly free from any form of headache. Take vomiting again. How many of us are acquainted with nervous patients who have periodical attacks of vomiting which own no obvious cause; are not these very probably to be referred to partial migraine? So much for the limits of variation on the side of partial or milder phenomena, but to know what these limits are in the direction of severity is even more important. Take the following:—A gentleman was seized suddenly, first with blindness, of which he complained, then in a few minutes he became aphasic, in a few minutes more he was hemiplegic of the right arm and leg, and perhaps slightly unconscious for a brief interval. Then he vomited freely and when I saw him had practically recovered. After an anxious consultation his medical attendant and myself ventured to hope that the attack might belong to the migrainous species, though there was no headache. We based this on the rapid recovery, on his well-marked neurotic habit and on the history of overwork and anxiety. We were probably right; the attacks have recurred some dozens of times in the last five years, and in varying degrees, but have been much reduced in frequency and severity by appropriate medical and other treatment.

Again, before I left home for my holiday in the summer of 1873, I was most urgently called, with one of my colleagues, to see a lady, about forty years of age, under the following circumstances. She has been subject to migraine for many years. On a Saturday she had complained, as usual, of a bad "bilious attack." This lasted during the Sunday, when she was very sick, but she was able to walk from one room to another and to give a few orders to a servant. On the Sunday evening, however, when her husband and family expected her to recover as usual, she gradually became lethargic. When I saw her on the Monday she could only be roused with great difficulty, and

this to a very small extent. She could not or would not put out her tongue; she was completely paralysed on the right side, and her eyes presented a conjugate deviation to the left. On the Tuesday she was much the same, save that she showed some signs of returning consciousness, and my colleague and myself were constrained to give the opinion that the case was one of encephalic hæmorrhage. On the Thursday I met her husband by chance, and he said she seemed better, but we had a long talk about her apparently sad prospect. She was a lady of great accomplishments, and her right hand was almost her life to her, but I begged her husband to let things alone, and to avoid any active interference, such as faradism, until he had full leave from his advisers. I then left home for a month. On my return one of the first patients who walked into my consulting room was Mrs. — who entered briskly, smiling and holding out her right hand, which I shook warmly. It was perfectly restored, and she was not only quite well, but very soon after her attack she was using her fingers for the finest art work. A few days then had completed her recovery from a state which certainly seemed desperate, a state, however, which immediately followed a distinct attack of migraine. She had not only been subject to migraine for many years, but twice or thrice in her adult life she had been suddenly struck with aphasia, which, although rather severe at the time, had passed away in a few hours or less. These two cases, and some others of less severity which I have seen, would seem to associate migraine with loss of controlling power in the anterior part of the left hemisphere (*vide* Liveing, p. 96). If subsequent inquiries can prove to us that migraine can put on so grave a form as we have hinted, we cannot make these facts too widely known (*vide* Liveing, p. 221). The dizziness to which I have already referred as a cognate symptom, may often attain to very alarming proportions From a transient dizziness, which may cause but a momentary interruption, to a complete bouleversement there is every gradation.

A distinguished churchman lately complained to me of such a transient vertigo, which would seize him from time to time not respecting him even when in the pulpit: for a moment he is confused, he makes a strong effort, the giddiness diminishes and he is safe. Up to middle life he suffered from migraine in the usual form, now he never has it. Compare this with the state of a clergyman whom I once saw, who comes of a highly nervous stock, who had migraine intensely up to middle life and in whom the migraine then gave way to vertigo. He would be seized with irresistible dizziness, which would hurl him off his feet on to the floor, where he would lie for an hour or two

dreading removal. The least attempt to raise his head would always bring on an increase of this distressing symptom and a sense of nausea. After a while he would vomit, and all would come right. This case came under my notice about ten years ago, and I understand that the attacks still recur, but in a much less degree. His health is otherwise good.

I have another patient to whose case the same description would apply. He has been under my occasional care for some years for this kind of vertigo, ending, when severe, in vomiting. Not many weeks ago he was found in the street clinging to a railing, and was brought to my house. There he remained incapable of raising his head until free vomiting occurred, when he obtained his release. This gentleman had suffered greatly from migraine, as a young man, and nearly all his children have been under my care for nervous affections. Now is there any organic connection between the last and the earlier states of another and similar case which I have now under observation. Mr. X— is a nervous man, and for many years had migraine. Then, as he lost the migraine in middle life, he became subject to the vertigo, and had it in a distressing though not in an extreme form. It rarely went on to vomiting, though he was often obliged to cling to railings and other supports lest he should fall. Some months ago he had this vertigo—for it seemed in all respects the same—in a terribly aggravated form. He remained so confused that for several days he could not raise his head from his pillow, and he vomited repeatedly but without much relief. Consciousness was never affected. As he became more able to move about, he found that the right hand was ataxic, and his articulation was also struck with ataxy. His right hand, though not weakened, was incapable of precise function; and although he never used wrong words his utterance was clipped and unrhythmical. Four or five months have elapsed since his seizure, and he has slowly improved; yet the defects are far from being obliterated, and I fear he is a stricken man. If this seizure was hæmorrhagic it was strangely like his preceding attacks, which were undoubtedly migrainous. Dr. Liveing makes some very interesting remarks on cases of this kind at page 418, *et seq.*

The alliances of migraine with other neuroses, such as gastralgia and asthma, are full of interest, but I find that our limits will prevent our pursuing the subject in this direction. I would only say, that the skin diseases which I have so often described as being characteristic of asthma and gastralgia are not, I think, so common in persons who suffer from migraine alone. Irritable eczemas, lichens and psoriases occur abundantly in neurotic families, but seem to spare the purely

migrainous members. If this be so the exception is curious; for there would not seem to be much connection between such skin eruptions and the face marks before mentioned. Nor have I been able to satisfy myself that any very definite form of insanity is associated with migraine. Our classifications of insanity are utterly chaotic; and, if we may judge from the recent discussions of the matter, so they are likely for the present to remain. When we see the most distinguished observers of mental diseases all attempting to classify insanities without any reference to other bodily diseases, can we wonder that their classifications are all unreal, and can we wonder that they quarrel with one another after the fashion of those who dispute about shadows?

When alienists have learned that classifications are not to be made by superficial resemblances, but in accordance with affinities, which affinities are often or generally hidden, and when they learn that the thread of these affinities must be followed through the whole web of diseased function, whatever its place, then we may hope to have a classification of insanity which will not only satisfy the philosopher, but serve as a method for the teacher and the inquirer. In respect of this part of our subject I do not find that Dr. Liveing has obtained any very important material. He speaks of the "insane transformation" (p. 220), but he does little more than allude to the possibility of it; he offers no account of its modes. This alone as yet seems probable, that insanity replacing migraine will be of a paroxysmal kind, the periods being brief.

A gentleman whom I know intimately, who has had slight migraine, whose father had migraine in early life and vertigo in later life, is liable to periodical loss of animal spirits. Though certainly more irritable in temper at these seasons, yet he is not exactly morose but is sad and gloomy. His wife says that overwork or slight anxiety brings these attacks, and also that a very slight excess in port wine will cause them. This is curious, as gout also exists in his family. I cannot discover, however, that obvious lithiasis intervenes between the port wine and the nervous impression.

Another gentleman, whom I know well, and who is subject to severe migraine, is also liable to fits of excessive irritability of temper, fits which scarcely annoy those who know him and are aware of their nature, but which give rise to unpleasantness when they occur in the presence of strangers. The attacks seem quite uncontrollable, and they may and often do occur in public. The subject of them is otherwise a very kindly, amiable man, and is possessed, moreover, of great intellectual power and endurance.

The brother of another of my migrainous patients is liable to uncontrollable outbursts of drunkenness occurring on an average about twice a year. This unfortunate man is at other times rather above the average of thoughtful, agreeable and accomplished persons.

These observations and reflections, which I have ventured to string together as they somewhat incoherently arose during the reading of Dr. Liveing's treatise, must not be unduly prolonged. I would only say that little or nothing occurs to me which has not been already anticipated and discussed by Dr. Liveing, though it seemed better to put them forward independently. I would not close my review of the subject, however, without some reference to the crown of the whole, namely, to the therapeutical outcome of the inquiry. If we discover anything lacking in this book it is in this chapter, where Dr. Liveing, instead of being always better informed than ourselves, seems scarcely more than abreast of the general knowledge on the subject. As regards the paroxysm itself no doubt all that has been tried in the way of abbreviation or melioration has disappointed us. Bromide of potassium, so useful as a prophylactic, is useless in the paroxysm, even when pushed to doses which have an obvious physiological effect; this I have several times proved; but surely there are remedies proposed which are not unlikely in themselves, and which need some thorough investigations. Nitrite of amyl is one of these, and one from which I have been led to hope something; others are ergot of rye, cannabis indica, and digitalis.

The old remedy of brandy and camphor also has some virtue in cases of moderate intensity. It is prepared by half filling a phial with camphor and then filling up with brandy. A few drops of the solution are given on sugar. The continuous current, again, should have a fair trial, both in the treatment of the paroxysm and as a prophylactic. My own experience is not very favourable to it for either purpose, but we need some authoritative judgment of its merits. Of guarana Dr. Liveing's experience is very like that of other physicians—sometimes it is effectual, more often it fails. As medicines for the intervals none, in my hands, have equalled iron (*vide* Liveing, p. 438) and bromide of potassium in combination with strychnine. Indeed, for many neuroses I have found these latter drugs, in combination, to be invaluable, and it would seem that the addition of the strychnine frees the prolonged use of the bromide from many of the unpleasant effects which follow its use when prescribed alone. Dr. Liveing will certainly be asked for a second edition of his work. He could make no more welcome addition to it than a chapter on therapeutics which should

record the results of all likely remedies after adequate testing by the light of his practised experience and trustworthy judgment. Such a study needs not so much the notes of many and various cases as the prolonged observation of individual cases taken over long periods, and it would be well if we would all take careful notes of a few distinct cases and publish the results of a year's management.

By comparison we should probably arrive at some rules for permanent guidance; doubtful remedies would be accredited or discredited, and the handling of the more certain remedies would be facilitated. There are maladies more dangerous than migraine; there are maladies, perhaps, more distressing; but is there one more tormenting, or which so often cheats its victim out of the pleasures and duties of life? An invalid takes order according to his powers, and, knowing his weakness, prepares only for things within his reach. But men and women whose health is good enough to justify them in projects which call upon their energies or capacities are made helpless by migraine at the very moments of fruition.

A member of the House of Commons is engaged, in the language of the 'Times,' to deliver an "Extra-Parliamentary Utterance," an engineer has to give important evidence before a Select Committee, a reviewer has promised his manuscript to a day, and they are each and all of them tormented by the fear of utter prostration at the last moment—a fear which too often brings about its own fulfilment. Nor are these, perhaps, the worst instances or the instances in which the disappointment is most keen. The politician's bitterness is tempered by a sense of deliverance from the cross-questioning of a radical shoemaker, the engineer may escape the pitfalls laid by the opponents of the bill, the reviewer is too hardened an offender to feel the worst stings of remorse, but if we turn from apparent to real trials, if we see, as I saw four nights ago, a pretty girl who had come ten miles to a ball laid helpless in her finery on the hard couch of a frowsy cloakroom, waiting till the jarring hours laboured round to the time for home; then we may form some faint conception of the poignancy of such suffering. How this poor lady would beg Dr. Liveing to work at the chapter on Therapeutics! Meanwhile let us hope that she would be philosopher enough to know that the attainment of thorough knowledge must precede its application, and that for this condition antecedent, at any rate, we owe Dr. Liveing a considerable debt.

T. Clifford Allbutt.

IV.—Schroeder's Manual of Midwifery.[1]

SCHROEDER'S well-known manual has for some time been held in high esteem in Germany, as the most practical and scientific production of the modern German school of midwifery. Its good repute has led to the publication of three editions in a comparatively short space of time. The last of these now lies before us, and we propose giving our readers some account of German midwifery practice as exemplified in its pages.

We may pass lightly over the first part of the work, which treats on the pelvis, and presents no features calling for special notice. It may, however, be questioned whether the statement, that the due development of the female pelvic cavity is owing simply to the growth of the genital organs within it; and the illustration given in support of the affirmative opinion, viz., the case of a person with undeveloped genital organs, whose pelvis was remarkably small, cannot be accepted as conclusive evidence.

The second part is devoted to "The Physiology of Pregnancy," and deals with the ovum and its development. The account given is clear and sufficient for practical purposes. The descriptions of the fœtus in each month of gestation is excellent, and so are those of its nutrition and circulation.

The next subject is one which has particularly engaged the attention of German obstetricians; it is that of the Presentation, Position, and Attitude of the Fœtus within the Uterus. There can be no doubt that, at any rate, during the earlier months of pregnancy, the position of the fœtus varies greatly. It is of course interesting to know this, and to be acquainted with the mechanism whereby the various alterations are accomplished, but the study of such comparatively unimportant questions need not detain us. The only point of much interest in this connection, viz. the cause of the head lying lowest, is, according to the evidence adduced, now after much labour declared to be due to just what Aristotle said it was centuries ago, to wit, gravity. Simpson's notion that the fœtus makes reflex movements as long as it is an uncomfortable position, *i. e.* otherwise than with the head lowest, until the malposition is rectified, is not generally received, nor is that of Crede and Kristeller, that the head position is due to uterine contractions. Still both fœtal and uterine movements may well be admitted to exercise considerable influence on the position of the fœtus.

[1] *Lehrbuch der Geburtshülfe mit Einschluss der Pathologie der Schwangerschaft und des Wochenbettes.* Von Dr. KARL SCHROEDER. Bonn, 1872.

Multiple pregnancy is next considered. This may arise in several ways:—

"1. From one ovum several fœtuses may develop. The ovum thus contains either two germs, which, fecundated at the same time, continue their simultaneous evolution, or one germ has by division given rise to several fœtuses.

"2. One Graafian follicle may contain several ova, which, after the rupture of the follicle, are fecundated at the same time.

"3. Several Graafian follicles, either of one or of both ovaries may simultaneously rupture during menstruation, and the expelled and fœcundated ova develop together in the uterus."

The author says that twins derived from the same ovum have consequently a common chorion, are never of different sexes, and frequently show a striking similarity of bodily formation and of mental aptitude.

We are disappointed with the superficial manner in which the duration of pregnancy is treated. This subject, which under certain circumstances assumes great practical importance in medico-legal inquiries, is dismissed in a few lines. Dr. Mathews Duncan's able researches would have furnished the author with materials for an ample account such as a text book on midwifery should contain.

The changes in the maternal organism consequent upon pregnancy are for the most part well though briefly described. We are surprised, however, to note that, while attributing the pigmentation of the skin seen during pregnancy, and which is known by the name of chloasma uterinum, to the deposit of pigment, Dr. Schroeder should admit that such discoloration may sometimes be due to a fungoid growth. Should a fungoid growth be met with, such an occurrence must be regarded as a coincidence, for it is quite certain that the discoloration due to pregnancy, the true chloasma uterinum, does not depend upon the growth of any fungus, but is due to pigmentation of the skin itself.

For the diagnosis of pregnancy, several modes of examination are described, but nothing new or peculiar is presented; nor is there anything calling for special notice in the remarks of the author on the diagnostic signs of pregnancy, or on the diagnosis of the time of pregnancy.

The subject of dietetics during pregnancy is very summarily dismissed in a few unimportant remarks.

Part III treats upon the physiology of parturition, and in Chapter I the causes of normal labour are discussed.

The causes of the setting in of labour, a subject of extreme interest, are stated to be somewhat as follows:

The sympathetic is the motor nerve of the uterus. Whether

the sacral nerves have any influence in causing uterine contraction is doubtful; it is more probable that they are inhibitory nerves. The sympathetic is called into action by the irritation which the ovum exerts upon the terminations of the nerves on the inner surface of the womb. It is only towards the end of pregnancy that such irritation begins to be exerted, because only then, through fatty degeneration of the decidua, the ovum becomes a foreign body in the uterus. Uterine contractions are thus induced by the presence of the mature ovum.

Such is the explanation given by the author of this very obscure problem. The difficulty has always been in accounting for the setting in of labour—the primary contractions of the uterus at the end of the normal term of gestation. Once initiated, the increase in the intensity of the "pains" is readily accounted for by reflex action, for it is well known that irritation of the vagina by the hand of the accoucheur will provoke contractions, and *à fortiori* the fœtal head must do so.

The author says that it is as yet doubtful whether a normal pain has a peristaltic course, or whether it simultaneously attacks the whole organ.

Analogy would strongly suggest that the presumption is highly in favour of a peristaltic course, though from the rapidity of the muscular wave it may be supposed that the contraction is synchronously universal.

The description of the Course of Parturition is excellent, and, though short, is quite sufficient.

A few observations on the various positions of the fœtus are followed by an account of the Diagnosis of Fœtal Positions. Much importance is very properly attached by the author to external examination, which, he says, is less likely to mislead the unpractised observer than an internal examination alone. We think the author hardly attaches sufficient importance to combined internal and external examination, which is especially useful to the inexperienced.

In the majority of cases an internal examination affords the practised observer abundant information; but we quite agree with Dr. Schroeder in the remark that to a less practised one it gives rise to a variety of mistakes, and should, therefore, be supplemented by external examination. We would say the two should be combined after being practised separately, because it is rare, indeed, that the most inexperienced practititioner fails in this way to glean important information for his guidance.

The Mechanism of Parturition is well described. Beginning with a full account of head presentations, in which the mode of passage of the head through the pelvis is simply set forth, the

author next proceeds to consider those of the face, which are laboriously described.

There is nothing, however, that need detain us here, nor in the briefer description of breech and footling presentations.

We next come to a short chapter on Twin Labours, which presents nothing calling for notice.

The next chapter, however, on the Dietetics of Parturition, is ample and judicious. We cordially endorse our author's remarks on the importance of a woman having, not simply a midwife at her bedside during her labour, but a physician thoroughly acquainted with all the branches of his science. It is, as Dr. Schroeder truly says, the prophylactic treatment the parturient woman requires, and this, in its highest form, can only be administered by a physician fully acquainted with all branches of medicine. The author's remarks on the patient's position during labour are made from the Continental standpoint, and might be objected to by English obstetricians, who, as a rule, much prefer the lateral position, which is very seldom adopted on the Continent.

Chapter IX is On the Use of Chloroform in Parturition—a practice which, in a modified form, the author advocates.

The author very properly discusses the question whether chloroform gives rise to dangerous accidents. As regards retardation of labour, he quotes the accurate researches of Winckel, who has shown that, although there may be some retardation, it is really inconsiderable. Hæmorrhages, Dr. Schroeder believes, do not, with proper management, occur more frequently than if chloroform is not given.

The general feeling in this country is, we apprehend, contrary to this. The fact, however, that with us the drug is comparatively cheap, and may be used less sparingly than on the Continent, should not be lost sight of in this discussion. The author adduces another argument in favour of chloroform, viz. that, according to the experiments of Scheinesson, the production of heat is diminished by its administration. Vomiting, Schroeder thinks, has no unfavorable influence. Chloral, he thinks, acts beneficially.

Part IV is devoted to the Physiology of the Lying-in State. In the first chapter, on the Condition of the Mother, the author remarks on the peculiarities of the physiological processes which trench so nearly upon pathology, such as the fatty metamorphosis of the uterus, the restoration of the mucous membrane, the occlusion by thrombosis of the patulous vessels, &c.

The remarks on puerperal temperatures are excellent. This is an important subject, and one on which all accoucheurs should be clearly informed. Any one who will observe for him-

self will soon discover that within certain limits there is a distinct elevation of temperature during the puerperal state. A moderately high temperature (102° Fahr.) within the first two or three days—*i. e.* up to the establishment of lactation—need not, in the absence of other disquieting symptoms, cause alarm. The persistence of a high temperature, however, should certainly excite the watchfulness of the attendant, and lead to close investigation, especially if accompanied by a quick pulse. Dr. Schroeder attributes the elevation of temperature during the puerperal state to the gradually increased production of heat through rapid metamorphosis of the uterine tissues.

An excellent account is given of the changes which take place in the lining membrane of the uterus after delivery, and the manner in which the new mucous membrane is formed, is fully described after Friedlander.

A chapter is devoted to the Dietetics of the Lying-in State, which includes directions for the management both of mother and child. A very proper caution is given against allowing newly-born children to be bathed in too hot water, and Keber is quoted, who mentions that one midwife lost 99 children out of 380 deliveries from trismus, doubtless from this causc. The hand is not a good guide as to the temperature of water suitable for a child; the elbow is better, in the absence of a thermometer, which should not indicate a higher temperature than about 82° Fahr.

Part V is occupied with the Pathology of Pregnancy. The author disputes the assertion that the latter period of gestation offers great immunity to enteric fever. This is not so, for pregnancy is often prematurely interrupted by an intercurrent attack of enteric fever, though, on the whole, the disease does not take a more unfavorable course than in non-pregnant individuals. The death of the fœtus in acute febrile diseases of the mother is attributed to an over-accumulation of heat. According to Kaminsky, a maternal temperature over 104° Fahr. is very dangerous to the child.

The tendency to abortion appears to be least in typhus.

With reference to acute yellow atrophy of the liver, a disease which pregnant women are so well known to be liable to, apart from poisoning by phosphorus or septic infection, catarrhal icterus is, according to Davidsohn, the primary infection.

The state of the blood, œdema, bowel and bladder troubles, vomiting, salivation, &c., during pregnancy, are cursorily treated. Under the head of Anomalies of the Gravid Organ of Generation are discussed malformations and malpositions. With reference to retroflexions and versions of the gravid uterus, which are well and fully treated, the author curiously enter-

tains the doubt whether retroflexion can be produced by sudden causes. This we know from personal observation may and does happen. Schroeder thinks such cases arise gradually from the previously retroflexed womb becoming too large for the lesser pelvis, and, by growth, producing symptoms of incarceration. Mention is briefly made of prolapse and hernia, and lacerations and injuries of the gravid uterus.

The effects of decidual endometritis are very interestingly described. When very acute the blood- or flesh-mole may result if abortion do not happen. Hydrorrhœa gravidarum arises from catarrhal decidual endometritis, and is most frequently observed in hydræmic women. Schroeder says that the escape of liquor amnii is always followed by the commencement of labour, and thus the differential diagnosis between it and hydrorrhœa is readily established.

This will be doubted by some, but the statement appears reasonable. Metritis of the gravid uterus is rare, but the author thinks it not improbable that some cases of spontaneous rupture of the womb during parturition are due to friability arising from inflammatory softening. A few brief remarks are made on fibroids, carcinoma, and anomalies of the vagina and breast during pregnancy.

A full and good account is given of the various forms of extra-uterine fœtation. We cordially endorse the suggestion of the author, that if assistance is at hand when rupture of the containing sac takes place in extra-uterine fœtation, Cæsarian section should be performed. No mention is made of recent experience, such as Kœberle's, in dealing with the placenta; but the plan lately followed with so much success, viz. that of leaving it *in sitû*, and bringing the funis through the lower angle of the abdominal wound, and thus preserving a channel for the exit of discharges and the disintegrated portions of the after-birth, merits warm approval. This method permits of the use of suitable injections, and prevents the retention of decomposing discharges or substances.

A pretty complete account is given of the vesical mole, and its pathological anatomy is fully described. The description of placental anomalies and diseases is good though brief.

The causes of abortion are well discussed, both from the maternal and fœtal sides. It would require too much space for us to go into this subject here, but the section devoted to it will well repay perusal.

In Part VI the General Pathology and Therapeutics of Parturition are considered. According to the author's views, the following scheme sets forth the pathology of parturition:

I. Too feeble action of the expelling forces.

II. Too great obstacles. These may be caused by—
  1. The too great resistance of the parturient passages, either of—
    a. The soft parts, or
    b. The hard parts.
  2. Anomalies of the ovum, which, as a rule, depend on—
    a. The anomalous condition of the fœtus. These are—
      α. Too great a development.
      β. Abnormal position and attitude.
    b. Abnormal condition of the fœtal appendages.

III. Dangerous accidents, which do not interfere with the mechanism of parturition. They are chiefly—
  1. Pressure upon the umbilical cord when prolapsed.
  2. Laceration of the parturient passages.
  3. Hæmorrhage.
  4. Inversion of the uterus (in the after-birth period).
  5. Eclampsia.

The treatment suitable in each sort of difficulty is presented in the sections devoted to special pathology: thus the increase of too feeble pains is to be attempted by means of the following internal remedies:—ergot, borax, cinnamon, opium (which is highly spoken of, especially when feeble pains are due to nervous excitement), and chloral. The danger of ergot from its causing continuous contractions of the womb is very properly pointed out. Among external remedies are—passage of the catheter into the uterine cavity, douches, rupture of membranes, vaginal plugging, friction of fundus and electricity. Intermittent pressure is highly spoken of for the replacement of feeble pains. It should, however, be very cautiously used. We are surprised that in speaking of cases in which prompt artificial dilatation of the cervix is required, no mention is made of Barnes's bags. Perhaps Schroeder thinks they act too slowly for the cases he describes. The author's description of the forceps is according to the usual teaching, and certainly has the merit of clearness. The necessary conditions are well stated, but we apprehend English obstetricians would hardly subscribe to the author's dictum, that the head must necessarily have entered the true pelvis before the forceps can be applied. It is true he somewhat qualifies this statement, by implying that it is to be the guide of the inexperienced, and may be differently approached by the skilled.

Knowing the preference of German obstetricians for the dorsal position, we are hardly surprised that Dr. Schroeder

thinks it the best. We cannot admit, however, that two assistants are really necessary for the application of the forceps in the lateral position, which we usually adopt here. The experience of numbers of practitioners is, that they can and do frequently apply the instruments unaided; though we must say, we think it better always for protection sake that no obstetric instruments should be used, except after consultation. We think that the importance of the forceps as the chief of all obstetric instruments, *after the hand*, is hardly sufficiently dwelt upon. Its powers and value are so great, and the conditions in which its use is suitable are so numerous, that to describe these fully is to describe many of the difficulties met with in midwifery practice.

The description of extraction by the feet calls for no special comment.

The induction of premature labour, and the consideration of the cases in which it is indicated, are well discussed. The crowning difficulty of the matter is very justly put well to the front, viz. the great uncertainty as to the duration of the pregnancy in question. By strict attention and careful examination a safe and practical conclusion can generally be arrived at, but it behoves the accoucheur to be extremely circumspect in all such cases.

As regards the mode of inducing premature labour, the author gives preference to Krause's method, which consists in the introduction of an elastic bougie, which is to be left in utero. Various other methods are mentioned.

The operations of craniotomy and cephalotripsy are well described, and the uses of the cranioclast and écraseur are also indicated. The whole subject of lessening the fœtal head is exceedingly well handled.

The mode of performing Cæsarian section is well and tersely described. The various methods of turning are fully and excellently well described: nothing of importance is omitted; the same may be said of embryotomy.

Some useful remarks are made on anomalies of the parturient canal, especially on tumours.

That part of the special pathology of parturition which deals with the bony pelvis is very instructive, and especially so are the remarks on examination of the pelvis. For instance, the reminder that "pendulous belly is more frequently met with in the contracted pelvis," and that "a great forward inclination of the uterus in a first pregnancy is very suspicious," is valuable. Very judicious also are the remarks on pelvic measurements, and particularly that their significance is relative and not absolute.

We quite endorse the author's opinion, that the measurements of the pelvic outlet have hitherto been too much neglected. The mere examination, for example, of the false pelvis, and inlet of the true pelvis, might sadly mislead the practitioner in a case of funnel-shaped pelvis, and therefore a recognition of the deformity of the outlet is important. Altogether, we regard this section of the work as by far the most able: it is certainly excellent. The author is well acquainted with, and has evidently carefully studied, the whole subject of pelvic anatomy,—physiological and pathological, and speaks with the advantage imparted by accurate and extended knowledge. The only thing that strikes the English reader as imperfect is the *treatment* in cases of pelvic deformity, and this we are bound to say is not according to our standard of practice. Our action would certainly be in the vast majority of difficult cases more prompt, and we believe that in this way the unfavorable results so frequently chronicled by our German confrères would undoubtedly be avoided. Our German friends give us much valuable information based on scientific knowledge acquired by patient investigation, but we firmly believe that for sound guidance at the bedside, our English modes of practice far transcend in value those of any continental school. This is perhaps due to our national turn of mind being pre-eminently of a practical character, the influence of which is strongly felt in the treatment of suffering fellow-creatures, for whose relief we are eager to find remedies. We trust we may be permitted to remark, that English contributions to obstetric therapeutics have neither been few nor insignificant. At the same time we would gladly acknowledge the valuable help to be derived from foreign science, and particularly from German authors.

Anomalies of the Ovum are next considered, and the section opens with an account of Anomalies of the Fœtus, beginning with "Too great Development of the Fœtus." Mere length, Dr. Schroeder says, is of no importance in the mechanism of labour, the bulk and consistency of the skull constituting the matter of greatest importance. He asserts that the most important diameter of the head—the biparietal—increases quite out of proportion to the number of labours and the age of the mother, so that the broadest skull may be expected in a small fœtus of a pluripara somewhat advanced in age. Rules for the management of cases in which there is double formation of the fœtus are given. The diseases of the fœtus are succinctly described, the account given being instructive as far as it goes.

The important subject of Malposition of the Fœtus is briefly but clearly dealt with, the nature and mechanism of spontaneous

version and spontaneous evolution being well set forth. In referring to abnormalities of the fœtal appendages, Dr. Schroeder gives an admirable caution against frequent examinations in cases of pelvic contraction, as dryness, irritation, &c., of the maternal passages may be caused thereby.

Under the head of Anomalies of Parturition, which do not Impede the Mechanism of Labour, are mentioned several important matters. First comes compression of the umbilical cord, for the remedying of which the various methods of treatment commonly known are detailed. What is probably new to most English obstetricians is the plan of Schmeisser, who recommends fastening the prolapsed coil to an india-rubber bag, which is to be passed within the uterus, and then inflated. In this way it is said to be retained within the uterine cavity. Ruptures of the uterus, from the small cervical rents up to complete rupture, are very well described. We cordially agree with and would strongly emphasize the statement of the author, that sudden perforating ruptures of the womb, perhaps, never occur when the uterine tissues are healthy. In feeble, ill-nourished multiparæ, especially in those who have borne children with great rapidity, this condition may be present; and it is, therefore, important to conduct such patients as easily and quickly through their labours as possible, bearing in mind the augmented power otherwise slight exciting causes may assume when proneness to rupture exists. Besides the physical signs the state of the pulse is of the utmost diagnostic value; it becomes exceedingly thready, and frequent perforations, due to pressure, friction, &c., are instructively described: a wholesome caution may be derived from the perusal of this section. Lacerations of the vagina and vulva, including the perinæum, are next described. Dr. Schroeder very justly insists on accurate local examination when such accidents occur; lacerations, for instance, between the clitoris and urethra being of great importance, owing to the presence of cavernous vascular tissue in this region. Pressure and perchloride of iron are the best modes of treatment, separately or conjoined. Hecker's remark will be appreciated by every accoucheur of experience; it is to the effect that sometimes a perinæum is met with which tears like tinder.

Dr. Schroeder indirectly pays a compliment to the English obstetrical posture when he says that perinæal lacerations occur less easily in that position than in the dorsal. The author advocates immediate insertion of sutures and as absolute repose as possible.

Hæmorrhage during Labour is fully considered in its different aspects. Respecting placenta prævia we may remark that the author eschews controversy, and simply indicates what he

believes to be the most appropriate methods of treatment. The tampon and version are preferred by him.

One of the best sections of the work is that which is devoted to Puerperal Eclampsia. A clear and accurate account is given of all that is known regarding the etiology and pathology of this still obscure affection, and the value of chloroform and other narcotics, *e. g.* chloral, is clearly set forth. We are surprised, however, to find that the author altogether objects to obstetric manipulations, *in the interest of the mother.* This is surely erroneous teaching. We quite admit that practitioners are not unfrequently in too great a hurry to evacuate the uterus, and that harm may thereby be done; nevertheless we are decidedly of opinion that, perhaps in the majority of cases, prompt delivery is indicated, and is the best method of treatment, both for mother and child. By prompt we do not mean hurried and rash delivery, but deliberate and well-considered procedures. This certainty has the advantage of obviating the necessity for prolonged narcosis, whether by chloroform or other drug, which is obviously injurious, both to mother and child. Remarks disproportionately long, to our mind, are given on premature respiration, in which all the methods of treatment are mentioned.

The Pathology of Childbed is a subject of the deepest interest to the practitioner of obstetrics, and especially with reference to puerperal fever, which is ably handled by Dr. Schroeder. Almost at the outset the author rejects the view that puerperal fever is due to miasm originating in the crowding together of lying-in women, and asserts that it is due to absorption of septic material from the surface of a wound, which view he credits the English school of obstetricians with originating, particularising Denman.

The infecting material may be generated from within, or be introduced from without, the latter being, he believes, by far the most common mode of access. Auto-infection may arise from decomposition of bruises and otherwise injured parts, or of portions of retained placenta. Infection from without may take place in various ways, which are obvious enough.

There is, according to the author, nothing specific in puerperal fever; it is the same state as is frequently seen in surgical wards, known as erysipelas, pyæmia, ichorrhæmia, and septicæmia, the modifications in puerperal women arising from the peculiar place where the poison enters, and, in some degree, to the changes of the genital organs in the puerperal state. This is Dr. Schroeder's view. He also maintains that the disease is really not contagious, since by a contagious disease is meant one in which a specific poison is produced within a diseased or-

ganism, and which, transferred to other persons, always produces the same specific disease, such as smallpox, measles, &c. He admits, however, that it is manually transferable. Infection, the author believes, commonly enters through the lacerations of the cervix. An elaborate account of the pathological anatomy of puerperal fever is given, which will well repay careful study.

Changes in the position of the uterus and vagina are briefly described—too briefly, we think, seeing how often the foundadation for prolapse and other displacements of the womb is laid during an ill-managed lying-in time. Some judicious advice is given as to the management of puerperal hæmorrhages.

The remarks on Diseases of the Mammæ are short but practical; they present nothing calling for particular notice or comment.

Mental diseases and sudden death during the puerperal state are dismissed with a very few observations, illustrating again the unequal nature of Dr. Schroeder's work, for some subjects of the greatest importance, like these, for example, are treated in the most cursory manner, while others, of certainly less consequence, are amply described.

The work, however, notwithstanding these shortcomings, is an able one, and well deserves study. It ought to be, and no doubt is, very welcome to the English student of scientific midwifery. It will also be useful to the practitioner who wishes for special information on certain points.

Appendix to Review of Schroeder.[1]

An English translation of Dr. Schroeder's work has appeared. It is the work of Dr. Charles H. Carter, and is highly creditable. We welcome it as a medium whereby the practice of the German school may become known to the whole body of English obstetricians, and strongly recommend it to their attention and study.

V.—Bennet on Pulmonary Consumption.[1]

Amongst the chaotic condition of views recently expressed, as to the true nature of tubercle and its relation to pulmonary phthisis, there is not, we will venture to say, one practical idea

[1] *A Manual of Midwifery, including the Pathology of Pregnancy and the Puerperal State.* By Karl Schroeder. Translated iuto English from the Third German Edition by Charles H. Carter, B.A., M.D., B.S. Lond. London, 1873.

[2] *On the Treatment of Pulmonary Consumption by Hygiène, Climate, and Medicine, in its Connection with Modern Doctrines.* By James Henry Bennet, M.D. London, 1873.

likely to be turned to good account in the treatment of that terrible, frequent, and fatal malady called by common consent "consumption."

The laborious, the very ably conducted researches and experiments carried on of late years by Villemin, Andrew Clark, Sanderson, Wilson Fox, Cohnheim, Fränkel, and others, seem to have had only these two objects in view, viz.—1st, to make clear the morbid histology of the parts concerned; and, 2ndly, to show the possibility of certain mechanical proceedings—the introduction of putrescible matter in animals—producing a condition in every way similar to tubercle of the lungs; in fact, in no way—that is, in no *known* way—to be distinguished from such a morbid product.

Now, it is worthy of remark that in these researches no consideration is given to, no attempt is made to decipher, that ordinary and initial producing *cause*, or those ordinary and initial producing *causes*, which, above all others, it is so very essential for us to find out, if we may be pardoned for using so very commonplace an expression. The solution of this difficulty seems to have formed no part of the question these distinguished experimentalists have proposed to themselves, and yet, if the Hippocratic method of studying disease be correct, and that it is so, few will be found to deny, it is only by endeavouring to bring all morbid changes that spring from common causes into such order as will admit of their starting-point being recognised, that we shall ever advance our knowledge as to the correct treatment of disease, or be able to trace with accuracy the cause of disease to the minutiæ of its effects.

That with pulmonary tubercle, as with cancer, we have long since been in a position to give, and, indeed, have had given to us, a correct account of the morbid appearances as seen with both the unaided eye and with the microscope, every one must admit, whilst the probability, nay, the certainty, of particular mechanical irritations being favorable to the development of tubercular deposits, has been known to our investigators of disease for a very long time past.

Dr. C. J. B. Williams has said that those materials are most sure to produce tubercle which either resemble it in its tendency to decay, or show a septic character, as foul pus, putrid muscle, carious bone, and the like, and truly this writer's views generally as to the true nature of phthisis, whether designated tubercular or inflammatory, seem to have met with no contradiction, nor to have derived any noteworthy addition, from the wearily worked out and lengthily debated experiments we referred to when commencing this article. Thus a very important question—in fact, the *most* important question—still remains unan-

swered, and, be it remembered, that question is *not* what is phthisis, *but what occasions it, as met with in the ordinary run of practice?* Until this is fully and fairly answered, the means at our command and the knowledge of what those means should be for preventing or curing the disease, only remain what they were—an "unknown number."

The work of Dr. Bennet on Consumption, which appeared in 1871, has remained too long without receiving our notice, and certainly does not deserve to have met with such neglect at our hands. We trust, however, that this unmerited inattention may not tend to prejudice it in the minds of our readers, for we can assure them that the book, although a very unpretending volume, contains much interesting and useful matter, and is, altogether, both thoughtful and suggestive. The book is divided into seven chapters. The first portion is devoted to the consideration of the nature and causes of consumption, whilst the greater portion of the body of work is directed to the important subject of "treatment," so fulfilling the object expressed on the title-page, *i. e.* "The Treatment of Pulmonary Consumption."

Dr. Bennet starts by observing—"So much has been written during the last thirty years on pulmonary consumption by men of the highest order of intellect, that it requires a certain amount of moral courage to enter the arena." This amount of diffidence on Dr. Bennet's part is certainly not unbecoming, but, at the same time, it was certainly not a necessary feeling for him to experience, because he, amongst many others, may lay fair claim to having investigated the nature and causes of pulmonary phthisis, as well as the most approved modes of treatment, with an assiduity, care, and intelligence deserving all praise; nor can we allow that the absence of anything absolutely new or original in the volume should be looked upon as a blemish, for it is, to our minds, infinitely better to cling to that which is proven, than to surround the minds of those who read with crude and ill-digested hypotheses, which may be raising up to-day a structure of so flimsy a character, that the first breath of doubt breathed upon it to-morrow may raze it to the ground, and, until our investigators can bring themselves to some fixed definitiveness of purpose, and that purpose the discovery of the *cause* of disease, no important addition can be made to the *armamentum medicorum* which we already possess for contending against the many distressing maladies with which we are afflicted.

And here we venture to quote a paragraph from the work before us, in which the author seems to have clung to the same opinion we have expressed above. He says, at page 16—

"Thus, in the investigation of the nature and causes of pulmonary consumption and of tubercular disease in general, we must go a step further than can be reached by the most minute anatomical and histological researches. Clinical observation shows that the manifestation of these forms of lung disease, chronic and acute, must be looked upon as the evidence and result of a serious, perhaps final, diminution of vital or nervous energy; in other words, they may be looked upon as evidence of incipient decay of the organization from defective vital or nervous power."

It would be, we think, not unsafe to announce, as an axiom, that the initiation of all disease arises from some interference with nutrition; and in saying *so* much, it does not appear to be saying *too* much, for can it be doubted that all nutrition depends upon a *physiological* supply of nerve-force, any obstruction to which may terminate in a defective vital state; indeed, it seems not improbable that much that has hitherto been written upon the subject of the local origin of cancer may, by this light, admit of a further feasible explanation; for instance, at what period of life does cancer usually appear? Is it not at that age when waste and repair are most difficult of adjustment—when the balance of nutrition is most easily disturbed? Every organ, every tissue, attracts to itself by an inherent property dependent, there are good grounds for believing, on trophic nerve influence, the necessary pabulum for its repair, it may be that the nutritive supply may simply be in excess of the requirement, the necessary elements being too freely supplied, and then, as a result, there may be some simply homologous formation, or, it may be, that nutrition, misdirected by a disturbed nerve-force, selects elements improper in their proportions, or even improper as elements, and then may spring up some heterologous product. What course more likely to disturb the influence of nerve force, *locally*, than a blow on either of the mammæ?

The subject of cancer is, of course, outside the problem of the origin of tubercle, but it has, nevertheless, some bearing upon the view we take as to the origin of all diseases. The profession is sadly too much bound down by its consideration of mere morbid appearances, whilst pathology *as a function* is terribly neglected, and thus we enjoy (?) a self-satisfied adherence to mere meaningless phraseology, and, as a consequence, "localised pneumonia," "caseous pneumoniaa," "inflammatory consolidation," "scrofulous abscess or deposit, "lung trouble," and terms of like import, are retained and used by us all as though they were explanatory of the *cause* of the disease.

When accepting defective nerve force as a cause, or the cause, of pulmonary phthisis it is evident that it will include within

itself the admission of hereditary predisposition. On this subject our author says—

"Viewed in this light, so far from pulmonary consumption being a dire, inexplicable pestilence, striking indiscriminately the young and the old, it becomes one of the provisions by which Providence has secured the integrity of the human race. If those who are from birth, or otherwise, sickly or weak, in whom vitality is defective originally, or secondarily, and accidentally, could propagate their kind so that their progeny could live, the human race would soon degenerate and become a race of pigmies or sickly dwarfs, and eventually die out. Pulmonary phthisis is, in reality, one of the diseases by which Providence eliminates those that are weak, imperfect, and consequently unfit to perpetuate the race in its integrity."

Whilst fully admitting all the dire effects of hereditary predisposition in the transmission of defective nerve power, whilst also admitting that those who suffer from this plague-spot of consumption should abstain from the risk of propagating their infirmity, it is not palatable—it is very disagreeable—it is very hard to *believe* that an Omnipotent—that an Omniscient—that a bountiful and merciful Providence should *permit* the creation of those made in his own image solely for the purpose of removing them from this earth by means of a lingering and painful death.

Storms and hurricanes are said to purify the atmosphere, but even such purification has dangers of its own, which occasion us not to neglect the erection of "harbours of refuge" and "lightning conductors," yet it is not consolatory to think that whilst good is being done injury must be inflicted.

It may be all very well, indeed it is only right and proper—our very bounden duty—to bow to the decrees of Providence, still it can scarcely be said to be justifiable to point to suffering—that is, bodily suffering—as an evidence of the mercifulness of our Creator; and assuredly we should hesitate at looking too narrowly, or presuming too boldly, in attributing motives to that Supreme Power whose written word affords no warrant for the proceeding.

It does not appear to us that we shall fall into any error if we attribute the large amount of this fearful malady, met with both in Europe and America, to that civilization which is, most unquestionably, a not unmixed good. Diminished life, or nerve power, is more likely to be the effect of an artificial mode of living than of any other cause that we can think of; and, if pigmies are to be created as a matter of necessity, why commend us to collieries and factories for the manufacture of them?

Our rural population is being rapidly absorbed by our towns;

education, at least so-called education, is being so urged on that there appears to be a prospect, and such prospect not a remote one, of all mankind, that is, all European mankind, being merged into one seething population, each unit of which will derive the privilege of working with the head alone to the disparagement, if not to the absolute negation, of bodily work; in short, *hand labour is going quite out of fashion;* and that it is so, this country at least will some day have cause to rue. We are losing our men of thews and sinews, and may look in the future for a race of big-headed men with overworked brains, and extremities so attenuated that they will be little better than mere appendages having a very limited usefulness.

But to proceed with Dr. Bennet's book. The second chapter refers to the hygienic treatment of consumption, and includes under this head—bodily hygiène, food, stimulants, respiration and ventilation, the skin, exercise, mental hygiène, the passions. This word, "hygiène," includes within itself a very wide scope of meaning; it not only means, according to its derivative, "ὑγιαίνω," to be well, *i. e.* in good health; but, as applied in the present work, it signifies, to *improve* the health. Some years since a very admirable little treatise on the "Hygienic treatment of Consumption," was written by Dr. B. W. Richardson; it was an able digest, or *résumé*, of all that can, with our present knowledge, be said on the subject. At the time of its appearance this small book received, as it deserved, a very general commendation from the medical press, and we have often been surprised that it should have been so seldom quoted by writers on the treatment of consumption.

The divisions adopted by Dr. Bennet in this matter of hygiène appear to be, for the most part, satisfactory; but, when it is considered that the bodily conditions of individuals, both in a social and mental aspect, have to be dwelt upon, it will not be difficult to understand the almost impossibility of laying down anything like dogmatic directions for the management of the health of many persons, a very considerable number of whom will differ from each other quite as much in their constitutional qualities as they do in their outward configurations. Dr. Bennett remarks, that "theoretically the injunction to attend to bodily hygiène in a disease of debility seems so rational that it appears merely necessary to lay stress upon it, but practically it is not so." The truth of this observation will be, we feel sure, obvious to every one, for, whilst all mankind, at least all civilised mankind, will admit readily enough that it is above all things essential that bodily health should be preserved, and if possible improved, yet "practically," as our author says, but few seem to care very much about the matter. Amongst the

profession, too, there is a sort of hesitancy, or fear, apparent in the general directions they give to those labouring under pulmonary affections lest the use of a liberal diet, the admission of cool and fresh air, and the application of cold water to the surface of the body, should appear to their patients to be risky or heroic proceedings; and indeed, it does require on the part of the physician, a good deal of discernment and discriminative power in the selection of cases, and a due consideration of the relative condition of these cases, to be able to say, with confidence, when and with whom such proceedings and directions as those we have been referring to should be carried out. All cases are not equally in similar conditions, and consequently, many "hygienic" modifications may be required. There is a proverb, that "one man's food is another man's poison;" and, figuratively, this is not incorrect; one may get fat upon a diet that would occasion loss of flesh to another; certain elements contained in food are more readily assimilated by one person than another, just as some elements are more required by one person than another, and so on with other matters connected with "hygiène."

A large portion of this chapter consists of what may be called clinical instruction, and the whole may be read with interest and advantage. Perhaps, if there be any one particular part of the chapter more vigorously insisted upon than another, it is that part which enforces the necessity for pure air, and we find Dr. Bennet quoting pretty freely from Dr. M'Cormack's book on consumption from re-breathed air in favour of his opinion. So highly does Dr. Bennet think of Dr. M'Cormack's views, that he says his work—that is, Dr. M'Cormack's—"is the most eloquent pleading in favour of pure air and physiological respiration that I have ever read, and the physiological and pathological facts that he brings to the support of his views are unanswerable."

Dr. Bennet also notices the work by Professor Hind on 'Labrador.' From this volume it appears that consumption is, of all diseases, the one most unfrequently met with; indeed, the natives who reside in the depths and fastnesses of this dreary region, and whose residences are mere tents made of the branches of the spruce fir, wretchedly lined with skins, and more or less exposed in every direction to the entrance of the external air, and who are, in addition, not unfrequently subject to hardships, famine, and distress, never scarcely are known to have a case of consumption amongst them; but no sooner do these people visit the St. Lawrence for the purpose of joining the fishery, occupying houses the very opposite to the kind of tents they have been in the habit of living in—in fact, living in a state of

comparative luxury—than most of them, in a year or two become consumptive and die miserably.

The writer next addresses himself to the necessary attention to the skin; he dwells especially on the importance of cleanliness as accomplished by means of the sponge bath daily; the temperature of the water to be from 65° to 70°, nor are we at all disposed to dissent from the estimated value he puts upon this proceeding. No doubt the skin is in many ways just as much an organ as the liver, the lungs, or the kidneys; indeed, it is, as we just before said, "something more than a mere bag to keep the bones in." It is an excretory organ of very great importance, and the purification which it accomplishes is so essential that, although nature is wonderfully accommodating at times, any prolonged interference with its function is sure to lead, though it may be insidiously, to serious consequences. It may be difficult to give an entirely satisfactory explanation of the fact, yet the thing is indisputable that one of the most certain ways of preserving the respiratory organs from catarrhs and colds is to ensure that the pores of the skin are kept open by the free use of cold or tepid water, followed by friction. Many instances are quoted by Dr. Bennet, and more might be mentioned by other authors, in which phthisical patients have been directly and unmistakably benefited by such daily attention.

On the question of exercise we have advice, and recommendations that are truly judicious, the sum total of them being that whilst quiet exercise is likely to be really beneficial, active exercise or strong exertion should certainly be forbidden.

As to social and mental hygiène, we are told that these are best accomplished by rest, repose, the absence of the ordinary duties of life, freedom from care, harass, and worries; the control of the passions is also considered to be a very necessary proceeding. Now, there can be no question that all these things should receive every possible attention; but, alas! the necessities of life only too frequently interfere to prevent many, if any, of them being attended to, except it be the last mentioned, viz. the control of the passions.

Chapter the third is entirely devoted to Climatology, and here Dr. Bennett is on ground with which he is very familiar; but are we not, in this matter of climate, on the very threshold of our knowledge concerning it? Do we not, in reality, stand very much in need of some really good work on the chemistry of climate? Assuredly we have had two most interesting and suggestive works from Dr. R. Angus Smith on Chemical Climatology, but such knowledge as these impart requires to be supplemented by further and systematic researches into the subject; nevertheless, these works of Dr. Angus Smith's will

serve to stimulate other investigators, the more especially if our chemists will bear in mind that Hippocrates himself has said that "Whoever wishes to investigate medicine properly should proceed thus: in the first place to consider the seasons of the year, and what effect each of them produces." This appears as though he gave to climate the very highest position as regards its capability of preventing, producing, or healing disease. With regard to climate as having a tendency to produce consumption, we have been almost astonished to find that Dr. Bennet makes no reference whatever to the recently observed coincidence, nay, consequence, of a damp soil and much consumption going together, and the reverse of this—a dry soil and little consumption.

As to temperature, Dr. Bennet's opinion seems to accord with that of most other observers. He considers that extremes of temperature are not in any way favorable to consumption, a temperate climate, with no great or rapid alternations, being the one most suitable to such patients. In this matter of climate our own experience is that individual cases, in different stages of the disease, need some difference as to the climate which is best suited to them. All observant practitioners will have met with cases in which at one time, that is, during one phase of the disease, a temperate, dry, bracing atmosphere has seemed to be both grateful and serviceable, whilst other cases, during a different period of the affection, have appeared to be most relieved by an atmosphere both warm and moist; and here again much discrimination and discernment is required.

Of course Dr. Bennet refers to each and all of the different health resorts frequented by those labouring under what are called "chest affections," and gives to each place what he believes to be its real value and merit. The climatic treatment of consumption is not an entertaining or very instructive subject, the more especially as the various writers on consumption, although not differing to any very great extent as to which are and which are not suitable places for the residence of consumptives, yet each writer has, somehow or another, a pet place or pet places, which he advocates to the, perhaps, unintentional disparagement of other places.

Chapter the fourth is headed "The Medicinal Treatment of Phthisis." The writer says—"I have now reached the most difficult part of my subject, one that still affords great room for difference of opinion, even if the premises contained in the previous chapters are admitted."

Dr. Bennet, as the result of his very considerable experience, has come to the conclusion that there is no medicinal antidote for consumption, whether it be called tubercular or inflamma-

tory; he runs through the list of drugs usually administered in this disease:—Cod-liver oil, iodine, phosphorus, iron, opiates, and expectorants, receive from him due notice and remark. To our mind he seems to estimate fairly the real value of each, giving to none so decided a preference as to make it appear that he looks upon any or either of these as a panacea. As to phosphorus, he takes occasion to notice the fact that Dr. William Bennike, resident physician at the German Hospital, Dalston, was the first to formally introduce phosphorus and its preparations for the treatment of scrofulous and tubercular diseases. This distinguished pathologist grounded his recommendation of the drug upon the circumstance that it is calculated to assist in cell formation, and also in removing one of the elements of the general dyscrasia which precedes and accompanies such forms of disease.

Subsequently—that is, in 1857—Dr. J. Churchill claimed for phosphorus and its preparations the position of positive antidotes for pulmonary consumption and other tubercular diseases. It is with something like pain that we refer to the above gentleman's name, as recent occurrences in connection with his disposal of a secret remedy to a limited liability company have given cause for much comment, and an infinite amount of regret. Dr. Bennet informs us that the treatment of consumption with the phosphates has not met with the same amount of success in his hands that is so unhesitatingly claimed for them by Dr. Churchill.

The fifth chapter speaks of the results of modern treatment, prognosis, the various types of phthisis, and histological theories. Taken as a whole, we may look upon this chapter as intending to convey to the reader the various conclusions Dr. Bennet has arrived at from clinical observation, especially as to the results he obtained from all the various means brought into play in the treatment of the disease.

As regards histological theories, we have already, when commencing this article, announced our belief that recent researches have added very little, if anything, to our previous knowledge—certainly not anything that can be turned to practical acount, in either preventing or curing the disorder; and one almost sighs over the time spent by eminent investigators in deciding as to the mere accuracy of histological description, whether such descriptions emanate from Bennet, Virchow, Southey, Lebert, Villemin, or Sanderson; nor can we think that the matter has been made at all clearer by Dr. Sanderson's proposition, namely, to consider tubercles as an adenoid growth.

The sixth chapter may be said to consist of certain clinical

histories, illustrating, as the author believes, the arrest and cure of pulmonary phthisis.

In concluding our observations we feel no hesitation whatever in saying that both the manner in which the book is written, and the matter which the book contains, render it a desirable volume to place on the shelves of any medical man's library. As we have before said, and as the author has himself expressed, there is nothing strikingly new or original in the volume, but there is a perfect mine of good, strong, common sense, and, in addition to this, there is a sufficient amount of physiological and pathological knowledge displayed to render it inaccessible to the charge of being defective in these respects; it is very pleasant reading, and any physician may take it up with every feeling of confidence, that the views enunciated by the author will be found to be able, honest, and orthodox.

VI.—Coles on Dental Mechanics.[1]

THREE books have been forwarded to us for notice by Mr. Oakley Coles. This gentleman is a writer to whom must be assigned at least the credit of some industry, although his talents seem to lie rather in his powers of compilation than in those of original investigation. We must confess that many objections present themselves to the publication of a class of book which seems rather intended to bring the name of its author into notice than to serve the higher purposes of instructing those who aspire to a knowledge of the profession of which it professes to treat; and in carefully examining Mr. Coles's works we regret to see so very little originality in them.

The most important book of the series is a 'Manual of Dental Mechanics,' and to this we would accord a modicum of praise, as it may be a useful guide to those who desire to gain a preliminary knowledge of the arcana of the laboratory, an acquaintance with which is necessary to every surgeon who intends to make the dental organs his special study, not so much that he may actually perform the mechanical work of his profession

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[1] 1. *A Manual of Dental Mechanics.* By OAKLEY COLES, L.D.S.
2. *Deformities of the Mouth and their Mechanical Treatment.* By OAKLEY COLES, L.D.S.
3. *The Teeth: Notes on their Pathology.* By OAKLEY COLES, L.D.S.

himself, as that he may be enabled to conduct the labours of those whose duty it is to perform it for him.

There is but little original matter in this volume, if we except that which professes to be the author's method of repairing breaches of the hard and soft tissues of the palate, of which subject we shall have to treat again when we come to the consideration of the second book submitted to our notice. The methods of working gold and vulcanite, in combination with artificial teeth, as substitutes for the natural denture, are entered into; but we cannot but notice with regret, in a manual professedly written for the student, that much more space is allotted to the consideration of the vulcanite base than is devoted to the manipulation of gold, the cause of this regret being the fact that few things have done more harm to this speciality in a social as in a professional point of view than the introduction of vulcanite, which, though one of the most useful agents in honest and skilful hands, requires but little talent to work it *indifferently*. It has rather caused a host of ignorant and unqualified men to set up as mechanical dentists, who, by their conduct and the character of their work, grievously injure the good name of the profession amongst a public who have not the common sense to discover that such men are intruders, and have no connection with it whatever.

We trust that the time is not far distant when the mere mechanist will have no more relation with the surgeon (for all ought to be surgeons) practising dentistry than the trussmaker with the practitioner who superintends the adjustment of the instrument. Mr. Coles certainly appears to the greatest advantage in this book as compared with the others, of which we have to treat, for he writes as a man who is evidently *au fait* with the more mechanical details of his calling, and his teaching will be useful in giving an idea to the tyro of the kind of work he will have to master before he commences the surgical part of his profession, though we must conclude our brief criticism on this manual by admitting that its author is guilty of no affectation when he warns his readers in his preface that he lays no claim to originality.

Of recent years much has been effected in the mechanical treatment of cleft palate, so that where from various causes the operation of staphyloraphy is not feasible the patient can obtain great relief by means of artificial vela retained in the cleft by ingenious devices, which it is not necessary to describe here. Mr. Stearn, a surgeon, of London, was the first to invent an instrument of any great utility, the only drawback to its use being the complexity of its parts and the difficulties involved in its construction. Next a gentleman of New York, Dr. Norman

Kingsley by name, simplified this invention so much that it had almost as much claim to originality as its prototype; and it is upon this conception that Mr. Oakley Coles has constructed a velum almost identical with Dr. Kingsley's, of which the author naïvely observes, "It is in the main based on the inventions of Dr. Kingsley," though he claims for it that it is infinitely less complicated in construction. To this latter assertion we demur *in toto*, and we can only think that Mr. Coles cannot have seen any of the vela *now* used by Dr. Kingsley, which are so perfect, both in simplicity of form and construction, that he has cast a series of typical moulds in which he can construct artificial palates suited to nearly every case without the necessity of taking each individual model of the cleft to be treated. Of course there are some few cases in which the breach of tissues presents such characteristics that a mould must be especially made to meet the difficulties presented, but in practice these are few and far between, and we are in a position to conscientiously assert that there is no appliance to be compared in any way to that of Dr. Kingsley, to whom also must be conceded, especially as he is a foreigner, more credit than to any other practitioner who has laboured in the same field since an impulse was given to the consideration of the treatment of cleft palate mechanically by our countryman Mr. Stearn. Mr. Coles's book concludes with a list of cases treated by himself, and judging from them he would seem to have met with great success.

Whilst on this subject we cannot but think that the operating surgeon and the mechanist might join hands in the instrumental treatment of cleft palate, and we would suggest that a modification of the usual operation for cleft palate might assist the employment of artificial means materially in those cases where staphyloraphy would not be likely to succeed, owing either to want of sufficient tissue, or to mobility of the parts, to permit of the pared edges of the cleft being brought into apposition. In many such cases we are of opinion that it would be quite possible to bring the surfaces of the bifid uvula together, thus leaving only a central breach in the soft tissues to which a soft velum might be adapted with the greatest facility, and with much more advantage than if the cleft with its relaxed and pendulous borders were left intact, for a firmness would thus be secured, which would not only greatly aid the management of the voice, but most certainly render the wearing of the requisite appliance far more agreeable to the sufferer.

The last book of which we have to treat is one which professes to be notes on the pathology of the teeth; and with no desire to be guilty of harsh criticism, we are bound to confess

that it is the least original of the triad, and though it is offered to the profession with a view of suggesting "fresh lines of thought," we fail to discover them save in a suggestion of the author, to set up a kind of stomach in a tooth, in cases where its pulp is exposed, that is, to treat it with pepsine, which it is claimed will *digest* away all that is unhealthy in its tissue, leaving only that which is sound. This dyspeptic treatment is upheld as having had its advantages proved by the result of experiment and continued experience, and we are sorry that the results of that experience have not been more fully placed before us.

The brochure is interesting in parts, especially to those who are not German scholars, inasmuch as the views of Brück on the development of osteo-dentine are somewhat fully explained, and the illustrations of the book, which are copied from those of that observer, are well worthy of being reproduced; and here we must in justice add, that all the illustrations in the three volumes of which we have been treating are particularly well executed, a measure of praise in which both the printer and the binder must also justly participate.

Mr. Coles is evidently possessed of considerable industry, but we trust that he will take our advice in good part when we suggest, that he might perhaps further his ambition more, and do himself greater justice, by writing fewer books and paying more attention to the intrinsic value of his work than in reproducing, however well, the ideas and opinions of others, which being well known, do not require to be re-born, as it were, under the fostering shadow of the author's wing.

We shall look forward to the time when a more perfect and fully digested work may merit a somewhat different criticism to that which we have felt ourselves obliged to accord to the books now placed before us, for we feel assured that their author, who has evidently much perseverance, might, by devoting more time to his subjects, and by avoiding those faults to which we have referred, produce a work which would prove more useful to those whom he aspires to instruct, and reflect more credit upon himself.

VII.—Public Hygiene, and its Expositors.[1]

The Public Health Act of 1872, although fragmentary and disappointing in no small degree to those who had looked for a full measure of reform, will always be remembered as the first systematic attempt to bring the whole country under sanitary control. By its provisions for establishing health authorities and health officers in every quarter of England and Wales a position has been gained for preventive medicine which nothing can assail. It has taken years of writing and agitation to bring about this result; but, so much having been attained, we may look with confidence to the future; the people of England are not easily imbued with new ideas, but when once their value is realised there are no retreats, progress is certain.

In saying thus much we are far from affirming that all is well with the cause of public health. We should doubt if Mr. Stansfeld himself can look with satisfaction at the work of his own hands, and, if his system survive so long, he will be curious to see what five years of *evolution* will have effected in the sanitary government of the country, what the five years probationary struggle for existence will have done for the health officers of

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[1] 1. *A Handbook of Hygiene.* By George Wilson, M.A., M.D. London, 1873. Pp. 380.

2. *Manual for Medical Officers of Health.* By Edward Smith, M.D., F.R.S. London, 1873. Pp. 346.

3. *Handbook for Inspectors of Nuisances.* By Edward Smith, M.D., F.R.S. London, 1873. Pp. 296.

4. *A Manual of Public Health.* By W. H. Michael, F.C.S.; W. H. Corfield, M.D.; and J .A. Wanklyn, M.R.C.S. Edited by Ernest Hart. London, 1874. Pp. 374.

5. *Health Officers, their Appointment, Duties, and Qualifications; being a Reprint of Official Documents long out of print, with Prefatory Remarks.* By Robert Ceely, F.R.C.S. Pamphl. London, 1873.

6. *An Address on the Working of the Public Health Acts.* By Henry W. Rumsey, M.D. 'Brit. Med. Journal,' June 28, 1873.

7. *An Address on Public Health and the Public Health Act.* By Ernest Hart, Esq. 'Brit. Med. Journal,' Aug. 16, 1873.

8. *Report of the State Medicine Qualification Committee of the British Medical Association.* 1874.

9. *The Training, Qualifications, and Duties of Nuisance Inspectors.* By David Davies, M.R.C.S., Inspector of Health for Bristol. 'Brit. Med. Journ.,' Nov. 11, 1871.

10. *Four Years' Experience as a Health Officer in Bristol.* By David Davies, M.R.C.S. 'Brit. Med. Journ.,' Nov. 13, 1869.

11. *Remarks on the State Medicine Qualification.* By H. W. Rumsey, M.D. Read in the Section of Public Medicine at the Meeting of the British Medical Association, Aug., 1873.

his original creation. We propose in the following pages to consider the position and duties of officers of health as at present constituted, and to this end it will be quite necessary to look back a little into the history of the Act under which they hold their appointments if we are to understand the curious anomalies which it will be our duty to notice. To go back to 1871, it will be remembered that in that year the Local Government Board was constituted supreme authority in all matters relating to the public health, and to it were transferred the powers and duties of the Poor Law Board in England, as well as the functions relating to public health hitherto devolving upon the Secretary of State or the Privy Council. By these changes health and destitution were brought under a common head, as suggested, with a warning note of danger, by Mr. Simon in his Report for 1868:

"I think it scarcely less than essential that any law which connects for local administration the two services of health and poor law relief, should do so in a different form to that of the law now in force. . . . . It seems to me highly desirable that, if the two administrations are to be associated, the Board (of Guardians) should be appointed *ab initio* expressly for the compound purpose, and should be invested by law with a new title denoting its double functions as authority for health and destitution." (11th Report of the Med. Off. Pr. Co., p. 26).

It does not come within our present purpose to inquire whether Boards of Guardians are the fittest sanitary authorities in rural districts, but the dangers so pointedly alluded to by Mr. Simon have more than come to pass. As might have been expected, the highly organized department of poor law management was adopted as a model for its younger and as yet weaker rival, with the result of giving a tone to public health in England which it will take years to efface. Unfortunately official lips are closed as to the intestine movements at Gwydyr House, otherwise it might be interesting to trace the suppression of reports which were year by year laying down the foundations of sound sanitary knowledge, and which must always remain as monuments of original investigation and solid work; to trace the steps by which a voice once trusted by the nation in all matters connected with health has become as an empty sound; to trace also the reasons for that persistent rejection of skilled assistance and advice which has been so notorious in the short history of the newly constituted department.

"There was a mass of experience," says Mr. Ernest Hart in his admirable address on public health, "available at the office of the Local Government Board, which could have told the president or the

secretaries of the Board what areas could be considered possible, what duties could fairly be entrusted to medical officers, what was the importance of gaining prompt and complete local knowledge, and what were the means by which the best instruments for obtaining such local knowledge could be selected, and the machinery by which they could be placed in communication with such central officers as could promptly co-ordinate and act upon that knowledge. The whole of that experience has been ignored."

The appointment of the Royal Sanitary Commission took place mainly, as is well known, at the instance of a joint deputation from the British Medical and Social Science Associations, and the Public Health Act of 1872 is the direct outcome of that inquiry; it was natural to expect, therefore, that suggestions from the promoters would receive at least common consideration, yet the rough draft of the Bill no sooner appeared than it was found that points of vital importance had been passed over and ignored; what these were may be seen from the following summary given in the valuable pamphlet by Mr. Ceely, one of the oldest and ablest of our sanitary reformers:

"1st. The necessity for utilising county authorities, present and future, in the administration of sanitary law, especially in the appointment of health officers and analysts.

"2nd. The superiority of the county area to any casual agglomeration of districts formed under the Act, as having already a governing body of independent and well-informed men ready to act.

"3rd. The inconvenience (involving the conflict of authority) of substituting 'union' counties for the present county areas of administration.

"4th. The analogy between the county police under its chief constable and a skilled staff for sanitary advice under a chief officer.

"5th. The absolute necessity of making every possible use of the poor law medical staff under such officers, the fact being, as the Poor Law Medical Officers' Association has urged, that they, if encouraged and protected, can tell the authorities much more about local sanitary defects and necessities than a single officer, whom some have advised, over a large area, *without their assistance.*

"6th. The advantage of consolidating ordinary sanitary functions and authorities within the provincial unit of area, viz. the registration district.

"7th. The necessity for two orders of medical officers of health—the one engaged in practice as union medical officers and certifying factory surgeons, the other debarred from general practice, receiving reports from the former, and acting over counties or first-class boroughs, with the prospect of promotion from the lower to the higher order, as a stimulus to good service" (p. 13).

Framed ostensibly on the letter, but certainly not in the spirit,

of the 'Report of the Royal Sanitary Commission,' framed in defiance of warning and advice from known experts, entangled from its birth in the red tape of a code which "stands to this hour a monument of English stolidity, a marvel of lazy and ignorant statesmanship," shorn of some of its most important clauses, and pushed through at the close of a long and arduous session with reckless haste, the Public Health Act of 1872 could not fail to disappoint those who are interested in sanitary reform, and must inevitably cause confusion and perplexity when brought to bear upon the great mass of English people.

"It is true" (to quote the words of the noble author of 'The Reign of Law') "that neither wealth, nor health, nor knowledge, nor morality, can be given by Act of Parliament; but it is also true that the acquisition of one and all of these can be impeded or prevented by bad laws, as well as aided and encouraged by wise and appropriate legislation."

The imperfections in our sanitary laws have been well pointed out by Mr. Simon, in his eleventh report as Medical Officer of the Privy Council:

"The essential fault," he says, "is that laws which ought to be in the utmost possible degree simple, coherent, and intelligible, are often in nearly the utmost possible degree complex, disjointed, and obscure. Authorities and persons wishing to give them effect may often find almost insuperable difficulties in their way, and authorities and persons with contrary disposition can scarcely fail to find excuse or impunity for any amount of malfeasance or evasion."

That the latest Public Health Act is no exception to the rule will appear as we proceed.

If there was one principle laid down more forcibly than another by the Royal Sanitary Commission it was—

"That there should be one Local authority for all Public health purposes in every place, so that no area should be without such an authority, or have more than one." Further, "that Health, Poor law relief, and Highways, should be in the hands of the same authority in each district."

Yet, as pointed out by Dr. Rumsey—

"Two sanitary authorities still really exist in every urban district, the Board of guardians directing medical and statistical action, the care of the sick poor, vaccination, &c., and the Town council or local board directing preventive action. In every rural district also there are, as a rule, two authorities concerned with matters of public health, for the guardians have no control over the highways. . . . . There is another anomaly about the new rural authorities. Every board of guardians, in a *mixed* district, consists of two distinct authorities; one is the whole board, having the whole area of the union under its control, for destitution, sickness, vaccination, &c.; the other is a

part of the board, acting for a part of the union for other purposes of health management" ('Brit. Med. Journ.,' Jan. 28th, 1873).

Another great principle insisted on by the Sanitary Commission was the adjustment of areas, yet the first difficulty which had to be encountered in carrying out the provisions of the Act was the area or limit for the health officer's work.

It soon became apparent that a serious error had been committed in allowing each local authority, however insignificant, to appoint an officer of its own, and attempts were made to rectify it. Mr. Stansfeld's inspectors were instructed to encourage combination wherever possible, with results inconceivably bizarre and mischievous. The maps prepared by Dr. Rumsey for his address, already quoted, show some of these districts, and help us to realise the facts pointed out by Mr. Ernest Hart, that we—

"See now, not a sanitary organization, but a sanitary anarchy throughout the kingdom; medical officers appointed, in some cases, in districts so small that it is impossible that sanitary works of any importance can be carried out, and with salaries so small that no medical man can be expected to devote any serious amount of time to his work . . . . whilst other medical officers are appointed over areas so large that if they were to attempt to carry out the work of ascertaining the primary facts of the outbreak of disease, of the condition of local nuisance, and of the daily incidents of disease, their whole life would be spent, as half their time is now, on horseback" (ibid., Aug. 16th, 1873).

How the Health officer is to meet these and other difficulties time will show; at present his relations to the local and central authorities, to his fellow officials, and to the inspectors of the Local Government Board, are so ill defined that perplexity must meet him at every turn. As adviser of his local authority he may use all his powers of persuasion, but his actual authority is small indeed. To quote Dr. Wilson's Handbook, p. 341:

"His relations to the sanitary authority should be guided by common sense and a sense of duty; he should always remember that he is their medical adviser, not their dictator. . . . . His proposals may be rejected, but if they do not lie within the scope of the statutory enactments requiring their enforcement, he should never resent opposition, but again bring them forward on future occasions."

It is of course easy to imagine a sanitary Utopia in which the Health officer shall have "the honorable distinction," as Dr. Smith expresses it ('Manual,' p. 315), "of being the adviser of an authority regulating and controlling the most important influences of a locality," but given a stubborn Board of

Guardians as one factor in the scheme, and it is not difficult to foresee the result. The position of a man powerless to redress the evils which he is set to search out and to rectify is no enviable one, and he will require the *mens conscia recti* in large measure to support him under the trial. Men of character and energy will here and there win their way and obtain influence with the local authorities, but it augurs ill for Public health that the inspectors of combined districts, the most highly qualified of their order, should place this among the foremost of their difficulties at a conference lately held on the subject of their common work ('Brit. Med. Journ.,' Jan. 17, 1874).

The relations of the officer of health to the Local Government Board and its inspectors, if he is under central control at all, are still more puzzling. Shut out from advice and support of the highest professional character, unaided, we might almost say impeded, by the central authority, he has to furnish an annual report, entailing often a knowledge of matters quite beyond his control. The absurdity, for instance, of demanding from one officer of the Local Government Board statistics which must be purchased from another officer of the same Local Government Board, will be noticed when we come to deal with that portion of the health officer's special duties; but it may be mentioned here, as an illustration of the economies which it was Mr. Stansfeld's boast to practice (see 'Speech at Halifax,' Times, Jan. 20th, 1874), and of the vexatious difficulties placed in the way of an energetic performance of duty. But if there is one part of Mr. Stansfeld's organization more disappointing and surprising than the rest, it is the employment of the lay inspectors of the old Poor Law Board for the purposes of Public health.

That it was not contemplated by the Royal Sanitary Commission is clear from the wording of clause 30 on page 176 of the report:

"The additional inspection thus required under the new sanitary law may be provided for by the employment of inspectors already attached to the departments which will be under the central authority or new minister, with such increase of staff as may be necessary."

Which certainly cannot be intended to exclude the able and well-known staff of Mr. Simon recently incorporated with the Local Government Board. On the relations of the Inspectors to the Health Officers, and their powers, the greatest doubt seems to prevail. Dr. Bond, the able and energetic officer for combined districts in Gloucestershire, says:

"He had heard with considerable surprise that the medical officers of health were under the supervision, either tacitly or avowedly, of the lay inspectors of the Local Government Board, because he had had no experience of any kind to justify such a supposition, and he could scarcely understand the circumstances under which such a state of things could occur. He had every reason to believe that his own reports had gone direct to the medical officer of the Local Government Board; and whenever he was brought into collision with a lay inspector on a subject that involved medical knowledge, he should be quite prepared to throw up his appointment" ("Conference of Medical Officers of Health," 'B. M. Journal,' Aug. 16, 1873).

But whatever be the case in combined districts such as Dr. Bond rules over, there are many points of contact, especially in rural parishes, where poor law advice in medical matters has been too habitual to be easily thrown aside, and the experience of Macclesfield (see 'Brit. Med. Journ.,' Feb. 1st, 1873) may be repeated at any moment when there is not an official of Dr. Thorne's judgment and capacity at hand to quell the storm.

In addition to the local authorities, the central authorities, and the inspectors of the Local Government Board, there is another officer, appointed under the same Act and in every way as independent as himself, with whom the officer of health has of necessity the most intimate relations. The position held by the Nuisance inspector under the Public Health Act of 1872 is typical of that element in English legislation which, in the transition from one stage to another, retains just so much of the old as will clog and hamper the free working of the newer law. When medical officers of health were almost unknown, and inspectors of nuisances were entrusted with duties which now fall to the higher office, it was right that they should be clothed with the necessary powers; under the new act, however, all was changed, and nothing has given health officers more concern than the parallel appointment everywhere of men in an inferior grade, nominally their assistants, but with complete independence of action. It was the subject of discussion by the health officers of combined disticts in January last, as it was also in a larger conference in August of 1873, when Dr. Tripe, the experienced medical officer for Hackney, made the following remarks, which were fully endorsed by the meeting:

"He himself," he said, "had taken care to obtain from his board such a supervision over the inspector of nuisances that he could suspend him at any time if he did not do his work. That power had only been acquired by an arrangement before appointment, that, notwithstanding anything in the Act of Parliament, the inspector should be under his control and direction in everything. It was most important for all who were newly appointed that they should

do the same thing, and struggle for their rights" (Brit. Med. Journ.,' August 16th, 1873).

It was the evident intention of the Sanitary Commission that nuisance inspectors should be the *antennæ* (as Mr. Davis happily expresses it) of the officer of health, and so it is sometimes presumed he will now be under the Act. Dr. Edward Smith, for instance, whose 'Handbook for Inspectors of Nuisances' comes with *quasi* official authority, and is with all its faults a really useful volume, reads between the lines of the instructions issued by the Local Government Board to the inspectors, and urges the importance of their looking to the officers of health for everything, of studying their views, and acting always in accordance with their wishes. It is impossible, however, to blind ourselves to the fact that, in every urban and rural district of England, it lies absolutely with the local authority to decide whether the nuisance inspector shall be the subordinate, the equal, or, it may be, the superior of the medical officer of health.

If we except one or two compulsory communications, such as immediate notice of the occurrence within his district of any contagious, infectious, or epidemic disease of a dangerous character, and the production of his books at all reasonable times when applied to for the purpose, the inspector of nuisances may hold quite independent ground; and we can readily imagine with Dr. Bond that—

"The medical officer of health's greatest difficulty will be with the inspectors, some of whom much prefer running about in a desultory way, looking up nuisances, and making ambitious reports on their own account, to the more prosaic and exacting duty of house-to-house visitation which the survey involves" (Ibid., Feb. 4, 1874).

Or with Dr. E. Smith ('Manual,' p. 314), that—

"It is possible that the views on which the health officer founds his advice may not agree with those of the inspector of the district or of the Local Government Board, and generally the duty (*of advising the sanitary authority*) will be more arduous than agreeable."

The communications of the health officer with the public Analyst, where such an officer exists, will be under the Adulteration of Food Act, 1872, with the sanction of his local authority. Future legislation will probably make the appointment of analyst compulsory on local authorities or in combined districts, and it has been urged with much force by Mr. Bulteel, "The Public Health Act, 1872, with special reference to Plymouth, Stonehouse, and Devonport, by Christopher Bulteel, Pamphlet;" that the health officer should undertake the duty. Under present conditions, however, it might well be doubted whether the addition of delicate chemical investigations to the already onerous

duties of the health officer, even if he were qualified for the work, would be conducive to the public good.[1]

Passing from the surroundings of the health officer to the Health officer himself, nothing but a tabular statement of the appointments made in urban and rural districts, with the salaries and terms of agreement in each separate case, could convey an adequate idea of the results which have been attained by the Act of 1872.

Commencing with the officers of combined districts with comparative freedom of action, we should find every variety of tenure, some with private practice, others debarred from private practice; some partly under the Local Government Board, others wholly independent of central control; some drawing a salary of £800 per annum, others considered to be amply remunerated for their services by a ten-pound note. It was, of course, impossible, in response to a sudden call, to find an army of men fully equipped for new and arduous duties. Curative medicine, although indispensably necessary, is not the whole training required to make an efficient officer of health, and it would be well if rural authorities and those gentlemen who, like M. Ollivier, have entered on the sanitary warfare with a light heart, adding it in many instances to the labours sufficiently arduous of private or union practice would consider the reasons, omitted in the Instructions of 1872, but most strenuously urged by the General Board of Health in 1851 against the admixture of private practice with public duties, a case being quoted in point—

"Of the appointment of the officer of health for Liverpool, in which, when the sanction of the Secretary of State for the Home Department was required, Sir George Grey declined to sanction the admixture of private practice with public duties, and *subsequent experience has shown the soundness of that decision*" ('Minute of the General Board of Health in relation to the Appointment of Officers of Health under the 40th Section of the Public Health Act').

[1] The doubts here expressed have been amply warranted by circumstances which have occurred since these pages were writtten. We need only refer to an article in the 'Times' of March 2nd in the present year, for an instance of the very great injury which may be done to the sanitary cause in England by men who undertake duties for which they are not fully qualified.

It is to be feared that many disused and rusty weapons have lately been unsheathed for the purpose of public analysis, and examinations of the most delicate kind are being undertaken by men who, even if skilled, are certainly not practised in the work. If platinum vessels and tests, which shall always be above suspicion, are requisite for the detection of alum in bread, it can scarcely be held that every health officer in England shall be thoroughly equipped for the task; and the conclusion is forced upon us that for the purposes of analysis under the Adulteration of Foods' Act and the various Sanitary Acts, men of the largest chemical experience will be required, acting of necessity over extended areas, and available for reference to every health officer in his district.

The question of qualification also, although strangely ignored in 1872, formed a distinct feature of the instructional minute issued in 1855, where the distinctions between preventive and curative medicine are clearly stated, and a competent knowledge, not only of pathology and chemistry, but of natural philosophy and vital statistics, is fully insisted upon.

Experience may, no doubt, convert a well-informed medical practitioner into a good health officer, but experience on a national scale would be bought, and bought dearly, at the national expense. It is essential, therefore, in view of the large requirements of the country, that some special training should be insisted upon for those who are to hold the public health appointments of the future. The University of Dublin has set an example which the English universities must soon follow, of instituting a qualification in state medicine. As a department of the natural science schools at Oxford and Cambridge, Public Hygiene might at once be placed on a proper footing, and adequate tests might be supplied for men who aim at filling the higher posts in the sanitary service of the country. The recommendations of the state medicine qualification committee of the British Medical Association go further, and propose to establish—

"An uniform qualification in State Medicine, to be held in future, besides the license to practice, by all persons (except those who shall have obtained a diploma in State Medicine, granted by any University as provided), before they are elected to hold the office of—

"(A) Medical Officer of Health or Deputy Medical Officer of Health or Union Medical Officer, acting in either of those capacities under the Public Health Act of 1872.

"or, i, Union Officer. ii, Medical Officer of Health.

"(B) Medical officer of any institution maintained out of the funds raised by national or local taxation, as a Prison, Reformatory, House of Correction, Industrial School, Police force, &c.

"(C) Medical superintendent or Visiting physician of any Hospital for the insane or Lunatic asylum.

"(D) Medical inspector of seamen.

"(E) Surgeon or Medical inspector of any hospital under the Contagious Diseases Acts.

"(F) Medical inspector under the Local Government Board, &c."

The wisdom of providing some test for those who are to exercise Public health functions must be allowed by all who have paid any attention to the subject, but the greatest care will have to be exercised if the test is not to become prohibitory, and we certainly think that the committee, or rather a section of it, have done wisely in suggesting the exemption of ordinary union

medical officers from the list of those on whom such a qualification in State Medicine as the one here proposed should be imperative.

"The qualification should include an adequate knowledge, both of legal medicine or medical jurisprudence, and of preventive medicine or public hygiene, comprehending medical police and the management of medical institutions, supported by national or local taxation;" the subjects of study being—"1. Vital and sanitary statistics. 2. Medical topography, climates, and meteorology. 3. Causes of death and disease. 4. Analysis of food, water, &c. 5. Principles of sanitary engineering and construction. 6. Epidemiology. 7. Preventive medicine in general. 8. The laws relating to the medical profession and the Public health. 9. Psychological medicine in its administrative aspects. 10. Medical jurisprudence in general."

For the present, however, the Health officer, isolated and without special education in Preventive medicine, is thrown on his own resources, and must seek for information from the best sources at his command. If we except the expensive and elaborate work of Dr. Parkes on 'Military Hygiène,' the excellent little volume of 'Lectures' by Mapother, Gairdner 'On Air and Water,' and a few others, there was an absolute dearth of accessible information on sanitary matters at the passing of the Public Health Act. Material there was in abundance, and of the richest kind, but it was scattered through the various journals, in parliamentary blue books, and in pamphlets often of the greatest value, but long out of print and forgotten. The task of writing for officers so differently employed as the District medical officer and the medical officer of health for a whole county was not an easy one, as Dr. Ed. Smith acknowledges in the preface to his work; indeed, the subject of State medicine is so extensive that perhaps no mere handbook could be expected to grapple with it satisfactorily; and a Dictionary of Public health on the principle of 'Reynolds's Medicine,' or of 'Holmes's Surgery,' or like Tardieu's Dictionnaire d'Hygiène,' emanating from many minds, would probably be the form best suited to a subject so varied in the knowledge which it exacts. In the long-promised manual by Mr. Ernest Hart and his three able coadjutors we had looked forward to something of this kind, and could not help feeling somewhat disappointed when the volume at length came into our hands. Part I, as might be expected from the legal ability brought to bear upon it, is an excellent epitome of sanitary enactments. In the form of a running commentary and abridgment the whole sanitary code is reviewed, with an occasional suggestion for amendment or advice which is always sound and to the point.

To this are added many official minutes and instructions which will prove most useful, together with model bye-laws, waterworks regulations, and tables which exhibit, in a condensed and accessible form, the powers as well as the penalties, under the various Sanitary Acts. Of Part II, dealing more especially with the Health officer's work, and Part III, devoted to analytical work, we shall have more to say in detail, but the general impression after reading them is that of work hastily put together, and scarcely equal to the reputation of the writers.

In Professor Corfield's portion, for instance, out of 114 pages professedly dealing with the whole scope of a health officer's duties, fifty are devoted to refuse removal and the water carriage systems, while many important subjects, such as statistics, topography, unwholesome food, &c., are dismissed in a page or two, if they are even considered worthy of notice.

Of the higher and more scientific aspects of Public health, and the splendid opportunities placed in the hands of Health officers for improving sanitary knowledge, there is scarcely a word, and in place of references to the rich classical literature of Public health in England, to the 'Privy Council Reports,' to Dr. Farr's admirable letters, to the 'Social Science Transactions,' and other well-known sources, the student is kept closely to the letter of instructions from the Local Government Board, and to the dry bones of sanitary enactments. We may add, that the absence of tables of weights and measures, and of an index, in a work intended for rapid and frequent reference, are serious and embarrassing omissions.

In the 'Manual' published by Dr. Edward Smith we find an arrangement which, from the nature of it, must lead to confusion and inadequate treatment of the subject. Taking the Order of the Local Government Board of November 11th, 1872, as his text, he proceeds to illustrate it, paragraph by paragraph, by quotations from various Acts, supplemented here and there by original observations, which we have calculated to cover barely 100 out of the 400 pages which make up the volume.

Coal mines and Factory Acts, with which Health officers have nothing to do, occupy fifty pages, while at least ten are devoted to the Contagious Diseases Acts (Women), in illustration of the personal habits of the people! It will readily be imagined that even with Dr. Smith's additions, which are often of much value, a minute of the Local Government Board, illustrated by the *ipsissima verba* of Acts of Parliament and other official documents, could scarcely prove interesting, or point out any but the most prosaic views of duty.

The third text-book which we have to notice is one by Dr.

Wilson 'On Hygiene,' differing in its arrangement from those already mentioned, and, we think, superior in allowing a greater breadth of treatment to the heterogeneous collection of subjects which come under the head of Public health, or, as we should prefer to call it, State medicine. The work shows not only extensive reading in the best sanitary literature, but a good use as well of the opportunities which the author, as the officer of a convict prison, enjoyed for original research.

The chapters on Air and Ventilation contain valuable contributions to our knowledge on these subjects, and are the best in the book. In other portions, and notably in those devoted to Food and to Water, inequalities of treatment are apparent, which will require attention in future editions of the work.

With these few general remarks we pass on to consider a little more in detail certain portions of the Health officer's ordinary work, which seem more especially deserving of notice. As we have already pointed out, the Public Health Act of 1872 has given a national importance and standing-point to Public health unknown before. For the first time in England sentinels are set on duty to watch everywhere the inroads of disease and death. It remains to be seen what use the Government or the Health officers themselves will make of opportunities so favorable for combined observation and research.

Questions of the greatest moment now lie within our reach if we will only seize the threads which lead to their discovery. Nothing is more certain, for instance, than the influence which Topographical conditions have upon human life, yet the subject has never yet received the attention which it deserves. The medical topography of his district, if thoroughly and systematically studied by the Health officer, may afford a clue to many anomalies, and materially aid his work.

Isolated attempts have been made from time to time to trace the distribution and the ætiology of disease in England, in many cases with the most encouraging results. We need only mention the researches of Dr. Buchanan on the influence of subsoil and drainage on the distribution of phthisis, and the elaborate charts of Dr. Haviland, which, founded as they are on the death-rate, foreshadow the larger and truer results which might be anticipated from the wider basis of a registration of disease.

But what has hitherto been entrusted to individual effort should now become a national care. With Health officers in every corner of England, many of them men of observation and culture, it will be inexcusable if the best use is not made of the varied and accurate information which it will be in their power to afford.

Again, every medical practitioner is familiar with the influence of the Weather on the persons of his patients, "those accurate bodyometers," as Sir Humphry Davy used to call them, yet he is unable to decide whether the effect is due to barometric pressure, to excess of ozone, to preponderance of negative or positive electricity, to increased or diminished humidity. The epidemic constitution of seasons expresses a fact but ill understood.

It is only by accurate local observation spread over a long period that the relations of climatic changes to disease can be fully ascertained, and every Health officer may contribute to this end by accumulating facts concerning the seasonal distribution of disease, and by preserving a record of meteorological data which would in time be a valuable addition to the medical history of the locality.

With the exception of a chapter in Dr. Smith's work, the text-books are strangely silent on this very important portion of a Health officer's work.

Turning to the more routine duties of the Health officer, questions connected with the Water Supply are amongst the most important which he will have to answer, for it is certain that no new source will be brought into use without his sanction, and that specimens of long established supplies will be submitted for his opinion and advice. We have looked, therefore, with some interest to the instructions given by the text-books on various mooted points: river water contaminated with sewage, for instance, as a source of supply for towns. On this subject we are glad to find that there is no hesitation, and that Dr. Frankland's conclusions are accepted without reserve:

"It is impossible for us to be satisfied that all the organic matters in sewage, which may include the poisons of special diseases, are destroyed in a river, whatever be its length. . . . . It is obviously absurd to pollute water first, and then resort to filtration and other expedients to make it presumably fit for drinking afterwards" (Hart, p. 241).

The use of well water in towns also, a matter of the utmost moment as connected with half the enteric fever in England, is dealt with very decisively:

"Wells in the subsoil of towns ought not to be used to supply water for drinking" (Hart, p. 255).

"In crowded localities they should always be regarded with suspicion, and, as far as possible, their use should be discontinued" (Wilson, p. 137).

On this point Medical officers of health will require all the authority which they can bring to bear, for important interests are not unfrequently at stake, and the powers of the Act are

often insufficient for the purpose intended. We may instance a case of a town in which the well supply is condemned, and where the sanitary authority is willing to enforce a supply upon unwilling landlords from an unwilling water company. The rate, however, of twopence per week, which can be enforced by the Act, although sufficient for the house-supply alone, is inadequate to pay for house and closet together. The result is a sanitary deadlock, which no one seems able to remove.

Having in view the peripatetic duties of a Health officer, and the impossibility of bringing home samples of every water for analysis, it is of the utmost importance that he should be provided with rough and ready rules, as well as with tests such as he could carry in a satchel at his back, and apply upon the spot. Chemists may deride them, but they have their value, and we should be glad to see them more prominent in the manuals put forth for the Health officer's use.

Water analysis has gained nothing from being the battle ground of rival chemists. While "previous sewage contamination" and "albuminoid ammonia" have been paraded *usque ad nauseam*, many useful points are appreciated at less than their true value. In the face of many facts and valued opinions that hard water may be injurious to health, we are told that "the importance of taking the degree of hardness has been greatly over-rated, and the medical officer of health can hardly ever be required to determine it" (Hart, p. 308).

Again, there is no question that the presence of nitrates, and especially of nitrites, is suspicious as pointing to possible sewage contamination, yet the Health officer is advised "to avoid making determinations of nitrates in drinking water" (Hart, p. 310), and no test is given for their detection. We are surprised that no notice is taken in any of the text-books of Mr. Horsley's very portable and delicate test with the pyrogallic and sulphuric acids, so admirably adapted for work in the field, which will be found in the 'Chemical News' for June 6th, 1863.

On the subject of organic matter in water much remains to be worked out, especially in its relation to disease. Less attention has been paid to vegetable impurities than the subject deserves, and a large field is open in that direction for observation and experiment.

Of animal impurities much has been heard of late in connection with cholera, and especially of typhoid. The volumes of the Privy Council are full of indisputable evidence as to its pernicious properties, yet we have still to learn whether simple putrescent matter can ever originate specific disease, and the conditions under which specific poison once formed can be rendered active and dangerous to life. Several processes are

given in the text-books for the detection of organic matter, the Condy test (Wilson, p. 158) being, perhaps, the most available for field work, that of Messrs. Wanklyn and Chapman for the more careful home work of the laboratory. In Mr. Hart's 'Manual' no less than thirteen out of the twenty-three pages given to water analysis are devoted to organic matter and the ammonia process, yet we look in vain for distinctions grounded on the animal or vegetable origin of the impurity, and by the hard and fast rule laid down, that no town ought to be served with water that contains more than ·06 or ·07 milligrammes of albuminoid ammonia per litre, the Glasgow supply is condemned as containing more organic matter than ordinary London water. It is time, indeed, that chemists should enlarge their field of view when they can prefer, on chemical grounds, the home waters of the Thames to those of Loch Katrine; when they can venture, on the same grounds, to ridicule, under the name of "milk panics" (see 'Milk Analysis,' by T. Alfred Wanklyn, M.R.C.S.), the facts which have so laboriously and conclusively been worked out by Dr. Ballard and others.

The subject of Food and Drink is so extensive that it could scarcely be adequately dealt with in any ordinary manual; still there is no doubt that the Health officer should be conversant with dietary tables and the means for detecting the more common adulterations; and the chemical portion of Mr. Hart's work has been intended to provide for this division of his work. We venture to think, however, that it would have been more useful if it had been less rigidly chemical. Take Milk, for instance, which, with other products of the dairy, is likely to be placed more immediately under his care, and imagine the hard-worked Officer of health going through the intricate analysis described at page 335 of the 'Handbook:'

"Abandon the use of the lactometer," is the advice of the pure chemist. "The specific gravity is a most important test of the quality, and hence the value of the lactometer," says Dr. Wilson, who gives very useful tables for judging of the value of the milk from the specific gravity alone. This is but one instance out of many in which readers of the various text-books will find that doctors disagree. While Dr. Smith and Dr. Wilson devote several pages to the subject of unwholesome meat, the recognition of which presents some difficulties to the untrained Health officer, Mr. Hart dismisses it with the remark that it "must be left to common sense, guided by a little experience" (p. 296).

The connection which has been shown to exist between many well-marked types of disease and special forms of industry gives the study of Habit and Occupation a peculiar interest to

the Health officer. It was a subject to which the late medical department of the Privy Council paid much attention, and the results of their inquiries were such as to encourage further effort in the same direction; indeed, it may well be doubted whether diseases of local and specific origin do not in many cases outweigh in importance the various forms of epidemic which of late seem to have had almost a monopoly of sanitary attention. Every Health officer, however small his sphere of duty, may add to our knowledge on these and kindred subjects, and if no special organ is started for the purposes of Public health, the medical journals will do well to devote a large portion of their space to communications of this kind, which cannot fail to be interesting as well as useful to the ordinary practitioner.

Disinfection is another subject which has been so overloaded by the claims of rival chemists that little of solid truth remains. Experiments on bactrios, on germs, and on putrefying meats are quoted in favour of this or that disinfecting agent, while the crucial tests on specific contagion are too long left untried; and the result is a growing scepticism on the one hand and an indiscriminating faith on the other. In the text-books of Wilson and Smith we find lengthy lists of chemical agents. many of which are of doubtful efficacy, while in Hart we read in one page (370): "There is no just reason to trust in any fumigation with chlorine, sulphurous acid or carbolic acid;" in another, speaking of fumigation by sulphur and whitewashing: "Very frequently the room has to be reoccupied on the same day. Notwithstanding this we have never known of a single case in which fever has again broken out in a room which has been so disinfected" (p. 273).

Dr. Ransom's paper on Disinfection by heat ('Brit. Med. Journ.,' vol. ii, 1873, is a valuable contribution to our positive knowledge on this subject, and might well form the starting-point for more extended experiment.

Passing to the great subject of Vital statistics, we regret to find that it occupies a position in the text-books analogous to that which it holds in 'The Instructions' of Mr. Stansfeld himself. We wish it had been otherwise, and that the authors who have addressed the Health officers of the country, instead of writing down to the Government level, had written up to the ideal of those who have spent their lives in the promotion of sanitary measures.

The Vital statistics of a country are the very backbone of all sanitary knowledge—the basis from which the Health officer's action should spring; yet what are the facts as regards England? Statistics of population are published by Government in the gross,

while the details are inaccessible; statistics of death are published in the gross at intervals after date varying from a week in the metropolis to a year or more in the rural districts—the details are inaccessible except by payment; statistics of sickness are unpublished and inaccessible except by special favour or by payment; yet the health officer is directed to report from time to time to the sanitary authority "with respect to the sickness and mortality within the district, so far as he has been able to ascertain the same." "He shall also prepare an annual report, comprising tabular statements of the sickness and mortality within the district classified according to diseases, ages, and localities."

Truly other governments besides that of Egypt can require bricks without straw! To show the entire absence of all method and control, we need only mention the fact, that for the tabular reports which are compulsory throughout the country, no authoritative forms have been issued, and each Health officer is allowed to please himself as to the form in which his annual report shall appear. If Mr. Stansfeld ever dreamed of making use of these returns for central information and imperial purposes, we can only pity the clerks on whom the unravelling of so many sanitary puzzles will devolve.

The first essential to a Health officer is a census of the population in detail, and for this purpose the numerators' returns now so carefully stowed away (or burned?) in London should be made freely accessible to local inquiry. The death-rate of a street or of a district cannot be estimated from the census returns for a parish or a registration sub-district. Again, it would seem incredible that any government should require statistics of mortality and of sickness, while they, at the same time, refuse to sanction the payment by which alone the data may be procured;[1] whilst the registrars themselves, who are also officers of the Local Government Board—

"Express a sort of indisposition to supply the returns so regularly as might be wished, and state that it is a purely voluntary act on their part" ('Brit. Med. Journ.,' August 16th, 1873).

Thus returns, which are gratuitously given by the medical profession to one officer of a Government department, are refused to a medical officer belonging to the same department except on

[1] "Dr. Thursfield said, that after a great deal of trouble he had arranged with the sanitary authorities in his district to get returns of deaths from the district registrars .... but to his surprise and disappointment, last week he received a letter which had been sent from the Secretary of the Local Government Board, stating that that Board had no power to sanction any payment to the registrars for such reasons" ('Brit. Med. Journ.,' August 16th, 1873).

payment of a fee by himself or by the local authority under whom jointly with the Local Government Board he holds his appointment. For the main facts relating to Death certificates and returns of Sickness we would refer to two former articles in the numbers of this Review for October, 1869, and April, 1871, which are as true now as at the time they were written. No advance has been made, if we except the shadowy and farcical registration of sickness, which is now being carried on at the suggestion of the Local Government Board. The chance of procuring valuable information, for nothing was far too good to be lost by an economical Government, and accordingly we find poor-law officers and others who alone possess the facts relating to illness urged, on personal as well as public grounds, to supply them. What wonder that many refuse? Mr. Hart boldly, and, we think, wisely recommends that, for the present, little stress should be laid upon them. Certainly no useful results can be reached, except for strictly local purposes, from returns which are fragmentary and uncertain. The value attached to sickness returns on the present system may be judged from the fact that in one only of the three text-books, Dr. Smith's, is it considered necessary to give even a table of the diseases which it might be useful to register, and that no reference is made to the valuable experience obtained by voluntary effort, extending over many years, in Manchester and in Newcastle-upon-Tyne.

We should have been glad to touch upon many other matters connected with the Health officer's work; sufficient, however, has been advanced to show how incomplete and unsatisfactory is even the last phase of sanitary organization.

A new Ministry may, indeed, raise new hopes, but we believe the best prospects for Public health may be seen in the energy and ability of the Health officers themselves, and in the pressure which they will in time bring to bear upon local authorities, the Government, and the people of the country. The conference lately held in London will, doubtless, become the nucleus for a powerful and united association, under whose auspices uniformity of action among Health officers and Local authorities m y to some extent be obtained. The task of educating the sanitary sense of the country is no easy one, yet, in the words of Dr. Druitt—

"It is little use to declaim against evils till the public understanding be enlightened to consider them such. Even the argument which convinces the reason may be impotent against the passion that 'stronger is than death,' against the family pride, the unreasoning affection, the adherences to old prejudices, which underlie many of the evils we declaim against; and it is uphill work to get laws put

in force by those whose interests and opinions these laws are intended to counteract" ('Med. Times and Gazette,' October 24th, 1868).

But in face of difficulties much may be done by Health officers and all who are interested in sanitary advancement, to prepare the public mind for a further and more satisfactory organization in the future.

The progress of Public health in England may be delayed, but it cannot now be stopped. In the long roll of Health officers pressed into its service, some of them men of the highest ability and energy, a new force has been given which must bear it onwards. By the advent of a Government pledged to sanitary reform fresh spirit has been infused into many whom Mr. Stansfeld's conduct at the Local Government Board had wellnigh driven to despair.

Mr. Sclater Booth, in becoming virtually the minister of Public health, has a wide field of usefulness before him, and we can imagine no higher service which a statesman could render to his country than the consolidation of an amended sanitary code, and the thorough reorganization of a department whose sphere of duty lies in the preservation of health and the saving of human life.

VIII.—Modern French Surgery.[1]

In the pile of volumes now lying before us we have a faithful reflection of the teaching of the present school of surgery in France, a reflection conveyed—at least in M. Gosselin's admirable lectures—in the pleasantest form. We have no recent English work to compare with this series of lectures which does for surgery what Trousseau's classical treatise did for medicine.

There are two methods of clinical teaching followed by those who prefer a set discourse in the lecture room to the discursive but valuable bed-side comments of some of our ablest teachers. Professor Bennett in Edinburgh, and Sir William Jenner and Dr. Murchison in London, have recently shown us to perfection how this latter form of ward-teaching should be carried out, and we have always desired to see surgeons emulate the physicians more than they do in this highest utilization of the ordinary

[1] 1. *Clinique Chirurgicale de l'Hôpital de la Charité.* Par L. Gosselin. Paris, 1873.

2. *Éléments de Chirurgie Clinique, comprenant le diagnostic Chirurgical, les Operations en général, les Methodes Opératoires, l'Hygiène, le Traitement des Blessés, et des Opérés.* Par J. C. Félix Guyon. Paris, 1873.

3. *Les Ambulances de la Presse annexes du Ministère de la Guerre pendant le Siége and sous la Commune,* 1870-71. Paris, 1873.

ward-visit. But after all, it is probably only a comparatively small number of pupils who greatly profit by this system of educating eye, ear, and hand at the bedside of the patient. For the majority of learners, as for the majority of teachers, the readiest way of imparting knowledge is by means of an address in the lecture room at the close of, or before the commencement of, the visit to the wards. But we hold that to be really clinical, such discourses should be based upon cases actually under observation in the hospital at the time, so that the student may verify for himself the statements of his teacher, and note how far the theory of the theatre accords with practice at the bedside.

In carrying out this plan the surgeon may either adopt the more recent method of taking some special disease or injury, dilating upon its symptoms and treatment and then illustrating the subject by reference to one or more cases under observation in the wards; or he may prefer the older method of taking some case, graphically pourtraying it, and thence drawing general conclusions as to the etiology, symptomatology, prognosis, and treatment of the lesion in question. This last process may be varied by taking several cases somewhat resembling each other and drawing attention to the contrasts and harmonies displayed by them under the same several heads.

M. Gosselin prefers this older method as that which was pursued by his most valued teachers, including the honoured names of Chomel and Bouillaud amongst physicians, and Dupuytren, Velpeau and Blandin among surgeons; and the admirable way in which the system is carried out in the lectures before us makes us impatient to see a similar work by one of our own surgeons to take the place of the somewhat dry pabulum afforded by our average surgical text-books.

Some years ago no English medical student was thought to have thoroughly studied his profession unless he had worked for some time in the Paris hospitals, but for a good while past Berlin seems to have taken the place of Paris in this respect. We are not sure that much has been gained by the change. As schools of pathology, no doubt both Berlin and Vienna are far superior to Paris, and a session spent in the pathological laboratory of either of the German schools is of inestimable value to an advanced student who wishes to qualify himself for subsequently teaching others. But for the man whose aim is to become a sound practitioner and to cultivate therefore broad views in diagnosis, prognosis, and treatment rather than to prosecute extensive researches in morbid anatomy, a winter at Paris, with the early morning work in the wards of La Charité, or the Hôtel Dieu, will still be found, in our opinion, the most useful

addition he can make to the excellent courses of study now provided by our own schools.

In glancing at the teaching of the French schools as set forth in the volumes suggesting this article, we shall confine ourselves to such of the subjects as are of most importance in themselves, or have been by recent events forced into comparative prominence.

It may not be altogether out of place at the outset to review briefly the work of French pathologists towards building up those modern views of pyæmia which are even by French writers themselves usually attributed to the German school, but which M. Gosselin shows clearly were for the most part, if not altogether, anticipated by his own countrymen.

There are three chief theories explanatory of the multiple abscesses and other lesions, which follow only too frequently the more severe operations performed in the Paris hospitals, and which have by some been supposed to be so exclusively the result of conditions only met with in such institutions as to have given rise to the misleading term "hospitalism." During the late remarkable debate in the Clinical Society of London on Mr. Prescott Hewitt's paper on "Cases of Pyæmia occurring in private practice," it was abundantly shown that such diseases as pyæmia, erysipelas, and "hospital gangrene" are by no means the exclusive property of hospital wards, although it is probable that the presence of one such case is apt to cause a calamitous spread of the disease amongst surrounding patients; but that surgeons in extensive private practice amongst patients occupying the highest social position have to deplore these accidents as frequently in the best houses, and surrounded by the most perfect hygienic conditions, as amongst their poorer patients crowded in the wards of the great London hospitals.

However this may be abroad, it is certain that the death rate after major operations in the Paris hospitals is lamentably high, and that the researches of those who have had such abundant opportunities for the investigation of the causes of this mortality have thrown more light on the pathology than on the treatment of pyæmia and the allied diseases.

1. As early as the year 1823 Velpeau put forth the view already long since hinted at by Petit and Morgagni, that pus was absorbed by the gaping veins in a suppurating wound, and carried by them to the viscera, there to form "metastatic abscesses." This view even now meets with considerable support under the title of "purulent absorption;" but the great objections to its acceptance are, that it is not clear that cut veins absorb as readily as delicate capillary networks are known to do, and that these secondary abscesses are, in the viscera at least, preceded by

stages of blood extravasation, and infiltration with plastic matter, forming the dark red and firm orange and yellow nodules in the lungs familiar to pathologists.

2. In 1828, Dance, and subsequently Cruveilhier, Blandin, and P. Bérard modified Velpeau's doctrine by making phlebitis the starting-point of that admixture of pus in the general circulation which they admitted to constitute the essential feature of the disease. But the phlebitis, though undoubtedly present in some cases, it is frequently impossible to demonstrate, as was pointed out by Darcet, Sédillot, Tessier, and Gosselin himself: Tessier especially insisting on the fact that even where the cut veins are inflamed, firm coagula usually block the upper parts of the vessels and so hinder the passage of the pus into the general circulatory current. Moreover, recent researches have abundantly demonstrated the impossibility of distinguishing pus-cells from ordinary leucocytes when within the blood-vessels, as used to be accomplished triumphantly enough by those who were most firmly wedded to the older views of pyæmia.

3. The third and most recent as well as most widely accepted view is that expressed by the term *septicæmia*, and it is this doctrine which has been usually attributed to the German school even by the countrymen of those who really first published the observations and deductions on which the doctrine is founded. This theory explains purulent infection by the absorption and introduction into the blood of minute putrid and septic particles derived from the decomposition of blood-serum, sloughing tissues, or any other decaying matters which may be present in a healing wound or any unhealthy inflammation.

Fifteen years before Virchow propounded this theory with the title of septicæmia,[1] Darcet had published a pamphlet in which nearly the same propositions were advanced, the main difference between the two pathologists being that, whereas Virchow attributed the secondary abscesses in the lungs to the washing away of emboli from the clot-occluded veins in the wounded part, Darcet suggested that they were little fibrinous plugs derived from the decomposing purulent matters rather than from the blood. Sédillot, in 1849, came still nearer to the modern doctrines of septicæmia, when he insisted that pyæmic abscesses were produced not alone by the mixture of pus with the blood, but by the absorption of putrid matters from the wound or inflamed part into the circulating stream.

It seems to have been M. Guérin who, in 1847, first distinctly charged hospitals with the chief share in the production of pyæmia, by his theory that the disease was caused by the

[1] 'Recherches sur les Abcès multiples et sur les accidents qu'amène la présence du pus dans le Système Vasculaire.' Thèse Inaugurale. Paris, 1842.

absorption into the blood-vessels of wounded parts of poisonous miasmata from the air, these miasmata being specially prevalent in hospital wards and all narrow and ill-ventilated passages and staircases; and he thus explained the supposed greater frequency of pyæmia in hospitals than in private practice, and in towns than in the country.

M. Gosselin himself, in 1854-55, as the result of repeated experiments upon animals, and careful observation of surgical patients, showed clearly (1) that absorption readily takes place from the marrow of bones and from the surface of wounds, and (2) that, in cases of injury of bone with exposure of the medullary canal, the marrow itself is apt to become putrid and poisonous where it is exposed to the air, and that wounds contain besides abundance of material by whose absorption in the earliest stages traumatic fever is produced, whilst the absorption of other (and presumably different) gangrenous matters at a latter stage causes a graver febrile condition with the metastatic abscesses of pyæmia. The only missing point in all these observations seems to have been a convenient name, such as septicæmia, by which to express them, and it is indeed singular that on the name being suggested in Germany, French and German writers alike contrived to overlook to a great extent the valuable labours of those whose work we have quoted, and to give almost all the credit of the septicæmic view of pyæmia to the German school, until in the great debate on the subject in the Academy of Medicine in 1871 the French claims were fairly put forward.

When we turn to the teaching of modern French surgeons as to the treatment and prevention of pyæmia we are forced to admit that in these essential points they can help us very little. In fact, we are driven to the conclusion that thus far we have done next to nothing in the direct treatment of the pyæmic state, although we flatter ourselves that we have done a good deal in the way of prophylaxis.

The opinion of surgeons in France seems to be pretty unanimous as to the great value of an abundant supply of *fresh air* to those who, like parturient women, and the subjects of grave surgical operations, are specially liable to one or other of the forms of blood-poisoning. Hence their advocacy of tents for the reception of such patients as provided by the Necker, Saint Louis, and Cochin hospitals; and, where this plan is unattainable, their insistence upon isolated airy wards, for patients already affected, and, where possible, buildings in the country rather than in towns for the reception of such as are to undergo serious operations. We are not sure that the benefits conferred by such precautions have been at all satisfactorily proved. The costly

detached blocks of St. Thomas's Hospital on the banks of the Thames, the Atkinson-Morley Hospital on the heights of Wimbledon, and the beautiful Convalescent Hospital on the downs by Beachey Head, have all furnished cases of so-called hospital diseases sufficient to make one uncertain of the extent of the prophylactic influence of ventilation, isolation, and pure air. Meanwhile, our continental brethren seem sure of the advantages to be thus secured, and speak warmly of the use of deep open-air balconies or garden tents into which severe surgical cases may at least be moved during the day where more perfect change of air cannot be provided.

We hear so much at the present time about the effect of dressings in preventing these diseases that it is interesting to notice the value set by French surgeons upon such means. In the first place, then, it is noteworthy that our continental brethren still disbelieve in the occurrence of primary union in all but the smallest wounds, and occasionally in children; and that, therefore, admitting the facility of obtaining superficial union, and the grave danger of so locking up all the discharges which putrify deep in the wound, they discountenance all attempts at immediate union of such wounds as those of amputation. Now, setting aside for the moment the theory which is thought to account for the remarkable results obtained by Prof. Lister in the treatment of amputations by the so-called antiseptic method—one essential feature of which is the immediate and accurate apposition of the divided tissues,—British surgeons know well that, although indeed cases of union "without a single drop of pus" such as used to be reported from Aberdeen in the early days of enthusiasm about acupressure are as rare as ever, yet that by attention to the ordinary rules of surgery which were as well known to John Bell and Abernethy as they are to the present race of surgeons, a fair proportion of amputation and similar wounds do still unite so speedily and with so little suppuration as to justify us in applying to such a mode of healing the name of primary union. In such cases the chief causes of pyæmia are avoided, and the mortality is proportionately lowered.

The published statistics of Mr. Callender's operations during the past few years at St. Bartholomew's Hospital sufficiently attest this fact. There is absolutely nothing new in Mr. Callender's method. Great care in attending to the suggestions of common sense and surgical experience suffices to obtain results so admirable that the Paris hospital surgeons may well be incredulous. By the substitution of torsion or animal ligatures for the old threads a valuable drain from the deeper parts of the wound has been lost; but a fine silver tube introduced for a day

or two to carry off the superfluous fluids which always exude from freshly cut surfaces supplies this want, whilst the sloughing ends of tied tissues are avoided. For the rest, strict attention to cleanliness and quiet is all that seems necessary to achieve the desired end. If surgeons think that it is essential to carry out all Prof. Lister's minute directions in order to ensure this rest and cleanliness, by all means let them do so. For our own part we believe that the chief merit in Lister's plan lies in the extreme care it entails upon the surgeon employing it, and that with such care the special use of so-called antiseptics may be safely dispensed with, whilst without such care only a greater danger is incurred of locking up in the wound fluids which are apt to putrify unless permitted to escape almost as soon as exuded. We cannot help deploring the scepticism of modern French surgery which prevents them from adopting *the* means *par excellence* of obtaining immunity from the grave risks of pyæmia by attempting to secure immediate union.

During the last year or two an approach has been indeed made towards this attempt by the method of "infrequent dressings" advocated by M. Alphonse Guérin.[1] This method does not indeed aim at the complete avoidance of suppuration, but it aims at depriving this suppuration of its most injurious qualities by keeping the part perfectly at rest and by the exclusion of air. Early in the seventeenth century, an Italian surgeon, C. Magatus, published a bulky volume in defence of his practice of seldom dressing operation wounds, averring that it was important to hinder the access of air to the part, to keep the wound absolutely at rest, and to confine the pus, which he considered an essential agent in the reparative process.

Magatus removed his wrappings every third or fourth day. The plan died out, however, to be revived nearly a century later by Belloste, and subsequently to be occasionally adopted by surgeons from time to time with by no means uniform success until M. Alphonse Guérin, in our own day, in obedience to his view of the part played in the production of pyæmia by the absorption of poisonous miasmata from the air, to which reference has been already made, advocated a plan bolder than any which preceded it.

M. Guérin wraps up a stump or wounded part in a thick layer of cotton wool, carrying the wool for a considerable distance along the limb on either side of the wound, and firmly bandaging the whole so as to produce a very considerable general pressure upon the limb, insufficient to arrest circulation,

[1] "Discussion sur l'Infection purulente." 'Bull. de l'Acad. de Médecine,' 1871, tome xxxvi, p. 328.

but quite enough apparently to subdue all such excessive blood supply as might light up injurious inflammation. The part is left in this condition for three weeks, at the expiration of which time the dressing is removed and another similar application made for the same interval, to be repeated if needful until cicatrization is quite or nearly quite completed. By these simple means air is completely excluded, and the limb kept absolutely at rest. On removing the wool at the expiration of the twenty-one days, the end of the stump is found bathed in creamy sweet pus, its lips red, florid granulations between the flaps, and a certain amount of erythematous flush extending round the wound, due, doubtless, to the soaking of the skin in the pus. This redness, however, soon passes off, and the pus is perfectly free from any offensive odour, whilst the patient suffers hardly any pain either during the firm bandaging over the wool or afterwards.

This plan of treating amputation stumps is still too novel to permit us to speak definitely of its merits. It is certainly as simple as could be desired, and in M. Guérin's hands it has proved extremely successful. With M. Gosselin its results have not been so happy, for of the first six amputation cases in which he tried this method, only one survived; but, as he frankly admits, these were all exceptionally severe cases of delayed operation for serious gunshot injuries, and in all, symptoms suggesting the onset of pyæmia, or at least severe traumatic fever, had appeared before the operation.

To M. Jules Guérin and to M. Maisonneuve modern surgery is indebted for another proposal in the treatment of wounds having the same object as that of M. Alphonse Guérin, namely, the exclusion of air from the divided tissues, but pursuing this end by a far more complicated route. The proposition which emanated, apparently independently, and at about the same time from both of these surgeons, may be described briefly as a direction to keep the stump protected from the air by enveloping the stump in an impermeable muff fastened securely to the limb above, and then by exhausting the air between the stump and the muff by means of a side tube connected with an air pump. By this plan of "pneumatic occlusion," M. J. Guérin trusts to obtain primary union as simply as in the case of small subcutaneous incisions by the mere absence of air with its supposed toxic pollutions. M. Maisonneuve, for his part, desires in addition to suck up as soon as excreted all liquids and gases which may be generated on the face of the wound, and so orders the aspiration to be repeated eight or ten times a day, a little disinfecting fluid being washed through the apparatus in addition from time to time.

The impossibility of carrying out these indications completely will prevent these suggestions receiving general favour, and the absence of any satisfactory evidence of utility so far renders it unnecessary for us to criticise these recent productions of scientific surgery. It is obvious that if the mere access of air be the source of all the dreaded evils of amputation and such like wounds, there are few practical surgeons whose common sense will not suggest other simpler and better means of attaining the desired end.

The so-called "antiseptic dressings" of Prof. Lister have been, not largely, but apparently fairly tried by French surgeons, notably by M. Léon Labbé, and by M. Cruveilhier fils, but without yielding the good results recorded by Prof. Lister himself. Whether this be due, as will doubtless be suggested by some, to defective management of the apparatus, or to want of faith in the underlying theory, or to some special vice in the constitution of the patients or the hygienic conditions surrounding them, it is impossible to say.

It must of course be remembered in reviewing the results of these various treatments of operation wounds in France during the last few years, that the unhappy political circumstances of that country have yielded to the surgeons a class of cases very different to those falling under the care of our civil surgeons at home. The amputations and excisions which have been so largely practised abroad have been mostly for the relief of severe gunshot injuries, often postponed until the onset of acute traumatic fever, and then performed upon men demoralised by defeat, or exhausted by the prolonged struggles and excesses attending a triumphant rabble and a disorganized government. We must wait until the happier times now inaugurated have settled down into the normal condition of things before we can fairly compare the results obtained by operating surgeons at home and in France.

Turning now to other branches of surgery in which we may study profitably the researches of our neighbours, it is instructive to note how much light has been thrown, and especially by M. Gosselin, on the surgical diseases of adolescence, of that age between fifteen and twenty-five which seems particularly prone to the occurrence of certain disorders of development. Such are, for instance, ingrowing toe-nail, sub-ungual exostosis of the great toe, epiphysial exostosis and osteitis, fibrous naso-pharyngeal polypi, and tarsalgia.

The clear recognition of the fact that these *are* diseases of adolescence is of itself of great clinical and prognostic importance, and hence the advantage of devoting a few pages of this sketch to their consideration.

Ingrowing toe-nail, a slight but very painful affection, demands more care than is usually bestowed on it, both because of the suffering it entails, and also because it is met with by far most frequently in lads in the humbler ranks of life, with whom a few weeks or months of serious interruption to daily work may mean the loss of the chance of learning a good business, or of the rise in life which is secured by steady application to one pursuit under one employer. Whether the cause of this malady be the wearing of tight boots, or some alteration in the matrix whereby a nail is formed too large for the skin which overlaps its base and sides, it is singular that it is far more commonly encountered amongst boys than in girls. Thus of 54 cases carefully noted by M. Gosselin, only 10 occurred in girls, whilst of the 54 boys 41 were between fourteen and twenty years old, 9 between twenty-one and twenty-five, and 4 between twenty-six and thirty, none being older than this. Of the affected girls in like manner 9 out of the 10 were between fifteen and twenty-two years of age. With two exceptions all these patients occupied the humbler ranks of life, and in nearly every case the outer side of the nail was at fault, the inner side seldom sharing in the irregularity.

Few surgeons have not been disappointed with the occasional return of the disease in despite of all the usual routine modes of treatment, although we believe that it has been only recently pointed out that this liability only persists through the period of youth, ceasing with hardly an exception at the age of thirty. In view of this unhappy liability to return, one is grateful to M. Gosselin for his suggestion to excise a portion of the matrix after avulsion of the nail, so that the nail-forming layer may occupy a narrower base on the face of the toe. Although not invariably successful, this gives by far the best chance of a radical cure.

The sub-ungual exostosis of the great toe contrasts with the last complaint by being met with more often in girls than in boys, but, like it, it is seldom encountered later in life. Anatomically it resembles ordinary exostosis in that the spongy bone forming its bulk is continuous with that of the phalanx itself, whilst its surface is invested with tough fibrous tissue. Removal of the little growth with a strong bistoury, after tearing off the nail, and then scooping out slightly the surface of the exposed phalanx, is all that is required for a cure, without the necessity for amputation of any part of the toe.

Allied to this not very common complaint is another also somewhat rare condition in which many bony outgrowths take place near the epiphyses of the long bones, and it is of great importance to recognise the fact, strongly insisted upon by

French surgeons, and indeed not entirely overlooked by ourselves, that these numerous small exostoses cease to grow when the epiphyses unite with the shafts of the bones. Not, indeed, that they are formed, as has been suggested, by local hypertrophy of a part of the epiphysial cartilage and its subsequent ossification; for they are oftener seen springing from the shaft a short distance above the cartilage line. They appear to result from the development of cartilage in the under layer of periosteum and its after conversion into spongy bone which is in direct continuity with the cancellous tissue of the shaft; but that they are met with almost only when youth is passing into adult age, and that they cease to increase when that age is attained, are facts of the gravest therapeutical importance, warning us not to remove them lightly, as at worst they will only be causes of slight inconvenience, whilst, if removed, the exposure of the spongy tissue of the bone beneath may not unlikely give rise to acute osseous suppuration and its perils, even if the neighbouring joint escape damage, which, from the occasional close proximity of a pouch from the synovial membrane, must always be uncertain.

Naso-pharyngeal fibromata furnish another example of the light thrown by modern French surgery on the diseases of this period of life. The pathology of this growth, its habit of springing from the basilar process and of projecting thence into the nose and pharynx, with the serious symptoms it may produce, have been amply demonstrated by the researches of Nélaton and others, whilst they at the same time affirm that the growth is restricted to boyhood. Hence M. Legouest suggested the advisability of employing the simplest means for its removal or alleviation until the age for its further growth should be passed. It was reserved for M. Gosselin to record a case in which a large polypus of this kind which had given rise to most distressing symptoms, spontaneously shrivelled up, and disappeared when manhood was reached. Whether this happy result is or is not the rule in such cases, a clear indication is suggested not to meddle with these firm pharyngeal polypi more than is absolutely necessary until the age comes when they may either spontaneously waste, or at least cease to grow further, when they may be strangulated without much fear of their return.

M. Gosselin has also brought together into the diseases of this age two varieties of epiphysial osteitis. At this time of life, when the whole bony framework is in a state of unwonted activity and especially about the epiphyses, soon to be united to their shafts, it is not uncommon for inflammation more or less severe to be excited in these tissues from very slight causes, as a blow, a fall, or over walking. These inflammations M. Gosselin

has divided into two classes, of which the first includes those chronic inflammations of the great trochanter or tibial tuberosity, or more rarely of the ends of the long bones, which do not tend, save in cachectic subjects, to suppuration, but which end, if the part be kept well rested, in local hypertrophy or even in partial anchylosis of the involved joint. The second and larger class comprises those more severe forms of suppurative osteitis which occur mostly in the lower end of the femur and tibia, and which are more destructive at this time of life than at any other. M. Gosselin recognises three varieties of this graver class according as the suppuration is limited to the periosteum, or to the superficial parts of the bone, or invades the bone generally and extends to the neighbouring joint. The practical importance of this not very easily drawn distinction lies in the indication afforded for amputation in all cases of invasion of the joint itself as the best chance of saving life, the slighter forms yielding to milder measures and leaving behind them only the deformities due to the altered shape and size of the bone which persist in adult life. During adolescence, however, sufferers from these bone inflammations are very prone to re-lighting up of the mischief by slight causes, and they need therefore to be carefully attended until they have outgrown the propensity.

Tarsalgia is another of these complaints of youth which has much engaged the attention of French surgeons. It used to be taught by Nélaton, Jules Guérin, Bonnet, and Duchenne that it depended primarily upon muscular contraction. The youths complain of painful flat foot, which at times passes into marked valgus, and the suffering seems to be induced and augmented by long standing and much walking, the bearing of heavy burdens adding to the evil effects of the prolonged posture or exercise. Although in the later stages the muscles may become more or less shortened, the earliest symptoms are referrible to the tarsal joints themselves, and especially to the astragalo-scaphoid articulation which is apt to become anchylosed. The inflammation present, however, very rarely goes on to suppuration, and after youth has passed a painless deformity only is left. The best treatment seems to consist in fixing the foot for two or three months in some immovable apparatus, dividing the peroneal tendons in severe cases in order to bring the foot into good position. In this as in the other diseases to which we have made reference, return of the malady may be expected up to the end of adolescence, but not afterwards.

The treatment of stricture of the urethra has received so much attention at the hands of French surgeons that to take even a short historical glance at their contributions to the subject would lead us beyond the limits of this sketch. We are mainly

indebted to them for the gradual substitution amongst us of flexible bougies with bulbous or olive-shaped ends for the old silver and steel instruments. Their clear recognition of the necessity for always avoiding anything like violence in exploration of the urethra leads them to the almost universal practice of restoring the calibre of the canal, by the gentle use of these soft instruments, always passing them with as little effort as possible to avoid lacerating the mucous membrane, and in this they have a considerable advantage over us in their more gradually increasing sizes of the instruments. In this way they usually treat ordinary strictures, occupying six or eight weeks or even more in the process, but with the great gain of causing no pain, hardly any risk, and interfering not at all with the ordinary avocations of the patients.

But for the more obstinate cases of very rigid or resilient strictures, for which this slow progressive dilatation is unsuitable, they do not scruple to employ some speedier method of overcoming the resistance. Even here, however, true to their strong opinion about the mischief attending rough treatment of this part, modern French surgeons are far more generally in favour of internal urethrotomy than of the plan of suddenly splitting the stricture long ago suggested and employed in this country, but for the convenient carrying out of which M. Pérève, some years since, invented an instrument which has been adopted by an English surgeon, and used by him so constantly as to have identified in some measure both the instrument and the method with his name in this country.

Mindful of the severe fever which is apt to follow the absorption of urine from any breach of surface in the urethral mucous membrane, rigorous rules are laid down to the pupils by hospital surgeons for the avoidance of all chance of allowing a drop of urine to come in contact with the divided part in cases of urethrotomy. This risk appears to be not greater in cases of forcible splitting than of urethrotomy, but it is such a genuine danger in both cases that preference is always, and justly, given to the plan of treatment by slow progressive dilatation with soft bougies where there is any likelihood of this being effectual.

In connection with this subject may be mentioned a rapidly growing dislike to the use of injections in gonorrhœa. Caustic injections are strongly condemned by M. Gosselin, and even the milder astringent injections are objected to as positively hurtful when—as is usually the case—they are improperly managed, and as apt to cause permanent damage by inflammatory thickening of the mucous membrane. The common detergent injections are also dismissed as useless. We believe that this is a

thoroughly sound change in opinion, and that most cases of gonorrhœa can be safely and, on the whole, most speedily brought to a termination by using only cleansing injections of warm or cold water throughout, together with some simple laxative medicine, rest, restricted diet, and, where there is much scalding, some alkaline drink. These views are gaining ground in England as well as in France, although we do not scruple to use medicated injections for the later stages of the disease when it has passed into a chronic gleety state.

Mention may be here made, in passing, to a sensible suggestion by M. Gosselin in cases of urinary extravasation. Instead of contenting himself with the orthodox scrotal incisions, M. Gosselin points out that, as the perinæum is always the seat of some preliminary infiltration, incisions should always be made as well through this part, extending from the side of the anus forward to the root of the penis.

There yet remain many features of interest in modern French surgery, notably in connection with the treatment of stone in the bladder, venereal disease, and tumours; but their consideration would lead us so far beyond the limits of this paper that they must furnish the basis of a second communication.

(*To be continued.*)

IX.—Barnes's Diseases of Women.[1]

Even those who know the unwearied energy with which Dr. Barnes cultivates the branch of the profession in which he is so highly distinguished will look with astonishment on the bulky volume which is the latest production of his pen. A treatise of nearly 900 pages, enriched with many new and original illustrations derived from the study of the stores of pathological specimens contained in our metropolitan museums, and showing, in every page, evidence of extensive literary research, indicates an amount of labour which would be surprising from any one, and which is simply marvellous as the work of a fully occupied practitioner, embarrassed with the engagements of practice and hospital work. That it redounds immensely to its author's credit, and will greatly enhance his already high reputation as a scientific physician, is only what one would expect; that it is not entirely free from faults of literary style, and evidences of somewhat hurried composition, would be to claim for it a perfection

[1] *A Clinical History of the Medical and Surgical Diseases of Women.* By Robert Barnes, M.D., Lond. London, 1873.

which would be almost an impossibility when the circumstances under which it must have been written are considered. These, however, are but of secondary consequence, and the book is, and will always remain, a monument of its author's learning and industry. At its very commencement Dr. Barnes seems to feel that some sort of apology for its unwieldy size is necessary, and he gives a by no means unmerited rebuke to those general physicians who think it possible to practise medicine without studying the influence of the generative organs on the female sex, and who he thinks, not perhaps unnaturally, will deem that so large a volume on the diseases of the female sexual organs is making a mountain of a molehill. There can be no doubt that in revindicating the importance of this influence he repeats the opinion of all who have studied the subject. The neglect of the study of diseases of the female pelvic organs is, indeed, one of the most crying defects of our medical system. It can nowhere be said abroad, as it unfortunately can be too truly said in England, that the general physician considers this class of disease as entirely beyond his province, and this fatal omission is the source of many and very serious blunders, which are matters of every-day experience to those who have much gynæcological practice. The following sentence expresses, shortly and truly, the important bearings which diseases of the sexual organs have on the female economy; and it would be well if Dr. Barnes's Fellows in the College of Physicians would read, mark, and inwardly digest it. Unquestionably the appreciation of the lesson he teaches them would be of material benefit to their patients:—"It may be affirmed that no severe constitutional disorder can long continue in a woman during the predominance of the ovarian function without entailing disturbance in this function; and the converse is also true, that disorder of the sexual organs cannot long continue without entailing constitutional disorder or injuriously affecting the condition of these organs."

The sentence is not very elegant, and somewhat tautological, but it will meet with the cordial assent of all who are qualified to judge of its truth; and if this be so, is it not a crying shame that a class of diseases having such important bearings on the larger body of the community is almost untaught in our medical schools? Teachers of midwifery—limited as they are by the ignorance and prejudice of the Medical Council to a short three months' course of midwifery—far too short to enable them to overtake half of pure obstetrics—are perforce obliged to allow their students to leave their schools without even a smattering of gynæcological knowledge. The consequences are disastrous, as many a poor sufferer could testify to her cost; but the blame should

not be cast on the practitioner, but rather on those on whom, it is to be hoped, Dr. Barnes's sermon will have some good effect.

It would lead us far beyond the limits of a short article to attempt anything like an exhaustive review of Dr. Barnes's work. All that we can hope to do is to direct the reader's attention to some of its leading features, and to discuss the views propounded on a few of the most important topics on which the minds of gynæcologists have of late been most exercised.

Passing over a very accurate account of the anatomy of the sexual organs in the female, which is an essential stepping-stone to an exact knowledge of women's diseases, and one which has been rarely, if ever before, fully entered into in any of our standard gynæcological works, we come to a chapter on leucorrhœal discharge. It does not, perhaps, contain much that is new; but it is worthy of notice, because it shows that Dr. Barnes has avoided a mistake that many gynæcologists fall into. Practitioners who are ignorant of female disease, and patients themselves, are apt to attach far too much importance to such discharges, and to attempt to cure them by perfectly useless remedies, such as medicated vaginal injections for discharges that are purely uterine in their origin. On the other hand, the scientific gynæcologist is carried by the reaction from this system much too far in the opposite direction. He either, like the late Dr. Rigby, believes them to be purely constitutional in their origin, and to require general remedies only; or, if he belongs to the modern school of gynæcologists, whose cry is, "There is but one uterine disease, and Hewitt is its prophet," he will consider all uterine discharges to be mere symptoms of flexions, and requiring nothing but local and mechanical treatment. From both these errors Barnes steers clear. While insisting strongly on the importance of constitutional remedies, he points out, with great truth, that in diseases of the eye and skin both local and constitutional treatment are required; so in uterine disease it is hopeless to expect a cure unless the local condition, whatever it may be, is topically treated. The distinction between vaginal and uterine leucorrhœa is further insisted on, and the futility of treating the latter without appropriate intra-uterine medication is strongly urged. With this we heartily concur, but when we come to consider what he says further on in his book as to the best modes of conducting this medication and the agents employed, we are bound to say we think him meagre and faulty. The dependence of uterine leucorrhœa on flexions does not seem to have struck Dr. Barnes; at least, he passes it entirely over without mention, which, if it be truly the prime agent in its production, as some maintain, is, to say the least of it, a curious

omission. In the following chapter we have a discussion on the various kinds of pain attending uterine diseases, and we refer to it chiefly because of the good practical lesson it contains, that many of the pains referred to the region of the ovaries, and erroneously attributed to congestion, irritation, or neuralgia of the ovaries, are, in reality, to be traced primarily to morbid states of the uterus itself. This is a familiar fact to all who have much opportunity of studying female diseases, and ignorance of it is very apt to lead to serious mistakes. We are pleased to see that Dr. Barnes gets rid of those misleading and unmeaning terms, "irritable uterus" and "ovarian irritation," which are mere cloaks of ignorance, and usefully high-sounding words to use to patients, when the practitioner is puzzled to give a more accurate definition of the disease, but which should certainly not find a place in the vocabulary of the scientific physician.

The next chapter treats of a subject of which we need say no more than that, according to Barnes, it is one which "is apt to entail the most serious disruption of conjugal relations." Nor would we have mentioned it at all were it not for the purpose of giving some further publicity to the exceedingly long name which Dr. Barnes has invented for it, and for which he obviously has a parental fondness. "Dyspareunia" is certainly a formidable appellation, but it is not so bad as "dyschezia," which we find on the preceding page, and which also, we presume, is the offspring of Dr. Barnes's classical studies. We feel some natural shame in being obliged to confess that we should certainly not have known what the former meant unless Dr. Barnes had explained himself in more familiar and less euphonious terms, and that we have not even yet the slightest idea of the signification of the latter. The chapter on sterility is very complete, and gives one of the best accounts of the subject with which we are acquainted. Considerable stress, but certainly not too much, is laid on the influence of morbid states of the lining membrane of the uterus, but the most important factor in the production of sterility is stated to be narrowing of the os externum and retroflexion of the uterus. Stricture in any other part of the canal of the cervix as a possible cause of the obstruction is not even alluded to, and the external os is supposed to be the only part at fault. To this conclusion many gynæcologists will certainly demur. Dr. Barnes says, in reference to these points, "So preponderating is the association of a minute os externum and retroflexion, separately or combined, that in any given case of a woman who remains sterile five years after marriage and suffers from dysmenorrhœa it may be predicated with almost certainty that one or other of these conditions exists." To this sweeping

conclusion we can hardly agree. The influence of acute anteflexion is here entirely ignored, and yet, in our experience, it is a by no means uncommon cause of sterility. In women who have borne one child, and subsequently remained sterile, retroflexion is unquestionably very often the explanation. Passing over several chapters on menstruation and amenorrhœa (noticing, in passing, that, in treating of absent menstruation and the so-called emmenogogue remedies, he entirely omits all mention of the chloride of ammonium, which has a most unquestioned action in promoting the appearance of menstruation in cases of its temporary suspension), we come to a long chapter on retained catamenia. The description of the various physical conditions is extremely accurate and exhaustive. In explaining the well-known fact that serious symptoms are very apt to follow the sudden emptying of a vagina and uterus distended by retained menses, Dr. Barnes hazards the theory that the uterine efforts at this expulsion of its contents may suffice to drive some of them "through its walls in the form of a fine oozing or dew, which hangs to the peritoneum." This idea, we presume, is purely theoretical. He does not, of course, disown the production of such symptoms from the retrograde expulsion of fluids through the Fallopian tubes, and further refers them, in some cases, to laceration of the tubes at their weakest parts by the sudden dragging on them of the retreating uterus, the tubes being, perhaps, held back by adhesions. In treatment the difficulty, of course, has always been to choose between gradual expulsion of the fluid and its immediate evacuation. Both are well known to be very often followed by troublesome and even dangerous symptoms. We are glad to see that Dr. Barnes proposes the gradual drawing off of the fluid by the aspirator. This idea had previously struck us, and, although we have not yet had an opportunity of putting it into practice, we believe that it will afford a good solution to the difficulty.

In the chapter on dysmenorrhœa Barnes seems constrained to adopt the old classification into neuralgic, congestive, obstructive, and ovarian, although this evidently goes rather against the grain, for he has a strong disposition to refer all cases to contractions of the uterine tissue induced by attempts to expel uterine contents. The facts, however, are too strong for him, and he is obliged, under protest, to admit that there are a considerable number of cases to which his theory will not apply. Even of them, however, he endeavours as much as possible to give a mechanical explanation. Thus, with regard to neuralgic dysmenorrhœa, the irregular, intermittent, and essentially nervous character of which he is obliged to admit, he says that it also is caused by the womb attempting to expel something. This

something is "the rapid preliminary development of the mucous membrane into menstrual decidua, the congestion of this structure, and of the uterus generally." If this assumption, for it is nothing more, be correct, it would seem rather to place these cases into the category of congestive dysmenorrhœa, and not into that of the obstructive class. There is not the slightest evidence to prove the correctness of the next sentence,—that "this is enough to cause tension of the uterine muscular fibre, and to excite it to contract, and this swelling of the mucous and muscular walls may close the os internum, and lead to partial retention when the flow begins." Indeed, the fact, which must be familiar to all, that severe pain often begins many days before the menstrual flow commences, and is relieved as soon as that shows itself, is conclusive proof against it. "The congested womb," says West, "aches till it bleeds," and therein he expresses a truth which is incompatible with Barnes's theory, for if that were correct the pain should greatly increase as soon as there was a flow of blood which might cause retention. It seems, indeed, a mistake to endeavour to force all cases into one groove. We do not in the least mean to underrate the influence of flexion, contracted cervix, and other conditions, in producing mechanical dysmenorrhœa, which is unquestionably a very common and very important form of the complaint, but we hold it to be only one out of several. Amongst these ovarian dysmenorrhœa holds an important place, to which we observe Dr. Barnes assigns in this work a special chapter, although in a former paper read at the Obstetrical Society "On the Essential Causes of Dysmenorrhœa," in which he referred all cases to retention, he made no mention of it. Even his ingenuity fails to bring such cases under the head of retention. We observe that here he again indulges himself in his strange fancy for coining new words, and, with the assistance of his colleague, Dr. Stone, hits on the curiously inelegant and altogether unnecessary term, "Dysootocia," which our classical readers will be glad to know is derived from δυς, and ᾠοτοκεω, "to lay eggs." Practitioners who hear that a patient is suffering from dysootocia will be, in future, puzzled to know whether she is the subject of ovarian dysmenorrhœa or one of the various forms of dystocia described in works on midwifery.

Passing over many chapters, and specially recommending to the notice of our readers a concise and accurate description of ovarian tumours and their treatment, which will be very valuable to ovariotomists, we come to a very complete discussion of the important subject of extra-uterine fœtation. This forms one of the best monographs on this topic that have yet been pub-

lished, and is well worthy of careful study. Barnes expresses a strong hope that we may, in some cases, be able to avert the too common catastrophe following the rupture of the cyst in tubal gestation. This, he thinks, may best be done by tapping the cyst by an aspirator or exploring needle, and draining off the liquor amnii, the cyst then ceasing to expand, and remaining in the body without further damage. Several successful cases are recorded, and no one will question the expediency of giving the patient the benefit of the doubt when suspicion of the existence of this formidable accident has arisen. Certainly, the mere passing of the aspirator is not likely, in any case, to be prejudicial, and it may avert a lamentable catastrophe. It is, unfortunately, too true, however, that the symptoms are so obscure as rarely to excite suspicion until rupture has actually occurred. Pain and hæmorrhage, associated, on vaginal examination, with fulness of the vaginal roof on one side of the uterine neck, the os uteri pushed over to the opposite side, and a swelling felt between the finger in the rectum and the hand depressing the abdominal walls, are the signs given. Obscure enough they are, but sufficient to lead to strong suspicion, and this, above all others, is a case in which suspicion should be held as justifying action.

The somewhat analogous question of performing gastrotomy after rupture has actually taken place is not answered in the affirmative by Barnes. We hardly think that all hope of this "dernier ressort" ever proving successful should be entirely abandoned. Certainly, it has never yet been done, and very possibly it never may be done, but we cannot see that it is entirely hopeless. Without it the patient will certainly die, so that matters could not be made much worse by operation. Some of Barnes's reasons for rejecting the operation seem questionable. One of them is that "removal of the blood by gastrotomy must add to the shock, and cannot restore the lost blood." Those who have seen the way in which extravasated fluids are removed after ovariotomy, by sponging out the abdominal cavity, will not be hopeless of removing a considerable quantity of blood in this way, and if further escape be at the same time arrested, the shock would be lessened, and not increased. Then again, "if we could tie the Fallopian tube and amputate the sac, the pain caused by the ligature would probably be so intense as to itself exhaust the vital force." This is pure speculation, and there is no reason why the sac should not be tied by a ligature cut short and left in the abdomen, as in Tyler Smith's method of treating the pedicle after ovariotomy, without any special pain following. Those who saw a case of extra-uterine fœtation exhibited at a

recent meeting of the Obstetrical Society, in which the patient had lived a whole night after the rupture, could hardly doubt that, in that instance, ligature and removal of the sac, and sponging out the extravasated blood, would at least have been quite possible. No doubt this is the very forlorn hope of surgery, but in desperate circumstances a doubtful remedy is better than none, and it seems not impossible that some day a bold and successful operator may yet be able to snatch his patient from the very jaws of death.

In the following chapter, on the changes induced by pregnancy, and the results of sub-involution of the uterus, Dr. Barnes treats of a subject of immense importance in the production of uterine disease, and one the influence of which is by no means sufficently recognised. No one who sees much of gynæcological practice will doubt the correctness of Dr. Barnes's statement, that "a very large proportion of the cases of uterine disease which come under treatment are the result, more or less immediate, of parturition." There is, therefore, much force in Barnes's protest against the modern practice, if it be a practice, of removal to the drawing-room in less than a week after delivery. Unquestionably, the longer we can persuade our patients to rest the more complete will be the involution of the uterus, and the more satisfactory the recovery. We also thoroughly agree with him that, however important is the due performance of lactation in promoting involution, in the large proportion of women in the upper ranks of life, whose constitutions are impaired by the enervating effects of civilised life, nursing is an impossibility. Every one must be familiar with cases in which the mother is only too anxious to nurse, but in whom there is either no lacteal secretion, or a milk so poor and unnutritious as to be useless, if not positively injurious, to the child. As regards the local treatment, it seems to us that the application of potassa cum calce to the cervix is recommended rather more incautiously than the severity of the application justifies. Unless the practitioner is thoroughly skilled in uterine treatment, it is an agent which is certainly not unlikely to do more harm than good. The application of pledgets of iodized cotton to the cervix is, in our own experience, one of the very best means of reducing the size of an involuted uterus, but we cannot agree with Barnes that the application may be entrusted to the patient herself. Unless the iodine is kept in very close apposition to the cervix by a large pledget of cotton wool soaked in glycerine, it is apt to fall into the vagina, where it not unfrequently causes much pain and irritation. The method of applying pledgets of cotton soaked in glycerine per vaginam every night, as recommended by Marion Sims, is one of the

most useful of remedies in this condition, and it is not alluded to at all.

This is a plan of treatment which possesses the recommendation of being easily carried out by the patient herself, and there are few more powerful agents in diminishing the congestion and tenderness of an hypertrophied womb. We are glad also to find that Dr. Barnes lends the weight of his authority to the application of suitable medication to the interior of the uterus in cases of chronic endo-metritis or uterine catarrh, the value of which is evidently not sufficiently appreciated; and as all who have studied the subject have pointed out, he insists on the risks of intra-uterine injections in the unimpregnated uterus. We cannot, however, agree with him as to the methods of intra-uterine treatment he adopts, or in the agents he selects. He tells us that "a most precious way of applying astringents, caustics, solvents, or alteratives, to the interior of the uterus is in the form of ointment or pasma." We should be inclined to say that it was a precious bad way of doing it, and unquestionably the introduction of his ointment positor, which is figured at p. 138, in hands less skilful than his own might certainly lead to serious mischief.

We pass over entirely the chapters on pelvic peritonitis, pelvic cellulitis, and pelvic hæmatocele, not because of their brevity or want of importance, for the student will find in them a very full and complete description of these diseases, but for lack of space to do them justice.

In treating of prolapsus uteri and its medical cure we observe that Dr. Barnes speaks in much more depreciating terms of restoration of the perinæum than we should be inclined to do. In a not inconsiderable number of cases we have observed this of itself effect a permanent cure, and it is not every one who can satisfactorily perform the more complex operations which Dr. Barnes favours. Undoubtedly the chances of a radical cure are much increased by the amputation of a small portion of the elongated cervix, which almost invariably leads to the absorption and shrinking of the rest. We are glad to find that he condemns, as dangerous and unnecessary, Huguier's complex operation of supra-vaginal excision of the cervix.

With regard to the *quæstio vexata* of uterine flexions, Barnes assumes the *via media* which we feel sure is the true solution of the controversy. He neither underrates their importance nor does he elevate them into the sole cause of uterine disease. This is entirely in accordance with the experience of all who have dispassionately studied the subject. We think, however, that Barnes is certainly open to the criticism of not sufficiently recognising the views of others on this point. However much

we may differ from Dr. Hewitt and his followers in their exaggerated views of the importance of uterine flexions, yet we cannot overlook the influence of their work, and it is certainly surprising that it should be passed over, with hardly any mention, in the way it has been.

We cannot help remarking that this apparent want of recognition of contemporary work is by no means an admirable feature in the book. Another remarkable instance of it is the entire absence of any allusion to Dr. Meadows's criticism of Dr. Barnes's views on hæmatocele, and to statistics on the effects of puncturing the tumour, views with which personally we do not agree, but which can hardly have escaped Dr. Barnes's memory, and were certainly worthy of notice.

There are many other chapters in his book which will well repay perusal, but which we must pass over unnoticed. On the whole, if it has a fault, it may be said to be too bulky and diffuse for any except those who wish to study the subject very profoundly. It will, therefore, perhaps, never be so popular a book with the student or general practitioner as with the professed gynæcologist. Nor does its style and diction compare favorably with some of the more well-known works on the subject. On the whole, however, it will always be quoted as an authority and as a mine of reference on the subject of which it treats.

X.—Pettigrew on Animal Locomotion.[1]

FEW of the many books written by modern authors are beyond the pale of honest criticism. The book before us is, however, an exception to this general rule. It is in every sense an admirable popular exposition of the mechanism of locomotion, as exemplified by animals living in and on the great domains of the earth, written by one who has not his superior as an accomplished philosophic anatomist and original observer. There is little or nothing new in the book, the author's views having been made public at different times and places. But if not new, the matter is reduced to the plainest and simplest language compatible with clearness, and intelligibility, and thus brought within the comprehension of men unblessed with scientific education. This is a step in the right direction—it is a step towards the realisation of that great problem which has for centuries baffled the fertile ingenuity of the most gifted minds, viz.

[1] *Animal Locomotion; or, Walking, Swimming, and Flying; with a Dissertation on Aëronautics.* By J. BELL PETTIGREW, M.D., F.R.S.

aërial locomotion, which can only be effected by a thorough knowledge of the mechanism of the appendicular parts of animals accustomed to soar in that, to us, great and forbidden region, the air.

The opposition manifested by the masses to aërial navigation is in a great measure due to insufficient knowledge of the mechanism by which animals fly. Because some animals have, as far as history can relate, been accustomed to fly—because other animals have, according to history also, never been able to fly—some men reason that it is utterly impossible for man to fly, and more, that it is an unwarrantable interference with the natural laws of Providence to attempt to fly by artificial means. Such men rejoice in asserting that the impediments to artificial flight are of so enormous a magnitude that it is impossible to overcome them; balloons are at the best uncertain and dangerous, flying machines hitherto made have been miserable failures, and artificial wings have proved as untrustworthy as they were cumbrous and unworkable when tested. Over and over again it has been asserted that everything has been done that can be done to ensure success, but the success is just as far from actual realisation as when first attempted. It must be granted that thus far success has been of a very equivocal kind. But it is invidious to assume that more extended knowledge and continued application to the subject will not bring forth inventions — elementary they may be — indicative of future triumph. When Leonardo de Vinci, the celebrated Italian painter, invented his "Architonnerre," or steam-gun, he had probably no idea that the two great factors—fire and water—which he employed, or suggested to be employed, would play so great a part in the economy of the universe as they now do. The engine by which ships could be propelled without the use of oars and sails, exhibited by Blaseo de Saray to the Emperor and King Charles V in 1543, must have been a Lilliputian exemplification of inventive genius in comparison to the magnificent screw and paddle steamships of these days. Solomon and Isaac de Caus, Father Teurechon, Father Kircher, Edward Somerset, Marquis of Worcester, and others, may have had some knowledge of the power of steam, and may have invented little, but useless, engines; but to what end in their days? To no practical end, certainly! Yet these men were pioneers in a then unknown region of wonderful powers. These men could no more anticipate the present gigantic results of their pigmy inventions than we can now foresee what will be the common mode of progression in the year 2001. But the engines of the preceding inventors were marvellously superior to the steam-kettle and æolipile of Hero the Alexandrian. All knowledge is progres-

sive. Men are led into the by-ways of invention by the forebodings of necessity. The latter cast their shadows before, even ages prior to the actual necessity of their accomplishment. Useful motion produced by steam has neither been suddenly invented nor perfected. It has been marked throughout its earlier phases by so slow a progress that it is next to a miracle it has culminated into the slightest semblance of usefulness. But when once a definite status had been obtained, mark how rapid the progress. The leap-year of locomotive progress is characterised by the advent of the odd-looking, slow-travelling, noise-producing, and cumbersome "Rocket," a marvel of mechanical invention in its day, but only capable, by laborious puffing, of travelling about twelve miles an hour. Contrast this well-nigh pre-historic megatherium-like combination of levers with the elegant and swift-travelling locomotives which daily carry passengers from one end of the country to the other now, and the difference is as great as the degree of perfection attained in so short a time, as conversely the progress towards utility and the time preceding from Hero's engine to the "Rocket" were respectively little and long. If it has taken well-nigh two thousand years to produce that which is yet by no means perfection, there is surely a hopeful future for aërial locomotion. The incomprehensible Architect of the universe has well determined that we shall not learn the simplest of even small things suddenly and without labour, and also that we shall not attain those things which we either do not deserve on the one hand or are not ready for on the other.

All absolute knowledge has been as slowly as it has been laboriously attained. It has not come to us as volcanoes evacuate. Each age has contributed its mite towards the accomplishment of that which, whatever it is, is, at the end, a general substantial blessing. The fact must not be overlooked, however, that the pioneers have invariably been regarded as visionists, whose worthiness, if admitted, consisted in their being monomaniacs. The majority of men have so limited capacities that they can only appreciate when unequivocal success has been attained.

In respect to aërial locomotion one would naturally think that no other subject could arouse the enthusiasm of human minds to so extravagant a degree; irrespective of it being the one great thing which human ingenuity has not yet accomplished, the subject is still fraught with much that is noble and grand. All great minds, all admirers of the ideal as well as the real, and every lover of the most lovable of nature's greatest works, must look upwards. It is in those regions far above us, beyond the clouds, beyond the rude tracts of stone and iron

roads, we wish to lay the lines of future locomotion. As the minds of men hovered around the wonders of steam power in early days, so have they fondly dwelt upon the delights of flying, but in vain. The notion of imitating the flying of birds is very ancient. We disregard the fables of the winged gods, the stories of the Scythian Abaris, Dædalus, Bladud, and the like, and even the *Capriobatæ*, a Scythian race (who, as Strabo tells us, raised themselves by smoke), and the oracle of Hieropolis; we will also ignore the tale told by the illustrious Bacon in his 'De Mirabile Potestatâ' of a flying machine. However, fables as the preceeding most undoubtedly are, men were led by them to consider the practicability of flying. Faujas de St. Fond, Cavallo, Bourgeois, Bishop Wilkins, Van Helmont, Schott, Baptista Porta, Cardan, and many other comparatively ancient writers, maintained the possibility of flying; but Giovanni Alfonsi Borelli, the mathematical physician of Naples, was probably the first to attempt to reduce the science of flying to mathematical certainty. In his memorable work 'De Motu Animalium' he seems to have anticipated the author of the book under review; we mean anticipated the only method by which flying will be ultimately accomplished. There is no more beautiful example of history repeating itself, as Carlyle says, than the fact that Dr. Pettigrew has taken up the theory *in extenso* which mistily floated through the brain of Borelli, while intermediate between these two observers, Montgolfier and a host of other adventurous aëronauts have been wedded to balloons, a method of locomotion which if never discovered it had been well. As an illustration how slowly the human mind accepts a self-evident truth, we may refer to the idea that bodies lighter than air can alone fly, in contradistinction to the now more feasible view that a body must be heavier than air to enable it to fly. The converts to this view are too numerous to mention here. It is remarkable, indeed, that the converse theory should ever have been entertained. All practical ideas with which we are familiar on this subject point out to the one condition of flight by means of suitable mechanism, irrespective of such artificial means of lightening the load to be raised as those adopted by balloonists. The assertion of Fontenelle, that "a new truth is a wedge that only penetrates with time, and by the wide end," is true enough.

But to return to the book under review. The author states that "the great panorama of life is interesting because it moves." Motion is the chief and most prevalent law exemplified in the universe. It is manifested in and under almost every conceivable form and condition. The power of voluntary locomotion, as Agassiz says, is the grand characteristic of animals;

and, as a French writer has it,—"it is to motion, and motion only, that is to be ascribed all the changes, all the combinations, all the forms, in short, all the various modifications of matter. It is motion that alters the aspects of beings, that adds to or takes away from their properties, &c." It is this law of motion which has impelled man to observe, contemplate, and imitate, and to devise machines to outrival even nature herself, "until the genius of mechanism smothers him worse than any nightmare did; till the soul is nigh choked out of him, and only a kind of objective mechanic life remains. But cannot he fathom the doctrine of motives, and cunningly compute these, and mechanise them to grind the other way?" (Carlyle.) Whether or not, Dr. Pettigrew has made an attempt, and if a logical mensurative faculty goaded a human mind towards the confines of a successful elucidation of a great natural law—a law capable of being artificially applied to beings long doomed by necessity to wander upon the face of the earth, to calmly contemplate the skies above, destitute of the power to invade them, while animals lower in the scale enjoyed the enviable privilege—the discoveries of the author may be said to have done so.

Dr. Pettigrew has assailed nature with her own weapons. He hesitates not to enter the lists against the mighty and long unassailable monopoly of the winged legions, but not as our speculative forefathers, in ignorance of the simplest of the mechanical contrivances exemplified in those animals alone capable of locomotion in air.

By imitation much has been effected. Man, can by practice hold his own in water, while on land he eclipses the swiftest and the strongest of all animals, by the machines which he has invented. But one of the most powerful of all the powers of locomotion is the fact that motion in all animals is produced after one definite and simple method or plan. We have long been familiar with Dr. Pettigrew's 'figure of 8.'

It is many years ago since the author first made the discovery of the prevalent and extensive distribution of this peculiar mode of arrangement of muscular fibres in certain organs. Year after year Dr. Pettigrew has continued his investigations, and the more extended they have been the more they have evidently convinced him of the truthfulness of his discovery, and also of the extensive applicability of this ellipsoidal factor of active motion. There can be no doubt that other authors have contributed facts in support of the beautiful theory of figure-of-8 motion.

But it must be granted that Dr. Pettigrew was the first to discover it. If, then, M. Marey has made independent discoveries, we must ask the question how far those discoveries

have been influenced by the previous labours of Dr. Pettigrew. Every one who enjoys the privilege of his acquaintance knows well that long before 1868 Dr. Pettigrew was at work upon this subject, and that his views were well known to the scientific public. There can be no doubt that before Dr. Pettigrew's investigations and publications upon the figure-of-8 movements, little or nothing had been done. It is easy to extend the application of a discovery once made. The discovery is the chief difficulty, and he who first discovers deserves more credit than he who improves upon or elucidates something new from that discovery.

There are several statements made in the book which have been by other reviewers severely commented on. It strikes us forcibly that the only individual capable of answering those statements satisfactorily is Dr. Pettigrew himself. As far as we can learn from a careful perusal of his book, there are some errors, but of little moment; some statements open to question, but none justifying the somewhat bitter reviews already published. The book is an admirable one, and we sincerely trust it will fill the gap which has long been felt, and we sincerely hope that it will be as much appreciated as it deserves to be by men less hypercritical than some of Dr. Pettigrew's reviewers.

The present most prevalent mode of criticism is decidedly objectionable. The method adopted is to pick out one or two weak points, and, either from personal or acquired knowledge, bring a column of charges upon it, adverse to the unlucky author. But all the good in the book is passed by without a word of commendation or encouragement. Such criticism is worth no consideration whatever, but rather tends to bring disrepute upon itself.

XI.—Norris's Contributions to Surgery.[1]

In this volume Dr. Norris has collected several essays, which originally appeared in the 'American Journal of the Medical Sciences,' and to these "have been added a paper on compound fractures, a large amount of new material on the occurrence of false joints, and numerous clinical histories drawn from a hospital service of thirty years."

The essays are well worth reprinting, and we are glad to have the result of Dr. Norris's enlarged experience on the important subjects of which they treat.

[1] *Contributions to Practical Surgery.* By George W. Norris, M.D. Philadelphia, 1873.

The first is the well-known paper on the occurrence of non-union after fractures, which, in its present form, is probably the most complete essay existing on this subject. The paper is based upon 150 cases of ununited fracture, which the author has collected and tabulated. We are glad to see that Dr. Norris admits the objections to be made to many of the conclusions arrived at by the statistical method, and is aware that the results thus obtained are usually much too favorable, on account of the more common publication of successful, than of unsuccessful cases. It is also needful to remember the impossibility of obtaining a series of cases in all respects and exactly comparable. But, at the same time, the careful study and analysis of a large number of accurately recorded histories of disease cannot fail to yield some useful results, and Dr. Norris's tables certainly furnish much valuable information.

True ununited fracture is, fortunately, not of common occurrence, although cases of delayed union are not rare; and, practically, the two classes of cases are not always at first easily distinguished, for doubtless some fractures unite soundly after unusually long periods of soft union; but there are some in which even the most persevering use of appropriate treatment fails to produce bony union, and these are the cases to which Dr. Norris especially refers.

After describing the process of normal union after fracture, the author proceeds to investigate the conditions found when this fails to take place. These are of four kinds. In the first, the bones are found united by a fibro-cartilaginous mass resembling that produced in normal union, but which has failed to ossify. There is an arrest or retardation of the natural process. An important diagnostic symptom of this condition is that the handling of the limb causes pain.

In the second class of cases there is entire want of union of any sort between the fragments, the ends of which seem to be diminished in size, and are extremely movable beneath the integuments. The limb in these cases is found greatly shrunken, and hangs perfectly useless.

"In the third and most common class of cases the medullary canal is obliterated in both fragments, and the ends of the bone are found more or less absorbed and rounded, or are pointed and covered with a tissue resembling the periosteum, and are connected together by strong ligamentous or fibro-ligamentous bands, passing from the extremity of one fragment to that of the other.

"In the fourth class of cases a dense capsule, without opening of any sort, containing a fluid similar to synovia, and closely resembling the complete capsular ligaments, is found. In these cases the points of the bony fragments corresponding to each other are

rounded, smooth, and polished, in some instances are eburnated, and in others are covered with points, or even thin plates of cartilage, and a membrane closely resembling the synovial of the natural articulations. It is in this kind of cases that the member affected may still be of some utility to the patient, the fragments being so firmly held together as to be displaced only upon the application of considerable force."

The causes of non-union after fracture are divided, as usual, into constitutional and local.

Of constitutional causes, syphilis, lactation, and pregnancy may occasionally delay or arrest union, but we agree with Dr. Norris in thinking that they very rarely do so.

Cancer is, perhaps, more, strictly speaking, a local than a constitutional cause of non-union, and, doubtless, the disease which prevents the union, has often been the cause of the fracture, of the bones.

Fragility of the bones leading to easy fracture is said by the author not to interfere with union, and we have ourselves seen a case in which nearly all the long bones of the body had been fractured (some of them several times) by very slight force, but had united without the slightest difficulty.

General debility, starvation, want of nervous influence or of blood-supply, and advanced age, are all mentioned as occasional causes of non-union, although fractures may, no doubt, unite perfectly, even in very old persons, and in spite of the ligature of the main artery of the limb.

We are surprised that Dr. Norris does not allude to phosphatic urine as a cause of delayed union, although he quotes (p. 54) a case in which large quantities of phosphates were passed by an old man in whom soft union occurred. We are inclined to think that this is one of the commonest constitutional causes of delayed union, and have many times seen fractures which had failed to consolidate in the usual time, become firm as the urine became natural under appropriate treatment.

Of local causes the first mentioned is motion of the fragments, either from want of proper treatment or perverseness of the patient. This, we should think, is by far the most common local cause, and a notable fact bearing on the question of imperfect treatment may be gathered from Dr. Norris's tables, namely, that during the twenty years over which those tables extend, no case of ununited fracture occurred in the patients treated in the Pennsylvania Hospital, but all the instances of that condition were in patients sent into the hospital for its treatment.

Want of contact of the broken ends is the second local cause alluded to, and although bones may unite, the ends of which

are considerably separated, yet this separation may sometimes be sufficient to prevent union, especially as it is often combined with frequent movement.

Thirdly. The ends of the bone may be so much injured or diseased that necrosis and separation of considerable fragments may take place, but this is not incompatible with ultimate recovery with a firm limb.

The fourth cause is the interposition of foreign bodies between the fragments. The author does not admit among these the portions of muscles and soft parts which have been by some asserted to prevent union; and he justly remarks that although, if the bones are not in contact, some of the soft parts naturally fill the gap, yet that if these were pressed between the fragments they would either become absorbed or ossify. The often-quoted case of Sir James Earle is an instance in point. In this the fracture was extremely oblique, and the fragments displaced, causes much more likely to account for non-union than the presence of a portion of muscle between the broken ends.

Tight bandaging, the diminution of the temperature of the part, and the too early use of the limb, are also given as causes sometimes leading to want of union. But there still remain some cases in which no cause can be assigned for the failure or softening of union; and, on the other hand, many fractures unite well under the most unfavorable conditions.

Many illustrative cases are given by the author, one a remarkable instance, not merely of want of union, but of absorption of the whole humerus, after a fracture.

"The dissection (thirty-four years after the accident), which is minutely described by Dr. C. B. Porter, showed all traces of the humerus to be obliterated, except its two extremities, the lower one being an inch and a half long, and the remains of the upper extremity consisting of a thin auricular-shaped plate of bone two inches long and one wide, in close relation with the articular cavity, but presenting no articular surface."

Before proceeding to consider the surgical treatment of ununited fractures, the author justly points out that the limb thus affected may often be rendered a very useful one by mechanical means, and quotes cases to illustrate this. In the majority, however, this is not the case, and some curative measures are demanded by the patient. Of such, the most ancient method of treatment is friction of the ends of the bones against each other, either by handling, or allowing the patient to use the limb, to which a splint is applied. This is doubtless often effectual in delayed union. Blisters, sinapisms, and tincture of iodine, have all been found useful in exciting the desired action in the dormant tissues.

Pressure upon the part by means of a tourniquet applied on the splints has been found useful in some of the more recent cases.

Electricity has been used with benefit, but of this treatment we want further experience; it seems, however, rational in cases exhibiting a want of action. Mercury has been recommended by some as beneficial even in cases not syphilitic, but is, we think, of doubtful value.

These milder methods failing, it will be needful to resort to more severe treatment. Setons have been frequently used, and may be passed either between, or near, the extremities of the bones; they may be of silk or metal. Dieffenbach's plan of driving iron pegs into the ends of the bones is one which has been by some strongly advised. Of recorded cases, about one half succeeded under this treatment.

A somewhat similar method is that practised by Dr. Brainard, and suggested by Sir Charles Bell, which consists of subcutaneously drilling the bones. Again, the ends of the bones may be scraped, as was done by John Hunter, or cauterized by the hot iron or by caustic potash, procedures all having for their aim the removal of the tissue covering the ends of the bones, a result which may be obtained also by resection. This last, although giving some excellent results, is a very severe operation, and should not be lightly undertaken, yet it is, no doubt, proper where other milder methods have failed. We think, moreover, that its application should be limited almost, if not entirely, to the humerus.

After pressure and rest have been tried (and these are applicable only to cases of delayed union), the treatment chiefly advocated by Dr. Norris is the use of the seton, which he considers "one of the safest, least painful, and most effectual of the numerous operations that are performed for the cure of pseudarthrosis." His tables, however, show that the treatment by setons is by no means a simple affair. It is often difficult, sometimes dangerous. Of 46 cases thus treated, 36 were cured; but nearly one fourth of these had severe symptoms (fever, erysipelas, or profuse suppuration), and there were two deaths. The author also strongly recommends the use of caustic to the ends of the bones before resorting to resection.

The tables appended to the paper are very carefully prepared; we quote the conclusions drawn by the author:

"1st. That non-union after fracture is most common in the thigh and arm.

"2nd. That the mortality after operations for its cure follows the same laws as after amputations and other great operations upon the extremities, viz. that the danger increases with the size of the limb

operated on, and the nearness of the operation to the trunk; the mortality after them being greater in the thigh and humerus than in the leg and forearm.

"3rd. That the failures after operations for their relief are most frequent in the humerus.

"4th. That after operations for the cure of ununited fractures, failures are not more frequent in middle-aged and elderly than in younger subjects.

"5th. That the seton and its modifications is safer, speedier, and more successful than resection or caustic.

"6th. That incising the soft parts previous to passing the seton augments the danger of the method, though fewer failures occur after it.

"7th. That the cure by seton is not more certain by allowing it to remain for a very long period, while it exposes to accidents.

"8th. That it is least successful on the femur and humerus."

And for treatment, he recommends—

"1st. To apply the method of cure by rest and compression. If the fracture has been regularly treated, and is not consolidated at the usual period, replace the limb in the apparatus, and insure to it a state of complete immovability; if the treatment of the injury has been altogether neglected, or been inefficient, apply proper splints and moderate compression with a roller, and renew these as soon as they become in any degree lax.

"2nd. If, from want of action in the seat of injury, rest and compression are in themselves insufficient to produce a cure, continue the state of immobility in which you have placed the limb, and apply blisters, moxas, iodine, or some other stimulant to the seat of fracture.

"3rd. If both these modes fail in producing a deposition of callus, employ frictions.

"4th. If the methods mentioned fail to produce a change, or the patient has already been suffering from his injury for eight or ten months, and there is no contra-indication to it, resort to the seton.

"5th. If the case be one to which, from its long standing, or state of the fractured parts, the seton is inapplicable, expose the fracture and apply caustic potash to the fractured end.

"6th. If all the above means have been carefully resorted to unsuccessfully, then, and not till then, resect the ends of the bone.

"7th. Never resort to amputation of the member until fair trials have been made with all these methods, and then only at the request of the sufferer, after he has found that the limb can be of no possible service to him.

"In employing any of the above means, the obstacle to the occurrence of union which may exist, arising from the state of the constitution, should be carefully sought for and combated by an appropriate treatment."

The next paper in the volume is on the treatment of deformities following fractures.

The three methods usually employed, viz. pressure and extension, rupture of the callus, and resection, are each considered, and illustrated by cases. We may remark that the deformity must be very severe and detrimental to warrant either of the last two modes of treatment.

It is unfortunate that in the statistics of fractures and dislocations treated in the Pennsylvania Hospital, no distinction is made between simple and compound fractures.

In his remarks upon these, Dr. Norris well points out that no pain should be permitted to exist in a case of fracture under treatment, without a careful examination of the dressings, with a view to discovering and removing its cause. For, as we have often observed, such pain is an almost certain sign that the bones are not in good position, or that there is something wrong in the application of the apparatus.

In fractures of the patella the limb is placed on an inclined plane, and the fragments brought together by bandaging. No mention is made of Malgaigne's hooks. We think, moreover, that there is no special advantage in raising the limb, and that if it is more comfortable to the patient to place it flat (as it sometimes is) it is best to do so.

The author speaks of the unsatisfactory results often following fractures of the elbow and forearm, and, we are surprised to see, recommends splints to be applied, extending to the *ends of the fingers.* It is quite unnecessary that the splints should extend beyond the palm of the hand, and by thus limiting them, that stiffness of the fingers which is often a source of trouble long after the fracture is healed may be avoided.

In fracture of the elbow-joint the plan recommended of gradually changing the angle of the splint so that the fore-arm is moved from a right angle to a straight line with the arm, and then back again is, we think, a very good one.

In speaking of dislocations of the humerus, Dr. Norris still adheres to the old error of speaking of the most common displacement as that into the axilla; although it is well known, at least in this country, that the sub-coracoid is by far the most often met with. He does not allude to reduction by manipulation. In irreducible dislocation of the astragalus he advises, and we think rightly, the removal of the bone.

The author considers that Sir A. Cooper was in error in stating that simple dislocations of the astragalus were more common than compound; and he quotes a remarkable case in which the bone was thrown completely out of the foot, and found at some distance from the patient.

An example of dislocation, without fracture, of the fifth from

the sixth cervical vertebra is related, on account of the extreme rarity of this form of injury.

The question of amputation in compound fracture is discussed, concerning which the author agrees with most of the recognised rules; but we think his fourth rule (that amputation should be resorted to whenever a large joint is implicated, even though there is but little laceration) should not be invariable.

The author is in error in supposing that the bent position advised by Pott in fractures of the leg, is the one most commonly adopted in this country, and he makes no allusion to the very comfortable plan of swinging the limb. As a dressing to the suppurating wound of a compound fracture, dry bran is recommended. We should think this would be comfortable, but not so generally useful as oakum, which has the great advantage of acting as an antiseptic. Professor Lister's method is not spoken of.

Delirium tremens is treated by opium, nourishment, and moderate stimulation, and, in the later stages, by counter-irritation to the head and neck. The author does not believe in the arrest of erysipelas by the application of nitrate of silver, but advises the moderate use of iron internally. A table is given of 228 amputations, which, added to those previously published by Mr. Norris, exhibits the mortality in 428 amputations upon 424 patients. Of these 321 were cured and 103 died, which, as Mr. Erichsen has recently shown, is a favorable percentage.

The remainder of the book is occupied with some valuable tables of cases of ligature of arteries, and with a view to increasing the value of such collections in the future, we cannot do better than close our notice of Dr. Norris's interesting book, with some excellent remarks he makes upon this subject.

"In these tables, as in all such, the actual results are, I have no doubt, less favourable than they appear to be, unfortunate operations being, as is well known, less generally reported than successful ones, and in those recorded any one who attempts to collect materials of a similar character to those here presented, will often have to lament that the comparatively unimportant steps of the procedure were given and commented upon with minuteness, while the dangers attendant upon it, the difficulties of diagnosis, and post-mortem appearances, are either passed slightingly over, or altogether omitted."

XII.—Comparative Therapeutics.[1]

Perhaps nothing could afford better evidence of the progress of modern veterinary science than the success which has attended the efforts to establish a rational system of medication for the cure of the diseases to which the domesticated animals are liable. It is true that the attempts to place veterinary therapeutics on a scientific basis date but a few years back—only, indeed, since the anatomy and physiology of these animals has been carefully studied, and the aid of chemistry and botany have been invoked; but recent though these attempts have been, it is none the less a fact that the progress made in this direction has been most creditable, and marks a distinct epoch in the history of veterinary science. It appears but a short time since the practice of medicine was something even less than empirical, and consisted in administering drugs whose properties were unknown, for the cure of diseases which were not understood. The chief thing then arrived at seems to have been to put a great number of ingredients together, each of which was supposed to possess some peculiar property, so that the combination should produce as many effects as there were medicines. No regard was paid to incompatibility, either in a physiological or chemical sense, and the specific action of any particular agent was never thought of. And not much more than a century ago the remedies prescribed were even more objectionable; for it appears as if no potion could possess any virtue unless the most filthy matters were incorporated with it; and we read of hedgehogs put into a covered pot and stewed alive, to furnish medicine for a cough, or a living fowl ripped open and applied to a sprained tendon. To their honour be it said, members of the medical profession were the first to rescue veterinary medicine from the degraded hands of the farrier, and to Doctors Gibson and Bracken, who lived in the middle of the last century, we owe the first attempts towards treating the diseases of animals in a reasonable manner. So low does veterinary medicine seem to have been at that time, that those physicians who began to study and write concerning it offer frequent apologies to their brethren for so debasing themselves. Thus, Bracken, in the preface to the seventh edition of his 'Farriery Improved'

[1] 1. *Veterinary Medicines, their Actions and Uses.* By Finlay Dun, formerly Lecturer on Materia Medica and Dietetics at the Edinburgh Veterinary College. Fourth Edition. Edinburgh, 1874. Pp. 576.

2. *The Specific Action of Drugs on the Healthy System; an Index to their Therapeutic Value, as deduced from Experiments on Man and Animals.* By Alexander G. Burness, M.B., C.M. Univ. Aberd., and F. J. Mavor, M.R.C.V.S., President of Central Veterinary Society. London, 1874. Pp. 184.

(published in 1752), speaking of the theory of medicine, writes:

"A human body is a curious machine, and so is that of every creature through the whole creation, for the component and constituent parts of a horse are subject to the same laws of motion as those of a human body, and both these to the same laws by which the infinitely wise God governs the universe. For both man and beasts are composed of solids and fluids, which are governed by the laws of gravitation, impulse, and reaction, and what changes are brought about in the animal economy by the motion of matter, under the conduct of those laws, can no way be estimated so well as from the mathematics.

"Let us not wonder, then, to see a physician take pen in hand in order to write down a discourse upon the distempers in horses, seeing (as I have said before) the property of body is alike in human and brute creatures. And, besides, there is full as much learning required to treat tolerably upon this subject as there is in compiling any other physical treatise, which truth I could plainly make appear from several circumstances, but that my time at present forbids it. Therefore, I say, let not my brethren murmur and complain at me, as if I were debasing the profession, seeing it is certainly a fact that he who cannot write sensibly about the distempers in brute creatures is not fitly qualified to prescribe for man, by reason, 'tis plain, he has not studied nature thoroughly."

And referring to the silly nostrums for which every empiric had his own recipe, he says:

"I must likewise inform the reader that I had the offer of numberless receipts (as they are termed) from several gentlemen, that I might insert them in this book, but I have not in the least made use of any of them, seeing he who has his head full of receipts has his head full of nonsense, by reason that there is not any such thing as practising by receipts, and a number of them only serve to perplex and confound the reader. Therefore I have not erred in this particular, although I hope I have set down what is necessary for the cure of each distemper in horses."

The change thus begun was continued, but made slow progress. The Brackens and the Gibsons were few and far between, and the farriers proved too strong for them until within the memory of the present generation, when men of education became veterinary surgeons, and, adopting every scientific discovery that might assist them, and especially in physiology, veterinary materia medica and therapeutics were carefully and systematically studied.

The results of this study are now before us in Mr. Finlay Dun's excellent work on 'Veterinary Medicines, their Actions and Uses,' of which it is not too much to say that it is by far are best book on the subject in any language. For many years

we were obliged, personally, to have recourse to the first-rate 'Praktische Arzneimittellehre für Thieraërtze,' by Hertwig, of the Berlin Veterinary School, and the as useful 'Nouveau Traité de Matière Médicale, de Thérapeutique, et de Pharmacie Vétérinaire' of Tabourin, of the Lyons Veterinary School. Indeed, until the appearance of Mr. Dun's work it may be said that we had no scientific treatise on the subject; and even the first edition, published in 1854, when he was a lecturer at the Edinburgh Veterinary School, though highly praiseworthy, was still not equal to the text-books of Hertwig and Tabourin. Now, however, in this, the fourth edition, we can confidently and honestly assert that the great improvements made in the intermediate editions have culminated in giving the medical man and veterinary surgeon the best work to be found on the subject of which it treats.

And this subject must ever prove, not only interesting, but of the highest importance to the physician, pharmacologist, and toxicologist, as well as to the veterinarian, as for many years the action of drugs and poisons on the lower animals has been the only safe guide in ascertaining their probable effect on man, and nearly every new medicine which has been added to the Pharmacopœia has been first tested in this way. Not only is the subject interesting and valuable from this point of view, but the differences in the physiological action of many substances in various species of animals is curious and noteworthy, particularly to the experimenter, who, if not aware of these, may arrive at erroneous conclusions with regard to the action of the same drugs on man. Some creatures can live, and even thrive, on vegetable substances which are a positive and active poison to others. Rabbits can eat belladonna, stramonium, and henbane with impunity, it is said; pigeons can revel on the poppy, and goats can enjoy masticating a quantity of tobacco which would produce serious effects on larger animals. Schweinfurth, in his splendid work on 'The Heart of Africa,' informs us that the long flower-stalks of the Nubian *Dracænæ*, or "dragon trees," serve as excellent food for camels in June, while for goats they are almost poison. It is the same with medicinal substances. For instance, as Mr. Dun points out, a few grains of tartar emetic cause almost immediate vomiting in dogs, whereas the same medicine, even when given in doses of several ounces, has scarcely any physiological effect on horses and cattle. Aloes, the most uniform and convenient purgative for horses, is uncertain and irregular in its action on cattle; and to purge dogs a dose of about a drachm, or eight times as much as is given to a man, is needed. He also correctly observes that opium, strychnine and ether, further afford good illustrations of

the different effects which the same medicine has on various classes of animals; acknowledging, however, that in the present state of our knowledge we cannot satisfactorily account for some of the anomalies, though most of them depend on differences of organization and habit. Thus, in the horse, although the stomach is small, the intestines are capacious, highly vascular, and abundantly supplied with nerves; provisions which, while they ensure the thorough absorption of nutriment from bulky and comparatively innutritious food, render the animal peculiarly liable to super-purgation and inflammation of the bowels. Vegetable purgatives appear more suitable than mineral ones, and act chiefly on the large intestines, and only slightly on the stomach and small intestines. Except in disease, and under the influence of aconite and a few other poisons, horses never vomit, vomiting being hindered by the smallness of the stomach, by its distance from the diaphragm and abdominal muscles, and the consequent difficulty with which it can be compressed between the two; the strong ring of muscular fibres surrounding its œsophageal opening also, in all probability, operates powerfully in preventing regurgitation of the contents, and some authorities are even of opinion that the inaptitude of the vagus nerve to receive and convey the special irritation has something to do with the inability of solipeds to vomit. With regard to most substances which act as emetics for men and dogs, it is supposed that they produce a sedative effect when given to the horse in sufficient doses; but the author observes that the many sedatives available in human and canine practice operate uncertainly and imperfectly in horses, for which aconite is the only reliable sedative medicine. It is the same with sudorifics, which are less active and useful than in man, and are very apt to act on the kidneys, unless the animal be well clothed. Opium and other narcotics also exert less soporific influence on horses, and, indeed, on all the lower animals, than on man. We have given two, three, and even four drachms of gum opium, and three and four ounces of the tincture, without producing any very obvious effects.

With cattle we observe the same peculiarities in the action of medicines, and the majority of these may likewise be referred to the construction of their alimentary canal, and their lymphatic or phlegmatic temperament. In the Ruminantia, the stomach is quadrisected and extensively lined with insensible cuticular membrane, the first three compartments being much less vascular and more mechanical in their action than in that of man, the horse, or the dog. The first and third of these compartments always contain food, often in large quantity, and these facts, as Mr. Dun says, explain why cattle require such large doses of all

medicines, why considerable quantities of irritant and corrosive poisons can be given them with comparative impunity, and why purgatives, unless in large doses and in solution, are so tardy and uncertain in their effects. The kidneys and skin of cattle are less easily acted upon than the corresponding organs in the horse, while their dull phlegmatic disposition resists the influence of tonics and stimulants to a wonderful degree.

The notion is very prevalent that medicines, when poured very slowly down a cow's throat—for medicines should always be given in a fluid form to ruminants—pass, like the ruminated food, direct to the fourth compartment, or true stomach. Mr. Dun states, with regard to this notion: "From a number of observations made at the slaughter-houses on both cattle and sheep, I find that neither animal can be induced to exert this voluntary effort in behalf of our medicines, which, in all cases, no matter how slowly soever they may be given, fall into the first and second stomachs (compartments), whence they shortly pass onwards through the third and fourth stomachs, especially if given, as they always ought to be, with a large quantity of fluid." M. Colin, in his splendid work, 'Traité de Physiologie comparée des Animaux domestiques,' has shown that experiments which consist in ascertaining immediately after death into what compartments the fluids which the animals had drunk have passed are not conclusive, as in a few minutes after being swallowed they pass from one reservoir to the other; while the violent movements of the animals during slaughter, the altered position, and the manipulations necessary to expose the stomach, completely alter what has happened immediately after deglutition. Having established a large fistulous opening in the rumen, towards the left flank of several bulls, he observed that when the animals drank, the food in this compartment was slightly elevated towards the upper part of the left hemisphere, and there quickly appeared a current of water between the right wall of the organ and the alimentary mass; this stream, more and more marked, gradually rose until it covered the food. An instant afterwards, in consequence of movements impressed on the mass contained in the paunch, the water was mixed with the food. To discover how the fluid reached the viscus, Colin inserted his hand as far as the cardiac orifice, and he then found that when the animal drank from a bucket the waves (or gluts) were thrown with considerable force, and at regular intervals, into the first and second compartments, the insertion of the œsophagus being at the junction of these reservoirs. The second compartment (reticulum) was soon filled, and the water overflowing the fold which separates it from the first compartment flowed abundantly into that. Lastly, the finger placed in

contact with the slightly closed lips of the œsophageal groove felt a very small quantity of water flowing directly into the third and fourth compartments. In addition, the energetic contractions of the reticulum, occurring at variable intervals, propelled a certain portion of its contents into the first and third compartments. The gluts or swallows of water ingested are so great when the animal drinks freely, that fifteen or sixteen are sufficient to send ten litres (2 gallons 1 quart) into the stomach. They are smaller if the water is poured slowly into the mouth, six to eight going to the litre, the greater part of which passes into the reticulum.

In this respect the result of Colin's experiments coincide with those obtained by Flourens ('Mémoires d' Anatomie et de Physiologie comparée,' p. 36), and prove that the water drank by an ox flows for the greater part into the first two compartments, whence it escapes partially into the third and fourth receptacles, the œsophageal furrow only conveying a very small quantity.

Stating that medicines generally operate on dogs much in the same way as on man, Mr. Dun nevertheless admits that there are some remarkable exceptions. For instance, dogs will take six or eight times the dose of aloes usually given to the human subject, but are seriously injured by half as much calomel or oil of turpentine as is prescribed for man. And it is judiciously remarked that the opinion generally held, that medicines may be given to dogs in the same doses as to man, cannot be safely entertained without a good many reservations. In dogs the alimentary canal is short and straight, and purgatives consequently act with greater rapidity than in other domesticated animals. Another peculiarity is the facility with which they can be made to vomit, vomiting being often naturally produced by their eating various sort of grasses, by their swallowing nauseous or unpalatable matters, or by their overloading the stomach. These facts have to be borne in mind by the experimenter as well as by the veterinarian.

In the dog the kidneys are excited with more difficulty than in horses and cattle, and diaphoresis can scarcely be said to occur at all, the skin not being adapted for cutaneous transpiration. Mr. Dun forgets to mention the extremely irritant effect produced by oil of turpentine when applied to the skin or injected into the anus of the dog. Such an application is sometimes resorted to by cruel people when they wish to drive away strange dogs, and house-painters have been known to "turpentine" dogs for their amusement, and to witness the unfortunate creatures writhe in convulsions produced by the pain. Such conduct deserves the severest reprobation. A dog so treated becomes perfectly furious; if not tied up it rushes about in the most

frantic manner, howling and yelling, tearing up the ground until its claws are worn to the quick, dashing hither and thither, and attacking its own body with its teeth, or flying at any animals or persons in its track. The furious form of rabies is so closely simulated, that this turpentine mania has not unfrequently been mistaken for the terrible disease. Of course, the odour of the turpentine is so marked that such an error in diagnosis should not be possible, but it is well to know of the similarity in the manifestations of the two conditions.

It is to be regretted that Mr. Dun says so little about the medication of pigs, and contents himself with stating "that the effects of medicines on them are somewhat similar to their action on men and dogs, but the practitioner is seldom required to prescribe for these animals." Now, it is a fact that the pig is a very important animal as a food producer, and is reared in immense numbers on the Continent of Europe, in America, and even in this country; and when we know that it is liable to several most fatal maladies, one or two of which, as the so-called "hog cholera," sometimes sweep off thousands of the porcine tribe and cause most serious loss, it is a pity that British veterinarians do not devote themselves to a careful study of the maladies to which this creature is liable, and to their curative treatment. This has been already done—and well done—in France by Pradal ('Traité des Maladies du Porc,' 1848) and Benion ('Traité de l'Elévage et des Maladies du Porc,' 1872), and in Germany by Carsten Harms and others. These diseases acquire increased interest from the fact that some of them are transmissible to the human species, as trichiniasis and the "leprosy" or "measles" (*Cysticercus cellulosus*), and anthrax in its various forms.

However this may be, it is worth remarking that medicines have much the same action upon pigs as upon the human species, and in like doses; indeed, there is the most painful similarity, not only in this respect, but also with regard to the analogy and course of several diseases. This may be due to a large extent, of course, to the fact that man and the pig are omnivorous, and are submitted to highly civilised influences.

The modifications in the action of medicines brought about by age and size, mode of exhibition, habit, idiosyncrasies, diseases, external circumstances, &c., are briefly alluded to.

The mode of exhibition of medicines to animals is a serious subject with the veterinarian, and frequently demands an amount of intrepidity, skill, and tact, which are not required for the lord of creation. Without mentioning the elephant or camel, creatures which not seldom come under his care in India, and which are not alluded to by Mr. Dun, there are the long jaws

and powerful grinding molars of the horse to be encountered, as well as its front feet on occasions; the dangerous horns of the cow, the sharp fangs of the dog, and the tearing claws of the cat. It has even happened that the veterinary surgeon has had to encounter the tender mercies of the tiger, lion, and bear, when these have required medicines in their menagerie ailments; but of course no text-book would include these untamed brutes in its list. The subcutaneous mode of exhibition is gradually being resorted to, and with animals it possesses more advantages than it does in mankind, the greatest of which is facility in administration. In giving medicines by the mouth, comparatively large doses must be given to herbivorous creatures, and especially ruminants, as the stomach usually contains more or less food, which may alter their properties and hinder their speedy and complete absorption. By having recourse to subcutaneous injection there is rapidity, certainty, and directness of effect, as well as a saving in the quantity of the drug. Mr. Dun asserts that it proves especially useful in arresting or controlling the spasms of colic and chronic cough, the sharp twinges of rheumatism, inflammatory pains, such as those of enteritis and pleurisy, as well as the effects of poisons. He also adds the necessary caution that, with active agents, it is unwise, without careful trial, to use more than one fourth of the dose which would be given by the mouth. The drug is best dissolved in water or some other perfectly bland fluid. One or two ounces of solution is sufficient for one injection for horses or cattle, and proportionately smaller amounts for sheep and dogs. There is less risk than in the human subject of untoward effects, and the operation is performed in a similar manner. A fold of skin is taken up between the finger and thumb of the left hand; a suitable syringe is quietly inserted with the right hand; the point is carried about an inch underneath the skin, parallel with the surface; it is then slowly emptied, held for half a minute, cautiously withdrawn, and the finger pressed for a minute on its track. No plaster or dressing is required for the puncture.

We are cognisant of some very striking, and almost instantaneous recoveries from paralysis of the hinder extremities in horses by the subcutaneous injection of strychnine over the loins, when the same remedy given by the mouth has proved impotent.

We are sorry we cannot afford to give a more extended notice of this most interesting and valuable work, which it has given us great pleasure to peruse and study, for there is ample material for instruction in its pages. The most recent discoveries and inquiries appear to have received due attention in its revisal, though we now and again miss something which has appeared

in the foreign literature of the last three or four years. The improved chemical nomenclature, as well as the new notation, has been introduced. Everything relating to the individual medicines is noticed, the points chiefly dwelt upon being their natural history, preparation, properties, and most common impurities and adulterations; their general action on the various domesticated animals, and their uses, doses, and medicinal forms. In the previous editions there was an appendix, comprising short notices of the nature, causes, symptoms, and treatment of the most common diseases of the domesticated animals. In the volume before us this has been judiciously omitted, and in its stead is an index of diseases, in which are set forth, under each disease, the appropriate remedies, arranged chiefly in the order of their value or of their application in the earlier and later stages of the disorder. This will prove far more useful to students than the appendix, though it may be less appreciated by those amateurs who love to dabble in animal doctoring, which is somewhat common, although even more unsuccessful than amateur man-doctoring. Of this an amusing instance occurred in our own experience not long ago. An officer in command of a battery of field artillery, who had been several years among horses, and therefore, it may be supposed, considered himself privileged to prescribe for their ailments, requested our assistance in a case which had very much baffled him, though he had anxiously studied it book in hand in the sick stable. On our arrival we were shown an animal whose original colour had been a light grey, almost white, but which was now a primrose yellow from the inunction of mustard paste over the whole of its body and neck, and which was evidently suffering a considerable amount of pain. The officer explained that the horse was found on the previous Monday morning, when the men went to the stables, "blowing" very hard and refusing its food; and visiting it soon after, he diagnosed congestion or inflammation of the lungs. As mustard was his sheet anchor, large quantities of that substance mixed with strong ammonia were rubbed into the skin covering the sides of the chest as well as the neck. When the restlessness occasioned by this extensive irritation had passed away no amelioration in the blowing could be perceived, so the mustard was repeated. Chancing to be in the stable when the horse attempted to micturate, it was noticed that these attempts were only partially successful, and that the hind legs could not be extended backwards in the customary way, owing, it was suspected, to something being the matter with its loins. Inflammation of the kidneys was then pronounced to be the disease, and, accordingly, the back was largely plastered over with the sinapism. Not long afterwards the horse began to

stand uneasily and evince a dislike to lie down; enteritis was then apprehended, and the mustard liberally applied to the abdomen. The popular work on 'The Horse and its Diseases' had been studied in vain; for the cause of all the symptoms, or rather the disease, was simple lymphangitis of one hind limb—an affection accompanied by much pain and fever, but which is readily amenable to treatment.

Messrs. Burness and Mavor, in their work on 'The Specific Action of Drugs,' as it is designated on the title-page, and 'The Therapeutic Action of Drugs' on the cover, give us the results of a series of experiments conducted at various periods, in order to ascertain the true therapeutic value of each drug, by noting its physiological action on the healthy system. Mr. Burness has, it appears, devoted for some time special attention to this subject, with the object of treating diseases on some scientific principle, and not by empiric remedies; and as Mr. Mavor held similar views to his own, and had also experimented extensively on the lower animals—Mr. Burness's observations being more particularly directed to the human species—the results obtained by both are conveniently classified under different headings. The purport of the work, as we are informed in the introduction, is—

"To point out that the full therapeutic value of each substance—its value in the treatment of disease—is only to be determined by ascertaining the symptoms produced, and the parts influenced by each substance when introduced into the healthy animal economy; and that this is to be done by careful observation of cases where a substance has been introduced either by accident or intention, the quantity taken in each case, as well as the form and mode in which introduced, being also noted."

The work is conveniently divided into chapters, in the first of which examples are given to show that each disease is characterised by certain primary symptoms peculiar to itself, and which are caused, in most cases, by some unknown agency that acts in a specific manner on some special parts or tracts; and instances are also brought forward as evidence to prove that there are various known agents which primarily influence certain parts, and produce certain symptoms peculiar to each when introduced into the healthy body, this influence being due to their physical, chemical or dynamical properties.

The second chapter is designed to show that the knowledge of the specific action of each substance thus obtained is the key to its therapeutic value, allusion being also made to the fact that each substance exerts a twofold action upon the same part, according to the quantity taken and the state of the part—one, its physiological action, and another, which the authors, for lack

of a better name, designate its "restorative" action. Indications are also afforded where it is advisable to employ an agent, either in physiological or in the so-called restorative doses. Illustrative cases are adduced to show that experience has already proved the correctness of the above assertions.

The third chapter deals with the form and mode of administering various substances for therapeutical purposes.

Chapter IV contains notes on temperature in health and disease, and the influence of various substances upon it. The remainder of the work is allotted to a consideration of the specific action of various drugs, as demonstrated by experiments conducted, when possible, on man and animals by the authors, and in other instances from reports of poisoning in treatises on toxicology, the therapeutic use of each drug being indicated in man and animals:

"For," say they, "we are convinced that when a certain drug influences special parts in the human body, it influences parallel parts in the animal body, both in the healthy and diseased state, although not necessarily producing in all cases the same train of symptoms; in fact, the diseases to which animals are subject are brought about in the same way as in man, viz. by some cause inducing primary derangement of some special parts or tracts, and that the same remedies which restore the functions of these parts or tracts in man will serve the same purpose in animals, in the majority of cases."

Their theory is founded on the fact that all non-nutritious agents, whether formed in the body or introduced accidentally or intentionally, tend to pass out by some one or other of the eliminating tracts, and in their passage affect these tracts by virtue of their physical, chemical, or dynamical properties; the word tract being preferred to organ, for the reason that no agent primarily influences any special organ as a whole, but only some special part of it, and from its influence over this it may affect the function of the whole organ.

Having given this summary of the work, it will be seen that it is really a treatise on the action and uses of medicines in man and the domesticated animals, and that its value must be estimated chiefly by the light it throws on the *modus operandi*, in health and disease, of the number of drugs the authors have experimented with. In this respect it must be admitted that the results of their labours have been most satisfactory; and while, in regard to several of the substances, we only receive confirmatory evidence of what was before pretty well known, we are furnished with interesting and novel facts pertaining to other drugs, which are also to be prized for their practical importance and utility.

In the chapter on the mode of administering drugs we find the great value of the hypodermic method here also strongly insisted upon, especially in introducing into the system such medicaments as morphia, atropine, strychine, aconitina, quinine, ergot, &c., as by it we can, with a comparatively small dose and in a short space of time, produce more or less of the physiological effects of the drug, and at the same time avoid the risk of deranging the digestive organs or having the property of the drug altered by the digestive fluids. In all acute diseases, especially if attended with pain, this method is to be preferred; in pleurisy, for instance, by the subcutaneous injection of morphia and atropine we can at once relieve the pain and in a short space of time subdue the disease, while in many other diseases pain can be removed by morphia thus administered, appropriate remedies being used at the same time to remove the cause of the disease.

"In the treatment of the diseases of animals this method of introducing remedial agents into the system is invaluable, and will, we are sure, eventually supersede the boluses and drenches, which are often so difficult to give, so difficult to take, and, in some cases, of so little good when taken. By this method the special agent is at once introduced into the circulating fluid, and in a short time comes in contact with, and acts upon, the part or parts over which it has specific influence. And although at present comparatively few drugs have been used in this way, we doubt not that more will be added to the list when we can prepare solutions of the active principles in such manner as they will not act as topical irritants."

It is incidentally mentioned that, in the human subject, ergotine may be used subcutaneously for internal hæmorrhages or purpura, when prepared as follows:

Ergotine, grains 5;
Glycerine, 1 drachm.

Twelve minims to be injected twice a day.

It is also noticed that in administering morphia in this way the sickness which is sometimes produced is obviated if a small proportion—about $\frac{1}{60}$th of a grain—of atropine be given at the same time; and in those cases in which we wish to relieve pain, as in neuralgia, sciatica, &c., without producing sleep, it is a good plan to give a small quantity for a dose, and repeat at intervals of six to nine hours if required— say about $\frac{1}{10}$th of a grain of morphia with $\frac{1}{60}$th of a grain of atropine.

"By this means we have the first dose eliminated from the system, to a great extent, before a second dose is given, and thus there is never sufficient in the system at one time to produce toxic effects. Of course, the effects of the first dose should be allowed fully to pass off before giving a second dose. In those cases in which we

wish to produce sleep, it is the best plan to give a large dose at once, and thus obtain the physiological effect of the drug."

The hint is also given that the readiest antidote to strychnine is the hypodermic injection of morphia, and *vice versâ*. In an experiment on a dog, half a grain of acetate of morphia was given, and in two hours, when the full physiological effects of the drug were developed, $\frac{1}{16}$th of a grain of strychnine was administered, and in forty minutes the dog had quite recovered. In another instance, a horse received $1\frac{1}{4}$ grain of strychnine, which induced rigidity of the muscles and the other characteristic symptoms within an hour. Then ten grains of acetate of morphia were given, and in an hour and a half the animal was nearly well and quiet, and in three and a half hours it had entirely recovered. To another horse eight grains of morphia and one grain of strychnine were given at the same time, but no effect was produced except slight dilatation of the pupil.

The authors agree with what has been already stated as to the diminished quantity of a medicine sufficing when given subcutaneously, one half, or even a third, of the quantity of any drug required to produce a physiological effect being ample.

The notes on temperature in health and disease are alike instructive and useful, and the experiments resorted to are direct and indisputable in their results. The conclusion the authors drew from them was, that various non-nutritious agents introduced into the system in health, by producing deranged function, tend to raise the temperature; but when introduced into the system when the temperature is above the normal standard, tend to reduce it by restoring the deranged function and removing the disturbing cause, though it is shown that there are certain agents which have the power of reducing the temperature below the normal degree by their direct action on the blood.

In the case of a mare suffering from an abscess in the pectoral region, and whose temperature was $104\frac{2}{5}°$, three fourths of a grain of sulphate of atropine was given in quarter-grain doses in three days; with each dose the temperature fell, and after the third it gradually descended to about the normal standard. After each dose the pupils were dilated, and the mucous membrane of the mouth dry. Quinine also reduces abnormal temperature; so does digitalis and aconite, as shown by Wunderlich. Mr. Mavor points out what we have frequently observed, that in horses affected with influenza, fever, &c., the temperature is often 105°, and that half-drachm doses of tincture of aconite three times a day invariably succeed in reducing the temperature to the natural degree and cure the disease.

The experiments on horses are nearly all full of interest. Take

the following two, with regard to hydrocyanic acid:—One drachm (fluid) of Scheele's prussic acid was injected subcutaneously; no effect was observed until four hours after, when convulsive movements set in; the horse had great difficulty in standing, the pulse rose from 36 to 90 per minute, but it was small; the buccal mucous membrane was pale, and the ears cold and clammy; in a very short time these symptoms passed away, and the pulse fell to 48 per minute. In the second case half a drachm of prussic acid, containing 50 per cent. of anhydrous acid, was injected subcutaneously into a horse. In less than a minute it fell to the ground, striking out its limbs in a violent and convulsive manner, the respiration being difficult and spasmodic; within five minutes after the introduction of the prussic acid the animal was dead. After death the pupil was observed to be dilated and the eye glistening. The object in this case was to kill the animal as rapidly and painlessly as possible.

The experiments to test the physiological action of belladonna and its alkaloid atropia are also interesting and significant, as are also those to show the effect of this drug and morphia when admnistered together. The results of the latter experiments prove that morphia or opium rather tends to prolong and increase the effects of belladonna or atropia. Morphia given to an animal under the influence of the latter increases the distress and raises the pulse: on the other hand, it neutralises the effects of strychnine. Atropia in conjunction with strychnine has been used with great success in the treatment of tetanus in the horse, and it appears to prolong the action of the latter drug in these cases.

The therapeutic uses of nux vomica and strychnia are very fully illustrated, and with regard to the last it is mentioned that in the lower animals its subcutaneous injection more readily, more certainly, and in a shorter space of time, restores deranged function of the intestinal canal than any of the active purgative medicines which are commonly used in such cases.

With regard to the therapeutic action of bichromate of potash, it is important to remark that, in man, a full dose causes increase of the secretions of the mucous surfaces, the discharge being sometimes of a purulent character; also inflammation of the mucous membrane of the throat, great coryza, and hoarseness; cough and dyspnœa; frequently nausea; vomiting and dysenteric purging; papular eruptions on the skin, which assume a pustular character, and sometimes inflammation and ulceration of the nasal mucous membrane, with sneezing and fetid mucus discharge; the stools are sometimes rendered scanty and clay coloured, the urine purulent or totally suppressed, and the periosteum swollen and painful. Topically applied to the skin it acts as a caustic, often causes pustular sores, which slough,

and leave painful ulcers which are very difficult to heal. In some cases it causes, by its topical action when swallowed, inflammation of the stomach, followed by vomiting, dyspnœa, paralysis, convulsions, and death.

To a horse at 12.25 midnight was given one drachm and a half of this drug, the temperature being 101$\frac{1}{5}$° and the pulse 36. At 8 a.m. the temperature was 104$\frac{1}{5}$° and pulse 40; at 12.20, 104$\frac{2}{5}$° and pulse 40; at 1.15 the respirations were 20; the throat was much inflamed; there was coughing, the conjunctivæ were highly injected; there was a discharge of yellow mucus from the nostrils, and the tongue was very dry; the symptoms altogether resembling those of influenza; the temperature was 104$\frac{3}{4}$°; pulse 40.

Its use is stated by the authors to be indicated, among other diseases, in farcy and glanders, in the early stages of which they say it may be considered a specific and certain remedy; and in the number of cases illustrative of specific treatment in animals, we find one of a horse suffering from "farcy:"

"The nasal mucous membrane was ulcerated (!), the near hind limb much swollen, and the lymphatic vessels, both of this limb and other parts of the body, were much inflamed and ulcerated. This animal was treated with restorative doses of bichromate of potash and sulphide of potassium, given alternately. In a few days the ulceration of the nasal mucous membrane was healed, and the condition of the lymphatic system much improved. In a few weeks the animal was quite well and in good condition. This is but one of many successful cases so treated."

Now, from the knowledge we possess of this most formidable disease, we have every right to seriously question whether this was a cure; or, if it was, whether the disease was "farcy" (or glanders?)

In the first place, the ulceration of the Schneiderian membrane would designate it as "glanders," while the ulceration of the inflamed lymphatics would cause it to be pronounced glanders complicated with farcy—one of the most fatal and dangerous maladies to which the equine species is liable, and which, according to our experience and that of the most eminent Continental veterinary surgeons who have made it a life-study, is absolutely incurable. There is not a well-authenticated cure of glanders on record, and though cases of farcy are now and again recovered, yet they are only those in which the lungs are not involved, and the virus has been communicated locally; or they are spurious outbreaks, not the specific disease. Glanders has been *apparently* cured when in the chronic form, but it has only been apparently, for eventually the animals have succumbed to it. The lung infiltration, which is the earliest

pathological alteration in glanders, may be checked for a time; but the horses are still capable of infecting, and may continue so for years until exposure to some exciting cause gives renewed vigour to the morbid process, when it reassumes the acute form. Such has been the experience of Haubner, Röll, Reynal, Bouley, and a host of the most trustworthy observers; and there is every reason to believe that if glanders could be cured, confirmed phthisis in mankind should be made readily amenable to remediable measures. Mistakes are frequently made in diagnosing both farcy and glanders: was it not so in the above instance? The description of the pathological appearances is so very meagre that no one could safely pronounce as to the disease; and until we have the fullest evidence that a horse suffering from the specific disease can be radically cured by administering the bichromate of potash and sulphide of potassium, we hesitate to give our credence to this recovery. There can be no difficulty in putting the virtues of these drugs to the test, however, as the malady is now, unfortunately, only too prevalent in and around London. We do not think there is on record a single case in which the disease, when transmitted to man, has been successfully treated. As in the horse species, it appears to be invariably fatal in him.

Notwithstanding our doubts as to the results obtained in this particular instance, we cannot allow them to detract from the high opinion we have formed of the labours of the authors of 'The Therapeutic Action of Drugs.' The volume is eminently practical and suggestive, and will be found of much value to the physician, toxicologist, and veterinary surgeon. It is very rare, indeed, to find a physician and veterinarian uniting in researches towards accomplishing the same object—the cure of disease in man and beast. The success of the present inquiry clearly demonstrates what valuable ends may be attained by such combined investigations, and how materially two such experimenters can assist each other, and advance the progress of science. We feel satisfied that we have performed a most useful work in bringing under our readers' notice two works of so much merit as those whose titles stand at the head of this article.

Bibliographical Record.

Dieulafoy on Pneumatic Aspiration.[1]—Dr. Dieulafoy brought his method of *aspiration* before the Academy of Medicine of Paris in November, 1869, and though he was, as he allowed, not the first inventor by any means of an exhausting syringe for the extraction of fluids deeply lodged in the body, he is, we think, entitled to claim to be the author of the modern practice of *aspiration*. Dr. Dieulafoy's merit consisted in using an already exhausted vacuum as a means of diagnosis, so that the moment the needle attached to it came in contact with fluid, its presence was demonstrated by its flow into the receiver. The whole theory and practice of "aspiration" is, in fact, stated in a single paragraph of the book (page 12), which we therefore quote:—

"It was to remedy the inconveniences of the exploratory trocar that I had the idea of making use of long hollow needles, of so small a size that the most delicate organs could be traversed by them without their being injured more than by acupuncture needles, the perfect harmlessness of which is well known. These needles should not measure more than half a millimétre in diameter, but in order to make fluids as thick as pus pass through so small a channel, the fluid must be drawn out by means of a powerful aspiratory force. This force I found in the vacuum of the air-pump, which I modified to suit the circumstances, and thenceforth I was in possession of the aspirator and the previous vacuum. What is, then, this previous vacuum to which I call particular attention? for it is that which from the first has decided the success of aspiration. An aspirator, whatever, it be, is nothing else than a recipient in which a vacuum is made. This recipient, or body of the pump, is furnished with stop-cocks, by means of which communication is obtained with the external air. As soon as the vacuum is formed in the body of the pump, a power of aspiration is held in reserve, to be utilized when the proper moment arrives. Thus a vacuum is first established. This vacuum, or, if preferred, the body of the pump in which it is made, is put into relation, by means of one of its stop-cocks, with

[1] *A Treatise on the Pneumatic Aspiration of Morbid Fluids; a Medico-Chirurgical Method of Diagnosis and Treatment of Cysts and Abscesses of the Liver, Strangulated Hernia, Retention of Urine, Pericarditis, Pleurisy, Hydrarthrosis, &c.* By Dr. Georges Dieulafoy, Gold Medallist of the Hospitals of Paris. London, 15, Waterloo Place, 1873, pp. 394.

the fine needle intended to be introduced into the tissues. To satisfy ourselves as to the value of this proceeding, let us take an example.—Let us imagine a cyst deeply seated in the liver, and let us proceed to search for the fluid by means of the previous vacuum. The aspirator is prepared, or, in other words, the vacuum is made as a preliminary, and the needle is put into communication with the body of the pump, the stop-cocks remaining closed. This hollow needle is then introduced into the region to be explored, and when it has passed the distance of a centimètre through the tissues (that is to say, when the opening at the point is no longer in contact with the external air), the corresponding stop-cock of the aspirator is opened. What occurs? The air contained in the needle is at this point rarefied by the previous vacuum in the body of the pump, and the needle possesses in its turn aspiratory power; it becomes an aspiratory needle, and carries the vacuum with it. Then, if pushed through the tissues, it is with the vacuum in our hands that we proceed to the discovery of the effusion. At the moment that the aspiratory needle reaches the fluid, the latter rapidly traverses the glass index, jets into the aspirator, and the diagnosis is inscribed in the apparatus without the interference of the operator."

Dr. Dieulafoy devotes a chapter to aspiration as a means of treatment, and considers this method applicable to any collection of fluid in the body. He considers it a grave error, however, to empty at one operation large collections of fluid, whether in the abdomen or chest, on account of the shock produced, and recommends rather a succession of punctures. The aspirator can also be employed as an injector, and Dr. Dieulafoy lays stress upon the advantages to be gained by replacing the portion of fluid withdrawn by a smaller quantity of the injection, until by successive substitutions the whole of the morbid fluid is withdrawn, and replaced by a comparatively small quantity of medicated injection.

The whole of the pith of Dr. Dieulafoy's book is contained in the first fifty pages. The remainder of the work consists of a collection of cases by various physicians and surgeons, illustrating the several diseases for which aspiration has been had recourse to, either as a means of diagnosis or treatment. These cases are arranged under the several organs and diseases to which they refer, viz. Liver, Bladder, Stomach, Ovary, Hydrocephalus, Spina bifida, Strangulated hernia, Pericardium, Pleura, Knee-joint, Peritoneum, &c., and are of some interest as illustrating the general success of the method in various hands. Dr. Dieulafoy is somewhat egostistical in his writing (for we have counted "I" nine times in sixteen lines!) and is not very happy in his translator. This latter gentleman has retained some unsightly Gallicisms in his text, *e. g.*, "Galien," "malaxating," &c., and has committed the more vicious error of translating "sonde" throughout as "sound" instead of "catheter," which makes some passages almost unintelligible. He has also spelt

"hydrarthrosis" as "hydarthrosis," both on the title page and elsewhere. It would have been convenient also to the bulk of English readers if he had taken the trouble to translate the metric system into English weights and measures.

Desmarres on the Surgery of the Eye.[1]—When we first met with this title it brought to mind pleasant recollections of the days, now long past, when we listened at Charité or Hôtel Dieu to clinical lessons, where the lecturer was stimulated by the earnest attention of the students to ever-renewed exertions, and where the student, voluntarily attending, felt day by day his stock of practical knowledge steadily increasing; so different from what was, and yet too often is, found in this country, where, thanks to compulsion, many a careless, inefficient, we had nearly said stupid, teacher is idly listened to by weary and unwilling pupils. Since those days we have read from time to time in page of weekly journal or in collected volume a clinical lecture by Nélaton or Trousseau, by Gosselin or Jaccoud, often with pleasure and always with instruction.

It was with happy anticipations, excited by such remembrances, that we took this volume in hand.

The first lesson is on cataract, and commences in this startling manner:

"Without seeking to modify in any respect the classical definition of cataract and the general ideas which have been emitted on this point, we will permit ourselves to formulate on this very definition a perfectly new opinion. Cataract, it is said, exists when the transparency of the lens is impaired."

We must confess our utter inability to see any remarkable merit in this definition or to find the least reason for calling it classical. However, be that as it may, our anxiety to learn the perfectly new opinion will not allow us to discuss this question further. Reading on, we are told that sundry qualifications, as soft, striated, hard, incomplete, are wont to be added to the generic name of cataract. This does not suffice for the author; he must have a definition "plus explicite" than the one just quoted. With this object in view he describes some cases and then proceeds:

"The enumeration of all these facts has for its object to prove that the course and development of cataract are subject to a law so far incompletely defined, to wit: that every opacity of the lens tends to disappear by natural resolution, and consequently, that a cataract soft at present may, after an uncertain period, become hard, and be reduced to an anatomo-pathological state, such as to leave only a residuum contained in the capsule."

[1] *Leçons Cliniques sur la Chirurgie Oculaire.* Par Le Dr. Alphonse Desmarres, Professeur d'Ophthalmologie, &c. Pp. xii and 490. Paris, 1874.
Clinical Lessons on the Surgery of the Eye. By Dr. A. Desmarres.

Consequently, according to M. Desmarres, and the italics are his:—

"*The complete cataract, in the real meaning of the word, is formed by the two layers of capsule containing between them only the fixed salts.*"

In the next page we are told that there are only four different kinds of *senile cataract:*

"1. Hard senile cataract, or cataract properly so called.
"2. Soft cataract.
"3. Cataract with a moveable nucleus.
"4. Cataract adhering to the capsule."

And then, to our amazement and complete confusion, we read that,

"Whatever is the nature of the cataract, whether hard, soft, mixed, &c., there is a first fact, the knowledge of which is of great importance, and that is whether it is *complete.*"

We certainly felt some hesitation about admitting the author's definition of a complete cataract, and fail to understand how two layers of capsule containing merely some fixed salts can be hard or soft, contain a moveable nucleus, or adhere to the capsule. However, we read on, and after toiling through a long account of how the patient with cataract holds his head, how the amaurotic patient holds his, and much similar twaddle, find that, notwithstanding the passage first cited, a complete is only another name for what is usually called a mature cataract, and that the new law and perfectly new opinion are immediately abandoned by their inventor. The safer plan would have been to adhere to the classical definition.

Not only does the author give us new definitions, laws, and opinions that are of no use, but he gives us cases and conclusions that painfully exercise our understanding. He relates, page 5, how in two patients the pupils are uniformly white; how, in the one, if the head is inclined a little suddenly forwards, the pupil becomes shaded, whilst nothing of the kind occurs in the other:

"This fact is of great importance in respect to the manual operation; in fact, the former patient will get well, whilst not only will the second not get well, but in him extraction will be impossible; when kystotomy is practised, the liquid layers will escape and the surgeon will not be able to make the nucleus come out."

We leave the reader to make of this what he can. For our part we sorrow for the unfortunate patient.

The author writes at considerable length, and gives for him a good account of the form of cataract, now usually called "over-mature," but which he names "adherent," or, more fully, "cataract adhering to the capsule." The first name, apparently unknown to M. Desmarres, is, in our opinion, the better one. The variety itself is worth more than a passing remark. Any one who had paid no

special attention to the subject would imagine that such a tolerably common form of cataract as this, one presenting special difficulties in its treatment, would be well known to most practical ophthalmologists, yet this can hardly be the fact, as a reference to any recent treatise will show. Turning to the treatment, we find that M. Desmarres always employs flap-extraction in hard cataract. When he thinks it adherent to the capsule, he seizes a fold of the latter with straight pupil-forceps and twists it slowly round so as to tear away the whole anterior layer. It would have been well if he had proved the practicability of this proceeding by adding an account of the cases in which it has been employed.

Vision will not be restored by removing a cataract from an amaurotic eye, and one of the many benefits bestowed on ophthalmic practice by von Graefe was to introduce a more accurate method of testing the retinal sensibility to light. The author does not allude to this, but in its place fills several pages with extracts from Serre's work on 'Phosphènes,' the luminous appearances caused by pressure on the eye.

The fourth lecture contains a long description of the operation for Morgagnian cataract and of a peculiar instrument, a "kystitome curette," an instrument of which we have not hitherto felt the want. M. Desmarres seems unaware that it is not unfrequently possible to extract such cataracts in their entirety, and that, when it can be done, it is by far the best treatment.

The cases related are throughout the work wanting in details. For example, take the one at page 96:

"An individual, missing his blow at a nail, which he wished to drive into the wall, broke it into fragments. A splinter, thrown forcibly into one eye, passes through the cornea and lodges in the lens; twenty-four hours after the accident this organ was completely opaque. Following a principle, which we shall formulate hereafter, we considered it necessary to wait before performing an operation, and that, to the great benefit of the patient, for seventy-two hours after the accident, the lens had become again completely transparent."

Is it possible? Was the pupil completely dilated so that the whole lens could be examined?

On the same page there is a case in which a fragment of a gun-cap lodged in the retina near the macula; No. 1 Jaeger could be read fifteen years later. We have once seen a similar case; a small piece of metal had been lodged in the retina near the optic disc for some years and caused no inconvenience.

The following passage from page 102 will show the occasional activity of the author's imagination. He is giving a description of traumatic cataract; he thinks that if it could be seen, the vitreous would be found to be clouded, and attributes the supposed cloudiness

to pigment granules which pass from the choroid through the retina into the vitreous:

"S'il était permis d'examiner les parties profondes de l'œil, on trouverait des phénomènes semblables. C'est ainsi que la choroïde subit une perte considérable de son pigment; elle présente des foyers apoplectiques plus ou moins récents, des plaques atrophiques bien caractérisées. Enfin on observe un symptôme inséparable de toutes les maladies profondes de cette membrane; le corps vitré est ramolli, diffluent, il perd sa transparence, devient troublé, et l'on remarque dans son intérieur ces corps flottants qui donneraient au malade si le champ pupillaire était libre et la vision conservée, la sensation de mouches volantes. . . . . La coloration du corps vitré est due aux granulations pigmentaires de la choroïde. En effet, cette membrane étant privée de sa circulation (previously stated to be due to intra-ocular pressure by the swollen lens; the iris is, according to M. Desmarres, in a similar state) tend, comme nons venons de le dire, à se désorganiser; les cellules de la couche pigmentaire la plus interne se dissocient, leurs membranes limitantes ne tardent pas à se déchirer; elles laissent alors échapper le liquide qu'elles renferment, ainsi que les granulations pigmentaires de couleur noire que celui-ci tient en suspension. Ces granulations, placées d'abord entre la choroïde et la rétine, ne tardent pas à traverser cette dernière membrane et à se répandre dans le corps vitré ramolli auquel elles donnent la couleur *jumenteuse*."

We have read this account several times with close attention, and heartly congratulate M. Desmarres on his discovery. The style is pleasant too. We recommend the passage very warmly to the compilers of some of the bulky treatises which have lately appeared. A few trifling alterations would make it read as if it were original.

We must hasten to a conclusion. The book is filled with exaggerated statements, hasty classifications, and impossible explanations. Errors of commission and errors of omission equally abound. Were we to stop at each doubtful phrase we should become more tedious than M. Desmarres. Yet we cannot let one passage escape notice. The author has met with only a single case of traumatic cataract, accompanied by a wound of the corneo-sclerotic junction, where blindness has not been the result, and all, according to him, owing to a single cause, the division of the ciliary ring. He enlarges on the same subject a little further:

"Les désordres qui résultent de la blessure du cercle ciliaire sont très-réels. Pour en être convaincu, il suffirait de connaître quelques-uns des faits qui se sont présentés à nos yeux, et nous en connaissons une dizaine qui ont offert les mêmes symptômes à la suite de ce genre de blessures. Par suite de la rupture du cercle ciliaire, il s'est formé dans l'œil blessé soit des tumeurs presque toujours de mauvaise nature, soit des phlegmons de l'organe entier, soit encore des ossifications partielles ou totales de la rétine."

Here at the 147th page we shall conclude our notice with the remark that we have rarely met with a less useful book, one with so few good, and so many bad qualities; unfit for student or practitioner, it will add one more to the works which appear to be intended to spread the name of the writer rather than to promote the science or art of medicine.

Glasgow Infirmary Surgical Report.[1]—One of the most important features about Dr. James Morton's report is that he is not an advocate of (the so-called) antiseptic dressings. In speaking of one of the most severe classes of cases he says:—"In my former reports it is stated that no peculiar plan of treatment is adhered to in the management of compound fractures; whatever apparatus, or position, or appliance, seems best, is used. From my assistants and dressers I demand great care in dressing, and the early use of water beds to prevent bed sores. Irrigation is frequently had recourse to when available, and almost invariably with much benefit." Dr. James Morton has seen what can be accomplished by antiseptic dressings, for Glasgow may be said to have been the place of their birth, but he has not been converted to their use. He may, therefore, be regarded as one of those who are helping most actively to work out this surgical problem, and to show what is the real value of Mr. Lister's method. It is only by a comparison of results upon a large scale—the results obtained by those who do, and those who do not, use antiseptics with all the precautions enforced by the distinguished Edinburgh professor—that we can arrive at the truth in this matter.

The eclectic principles upon which Dr. James Morton manages his cases certainly yield good results. Can antiseptic surgery offer us anything better? Last year his statistics included 11 compound fractures, all of which terminated favorably. During 1872 the number was eighteen, whereof fifteen recovered. Of the three that died two were considered hopeless and unfit for amputation at the time of admission; the third died of phlebitis. Such results as these must be regarded as satisfactory, and creditable to the system of treatment pursued, whatever it may be.

Perhaps the most interesting case related in this report is one of hæmatoma of most unusual features. The following is a description of it in Dr. Morton's own words:

"John Y., aged 32, was admitted on 21st of December, suffering from a tumour in the right groin, observed for three months. It was semi-elastic, fluctuant, and received an impulse on coughing. The pulsation of the femoral artery was traced up to and over this

[1] *Clinical Surgical Report for the year ending 31st October, 1872, with a Paper on Bromide of Potassium.* By James Morton, M.D., Surgeon and Lecturer on Clinical Surgery, Glasgow Royal Infirmary. Pp. 16.

tumour. A continuous bruit was audible over it. There was incontinence of urine for more than three hours. No disease of lumbar vertebræ. On the 30th a consultation was held, and all the surgeons inclined to the belief that it was an abscess. On January 4th the tumour was punctured, and a small quantity of bloody fluid was obtained, with grumous matter. The patient sank gradually, and died on the 7th.

Post-mortem Examination.—Within the abdomen, in the right iliac region, there was a prominence passing in from the swelling mentioned above. This prominence had a feeling of fluctuation. To its surface the caput cæcum coli was attached. The surface of the bulging consisted of peritoneum, apparently unchanged in structure, and the adhesion of the cæcum coli to simple normal attachment dislocated by the prominence described. On dissecting the prominence in the groin above, an irregular cavity was first opened into, containing a very stinking brownish fluid, and a more definite oval-shaped mass which could be readily separated all round. In size this mass was about as large as the two closed fists, but of an elongated oval shape. With the cavity in which it lies the prominence in the abdomen described above communicates, and the prominence is found to be formed by a collection beneath the peritoneum of stinking fluid blood. The more definite mass referred to is extremely irregular on the surface, and is composed, in great part, of blood clot, some of which is dark red and some paler. On the anterior surface, however, there was a soft greyish mass. On examining the bones of the pelvis a very irregular pedunculated bony mass is seen to project from the margin of the acetabulum downwards and outwards for about two inches. Though attached to the margin of the acetabulum it is somewhat movable, its surface is irregular, and it was found to project into the soft mass described above." It is much to be desired that Dr. Morton had conveyed the account more intelligibly.

The report concludes with a short paper upon certain risks attending the use of bromide of potassium, and the cautions which Dr. Morton gives are not without their value in these days when the bromide may be ranked among the fashionable drugs, and when it is given frequently in large doses and very empirically.

Neapolitan Surgical Clinique.[1]—The Pellegrini Hospital appears to be confined to surgical cases, and to admit only males. The contents of the report are, therefore, of a limited kind. It is divided into two sections, the first of which comprises fractures, dislocations,

[1] 1. *Annali Clinici dello Ospedale dei Pellegrini di Napoli,* vol. i. Naples, 1872.

2. *Di un' Amputazione della coscia a lembo rotuliano, storia del* Dott. Azzio Caselli. Bologna, 1873.

contusions, and concussions, while the second is occupied with the consideration of wounds. Under both heads a number of cases are related, and described minutely, both clinically and pathologically. These are followed by a general *résumé* and criticism; and statistical tables are given which contain many details, and represent them in a clear and lucid form. On the whole, the treatment adopted in this hospital does not seem to differ much from that which is in use in this country. There are, however, a few varieties of some importance, and these we shall notice as we proceed.

The compound and complicated fractures which are detailed are thirteen in number, and of these nine—*i. e.* 70 per cent.—proved fatal, altmost entirely from pyæmia or ichoræmia. This strikes us as a large percentage of deaths, and rather an unsatisfactory amount of pyæmia.

With regard to the treatment of these cases we observe that nothing is said in this part of the report about antiseptics. We presume, therefore, that none of these injuries were treated upon Mr. Lister's method or any modification of it; and yet it is just in these cases that the advocates of the so-called antiseptic dressing claim the most successful results. But, though nothing is said about carbolic-acid lotions or carbolised ligatures, yet a method was adopted which may, perhaps, be considered in its essential principle truly antiseptic. In every instance a bag of snow or of ice was applied; sometimes over the wound itself, sometimes on the limb immediately above it. Mercury was frequently given, either alone or with belladonna, as an antiphlogistic remedy, but it was not thought to have much influence. Douches and irrigation are spoken of favorably, and drainage tubes were found useful, but the chief stress is very properly laid upon the necessity for keeping the part at rest. Portions of bone were resected wherever it was thought advisable, and in one instance the lower extremity of the femur was taken away, constituting a novel kind of excision of the knee-joint. Among the prepared bandages which were in chief use were those of silicate of potash.

The enumeration of cases of fracture is followed by three histories of spinal concussion, all of which proved fatal.

We come then to what occupies the largest portion of the report, namely, wounds. These are divided into wounds of the head, of the neck, of the thorax, of the abdomen, and of the genito-urinary organs, each section being succeeded by a criticism upon the nature of the injuries and the mode of treatment.

Probably civil surgeons in Italy see more of incised and punctured wounds than we do in this country. A case is related in which the patient received no less than fifteen stabs. A young countryman, aged 30, was brought to the hospital on the 1st of January with six wounds on the head, one on the left ear, one at the base of the

neck, two on the left scapular region, one in the eleventh intercostal space, three in the dorsal region, and one on the upper part of the right arm. Of these, the wounds on the head and chest seem to have been the deepest and the most serious. The patient succumbed at the end of ten days from exfoliation of a part of the parietal bone and empyæma. Another interesting case is related of a weaver who received a wound from a scythe on the right parietal bone, by which a portion of it was carried away, and a loss of brain-substance took place. The patient was in a very critical state for some days, but subsequently recovered and left the hospital after the lapse of six weeks. Cases such as this are of great interest in a psychological, as well as in a surgical, point of view, but they must be reasoned upon with caution when we have a patient under our observation for only a few weeks. We should like to know what was his condition after six months or six years. Our own experience would lead us to say that sooner or later the mind breaks down after the brain has sustained such severe lacerations as this.

During the six months embraced by this report seventy-eight cases of wounds of the head were admitted. The mortality among them was 33 per cent. Out of fourteen cases complicated by fracture of the skull, thirteen are said to have died of suppurative meningitis. This high rate of mortality probably depends, in a great degree, upon the insanitary conditions of the wards; for the writer himself, in speaking of the desirability of obtaining union by the first intention, calls attention to the dangers of purulent infection, which, he alludes to as not being slight in that hospital.

The wounds of the neck tabulated in the report are eight in number, but none of them are of sufficient interest to induce us to lay them before our readers *in extenso*. They were all inflicted with criminal intent, but only one proved fatal. As the writer remarks, blows aimed at the neck are more easily warded off than those directed towards the chest or abdomen. Hence both their number and their mortality is less.

Twenty-nine wounds of the chest are reported, all criminally inflicted by hand weapons or by fire-arms. Twelve were penetrating and seventeen were confined to the parietes. Of the former, four were fatal, but the non-penetrating were all cured. The penetrating wounds were twice complicated by hæmoptysis, five times by empyæma, and three times by circumscribed pneumonia. For this latter affection the treatment consisted in ice poultices and digitalis. Bleeding was only resorted to in one case, and that to a very slight extent. The writer considers that in the cases of hæmoptysis and empyæma it would have been well if more energetic measures had been adopted, and he expresses a regret that paracentesis thoracis was not practised.

The section which deals with the wounds of the abdomen contains

the record of twenty-nine cases, all of which were inflicted by others. Of these lesions twenty were penetrating and the rest were confined to the abdominal parietes. Twenty-four were cured and five resulted fatally. The chief interest of this section centres round a question which seems to be keenly discussed at Naples, namely, whether wounds of the abdomen ought, or ought not, to be plugged. The principal advocate of plugging is Sig. Testa, one of the surgeons to this hospital, and he urges in its favour that it prevents the protrusion of the intestines, that it establishes a parallelism between the external and the internal aperture, that it leaves open a way for ultimate exploration in case it should be necessary at a future time to make a second examination, that it facilitates plastic formation, and that the analogy to cases of herniotomy recommends the practice. But the writer demurs to all these conclusions, and adduces statistics from the former annals of this hospital, which lead him to say that "the mortality in penetrating wounds of the abdomen increases in exact proportion to the use of plugging." Certainly the practice which prevails in this country is altogether opposed to the introduction of any foreign body, and the mechanical disadvantages of such a practice must be apparent to all. In English surgery a free opening is accounted of great importance, and in many cases it is only because there is such an opening that a good result is obtained.

The concluding section upon wounds of the genito-urinary organs includes only three cases, of which two were severe self-inflicted injuries. This is followed by an appendix containing an account of the extirpation of an inverted uterus by Professor Martino Barba. The patient had been suffering for seventeen months, but the operation was so entirely successful that after twenty-two days she was able to return home, and three months later was said to be in perfect health.

On the whole, the report is extremely creditable to the hospital from which it emanates. A good summary of the clinical work done in any hospital is an evidence that the institution is well conducted, and that the importance of careful observation is thoroughly understood, both in its pathological and practical bearings. We trust that the series of reports, of which the one before us is only an instalment, will be regularly continued, for we are sure they must have a beneficial influence upon Italian surgery.

2. This small pamphlet contains the account of an amputation of the thigh performed by Dr. Azzio Caselli, of Bologna, in which he practised Rizzoli's operation with some slight modifications of his own. It was successful. The patient left the hospital at the end of two months, and five months later he was able to walk several miles without even the aid of a stick.

Rizzoli's operation, as our readers are perhaps aware, is an amputation at the knee-joint, and consists in taking a long flap from the front of the leg, carrying with it the patella, and a short flap from the posterior aspect of the limb. The leg is then disarticulated from the thigh, and a portion of the lower extremity of the femur is sawn off. When the flaps are united the patella forms the bearing point of the stump, and, as the insertion of the quadriceps extensor remains uncut, the patient has a great deal of power in raising and advancing his thigh. Besides Caselli's case, another is described performed with slight differences by Professor Marcacci. The peculiarity of Caselli's operation consisted in the length of his anterior flap; while Marcacci lays great stress upon making the division of the vessels the last step in the proceeding.

The rest of the pamphlet is taken up with the discussion of details, such as the point at which the femur ought to be sawn across, the best place to apply ligatures to the main arteries, and the length of the flaps.

In Italy this operation appears to have an established reputation. The only question is as to certain minor details. In this country we have long come to the conclusion that amputation through the knee-joint is a good operation, but whether the patella is left or not, seems to be regarded as a matter of no great moment. The balance of practice inclines towards leaving it without sawing off any portion of the femur, and all our chief writers are agreed that the resulting stump is a favorable one. Mr. Bryant says, "The patella need not always be removed; when diseased it should be, but not otherwise; on three occasions I never saw the bone when I amputated at the joint, and excellent stumps resulted. I know of no stump so good as that which follows an amputation at the knee-joint," and these words express in brief the general opinion among English surgeons.

Taylor on Phymosis with Chancroidal Ulcers.[1]—The object of this brochure is to explain the author's method of dealing with a prepuce which has become inflamed and contracted in consequence of the presence of "chancroidal ulcers;"—in other words, in consequence of a phymosis following soft venereal sores.

The remedy which Mr. Taylor recommends is, in two words, carbolic acid. He advises that in a diluted form it should be injected under the elongated prepuce, and also that it should be applied as a caustic when the foreskin has been slit up and the sores exposed to view. In fact his pamphlet is one of the many eulogies of carbolic acid that we have had of late years. But in this particular case carbolic acid alone is hardly enough. It must be injected

[1] *On some Practical Points in the Treatment of the Phymosis produced by Chancroidal Ulcers.* By R. W. Taylor, Surgeon to the New York Dispensary, New York. 1873, pp. 19.

with the syringe which the author has advised, and, before it is applied to the sores as a caustic, the prepuce must be slit up with a pair of scissors which the author has invented, and in the manner that is peculiar to himself. It is from carbolic acid, *plus* Mr. Taylor's syringe and scissors, that the sufferers from chancroidal phymosis have derived so much benefit.

That much may be done to cure a contracted foreskin by the frequent injection of warm water or of medicated lotions is a fact with which all surgeons are familiar. A good instance of the value of this treatment is given in a foot-note to the 9th edition of Druitt's 'Vade Mecum' (p. 662). A congenital phymosis, of the tightest kind, was completely relieved in a few months by the simple injection of warm water under the prepuce. And no one who has made use of carbolic acid in general surgery can doubt that in a case of foul and offensive sores it forms an admirable dressing, and that like various other substances which might be named, it cleanses the wounds and puts them in a favorable condition for healing. When sores situated beneath the foreskin have cicatrised the contraction may be so great as to be a serious inconvenience to the patient, and then some form of circumcision must be undertaken. The author recommends two lateral incisions, with the scissors he has invented, as the best means of exposing the whole glans penis. But we fail to see the advantages which his method possesses over the various forms of section that have long been practised in these cases. For the rest, we do not doubt that carbolic acid lotions serve the purpose of the surgeon in these cases very well, and that the syringe the author has devised enables him to introduce them under the prepuce thoroughly.

Hospital Hygiene.[1]—Since 1869, when Sir J. Simpson published his surprising statistics comparing the mortality of amputations in private and in hospital practice, a great advance has been made in the prevention of those diseases which so frightfully increased the mortality in the latter. At the same time that Simpson was collecting statistics to prove that all our existing hospitals should be demolished in consequence of their walls being impregnated with the poisonous emanations from wounds, Mr. Lister was devising means by which these poisonous emananations should be abolished in the wounds themselves, rendering a surgical ward no more impure than any other room containing a similar number of persons in a similar space.

There is no doubt that this latter idea is the one which has found most favour with the profession, and although only a small but still, we believe, an increasing percentage of surgeons in the country have

[1] *Hospital Hygiene. The Annual Address to the Southampton Medical Society.* By Charles Langstaff, M.D., &c. 1872.

adopted Mr. Lister's mode of dressing, with all its precautions, yet there are few now who do not make use, to a greater or less extent, of some antiseptic in the treatment of wounds. The great principle has been fully recognised that the decomposition of discharges is an unmitigated evil, and one which, in many cases, is productive of the most fatal complications. That it is preventable in the majority of cases there can be no doubt, and when we consider the important part attributed by the majority of modern pathologists to the absorption of putrid discharges in the production of surgical fever, septicæmia, and pyæmia, it is clear that if we wish to improve the results of our major operations we must commence by preventing the developement of poisonous products in the wounds themselves, and we may then rest content as to the state of the hospital walls and floors. But it is impossible, with our present knowledge, successfully to apply any antiseptic principle of dressing to every wound. In a hospital ward there will always be a few cases in which, from the nature of the wound or from the previous treatment the patient has undergone, the perfect prevention of decomposition is impracticable. It is well, therefore, to construct our hospitals in such a way that their walls and floors shall be incapable of absorbing and retaining the poison from these wounds. If, therefore, we have a combination of non-absorbing walls, clean wounds, good ventilation, and careful attention to all the minor details of cleanliness, there is no reason why the results of surgical operations in hospital practice should not be equally successful, or perhaps even more so, than those of private practice. It is to the attainment of this object that Dr. Langstaff has directed his attention, and the interesting paper before us contains the results of his observations and experiments.

Dr. Langstaff suggests that not only should the walls and floors of a hospital be covered with some non-absorbent material, but that the furniture also should be painted with a similar substance to prevent the deposition and accumulation of organic matter in the cracks and joints of the wood work. The surface obtained should be such that for the purposes of cleanliness nothing more should be required than an occasional wipe with a cloth. The material which Dr. Langstaff has found to fulfil these conditions best is paraffin, and to render its action more perfect he mixes with it a small proportion of carbolic acid. To the walls and furniture it may be applied as a paint dissolved in turpentine or paraffin oil. By this means every crack is filled and a surface obtained which can be kept perfectly clean, without the slightest difficulty, by being wiped over with a damp cloth containing some antiseptic. The floors are prepared by pouring melted paraffin upon the wood and ironing it in with a box-iron heated by means of burning charcoal. The paraffin penetrates to the depth of about a quarter of an inch, and when the

excess of paraffin is scraped off and the floor afterwards brushed with a weighted hard brush, a smooth polished surface is obtained much resembling a waxed "Parquet Floor." It is not sticky and not so slippery as to be unsafe; it is perfectly non-absorbent, unaffected by acids or alkalies, is cleaned without washing, and will last without renewing for years. The plan is so simple and by no means expensive, and it seems to us to deserve a trial at least. Having thus prepared a perfectly non-absorbent ward, Dr. Langstaff proposes to purify the air admitted into it by passing it over some antiseptic before its admission. For this purpose he has invented a small apparatus which can be readily introduced into the ventilating apertures which are ordinarily used in hospitals, by means of which the entering air is made to circulate over the surface of a concentrated solution of carbolic acid in a box which also contains two upright iron frames, fitted with two pieces of flannel soaked in a similar solution. About four ounces of the solution is lost during the 24 hours from such an apparatus, and this is found to be sufficient thoroughly to impregnate the air with the odour of carbolic acid. From experiments which are recorded at length in the address, Dr. Langstaff found that the air of a room ventilated by means of this apparatus, was, contrary to expectation, drier than that of a similar room ventilated by an ordinary opening. He also found that decomposition of a piece of meat hung in the carbolized atmosphere was considerably delayed. It may be a question how the patients would like to be confined for any length of time in a room impregnated with a mixed odour of paraffin and carbolic acid, but probably in a few hours they would have become so accustomed to the smell as no longer to perceive it. In the treatment of wounds Dr. Langstaff has, for some time past, adopted the antiseptic plan of dressing as recommended by Mr. Lister. By these means, then, we have obtained the three first essentials of a healthy ward,—non-absorbent walls and floor, free admission of purified air, and a more or less complete absence of decomposing discharges from the wounds. But Dr. Langstaff does not stop here in the precautions he recommends. The hospital locker is a thing in which hygienic details are but too often sacrificed to convenience. In one hospital we have heard of, the patients' loaf and other provisions are separated only by a thin board (often cracked) from his chamber-pot in the lower compartment of the locker. Moreover, as Dr. Langstaff points out, closed lockers are almost always receptacles for dirt. The food compartment has always a more or less offensive odour of rancid butter, stale bread, &c., and it serves, moreover, as a place of concealment for all sorts of contraband artcles of food or drink. The compartment for excreta is always sooner or later impregnated with a more or less powerful odour of ammonia or, perhaps, even of something worse. Dr. Langstaff, therefore, advo-

cates open lockers, the upper shelf of which may be turned over the bed to make a table. The chamber utensils should stand so as to be in a free current of air; they should be covered with a closely fitting metal lid, and, except when the urine is required for clinical investigation, should always contain a small quantity of some antiseptic fluid. Another point to which Dr. Langstaff draws attention is the custom, in some hospitals, of allowing patients to wear their own clothes, or, in case they are confined to bed, of keeping their clothes in baskets or lockers in the ward. On this point he gives a very interesting anecdote, which speaks for itself.—On one occasion when a regiment of Hampshire militia were called out for drill, their civilian clothes were stowed away in a room which was also made to do duty as an office for the quartermaster-sergeant and his assistant, who, after inhabiting it for a few days, fell ill. "This occurred again and again, and others who supplied the places of the sick men also became ill." Every patient, on admission, ought to be put into a suit of some material capable of frequent washing. Another point frequently not attended to is the avoidance of all unnecessary bed hangings, blinds, mats, bits of carpet, &c., which are supposed to give an air of comfort to the ward. Venetian blinds and shutters should always take the place of ordinary blinds and curtains, as they are not only more effectual in the exclusion of sunlight, but interfere to a comparatively slight degree with ventilation. In conclusion, Dr. Langstaff calls attention to the important part devolving upon the nurses in the maintenance of the health of a ward. They are responsible for the cleanliness of the ward and of the persons of the patients in it, and unless they fully realise the importance of their duties in this respect they are not fit to be nurses. In the matter also of their own personal cleanliness and dress there is much that is of importance to the health of the hospital. The custom adopted by many of the religious sisterhoods, who at the present time devote themselves to so great an extent to nursing, of wearing a heavy black woollen robe, with drooping sleeves ready to pick up and retain dust, dirt, and disease of all kinds, cannot be too strongly reprobated. No nurse ought to be allowed to enter a ward unless she is clothed in some material which can be frequently washed, and it would be well if the same rule were extended to dressers and house surgeons.

All the foregoing principles are so obvious that no surgeon would, in all probability, be inclined to dispute their truth, but as a rule most surgeons are content for themselves with attention to one or more of the most important measures, leaving the rest uncared for. Thus one may say, if the ventilation is perfect we need fear no hospital diseases; another, if antiseptic surgery is adopted nothing can go wrong; and a third, if the walls and floors are non-absorbent the ward must be healthy. Dr. Langstaff in this address

clearly pointed out to his hearers that if we really wish to have healthy hospitals our attention must not be directed to only one of the above hygienic precautions, but to all, even to the most minute, nothing being so small as to be unworthy of consideration, and nothing too great to be neglected if the surgeon himself is negligent.

Dr. Langstaff does not attempt to enter into the nature of the poisons of the various hospital diseases and of their relation to the causes of decomposition, and as a practical surgeon we see no reason why he should. He is willing to adopt the "germ theory," at any rate as a scientific hypothesis upon which to found his principles of practice. It is acknowledged by almost all authorities that the causes of decomposition, and probably also of of infectious diseases, are solid particles conveyed by air or water; that their activity is increased by a moderate degree of heat, by moisture, and by the presence of organic matter upon which they can act, and diminished or abolished by drying, by a certain degree of heat, and by contact with those agents which are known as antiseptics. If, therefore, we understand what favours the formation and what destroys their activity, it becomes a matter of no practical importance, though doubtless of the greatest possible scientific interest, whether they are actually living germs, capable of propagating their kind by a true vital action, or whether they are merely organic particles undergoing peculiar unknown "physico-chemical changes," and capable of inducing similar changes whenever they meet with a suitable substance to act upon. It is unfortunate that subjects so eminently practical as the prevention of decomposition and of infectious diseases should, by the inevitable nature of things, have been thus mixed up with the question of spontaneous generation, a question which apparently from the impossibility of demonstrative proof on either side has, like a difference of religious creed, caused an amount of bitterness of feeling and argument rarely known in scientific discussions.

Quarantine in the United States.[1]—In June of last year the American Congress directed the secretary of war to send one or more army medical officers to visit the towns and ports on the Gulf of Mexico and the Atlantic coast liable to invasions of yellow fever, to "confer with the authorities of such port, or town, with reference to the establishment of a more uniform and effective system of quarantine," and to "ascertain all facts having reference to the outbreaks of this disease in such ports or towns, and whether any system of quarantine is likely to be effective in preventing invasions

[1] *Report on Quarantine on the Southern and Gulf Coasts of the United States* By Harvey E. Brown, Assistant-Surgeon to the United States Army. New York, 1873, pp. 173.

of yellow fever, and, if so, what system will least interfere with the interests of commerce at said port," and to report on these several matters to the surgeon-general of the United States army. Assistant-surgeon Harvey E. Brown was detailed for the service, and the report in which he gives the result of his inquiry is now before us.

The point of greatest interest, but at the same time that on which most controversy will be provoked, in Mr. Brown's report, is embodied in the following conclusion :—"That in the vast majority of epidemics, if not all, that have occurred in the United States, the germinal principle of the disease was imported from elsewhere, and was not due to local causes." Mr. Brown acknowledges that in enunciating this proposition he is at variance with the opinions held by many of the leading practitioners of the South, but he bases it on the history of yellow fever epidemics both in the Northern and Southern ports, of which he gives a detailed and valuable sketch. As no question has been more warmly debated than that of the origin of yellow fever outbreaks, and any review of the arguments and facts marshalled on both sides, would far exceed the space we can give to the present notice, we must content ourselves with a mere statement of Mr. Brown's conclusions, and refer our readers to his report for full information as to the ground on which he rests them. Mr. Brown is entirely opposed to the view which regards yellow fever as a malignant type of bilious remittent, and as due to the same pestiferous miasm. He argues that dissimilarity of origin is proved by the habits and habitat of the diseases. Yellow fever, he maintains, is essentially a disease of large cities and seaport towns. He asserts that it never originates in the country, even in the most swampy and malarious districts ; and when carried there by refugees from any town where it prevails, it fails to spread. Yellow fever originating endemically is unknown in the rice swamps of Georgia, or in the alluvial districts of Alabama and Louisiana, which are saturated with concentrated malaria, and where the high grades of intermittent and remittent fevers—the pernicious and congestive types—hold sway. But it is found that after an epidemic of yellow fever in New Orleans or Mobile, the remittents and intermittents partake more and more of the type of the imported disease, until at last the more potent poison seems for a time to take the place of the feebler one. Again, one attack of yellow fever generally protects from a second one. This is not, of course, the case with fevers of a malarial origin.—Yellow fever attacks the unacclimated, remittent fever those who may have spent their whole lives in the district. Coloured people are particularly susceptible to marsh poison, but though they suffer from yellow fever it is not so fatal to them as to whites. Lastly, yellow fever may prevail epidemically at places (such as Pensacola) where the surrounding

country is a high dry sand-barren, without any malarial influences to produce disease.

Mr. Brown is not specially concerned as to the truth of the various views which are held by observers and theorists as to the nature of contagium, whether contagious diseases originate and are propagated by microzymes, bacteria, or bioplasts; but he holds that, whatever be their nature contagious diseases are spread by organic living particles, and that probably, as supposed by Beale, these bodies penetrate the vascular walls of the capillaries and after escaping into the surrounding tissue find an exit from the body. In times of epidemic the air becomes filled with those floating particles. A ship will carry them between decks; they sink into and impregnate the bilge water, and become incorporated with the filth of her sides and bottom. The reproduction of contagion in a locality no doubt depends greatly on favoring influences, upon defective sanitary conditions, a depressed mental state of the population and the like. Some of the organic particles may survive a temperature below 32° F., and may reproduce in a succeeding spring the disease. But, to quote a passage from the United States Commission Memoirs, "The vital and all essential fact in the etiology and geography of yellow fever, is that which relates to the implantation of the epidemic germs, or the fomites, in a locality where temperature, humidity, and personal conditions favour their pestilential propagation." The practical inferences at which Mr. Brown arrives are as follows:—That it is possible to organize an effective system of quarantine, and that such a system properly organized would really prove beneficial to the commercial prosperity of the ports. On this point he writes: "It may safely be asserted that the southern cities would soon double their population were it not for the dread which universally exists of these epidemics of yellow fever. Replace the feeling by one of security, such as will be given by a well-regulated quarantine, and the unequalled advantages which the Southern seaport towns offer for commercial enterprises of every kind will attract the capital and labour which more than anything else they require." The present system of quarantine, however, in the South is decidedly faulty. It varies in different States, and in some towns is optional with the municipal authorities. Mr. Brown recommends that quarantine at all ports of the United States should be placed under the control of the General Government, and that officers of the medical department of the army be appointed as inspectors of quarantine and the hygiène of the ports, the general management of the system being confided to the surgeon-general's bureau. On this side of the Atlantic we have no means of forming an opinion on the advisability of affiliating the quarantine medical service to the army medical service of the United States. But we can speak very highly of the general character of the report which assistant-surgeon Brown

has produced, of the care and labour he has devoted to the subject, and of the moderation of the tone. The report is creditable to himself, and reflects credit on the service of which he is a member.

Vital Statistics and Meteorology of Tasmania.[1]—We have been favoured with a copy of a very interesting 'Blue Book' relating to these subjects, compiled for the Royal Society of Tasmania by Mr. Francis Abbott, F.R.A.S., F.R.M.S., assisted by Mr. E. Swarbreck Hall, M.R.C.S. Eng. The first portion of the volume contains the monthly and annual means of various meteorological observations, taken at Hobart Town during the 30 years ending 1870. The tables are very instructive. From them we learn that the climate of Hobart Town and of Tasmania generally is even more 'insular' than that of the British Islands. The average mean temperature of January (the *warmest* month) being 62·70, while that of July (the *coldest* month) is 46·1°, a range of only 16·6°. The average mean temperature of the whole year is 54·7°. In every particular the climate is equable. Thus the per centage of humidity varies only from 67 (January) to 83 (July); the mean dew point from 50·5 (February) to 40·0 (July). The average yearly rainfall is 22·71 inches, the average number of rainy days is 140. The average height of the barometer is 29·850 inches. The prevailing winds are N.W. (corresponding to our S.W.) and S.E. (corresponding to our N.E.). In winter north-westerly winds prevail uninterruptedly, but are light in force. In spring and summer the two winds N.W. and S.E. alternate with each other, and become stronger, especially in November.

Turning to the second part of the book, for which Mr. Hall is responsible, and which is entitled "Remarks on the Climate and Vital Statistics of Tasmania," we are not surprised to learn that this marvellous climate has a most favorable influence on the bills of mortality. The population of the whole island has increased from 89,977 in 1861 to 99,328 in 1870. Of this latter number 51,291, or considerably more than one half, were persons under 20 years of age. The total death-rate fell from 17½ per 1000 in 1857 to 14 per 1000 in 1870—the average for the years 1869-71 inclusive being 13½ per 1000! Of children under 5 years of age the death-rate in 1870 was only 29 per 1000. In England and Wales it is 67·5 per 1000. We heartily agree with Mr. Hall, when he exclaims enthusiastically—"surely the loving, anxious, wealthy parents in England who deplore so hopelessly the deaths, one after another,

[1] *Results of Five Years' Meteorological Observations for Hobart Town; with which are Incorporated the Results of Twenty-five Years' Observations previously published by the Royal Society of Tasmania, and completing a Period of Thirty Years.* By Francis Abbott, F.R.A.S., F.R.M.S., Tasmania. Hobart Town, 1872, folio, pp. 37.

of their little ones—often to the total extinction of ancient, time-honoured families—should try the wonder-working influences of this genial climate, and so have a chance of leaving their names and possessions to healthy surviving offspring!" He adds: "Even the first year of life shows how auspicious the Tasmanian climate is to life at that early age," and he then gives the average death-rate (in 15 years) of children under one year of age as 100½ per 1000, compared with the corresponding English rate, 165½ per 1000. In 1871, however, the death-rate fell to 87½ per 1000. Truly these are remarkable figures.

The average deaths of the four years 1868-71 were 1389·5. Zymotic diseases caused 205,75 deaths, or less than one-sixth of the total number; the English proportion being nearly one-fourth. Small-pox and true cholera are as yet unknown in this "happy land." The absence of the first-named disease has, however, caused a general and deplorable neglect of vaccination among the secure islanders. Let them not be too confident, but learn a timely lesson from the history of the late terrible epidemic of smallpox in many parts of Ireland. Chickenpox, measles, and scarlatina, occasionally prevail as epidemics. Diphtheria has been, unhappily, endemic in the island since January, 1859. Croup, Mr Hall thinks, should not be tabulated in the "miasmatic order' of the 'zymotic class,' but should be placed rather with diseases of the 'respiratory organs' as in the nomenclature of the Royal College of Physicians. He has not observed anything contagious about it, but has always traced its outbreak to the occurrence of sudden changes of temperature. In the four years 69 deaths were caused by the disease in all Tasmania. Whooping-cough was epidemic in 1868 and 1869 (119 deaths), but was unknown in the other years. Typhus, infantile and typhoid fever together caused only 99 deaths in four years. Dysentery and diarrhœa are still fatal diseases in Tasmania, although the mortality from both is yearly diminishing.

A glance at the death-rate in the remaining classes of disease shows signally interesting results, but time and space prevent our entering into them at length. It will be sufficient to mention that the most fatal disease in Tasmania is 'Old Age,' and that bronchitis, which is the second most fatal disease in England, falls to the seventh place, owing to the mild Tasmanian winter.

Scottish Meteorological Society.[1]—Although the more recent numbers of the journal of the Scottish Meteorological Society do not contain any essentially medical communications, yet we may fairly chronicle in this review the advance of a science so intimately

[1] *Journal of the Scottish Meteorological Society*, October, 1872, No. xxxvi; January and April, 1873, Nos. xxxvii, xxxviii; and July, 1873, No. xxxix. New Series. Edinburgh and London.

related to medicine as is that of meteorology. And of this advance we are glad to say the records of the society just named continue to afford a reliable indication. The 36th number contains the report of the council to the general meeting of the society, held on January 30th, 1873, in which some interesting facts relating to the influence of season on the herring fishery in Scotland, and to experiments on ozone, are given. A full report on the first of these topics appears in the the 39th number of the journal, and is signed by "Thomas Stevenson, *Convener*." It will well repay perusal, and we must not omit to mention that the inquiry of which it treats was instituted in consequence of a suggestion made by the noble president of the society, the Marquis of Tweeddale. Among the communications in Nos. xxxvii-viii are "Notes on West India Cyclones," by D. Milne Home, LL.D.; an account of the meteorological conference at Leipsig in 1872, by Mr. Alexander Buchan; and another paper by the same indefatigable meteorologist on the "Specialities of the weather of 1872 in Scotland." This article possesses much interest from an epidemiological point of view, for there are good grounds for believing that the persistent rains of 1872, and the consequently cool summer and autumn, acted materially in checking the advance westward of cholera, which was lurking at that time in Russia, Poland, and Bavaria. An accompanying diagram shows that the excess of the fall of rain in 1872 above the average of 15 years, amounted to 75 per cent. in some of the eastern districts of Scotland. Curiously enough, the rainfall was deficient in a limited area in the extreme north-west of the country.

In addition to the 'Report on the Herring Fishery,' to which allusion has been already made, No. xxxix contains a clever and suggestive paper, by the Rev. W. Clement Ley, on the "Mean inclination of winds towards the Lower Isobarics," From his investigations the author draws a conclusion which will prove of paramount importance to the seaman. "If," he says, "an argument may be drawn from analogy of our own wind systems, it seems *probable* that this indraft (that, namely, which is likely to occur *towards the centre of a tropical cyclone*) may be serious in the immediate front of the cyclone, comparatively slight on its flank, and unimportant in its rear." Now, we happen to have before us as we write a paper by Mr. Meldrum, which has just been published by the authority of the Meteorological Committee of the Royal Society. It is entitled "Notes on the Form of Cyclones in the South Indian Ocean, and on some of the rules given for avoiding their Centres,' and it is illustrated by two diagrams representing what Mr. Meldrum considers to be the probable motion of the air in a Mauritius cyclone. Mr. Robert H. Scott, F.R.S., director of the Meteorological office, in a preface to this paper observes: "The

navigator must see that the facts of wind direction and position of centre prove how very dangerous it is to suppose that the centre of a cyclone is always nearly at right angles to the direction of the wind, for several instances are given which show that, with his back to the wind, especially when it is between S.E. and N.E., *he almost faces the centre.*"

This rude awakening from an implicit faith in the accuracy and applicability of Buys Ballot's Law of Cyclonic Winds under all circumstances, is partly compensated for by the feeling of satisfaction which arises in our minds when we see the observations of two independent meteorologists in different hemispheres thus beautifully confirming each other.

From the report to the half-yearly general meeting of the Scottish Meotorological Society, held at Edinburgh on July 2nd, 1873, we learn that 13 of the society's observers are members of our profession; that the utility of the work being done is recognised by foreign governments, although we regret to say scarcely so by our own Home Office, and that the society's stations numbered (at the end of last June) 92 in Scotland, 5 in England, 4 on the continent, 2 in Iceland, 1 in Faroe, and 1 in South America.

Copeman on Cerebral Affections of Infancy.[1]—Dr. Copeman modestly gives his book the title of a 'Report on the Cerebral Affections of Infancy,' a subject of no mean importance, seeing, taking it in its widest range, how great are the issues with which it deals. The sanity of the future man, his power to cope with his surroundings be they evil, or ability to acquit himself well be they good, may depend largely upon judicious management during the period of infancy and childhood. The recent advances in the subject of idiocy, so ably conducted by Dr. Langdon Down and others in this country and abroad, sufficiently exemplify this, and therefore the subject which Dr. Copeman has chosen to illustrate is one which is well worthy his repute. The first part of the work is devoted to a brief historical account of convulsions, water on the brain, and other cerebral diseases.

The writer's own remarks are so mixed up with those of the numerous authors he quotes, as to cause no small confusion to the reader, who cannot help wishing for clearer and more definite information from Dr. Copeman himself; information which his extensive acquaintance with the literature, and his long practical experience ought to eminently fit him for imparting.

We are struck with the heroic tendencies, as regards therapeutics, which run through Dr. Copeman's work. Bleeding, mercury, leeches, and blisters, are frequently mentioned. The last we opine

[1] *Cerebral Affections of Infancy.* By E. Copeman, M.D. Norwich, 1873.

should be extremely rarely used in children's practice, and perhaps it would be best if they were banished altogether from it. The author, we are glad to note, does not approve of blood-letting in children.

In the "Conclusion" Dr. Copeman says, "I trust the compilation I have made will be found to be sufficiently copious to afford a tolerably complete history of what was known in earlier times and is now known respecting the nature, causes, and treatment of this class of disease." It is impossible to admit the correctness of the latter portion of this sentence. Dr. Copeman, we regret to say, has not informed us as to the most modern views of infantile cerebral diseases. No mention, for instance, is made of idiocy; a subject in which, thanks to the labours of Langdon Down and others, great advances have lately been made. Nor respecting the older writers do we find mention of the name of Cheyne. We are afraid Dr. Copeman's own views are somewhat cloudy as to what he evidently regards as the great centre-piece of children's cerebral diseases, viz. acute hydrocephalus. This is shown in his "generalizations." What we have seen of Dr. Copeman's work, as set forth in this little volume, makes us regret that, instead of compiling a "Report," he has not given us a succinct account of his own practice and of his opinions, which must be based on a rich clinical experience. Such a work would doubtless meet with a fitting welcome.

Ellis, Diseases of Children.[1]—This is a more ambitious work than that by Dr. Copeman, as it professes to deal with the whole subject of children's diseases. It opens with some excellent remarks on the medical examination of children. They are full of instruction, and deserve to be indelibly impressed on the mind of every one practising among children. The author has profited well by his early teaching, as shown by his frequent, though not too frequent, mention of Sir W. Jenner's name, and the numerous quotations of that distinguished physician's remarks. He has also diligently culled information on his speciality from various other sources. His work is therefore, in the main, a trustworthy guide; the more so, perhaps, because it is obviously a compilation. We fail, after careful and attentive perusal, and with every desire to give the author credit for his performance, to find satisfactory evidence of original work and observation by which alone the subject in question can be advanced. Nevertheless Dr. Ellis has produced an exceedingly useful book, and one which will probably bring new light to many practitioners. Should it set them thinking and observing for themselves it will have done no small good, and we think the information it contains is calculated to do this.

[1] *A Practical Manual of the Diseases of Children.* By Edward Ellis. London. 1873. Second edition.

Day on Diseases of Children.[1]—Dr. Day's little work does not pretend to be exhaustive. It opens with some sensible remarks on the study of this class of diseases, among which we would especially commend the advice, in cases of anorexia, not to stimulate children's appetites, but, as a rule, to give the stomach rest and allow it to recover its tone. Dr. Day's style is somewhat too discursive for his matter to be really instructive to the uninitiated. A student, for instance, would gather much more information were the same materials dressed in a more concise and compact form, and were each subject treated separately. In the article on "Debility," which disorder Dr. Day dignifies by treating as an entity, the singular omission is made of not mentioning the condition of the heart. In these cases a minim or two of tincture of nux vomica and of tincture of digitalis are a valuable addition to other medicines.

We regret to see that the author retains the name "Infantile Remittent Fever" even while disavowing his belief in the existence of such an affection as a separate disease. The term is altogether misleading, and serves only as a cloak for ignorance on the part of those who are unable to make a diagnosis, a category in which we do not include Dr. Day, who is certainly a very competent physician. In the vast majority of cases it is but a synonym of typhoid fever. It should always be borne in mind in this connexion that all children's diseases have a tendency to remit. This Dr. Day does not mention, but it is a point of exceeding importance, and deserves to be carried foremost in the mind of the practitioner of pœdiatrics. A clearer appreciation of this fact would have rendered the author's remarks on this subject more valuable, though we think that he has so far done good service in distinctly discontinuing the view that there is such a separate disease as "Infantile Remittent Fever." Dr. Day has some interesting observations on "headaches," but here again he omits to take into consideration the great influence of the heart. The condition of the cerebral circulation must surely be an important factor in some of these disorders. Still, this section is well worthy of attention, and is, we consider, the best in the book. While heartily commending Dr. Day's decided expression of opinion that croup and diphtheria are distinct diseases, we are astonished that he should confound, as he evidently does, some cases of true croup with largygismus stridulus or false croup. We cannot otherwise explain the statement that a child may have one (or several) attacks of croup at night, and be well in the morning. This cannot be croup: it is laryngismus stridulus, a disorder which Dr. Day should, in a future edition of his work—for we hope to see it attain this dignity—give an account of in connexion with croup and diphtheria. We are constrained to suggest this because however

[1] *Essays on Diseases of Children.* By W. H. Day, M.D. London, 1873.

satisfactory the treatment recommended may be for true croup, we are satisfied that it would be most injurious in laryngismus stridulus.

We congratulate the author on his essays, and trust the friendly suggestions we have ventured to make may be borne in mind in the preparation of future editions.

Instructions for Midwives.[1]—This little work is by an anonymous author. In the main, the "Instructions" may be said to be innocuous, and perhaps this is the best praise that can be accorded a book of this description. There is but little room for originality of matter, whatever may be the case as regards manner, and so the attainment of high standard should not be expected by the writer of a book for the guidance of midwives; at least, as they are at present educated. The author errs, we think, in recommending the administration of opium by midwives so frequently as he does, and we are very decidedly of opinion that he is wrong in telling them (p. 42) that they may undertake the management of "face towards pubes," "presentation of face or forehead," and "hand beside head presentations." With these exceptions this little book may be regarded as a tolerable safe and useful pocket-companion for the class of persons for whom it is intended.

We are glad to note that the author does not recommend the exhibition of ergot before the birth of the child. More stress might have been laid upon this point, as it is one of the pet errors,—and a most pernicious one it is, of midwives and ill-informed accoucheurs.

The author certainly deserves a meed of praise for his sensible teaching in this respect.

Thoughts Philosophical and Medical of Lord Bacon.[2]—We may best introduce this small volume to our readers by quoting the words found on its cover, viz., "To the thoughts of a man like Lord Bacon, on any subject whatever, it is impossible for the world to be indifferent." Now although in Bacon's time scientific medicine can scarcely be said to have had a beginning—except, indeed, in the hands of the immortal Harvey, a contemporary of Bacon, yet even the guesses at truth and the crude experiments attempted to question nature according to the newly-elucidated method of induction, by the great philosopher, must ever be interesting in the history of science. Consequently this collection of thoughts, or, as many may be called, aphorisms, will be interesting to every lover of science, although the advancement of knowledge may have detracted from their value in many instances. The collection of 'thoughts' is

[1] *Instructions for Midwives.* Waterford. 1873.

[2] *Thoughts, Philosophical and Medical, selected from the Works of* FRANCIS BACON; *with an Essay on his Health and Medical Writings.* By JOHN DOWSON M.D. London, pp. 80.

preceded by a very good sketch of the principal events in Bacon's life, chiefly of those with which his philosophical labours were mixed up; and Dr. Dowson has taken especial pains to convey to the reader a notion of the generally weak health of the philosopher, and in so doing has illustrated some of the prevailing pathological and therapeutical notions of the time of Bacon.

We may well recommend this small book to our readers as one replete with interest, information, and philosophical suggestions. Those who know Bacon's works at large will be pleased at this "collection of thoughts" bearing on physic and philosophy, and those who have not studied those works will here find a useful introduction to them and, we believe, an incentive also to make full acquaintance with them.

Henle's Handbook of Anatomy.—Nerves and Nerve-centres.[1]—This most important and valuable work on the anatomy of man has been in course of publication for several years, and has acquired general recognition for the excellency of its matter and the manner in which it is produced. The two parts now before us form a complete volume on the anatomy of the nervous system. The first portion is occupied with the description of the nervous centres; the second with that of the peripheral nerves.

In an introductory chapter the general facts relating to the varieties of nerve-fibres and to their minute structure and properties are duly set forth; after which the author enters upon a special description of the anatomy of the spinal cord and its appurtenances. The descriptive anatomy of the brain follows, occupying 246 pages, and is profusely illustrated by most admirable wood engravings. No description that we know of equals this in completeness and in accuracy of delineation and description, and the student who masters it will have laid the best possible foundation for arriving at a clear insight into the nature and seat of disturbed action, and for advancing our knowledge of the distribution and localization of brain functions.

The division of the volume on the anatomy of the peripheral nerves is also well illustrated and equally deserving of commendation.

There is one defect we may allude to, viz. the limited acquaintance Henle manifests with British contributions towards cerebro-spinal anatomy. In the introductory chapter, indeed, the names of several of our countrymen occur in the discussion of various questions relative to nerve-fibres, their origin, distribution, and termination; but, in the after part of the volume on brain-structure, amid

[1] *Handbuch der Systematischen Anatomie des Menschen.* Von Dr. J. Henle. In drei Bänden. Dritter Band, Zweite Abtheilung—Nervenlehre. Braunschweig, 1873.

numerous references to German authorities, the name of an English observer is rarely encountered.

Dictionnaire de Médecine, par Jaccoud.—The two volumes now before us of this magnificent treatise on medicine are occupied with articles ranging, in alphabetical order, from "*genou*" to "*humerus*." The sixteenth volume is chiefly taken up with two essays, one on medical geography, the other on gout. The former occupies above 300 pages, and is the most complete monograph we are acquainted with on the subject. The writer is Dr. H. Rey. Its preparation must have involved an enormous amount of reading and reference, but, either from lack of opportunity to consult them or from indifference to them, English authorities are but little noticed. Considering the proclivities of Englishmen for travel and for recording their travels, the extension of British settlements in every clime, and the multitude of official and non-official reports on the physical features, the climate, and the diseases of the greater portion of the earth's surface, to be found in English literature, this omission is much to be regretted. And turning to the bibliography appended to the essay we observe that it is pre-eminently an array of French contributions, and for the most part, of articles to be found in French journals, and of theses, with here and there a German or an Italian essay. On the whole, this article on medical geography is a laborious and painstaking one, but would admit of much reduction, and needs revision to render it satisfactory.

The essay on gout is by MM. Jaccoud and Labadie-Lagrave.

The more important essays in the seventeenth volume are those on hernia, on pregnancy, on the hip-joint, and on hospital construction. M. Voisin has contributed also an able article on heredity, M. Motet one on hallucinations, and M. Bernutz one on uterine hæmatocele.

The reputation of M. Jaccoud, the general editor, offers a guarantee of the value of the volumes of this comprehensive dictionary of medicine; and happy is the man whose purse enables him to acquire them, provided always he understands the language in which they are written, and duly seeks to learn from them.

Syllabus of Materia Medica.[2]—This brochure of thirty-four pages, plus eighteen of introductory observations, is the product of the united powers of an Aberdeen professor and an assistant-professor. Yet, though it be a small outcome from two such distinguished men, we must not appraise its value according to its dimensions. It will be found useful by students. It is, as the authors signify, a *catalogue raisonné* of the articles of the Materia Medica, and the arrangement

[1] *Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques.* Tomes xvi, xvii.

[2] *Syllabus of Materia Medica for the Use of Students, &c.* By A. HARVEY, M.D., and A. D. DAVIDSON, M.D. London, 1873.

adopted is virtually that followed in Dr. Garrod's "Essentials." The relative values of the drugs and compounds is sought to be displayed by the use of numerals and asterisks. The doses are also stated.

The introduction is mainly occupied by remarks on the method of teaching pursued in our medical schools, and on the requirements of the examining boards. These remarks will be read with interest, and particularly so, as coming from those engaged in teaching.

Carter on the Structure of Calculi.[1]—The effort made by Dr. Carter to elucidate the minute structure of urinary calculi has resulted in the establishment of several significant facts. The materials for research consisted of 80 examples of calculi, of which 79 per cent. were vesical, and extracted by lithotomy from male subjects. His plan was to make sections with the particular purpose of examining the nuclear portion, and the result of examination showed the nucleus of 62 vesical calculi to consist, in 34 instances, of urates mixed with crystals of oxalates; in 21, of oxalates chiefly; and in 7, of uric acid chiefly.

Again, the general fact comes out that urinary calculi are not mere precipitates or aggregations of ordinary crystalline and amorphous deposits, held together by means of mucus, &c., but have an animal basis as an essential component, constituting a substratum of firm consistence, more or less translucent, colourless and structureless. But the author regards the main result of his inquiries, to be the determination of the fact that some of the more characteristic ingredients of urinary calculi are present in forms peculiar to, what he terms, sub-morphous structures, as distinguishable from amorphous. Such peculiar sub-morphous forms are due to the modifying influence of animal or of colloid matters, and, to illustrate his views, Dr. Carter refers to the ingenious observations of Mr. Rainey on "molecular coalescence," and to those of Dr. Ord on the influence of colloids upon the form of crystals. In these circumstances he finds an explanation of the noticeable differences between crystals of uric acid found in calculi and those noticed in urinary deposits.

The conclusions thus arrived at he applies to the explanation of the comparative infrequency of stone, considering how common deposits and insoluble ingredients occur in the urine. If accretion were the only force necessary to the formation of calculi, we might, indeed, certainly look for their more frequent occurrence; but Dr. Carter appears to us to make it clear that another determining power must concur to induce molecular coalescence.

A variety of sub-morphous and crystalline bodies is shown by

[1] *The Microscopic Structure and Mode of Formation of Urinary Calculi.* By H. V. Carter, M.D. With Illustrations. London, 1873. Pp. 51.

the author to exist in calculi, and it is his impression that the like may be looked for in urinary deposits, and be made available to the diagnosis of calculi. He further indicates the need for examining the urine in connection with the views he entertains and the observations he has recorded.

On the subject of the "dispersion" of calculi—in other words, their dissolution or breaking up—he is not encouraging. In his opinion, alkalies, acids, and electricity, are likely to fail, regard being had to the composition of calculi.

This little book is a genuine record of work honestly and well done, and is a real contribution to our knowledge. Unlike too many writers who have some new fact or observation to publish, he has contented himself with the simple narrative of his researches, instead of wrapping them up in a mass of matter, possibly relevant, but destitute alike in novelty of information and in interest for the reader.

Galabin on Bright's Disease and Vascular Changes.[1]—This is an excellent specimen of a thesis written for the degree of M.D. at Cambridge, and a valuable contribution to our knowledge of a pathological condition which has formed the subject of several warm debates at our medical societies. It is here enough to state that his general conclusion is adverse to the hypothesis of Sir W. Gull and Dr. Sutton, and generally in favour of the views propounded by Dr. George Johnson.

Legg, Examination of Urine.[2]—The repeated demand for new editions, of this little treatise indicates the correctness of Dr. Wickham Legg's perception of the need on the part of students of the practical information conveyed in it. We have heretofore spoken of the book approvingly, and it now suffices to notice the appearance of this new edition, and to state that it substantially resembles previous issues, with, however, some expansion of the observations on the clinical value of morbid changes found in the urine.

Cooke's Tablets of Anatomy and Physiology.[3]—We have two of these so-called 'Tablets' before us; one on physiology, announced to be completed in three parts, of which the present brochure is the first; the other on anatomy, and occupied with the structure of the ear and eye. The former is a pamphlet of forty, the latter one of thirty pages. After an examination of their contents we are satisfied

[1] *On the Connection of Bright's Disease, with Changes in the Vascular System.* With illustrations from the Sphygmograph. By A. L. Galabin, M.D. London. 1873.

[2] *A Guide to the Examination of the Urine, designed chiefly for the use of Clinical Clerks and Students.* By J. Wickham Legg, M.D. Third edition. London, 1873. Pp. 94.

[3] *Tablets of Anatomy and Physiology.* By Thomas Cooke, F.R.C.S. London, 1873.

of their value as aids to the memory of students who have previously worked up these subjects in approved text-books. We are unwilling to look upon them as 'crams,' although liable to be so abused. The information is naturally very condensed, and the various matters treated of well divided and subdivided, so as to fix them on the memory; the style is also sufficiently clear and precise.

Adams on Club Foot.[1]—This is a great improvement upon the first edition, being enriched with the results of additional researches and clinical observations. The descriptive remarks on the repair of divided tendons and the appendix of illustrative cases are particularly worthy of study. The present edition has been carefully revised throughout, and thus maintains for the work its reputation of being the best treatise on club foot in the English language. The lithographs and woodcuts are sufficiently good and numerous.

The Half-Yearly Retrospects of Medicine.[2]—These volumes of abstracts, exhibiting the additions made to the science and practice of medicine from year to year, have had their value recognised during a long course of years: but it would seem that, with regard to one of them at least, the recognition accorded has not been of late so wide as to encourage its editor and publishers to continue its publication; and we have sincerely to regret that the volume of the 'Half-yearly Abstract of the Medical Sciences' now before us will be the last of its series.

The older serial, 'The Retrospect of Medicine,' edited by the Braithwaites, promises to survive. It has always been a favorite among the general practitioners seeking enlightenment in practical matters, and valuing most what is of home produce. We trust it may go on and prosper, fulfilling its useful task. It has lost one formidable rival, but yet much effort will be wanted to maintain its ground in face of the weekly, monthly, and quarterly abstracts supplied to the profession, not to mention annual and biennial "Reports" put forth by societies and enterprising individuals.

Both on Consumption.[3]—Dr. Both is impatient of the mystery that hangs about consumption, and proposes to remove it. So great is the prevailing ignorance upon the subject that in his own experience—which he represents as large—every patient applying for relief has been injured already by the bad practice of others. Yet

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[1] *Club-Foot: its Causes, Pathology, and Treatment.* By William Adams. Second edition, 1873.

[2] *The Retrospect of Medicine.* Edited by W. Braithwaite, M.D., and James Braithwaite, M.D. Vol. lxviii, July to December, 1873.

The Half-Yearly Abstract of the Medical Sciences. Edited by W. D. Stone, M.D. Vol. lviii, July to December, 1873. London, 1873.

[3] *Consumption and its Treatment in all its Forms.* By Dr. Carl Both. Boston and London.

his own success is not less conspicuous than the failure of others. "The writer has invariably succeeded in every case in effecting the arrest of the tubercular process in the lungs."

An author who thus asserts a monopoly of wisdom, and warns his readers "to place no reliance in the diagnosis of a general practitioner," can scarcely be writing for the benefit or approbation of his own profession. It is clear, indeed, from his phraseology and the tenor of his descriptions that Dr. Both is addressing the public at large. It is for them that a lengthy comparison is drawn between disordered digestion and an operative strike (41), and the lungs are described as having "somewhat the appearance of a sugar-loaf" (47). The book, however, is not merely descriptive; it lapses pretty soon into mere boasting. The author is obviously his own hero; "the one physician in a thousand who can diagnosticate the true condition of things," "the educated ear," "the competent specialist" amid a host of pretenders.

Shorn of such ornaments the sober argument of the work may be very shortly stated. The whole bane of phthisis arises from the accumulation within the lungs of catarrhal products or of "escaped blood." The one gives rise to chronic pneumonia, a condition "which is invariably the result of neglect in treatment," the other constitutes "the primary or real tubercle." Much depends, as we gather, upon "the manner in which the blood escapes" (60); acute pneumonia, tubercle, hæmorrhage, are all amongst the possible consequences of this event. Acute tuberculosis, however, can only occur upon a process of mortification;" "putrified masses" are caught in various parts of the body and so poison the blood (59.) Mixed up with such statements, which Dr. Both describes (with some injustice to the bird) as "a bird's-eye view of the processes of lung disease," are others upon general pathology equally surprising. Such is the assertion that a child "whose blood is correctly mixed will not catch scarlet fever if put in bed with a child sick with it" (43), and the doctrine that whooping cough is propagated solely by children coughing into each other's faces.

Upon such foundation as this is built up a system of treatment which reads like a coarse burlesque of the teaching of Niemeyer. The accumulated products of catarrh are to be got rid of by means of "lung gymnastics" (94), the patient "must learn to breathe correctly," he must neither ride nor drive, and "not sit much in chairs," while "absorption is to be produced by light poultices on one side and occasional light irritants upon the respiratory nerve on the other side" (93).

What is all this nonsense? We took up the book in the belief that there was honesty of purpose at the bottom of it, and we would think so still. The author's self-confidence, however groundless, is not assumed. Better instructed pathologists than Dr. Both have of

late expressed views in regard to phthisis which are only more nakedly put in these grotesque directions as to treatment. Granting that in certain opinions upon general pathology such as we have quoted, our author may fully claim to be original, yet upon the subject of the cure of consumption he does no more than state explicitly what others have expressed in more guarded as well as more modest language. What, then, is to be said concerning opinions of which this singular book is, if not a fair interpretation, at least an endorsement and, considered in the light of a travestie, by no means overdone?

Heart Diseases in Australia.[1]—It is difficult to form a just opinion of this book, for while, on the one hand, the author seems to have spent considerable pains in collecting statistical and other materials upon the subject he has chosen for his present work, on the other hand, there are so many palpable mistakes, not only in grammar and orthography, but also in pathology, that the resulting information is of very doubtful utility. On the principle that those who have glass windows ought not to throw stones, we think that Dr. Reeves would have done well to omit the disparaging remarks on the works of his Australian *confrères* which he makes in his introduction. He accuses them of paraphrasing German and French authors, and passing off their books as original, and perhaps Dr. Reeves is himself free from blame in this respect, for there is remarkably little in his own work which is derived from foreign sources, yet, on the other hand, we very much doubt the value of his original matter. His chapter, for instance, on Chorea of the Heart (?), which, he tells us, is very common in Australia, though very rare in Europe, is exceedingly difficult to understand, owing to the fact that his mode of description is so different from that of European authors that his meaning is in many parts quite obscure. The symptoms of this affection, we are told, are that the sounds (in chorea with valvular disease) become louder, *as if the orifice was more contracted than at other times;* that the only alteration about the heart (in a case recorded) *was a blowing sound heard along the pulmonary artery;* that in another case recorded the alteration in the pulmonary valves was louder (?), and there was slight alteration heard (?) over the mitral valve; that in two other cases there was *alteration* in the heart's sounds, but no information is given as to the nature of the alteration. We confess that we should be unable to recognise chorea of the heart, even if we met with it, from Dr. Reeves's descriptions.

It would be really a waste of time to follow the author through all his lucubrations, and we can only come to the conclusion that if

[1] *Heart Diseases in Australia, with Observations on Aneurism of the Aorta.* By C. E. Reeves, B.A., M.D. Pp. 188. Melbourne, 1873.

there be any peculiarities in the heart-diseases of Australia, his peculiarities in describing them are undoubtedly remarkable, and his grammar and spelling are equally peculiar and remarkable. Some of the statistics given, however, of heart-diseases in Melbourne are interesting.

An Introduction to the Study of Clinical Medicine.[1]—This little manual aims at pointing out to students a method of interrogating patients at the bedside, and the author assumes that his readers are already acquainted with the contents of the ordinary text-books of medicine before consulting his pages. We may at once state that Dr. Sturges has very ably carried out the object proposed, and that the student, armed with his manual, and already fairly instructed in the essentials of his profession, will find in it a trustworthy guide. It is justly observed that lectures and books, even of the best description, are very inadequate to render the student competent to grapple with disease at the bedside of the patient, for the lecturer and the author treat of medicine as a whole; the common cases and the rare ones are detailed with equal impartiality, and the precepts often appear to be of no practical importance when brought to bear on individual cases. A clinical manual, therefore, which tells the student how to set about examining a given case—the features of which are previously unknown to him,—and how to analyse, or separate, or combine the various facts presented to his senses, must have a peculiar value in leading him to just notions of the diagnosis of disease and thence of the treatment of his patients.

Dr. Sturges divides his book into eleven sections, and includes some general rules given in reference to the examination of patients, and it treats successively of the mode of taking the family and personal history of the case; the examination of the functions; the examination of the phenomena of the brain and spinal cord; the physical examination of the chest, its inspection and palpation; percussion applied to the heart and lungs; the auscultation of the chest; the examination of the abdomen and of the secretions; and the last two sections are devoted to very short directions as to diagnosis and treatment.

In an introductory chapter on the sort of help needed by the student at the bedside, Dr. Sturges truly remarks that "the explicit statements and sharply-defined distinctions and classifications of the books have no precise counterpart in nature," and that it is right the student should know that there is more of uncertainty and failure and surprise in actual practice than he would, from his usual

[1] *An Introduction to the Study of Clinical Medicine: being a Guide to the Investigation of Disease, for the Use of Students.* By Octavius Sturges, M.D. Cantab., Assistant-Physician to the Westminster Hospital, &c. Pp. 131. London, 1873.

studies, be led to expect, and that he should therefore learn the wide difference between his own early powers of diagnosis and the degree of precision of which the subject is capable. One of the most striking illustrations, probably, of the truth of these remarks is to be found in the investigation of the diseases of the nervous system, which, as Dr. Sturges remarks, may be, and often are, purely subjective as to their symptoms, and he might have put the case even more strongly than he has done, and might have mentioned that, while a host of subjective symptoms may be unattended with any known pathological condition whatever, some most serious morbid conditions of the nervous system are occasionally attended with few important symptoms.

The rules laid down for the physical examination of the chest, in connection with the diseases of the heart and lungs, are very sound and judicious, and here, as elsewhere in the manual, the student is warned against receiving too literally, or relying too much upon, the descriptions of sounds, murmurs, &c., laid down in books, and he is recommended rather to form rules from his own observation than to adopt implicitly the rules laid down by others. We cannot help, while on this part of the subject, referring to the mistake which Dr. Sturges (in common with many other writers on pulmonary diagnosis) makes in regarding "succussion" as synonymous with "splashing." Succussion is the physical act (shaking or jogging) which *causes* the splashing, and is not the splashing itself, any more than *percussion* is the dull or clear sound which is elicited by the fingers or the pleximeter.

The few remarks on treatment, which, after all, is the most important point for the patient, are also valuable, and Dr. Sturges is right, we think, in combating the precepts often laid down as to treating the *cause* of symptoms, rather than the symptoms themselves. If we *knew* the causes of disease—say of fever, or rheumatism, or pneumonia,—it would, of course, be right to remove those causes, if we were able to do so; but, in fact, we do *not* know them, or, at least, our knowledge is only conjectural, so that we are obliged, from the very nature of the case, to alleviate the symptoms which are the most distressing to the patient, and which are, of course, to him the most important features of his malady. In surgery the precept of removing the cause is perfectly sound, and it is often practicable; thus the extraction of a calculus from the bladder, or the division of a stricture, will relieve the symptoms to which those morbid conditions respectively give rise; but we are very far from having, in medicine, any such certain relation of cause and effect, and we must be satisfied, in many instances, with relieving present suffering and pain.

Family Thermometry.[1]—For reasons which are not very clearly explained, this little book is written in the form of a letter to a lady who, we are told, fervently wished to have a child and now wishes to know how to take care of it. Perhaps, however, Dr. Seguin means that the way to take care of a child is by continually watching and recording its temperature, and, indeed, this would appear to be his opinion, for he tells us that all diseases, whatever be their seat or apparent diversity, have this in common, that they are "ustions," whose combustive process is marked by a rise of the thermometer during the period of invasion, and by a fall towards the period of exhaustion of a disease. Hence he continues, "All the diseases may be viewed by a mother or a nurse, who is deprived of the light of modern medicine, as exaggerated or diminished combustion (respectively hyperpyrexia and apyrexia)." Hence also the conclusion that "the appreciation of the temperature of the body takes the precedence of everything else in the art of taking care of children and patients generally." He accordingly gives minute directions to the lady to whom the book is addressed as to the mode of making thermometrical observations on her child, both by using the natural thermometer, namely, her own hand, and that usually employed in medical practice. Why, he asks, should women be taught algebra and trigonometry, and not nursing? Why should they be taught to look through microscopes and telescopes, and not into the healthy or morbid faces of their little ones? Why can they tell the latitude of Pekin, and the height of Chimborazo, and not the indications of the medical thermometer which tell of their children's health? Such is the language used by Dr. Seguin, who, though his precepts are good enough, seems to carry his hobby rather too far.

Clinical and Pathological Observations in India.[2]—The contents of this book are of a practical character, being founded on the experience of Dr. Fayrer in Indian medical practice, and they include the details of many cases peculiar to intertropical countries, together with those of many more which are common all over the world. Perhaps the most interesting matters are of a surgical character, although the collection is a miscellaneous one, and many subjects relating to medicine and pathology and therapeutics, and even midwifery, are touched upon.

The volume commences with an address on surgery, delivered by Dr. Fayrer at the annual meeting of the Bengal branch of the British Medical Association, and one of the most prominent features

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[1] *Family Thermometry: a Manual of Thermometry, for Mothers, Nurses, Hospitallers, and all who have the Charge of the Sick and of the Young.* By Edward Seguin, M.D.

[2] *Clinical and Pathological Observations in India.* By J. Fayrer, C.S.I., M.D., F.R.S.E., Surgeon-Major Bengal Army, Professor of Surgery in the Medical College of Bengal, &c. Pp. 648. London, 1873.

introduced in it is the application of the antiseptic principle in the treatment of surgical diseases. In reference to this subject, Dr. Fayrer, after describing the theory on which the use of carbolic acid in dressing wounds and injuries is founded, expresses his satisfaction at the results of the plan as exemplified in the practice of his own hospital at Calcutta; and although he admits that he cannot speak with the unqualified enthusiasm with which some of its advocates express themselves, he yet states that it is a valuable application, especially in cases of pyæmia. The cases in which it was used under Dr. Fayrer's observation were amputations, compound fractures, wounds and surgical operations, abscesses, ulcers and sloughing sores, and a list is given of all the cases so treated. It is stated, however, that the results do not, perhaps, convey definitive proof of the beneficial results of the carbolic acid treatment, but that the surgeons who treated the cases were struck with its good effects and fully appreciated its value.

On the subject of the connection of pyæmia with osteo-myelitis Dr. Fayrer repeats an opinion he has formerly expressed, that, while fully recognising many other sources of blood-poisoning, he regards osteo-myelitis as a distinct, original, and dangerous form of disease, liable to occur after wounds, injuries, and operations, or even idiopathically, and productive of the most deadly form of surgical fever, resulting in disintegration or local death, with a low form of so-called inflammation in the cavities, viscera, and tissues generally, of the body, but capable of being cured if recognised early and the diseased bones removed. This statement appears to be made by Dr. Fayrer in order to controvert the views of those who regard osteo-myelitis as the consequence and not the cause of pyæmia, but he states, with satisfaction, that his opportunities for studying the former have considerably diminished of late, owing to its absence from the wards of his hospital.

Among the causes of death after surgical operations Dr. Fayrer mentions the existence of fibrinous coagula in the right side of the heart. When a patient dies in a few hours after a severe surgical operation or a serious injury the result is justly attributed to shock, nervous exhaustion, prostration from loss of blood, and the like; and pyæmia, gangrene, tetanus, and secondary hæmorrhage, are serious and even fatal complications; but Dr. Fayrer states that a patient may have recovered from the shock and the immediate after-effects, and subsequently perish from the formation of fibrinous coagula in the cavities of the heart—a result which is directly traceable to the operation, but hitherto not sufficiently understood by surgeons. He thinks there is no doubt that these fibrinous coagula do form in the heart before death, and that they are the cause of the fatal result, as is maintained by Dr. Richardson, although they have been chiefly observed in the advanced stages of some exhaustive diseases.

But Dr. Fayrer particularly desires to point out that they are sometimes only the result of the effects of the injury or operation, and not of any constitutional blood-poison, and he mentions the symptoms which indicate the existence of these coagula and the appearances observed when they cause death.

Another pathological change which is of great interest to the surgeon, as influencing his judgment when considering the question of operating on certain patients, is the existence of fatty degeneration of the muscular fibre of the heart. Dr. Fayrer thinks there is no doubt that when this change has made any progress the subject of it is much less capable of bearing the shock of an operation, and of rallying and effecting the repair of the wound. But unfortunately, as Dr. Fayrer admits, there are no signs that can be pointed out as absolutely pathognomonic of the disease in question, although its existence may sometimes be inferred from changes going on elsewhere. The general condition of some persons may excite the suspicion that there is degeneration of the cardiac muscular fibres, such as flabbiness of the muscles of the body, the arcus senilis, grey hair, and general debility, with a feeble, perhaps slow and irregular, pulse, hurried respiration, and weakened heart-sounds, but still, these indications may be absent when the degeneration exists, and it is only by watching and carefully noting the state of the patient, both before and after an operation, that his real condition can be understood.

Among the rarer forms of injury mentioned in Dr. Fayrer's book are the bites of animals, and he gives several cases of the kind, which are of an interesting character, six being cases of shark-bite, one of wolf-bite, and one of jackal-bite. Shark-bites, it appears, frequently occur in the Hooghly, the shark of that river (*Carcharias Gangeticus*) being a bold and fierce creature, dashing in among the crowds who are bathing in the river, and though seldom carrying any person away, yet often inflicting a dangerous or even mortal wound. These accidents are said to be more common of late, since the former practice of throwing bodies into the river has been discontinued, and Dr. Fayrer regrets that the simple precaution of staking off a portion of the stream used for bathing has not been resorted to, although the plan is found quite efficacious against alligators in the Loonderbuns. In two of these cases the injuries were comparatively slight, and required only simple treatment, but in the third case the foot and leg of the patient were so extensively lacerated that amputation of the leg was immediately performed; in the fourth case the arm, which was the part seized by the shark, became gangrenous, and necessitated amputation; and in the fifth the injuries were so serious that they resulted in death. In this last case the patient was seized in the thigh by the shark, which carried off a great portion of the muscles and integuments, exposing

the head of the femur and grooving the bone itself in several places. Amputation was performed at the hip-joint, but death ensued from shock about three quarters of an hour after the operation. In the sixth case, which was also fatal, the shark had torn away a large portion of the left thigh, but an attempt was made to preserve the limb, although in vain, and death ensued from exhaustion. In the case of wolf-bite, the injuries inflicted upon the arm caused necrosis of the radius and subsequent anchylosis of the elbow-joint, which, however, was successfully excised. The case of jackal-bite was one when a jackal had seized an infant thirty-four days old when lying by its mother's side, and inflicted a punctured wound on the left thigh. This wound, however, healed under surgical treatment, and recovery ensued.

Dr. Fayrer adduces eleven cases of Tracheotomy, and gives a tabular statement of the races, sexes, and ages of the patients, the affections which rendered the operation necessary, and the number of fatal and successful cases, the latter, however, bearing but a small proportion to the former. But the cases were mostly very unpromising and two probably hopeless, for they were instances of cancer of the larynx and aneurism of the innominata. Two are set down as cases of diphtheria, but it is doubtful, from the description, whether they were really of that character, for no false membrane was detected in either case, and no post-mortem examination was made. One case was very satisfactory, where the cause of obstruction was syphilitic ulceration of the larynx, and where tracheotomy was completely successful.

Many other surgical questions are touched upon, as the propriety of paracentesis of the knee-joint in the treatment of synovitis, Dr. Fayrer believing that the operation may be performed without severe inflammation being a necessary result; the radical cure of inguinal hernia, the efficacy of which operaton he quite admits, while he also points to its comparative freedom from danger; the treatment of stricture of the urethra by immediate dilatation, as proposed by Mr. Barnard Holt, and of which Dr. Fayrer writes in terms of general though modified approval; and the performance of lithotomy in Calcutta, an operation which it appears is not very successful in Lower Bengal, while vesical calculus is fortunately not of very frequent occurrence.

Among the diseases peculiar to hot climates is Elephantiasis, and Dr. Fayrer gives several instances of this malady, both as affecting the leg and the scrotum. The frequency of the affection in Bengal may be estimated from the fact that Dr. Fayrer gives a summary of 115 operations for scrotal elephantiasis performed from 1859 up to February, 1866. The number of fatal cases after operation was 17, the most frequent cause of death being pyæmia, the next most frequent being diarrhœa and exhaustion, while shock was the cause

of the fatal event in two cases, and tetanus and gangrene were each the cause of one death. In elephantiasis of the leg Dr. Fayrer thinks that the results of treatment by ligature of the femoral artery are not encouraging, for even if the patient do not die of the operation the improvement in the successful cases is only temporary. He gives two cases of this disease, in one of which there was a diminution in size at first after the artery had been tied, but the swelling gradually returned as the patient recovered from the operation, and in the other case, which seems to have been partly of a syphilitic character, the improvement seemed to be due as much to constitutional treatment as to the operation.

It appears that hydrocele of the tunica vaginalis, testis and spermatic cord, are of frequent occurrence in Bengal, and Dr. Fayrer regards the disease as having a malarious origin in that country. It is, he says, frequently associated with scrotal hypertrophy, usually of an elephantoid character, and is generally free from pain, except when the malarious influence is prevailing, when fever and pain may both exist. The quantity of fluid collected is often enormous, although Dr. Fayrer does not give any exact measurements, but he states that he has frequently seen hydrocele without elephantiasis attaining to the size of a man's head, and when complicated with that affection there is almost no limit to its growth. The results of treatment are stated to be generally very satisfactory, and Dr. Fayrer considers the most effectual plan to be by the injection of iodine into the tunica vaginalis.

The other subjects treated are of a very miscellaneous character, but they are interesting as records of practice in India. Among the cases, however, there are two of Aphasia, one being fatal, and the other followed by recovery. In the first there was cerebral softening from atheromatous degeneration of the vessels of the brain with embolism of the basilar artery, and Dr. Fayrer regards it as corroborating the views recently advanced by some pathologists as to the cause of this curious affection. The post-mortem examination revealed the presence of extensive disease of the left anterior lobe of the brain, this part of the organ being apparently shrunken and smaller than the corresponding part on the opposite side. There were also portions of softening both yellow and white. The vertebral and basilar arteries were thickened, rigid, and of a yellowish colour from atheromatous degeneration, and in the latter vessel a dark-coloured clot, of recent standing, was found, completely blocking up the cavity. In the second case there was, at first, convulsion on the right side, a fact which seems to support the view of those who localise the cause of the disease (aphasia) in the left hemisphere. Although the patient improved under treatment and left India, and was much better in England, he subsequently died, but no information is given as to any post-mortem examination, so

that the pathology must in this case be merely matter of speculation. The symptoms of aphasia, however, were well marked, and Dr. Fayrer gives several interesting illustrations of the attempts of the patient at reading, writing, and speaking, and of the progressive improvement which was observed while under medical care.

Continued Fevers of Great Britain.[1]—Eleven years have elapsed between the publication of the first and second editions of Dr. Murchison's treatise, and the delay in the appearance of the latter has been due to the desire of the author to embody in it, as far as possible, the result of the observations on the recent epidemic of fever. The statistical tables in the first edition were founded upon the cases of continued fever admitted into the London Fever Hospital during the ten years from 1848 to 1857, but those in the present edition are based upon all the cases admitted from 1848 to 1870, or, in other words, from the time when the different continued fevers were first distinguished in 1848 until the establishment of the new fever asylums in 1871, when the experience of the London Fever Hospital alone ceased to represent, with any accuracy, the prevalence of fevers in the metropolis of England.

Since the appearance of the first edition London has been visited by several epidemics of fever, but more especially by one of relapsing fever in 1868 and succeeding years, and Dr. Murchison devotes considerable space to the description of this affection. As a matter of fact, this kind of fever had been for a long time absent from London until the period specified, and it is equally certain that it has now again disappeared. But Dr. Murchison shows that epidemics of relapsing fever have occurred, and have been described during more than a hundred years in the British Islands, although it must be admitted that they have appeared at rare and somewhat distant intervals and in different localities. From 1828 until 1842 this form of fever was absent from Great Britain, but in the latter year it appeared in Scotland and to a less extent in England, and after lasting at fitful intervals until 1855 it again disappeared, and for more than fourteen years not a case of it was observed in any hospital of England or Scotland, while in Ireland it seems alsoto have been unknown. In these capricious visitations relapsing fever exhibited the character of many other epidemics, such as cholera and diphtheria, which are sometimes absent for a longer or shorter period, and then reappear at uncertain intervals and in very different localities. Hence it is not extraordinary that the features of relapsing fever should be unknown to a great number of medical practitioners, or that many of them when they happen to meet with it should regard it as a new disease.

[1] *A Treatise on the Continued Fevers of Great Britain.* By Charles Murchison, M.D., LLD., F.R.S. Second edition, pp. 729. 1873.

But from the peculiar features of this form of fever and its uncertain course Dr. Murchison derives a plausible and ingenious argument against the views of those who advocate the theory of a change of type in disease during the last half century. It is well known that bloodletting was strongly advocated in the treatment of fever some forty or fifty years ago, by some of the most distinguished physicians of the period, some of whom are still living. They then maintained that the abstraction of blood in certain forms of fever was not only justifiable but necessary and beneficial, and they still defend the practice as being applicable at the time referred to, although what is termed the change of type in disease has now rendered it obsolete. They did not then, nor do they now, declare that bleeding is applicable in all forms of fever, but only in those which presented what is called the sthenic type, or, in the language of former years, in synochia as contradistinguished from typhus. But since it has been satisfactorily shown that the old descriptions given as distinguishing synocha, synochus, and typhus, are no longer tenable, and continued fevers have been grouped in the two great categories of typhus or typhoid (or enteric, or, according to Dr. Murchison, pythogenic) fevers, with the subordinate affections known as febricula and relapsing fever, it becomes undoubtedly more and more difficult to justify or explain the practice of our predecessors in their advocacy of copious bleeding at the commencement of the present century. It is quite certain that no practitioner of our own day would bleed either in typhus or in typhoid fever, in consequence of the dangerous results which such a step would involve, but the great success which is said to have attended the measure in former times seems to indicate that the diseases then treated did not belong to the class of what are now the prevailing forms of fever. Those who advocated the practice then, but denounce it now, would account for their own change of opinion by referring to the supposed change of type in disease, but their opponents maintain that it is not the type of disease that has changed, but that the *diseases* themselves have varied, having prevailed at different periods with varying intensity, and often having occurred only at long intervals. Dr. Murchison argues that the disease which was said to have been benefited by bloodletting at the beginning of the present century was relapsing fever, but that the success of this mode of treatment was only imaginary, for the disease is not by any means a fatal one, and would, in all probability, have passed away even if no treatment whatever had been adopted. Whether this explanation be altogether satisfactory we are not quite prepared to assert. As we have just remarked, several physicians who observed and treated the fevers of the period referred to are still living, and some of them are among the most distinguished ornaments of the profession, and the younger race of practitioners are, of course, unable to determine, by

personal experience, the circumstances which seemed to their seniors to justify a practice now almost universally allowed to be inadmissible.

A chapter on the relative merit of isolating fever patients, or of distributing them in the wards of the general hospitals, will be read with interest, and the question is one on which something may be said on both sides. On the one hand there can be no doubt that the congregation of cases of contagious fever in a single building forms a focus of disease, which spreads itself to persons within reach of the infection; but, on the other hand, it is equally true that the introduction of cases of contagious fever into the wards of general hospitals tends to spread the malady to other patients not suffering from fever. Still, it is a common practice, whether for the purpose of clinical instruction or from motives of expediency, to allow in the general hospitals a few cases of fever, contagious or otherwise, to be mixed with the ordinary patients, and no great harm appears to ensue to the health of either the patients or the rest of the inmates. The question is discussed by Dr. Murchison with great care and impartiality, although his conclusion is, on the whole, in favour of sending fever patients to special hospitals, and perhaps the plan is more safe than that of placing them in the general hospitals, and is certainly preferable to leaving them (as would be done if no fever hospitals existed) to spread the disease in the crowded and unwholesome dwellings and localities where such maladies usually originate.

Parkes' Practical Hygiene.[1]—No work can be more welcome or more valuable to those who have to do with the hygiene, the feeding and lodging of their fellow-men, than this treatise by Dr. Parkes. Its value has been well tested, and is attested by the publication of a fourth edition. Civil sanitary medical officers will regard this new edition with even more favour than preceding ones, as the author has given increased attention to their special requirements, and has now subdivided the treatise into two books, by detaching from the rest and keeping to themselves those matters which more especially concern military medical officers and army hygiene. The new matter introduced has been very considerable, but to avoid rendering the volume too bulky some matter found in previous issues has been cancelled. Reference at once shows that no pains have been spared to bring up the contents of the treatise to a level with the latest investigations, and the perusal of any part gives evidence of the wish of the author to be as concise as possible in the directions he gives and the instruction he offers.

[1] *A Manual of Practical Hygiene, intended especially for Medical Officers of the Army and for Civil Medical Officers of Health.* By Edmund A. Parkes, M.D., F.R.S., &c. Fourth edition, London, 1873. Pp. 672.

Wortabet's Arabic Treatise on Anatomy.[1]—This is probably the first time that an English reviewer has been called upon to notice a modern Arabic work on medical or anatomical science. We do not mean to say that Dr. Wortabet is the first Englishman who has written such a book, for among the works published at Calcutta about fifty years ago, under the authority of the General Committee of Public Instruction, we find an Arabic translation of Hooper's 'Vade Mecum,' and also 'A Short Anatomical Description of the Heart, extracted from the Edinburgh Medical Dictionary,' both by Dr. John Tytler. Neither of these works has ever come before our notice, and there are probably several others with which we are equally unacquainted. In the present instance we do not pretend to have examined Dr. Wortabet's work (*which does not contain one word of English*) very minutely, and shall content ourselves with mentioning, with respect to the author, that his name is probably known to some of our readers on account of his evidence in the 'Report on Leprosy by the College of Physicians,' and to more from his "Memoir on Leprosy in Syria," inserted in the last July number of this Review, and that he is Professor of Anatomy and Physiology in the Syrian Protestant College at Beyrout. With respect to the book itself, he tells us in his preface that it is taken from the works of Gray, Holden, Wilson, and Quain,[2] and that the woodcuts (which appear to be very fairly executed) are chiefly borrowed from Wilson. It is neatly printed, but not so correctly as might be wished, as the list of errata occupies three pages. There is a table of contents at the beginning of the volume and an alphabetical index at the end, and the work begins with one of the usual pious formulæ, "In the name of God the Creator and Restorer." We have done no more than turn over the pages of the book for a very cursory examination, and we confess we are perfectly incompetent to express an opinion as to its real merits as a translation. We have, however, no doubt of its value and utility in facilitating the study of anatomy in the East, and we think that its publication is very creditable to the author. We may add that Dr. Wortabet has given further evidence of his zeal in the discharge of his professional duties by the publication of a folio atlas of anatomical plates, which we have not yet seen, but which is to be found in the Library of the College of Physicians.

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[1] كتاب التوضيح في اصول التشريح

[*A Treatise on the Elements of Descriptive Anatomy.* By JOHN WORTABET, Professor of Anatomy and Physiology in the College at Beyrout. Translated from modern English works into Arabic, with 364 woodcuts. Printed at Beyrout, 1871, large 8vo, pp. 742. Price 40 francs.]

[2] Probably these gentlemen have never seen their names printed in Arabic characters, and may be amused (if not edified) by the words ولسن كواين كراي هولدن

Sir H. Thompson on Urinary Diseases and Calculi.[1]—Of these two works, one is an old friend, while the other may be described as an old friend with a new face. The old friend is the third edition of Sir Henry Thompson's well-known clinical lectures on the diseases of the urinary organs; the old friend with a new face is the small work on the preventive treatment of calculous disease, which consists of two lectures, one reprinted from the larger work, the other new. This latter treatise deals with the old question of dissolving calculi by internal remedies, or by injections into the bladder; but, unhappily, nothing has yet been discovered which effects this desirable result.

As we have heretofore noticed at some length the former editions of Sir Henry Thompson's "Clinical Lectures," we need not say much about the work on the present occasion. We may, however, in a few words, express our admiration for it, and the renewed pleasure and profit that we have found in reading it. It is a book which cannot be too widely known, or too closely studied. The diseases it treats of are such as make their sufferers particularly miserable; and we have no hesitation in saying that if Sir Henry Thompson's teachings were thoroughly impressed upon the minds of practitioners a vast deal of human suffering would be avoided. Indeed, if all medical men were thoroughly competent to enforce what is described in this little work on the preventive treatment of calculous disease, and if they were alive to the earlier indications of the disease, it would speedily come to this—that the surgeon would only be called upon to deal with calculi in children and small stones in adults; and then, with lithotomy for those under puberty, and lithotrity for those over that age, the treatment of calculous disorders would become much more safe and satisfactory than it now is. It is those cases in adults and in old men where the calculi have been in course of formation for some time before they are diagnosed, and submitted to operation, that multiply the deaths from "stone." But if these were detected earlier, and at once subjected to the lithotrite, the rate of mortality would soon fall.

Mailliot on Auscultation.[2]—So long ago as 1843, Dr. Mailliot published a practical treatise on percussion, in order to demon-

[1] 1. *Clinical Lectures on Diseases of the Urinary Organs.* Delivered at University College Hospital by Sir Henry Thompson, Surgeon-Extraordinary to H.M. the King of the Belgians; Professor of Clinical Surgery and Surgeon to University College Hospital. Third Edition. London, 1873.

2. *The Preventive Treatment of Calculous Disease, and the use of Solvent Remedies.* By Sir Henry Thompson. London, 1873.

[2] *Traité pratique d'Auscultation appliquée au diagnostic des Maladies des Organes Respiratoires.* Par le Dr. L. Mailliot. Paris, 1874.

strate the importance of the researches of Piorry, and this has been followed by smaller works on the history and methods of practising that branch of physical diagnosis.

It is with the object of placing in relief the facts which result from the works of Laennec that the present volume is issued.

From this point of view it has considerable value, containing, as it does, the results of extensive researches into early medical literature, in the form of interesting quotations from the writers of the sixteenth, seventeenth, and eighteenth centuries. Abounding thus in the opinions of the past, the book becomes in great part historical, and in the portion devoted to the varieties of respiration there is very little more recent than the well-worn discussions on the nature of bronchial breathing and the cause of bronchophony. In these and other instances, though placing the views of Laennec prominently before the reader, the author gives full weight to the opinions of his critics, and on many subjects demonstrates the too great exclusiveness of the former physician's statement.

The subject is introduced by a short history of the rise of auscultation from the time of Hippocrates, and an account of the stethoscopes of Laennec, Piorry, Williams, and others. And upon this immediately follows the first section, devoted to the auscultation of the upper air-passages, the nasal fossæ, pharynx, larynx, trachea.

It is obvious that the auscultation of the larynx is but a limited subject, and we find that the long chapter devoted to it is in great part composed of accounts of the main diseases affecting the larynx, such as croup, laryngitis, the presence of foreign bodies, &c., including not only their auscultatory sounds, but their local and general symptoms.

The article is so far complete and valuable, but the author seems to us to fail in bringing forward the diagnostic points with sufficient distinctness, an omission which somewhat detracts from its otherwise great practical use.

The second and third chapters contain accounts of the auscultation of the lungs and of the pleura, and it is here that the author takes Laennec's writings as the basis of his work, though often comparing them with the later opinions of Skoda and others. On the disputed question regarding bronchial breathing and increased vocal resonance Dr. Mailliot is willing to allow the validity of all the explanations put forward by the rival authorities, as he thinks that the different causes assumed may all contribute to the result. A similar liberality is shown in his conclusions on the nature of amphoric breathing and metallic tinkling.

He describes the following varieties of morbid respiration, namely—bronchial respiration (this he further divides into capillary, bronchial, tubular, and blowing), cavernous, amphoric, snoring, sibilant, crepitant, and rattling.

The author has already stated his belief that the breathing may present the bronchial, cavernous, and amphoric characters, with all kinds of shades, according to the degree of density of the pulmonary organ, and the extent of that density, without the existence of the least trace of dilatation of the bronchi, of cavity, of pneumothorax, or of pleuritic effusion; but with the practical ends of auscultation in view, he treats them as three different varieties, describing under each the diseases in which they are respectively observed. His crepitant respiration includes the fine crepitation of pneumonia, and the rattling variety (*respiration râlante*) is simply divided according to the presumed size of the bubbles forming it.

The volume is closed by an article occupying more than 150 pages on the auscultation of the cough, and it is especially in this portion of the work that so much use has been made of quotations from the older authors. As many of these are from works published when physiology and pathology were yet very young, they must be allowed to have less weight than would well-authenticated observations of modern times.

Surely Dr. Mailliot could have found cases in his own practice to illustrate the connection of cough with pleurisy without going so far back as Valleriola, Bonetus, and Fabricius, while the context clearly shows that they are introduced, not as a matter of history, but as illustrative cases.

When we find, further, the author giving equal weight to the statements of Galen, that hepatitis caused cough, and of Argenterius, that it did not, because in that case it would be necessary for the humour resulting from the inflammation to pass the diaphragm and to be received into the substance of the lung, and then into the bronchi, "quæ vix fieri posse puto"—when, further, he asks, with regard to cough in ascites, whether it is to be referred to the difficulty the effusion causes in the development of the pulmonary organ or to the continual irritation this organ suffers in consequence of the increased acidity of the liquid—and when we continue our perusal of the chapter on hysterical cough and cough arising in the nervous system—we begin to think that the author has forgotten the connection of physiology with pathology, or even the very existence of the former.

In spite of these defects there are some very complete accounts of the cough in pulmonary affections, which seem to be the special department of the author.

Recent Treatises on Medical Electricity.—This parcel of books on electro-physiology and electro-therapeutics is of a far higher average quality than we have formerly had offered for our notice. The well-known work of Dr. Althaus has passed into a third edition, and is not merely reissued, but is somewhat enlarged and very greatly improved. We heartily congratulate Dr. Althaus on this ready sale of his work; for many years this able writer has preached to an unbelieving generation, and to those who turned a worse than deaf ear to his description of the inestimable qualities of the continuous current. He now has his reward, for the continuous current has passed through the first stage of universal contempt into the second stage, when it is said that every one knew it all before.

It is fair, therefore, to remind the public that Dr. Althaus was the first practitioner to introduce the remedy among ourselves, nor could the remedy have had a better prophet. Though we have ventured in this Review to differ in some detail from this author, and to call in question a few both of his facts and of his reasons, and although we venture still, in some places, to differ from him, yet we do so admitting that he is, perhaps, only second to Duchenne among living systematic writers on the subject.

He who writes a large book may seem weaker than he who, writing a small one, selects his own special ground, and offers fewer places for attack. Thus, Dr. Althaus is, as we have said beforetime, by no means wholly free from the thaumaturgical pretensions which mark too many of his craft. Too many of his cures are miraculous, and too many of his hypotheses need the corrective, so we think, of a more rigorous criticism. Still, taking the book as a whole, it is exceedingly good, sober, and useful, and if visionary at times is a very rock of safety when compared with such writing as that of Benedikt. The present edition is handsomer in form than the preceding, and it is better illustrated.

The chapter on physiology has received those alterations and additions which the increase of knowledge has demanded, the chapter on diagnosis has been amplified, and the fulness of the clinical chapter encourages us by its kindly growth.

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[1] 1. *Treatise on Medical Electricity.* By Julius Althaus, M.D. Third Edition. London, 1873.

2. *Principes d'Electro-thérapie.* Par le Dr. E. Cyon. Paris, 1873.

3. *Lectures on the Clinical Uses of Electricity.* By J. Russell Reynolds, M.D. Second Edition. 1873.

4. *Lectures on the Clinical Uses of Electricity.* By Walter G. Smith, M.D. Dublin, 1873.

5. *Clinical Researches in Electro-Surgery.* By Drs. Rockwell and Beard. New York, 1873.

We almost regret that Professor Cyon's treatise has been sent to us for review, because, although recently issued, it is but the record of work done in 1868-9, and of necessity, therefore, is either true and not new, or neither new nor true. Parts of it puts forth vigorously what has become familiar to most electro-therapeutists, and other parts, which are equally vigorous, nevertheless do not bear the test of reprinting. Nay, more, we think that much of that which Professor Cyon has to say would not have taken the world by storm even in 1868. It is very excellent, but we all know it, and we do not owe quite so much of it to the author as Professor Cyon would have us believe. Of course we speak in this way of the book because in the eyes of the author himself it is nothing if not critical—nay, nothing if not in some negative sense original. What, therefore, we should call very good in a text-book, when put forth as grammar, we call somewhat indifferent when specially printed as an important manifesto. The great defect in the treatise is in the lack of adequate appreciation of empirical inquiry. Did we wait to apply electricity until we could apply it "philosophically"—that is, according to a system of physiological discovery—we might wait long enough. Meanwhile we apply it at large, and use our senses as we administer drugs at large, and let him explain the results who can. At the same time Professor Cyon's treatise is admirably written, and is written in that uncompromising sceptical spirit which we find so sadly wanting among the empirics. Marry Cyon's rigorous methods to the patient labours of the empirics, and we should gain more valuable results than are now visible.

The little volume issued by Dr. Russell Reynolds became at once deservedly popular; it has no such aim as the comprehensive work of Althaus, but is, what it professes to be, a handy manual, by which the busy practitioner is enabled, without much thought or research, to understand the leading doctrines and uses of electro-therapeutics. In its improved form it represents, very fairly and expressively, the present state of opinion and practice. Moreover, coming as it does from the consulting-room of a busy and experienced physician, its contents will have all the practical value which belongs to the words of one so familiar with all the various forms of nervous diseases.

Dr. Walter Smith's very small treatise had scarcely found a place in our list. We had laid it aside as hardly worthy of formal attention. Fortunately, however, we departed so far from the reputed habits of the critic as to read it, and having done so we hasten to say that it is as excellent as it is brief. There could be no better test, perhaps, of the fulness and accuracy of a man's knowledge than such a book, and in its pregnant

style and lucid comprehensiveness we find evidence that Dr. Smith knows better than most men what he is writing about. We trust that Dr. Smith will give us his thoughts and experience more at large. He is evidently no thaumaturgist, and he seems a champion almost doughty enough to fight the last fight with that phantasm—the cervical sympathetic.

Messrs. Rockwell and Beard are as industrious as ever in their extensive applications of electricity to morbid conditions; and, indeed, we may take them opportunely, as the very opposites of Professor Cyon. He believes nothing, they have hearts large enough to believe anything. We never pretended to express an opinion about the results of "general faradization" as practised and reported by these authors, for we never pretended to have followed in their steps.

We are glad now that these industrious workers have entered upon the domain of surgery, as here, at least, their assertions do admit of more definite expression, and can be more adequately checked.

Their little book ought to be read, and we are glad to see that both here and in their other writings the authors do not forget to record some, at least, of their unfavorable experiences. T. C. A.

Lectures on Bright's Disease.[1]—These lectures, now collected in a volume, were originally published soon after delivery in the pages of the 'British Medical Journal,' and are, consequently, well known to many of our readers. This circumstance, conjoined with the fact that their author has previously placed before the profession his views more at large respecting the pathology and treatment of renal diseases, renders it unnecessary to make a critical review of the present volume.

Moreover, these lectures are especially addressed to students, and written with a view of their requirements as learners at the bedside; consequently, as the author himself notes, doubtful and disputed questions relating to the minute anatomy and pathology of renal diseases are omitted.

As a teacher, no one is more competent to set forth the pathological history of Bright's disease than Dr. George Johnson, for it has been his special study during nearly the whole of his professional life, and, therefore, both students and practitioners may read this latest account of the disease from his pen with advantage, and with the conviction that its teachings are drawn from a most wide and well-used experience, and are, in consequence, most trustworthy.

[1] *Lectures on Bright's Disease, with especial reference to Pathology, Diagnosis, and Treatment.* By George Johnson, M.D., F.R.S. London, 1873.

Many woodcuts are interspersed in the pages of this volume, which it is regrettable are not better. They are but rough diagrams, roughly executed.

A Phrenologist amongst the Todas.[1]—This history of a primitive and decreasing tribe will be peculiarly interesting to ethnologists, who, indeed, are numerous in the ranks of the profession. These Todas are referred to the Dravidian race which replaced the Kôls, the presumed aborigines of India, and has, in its turn, been largely replaced by the Argan race, the chief occupiers of Hindostan at the present era.

The Todas are purely a pastoral race, but not nomadic. Their home is on the high plateau of the Nilagiri Hills, where all the conditions of life are most favorable to their occupations and habits, and where their agricultural repose is little liable to be disturbed. What government they have is of a patriachal type; polyandry prevails among them, and, worse still, so does infanticide, chiefly of female children. They are, at the same time, a mild, inoffensive race, thriftless and indolent, recognising an external ruling power, but having ill-defined religious beliefs, and only a shadowy sentiment of a futurity with rewards and punishments, but whatever the unknown land may be their buffaloes are supposed to bear them company in it. At the same time they have set apart certain families as a priestly order, and pay reverence to particular places and objects.

Enough has now been said to induce, as we hope, our readers to refer to Colonel Marshall's agreeable volume for a full account of this peculiar race. The gallant officer is a firm disciple of phrenology, and the character, habits, and history of the Todas are pressed into the service of his creed by way of illustration and enforcement.

Egypt as a Health Resort.[2]—This little treatise is written for the public. The information it can afford medical men is slender, and it is not discoverable how far the author is writing from personal observation and experience; whether he be a casual traveller only, or a resident in the countries he describes for a considerable period. What, however, he has written is very readable, and will convey some useful hints to travellers in search for health as well as to others. The description of the voyage, and of some places generally landed at in its course, of the aspect of the towns and people, of their customs and habits,

[1] *A Phrenologist amongst the Todas; or, the Study of a Primitive Tribe in South India.* By Lieut.-Col. W. E. Marshall. With illustrations. London, 1873. Pp. 217.

[2] *Egypt as a Health Resort, with Medical and other Hints for Travellers in Syria.* By A. Dunbar Walker, M.D. London, 1873.

and of various incidental topics, is not only slight, as the dimensions of the book might necessitate, but is also an oft-told tale, setting forth nothing new to any reader of popular works of travel. The directions and advice given to travellers for the purpose of preserving or mending their health are good as far as they go, but the indications afforded for selecting Cairo as a health resort are insufficient to guide medical men who might refer to his work. The estimate of the value of that city for phthisical patients will be considered by many well acquainted with its climate, and the conditions of life found therein, as too high. The experience of the past winter has been anything but encouraging to invalids visiting the locality.

Pirrie's Surgery.[1]—This new edition of Mr. Pirrie's work upon the 'Principles and Practice of Surgery' needs only a brief notice at our hands. It is a book which has been favorably known to the medical profession ever since it was first published, and the fact that it has now reached a third edition is a sufficient testimony to its value. But if it was acceptable to the profession before, it will, we are satisfied, be even more so now, for it has been in a great part rewritten, and rewritten with the experience which the author has gained of what is required in a text-book of this kind. Several of the chapters which have a special character, or which relate to subjects like inflammation, whose pathology has been much advanced of late years, the author has entrusted to younger hands. But the great bulk of the book has been revised by himself, and bears the stamp of his own experience and of his own opinions.

There are some topics upon which it is interesting to observe what are the writer's views, and what amount of prominence is given to them in his work. Thus, antiseptic surgery, which is so prominent in Edinburgh, is only touched upon in the briefest manner by the Aberdeen professor, and Mr. Lister's methods are merely stated, but no comment is made upon them. And yet the meagreness of the statement is itself a significant comment, and clearly indicates that Mr. Lister's theories and practice are very lightly esteemed in "the granite city." It would not do to omit all mention of them, because they are much discussed at the present time. But to state them barely, without a word of comment, satisfies inquirers, while it does nothing to propagate opinions which the author probably regards as false and pernicious.

But if antiseptic surgery is not in favour at Aberdeen, there

[1] *The Principles and Practice of Surgery.* By WILLIAM PIRRIE, F.R.S.E., Professor of Surgery in the University of Aberdeen; Senior Surgeon to the Royal Infirmary, &c. 3rd Edition. London, 1873. Pp. 977.

is another novelty which holds its ground there better than elsewhere, and that is acupressure. Sir James Simpson's favorite hæmostatic has never found many friends on this side of the Tweed. It has been held to be less reliable than the noose of thread or of catgut, and those amongst us who have abandoned the use of the ligature have adopted torsion, and not acupressure. But in Aberdeen acupressure still enjoys a large share of popularity, and Mr. Pirrie devotes much space to its consideration, and fully explains and illustrates the various ways of applying it. Sir James Simpson thought that it was the greatest single improvement in modern times in the treatment of incised wounds, and expressed a confident opinion that it would one day do even more for his reputation than the discovery of chloroform. But, as far as time has yet gone, this opinion has not been borne out. Chloroform still holds its ground as an anæsthetic, though it is not unassailed by rivals; but acupressure has never been able to supersede the ligature, and indeed it has a very hard struggle to maintain its existence at all as a mode of arresting hæmorrhage. Were it not for such friends as the distinguished Aberdeen professor, it would soon be forgotten. Perhaps under some altered circumstances it may yet come into greater favour, and Sir James Simpson's prophecy respecting it may yet be fulfilled. But at present it seems to be far behind in the race.

The volume before us is profusely illustrated, and for the most part the engravings are excellent. Some are original, and have been taken from the author's private collection; others have been borrowed from well-known works, and some of these latter have been reproduced almost *ad nauseam*.

On the whole, this new edition is very creditable to the author, and will be of great use and value, both to students and practitioners.

Mercier on the Anatomy of the Bladder.[1]—This is a small treatise on the anatomy of the bladder from a surgical point of view. So far as regards the anatomy of the organ, the author does not profess to have anything new to tell us. His work is a respectable compilation of what is already known and is to be found in any of the numerous manuals of anatomy.

As far as regards his surgery, Dr. Mercier will scarcely, we think, persuade the profession to accept him as a guide. At p. 23 he declares himself very favorable to the hypogastric operations. He says—"We are great advocates of the hypogastric section. Not to speak of the facility of its execution,

[1] *Anatomie et Physiologie de la Vessie au point de vue chirurgical.* Par Docteur A. MERCIER (de Neuchatel). Paris, 1872.

which puts it within the power of surgeons of small experience, it has also the advantage of being a mild operation, and unattended by those unforeseen and formidable accidents to which even specialists and professors are liable. It renders possible the extraction of calculi which can be reached in no other way; and, lastly, we may mention, for the benefit of those who are fond of statistics, that, according to Moreau's report, there were only five deaths in thirty-two cases of stone operated on by the upper operation between 1719 and 1721."

These arguments are, to say the least, not very conclusive, and experience has long ago decided that there are better and safer ways of reaching the bladder than by the hypogastric section. But this is not all. A little further on the author recommends a new operation, which would certainly not be an advance upon our present practice. The following is his description of it:—"A sound is introduced and fixed, and the bladder is partially emptied, so that its upper end shall remain always at a level with a line passing three centimètres below the umbilicus. A first application of chloride of zinc is then made over the linea alba, between the pubes and the umbilicus, to the extent of about six or eight centimètres. The next day, the paste and the eschar having been removed, a second application is made to the base of the wound, and so on, until the bladder is uncovered." This seems such a monstrous recommendation that it is not worth while to waste words upon it. It would be a very tedious and painful way of getting into the bladder compared with those which are at present in use, and it would not secure us against any of the after risks; on the contrary, it would rather increase them.

From the consideration of stone in the bladder the author goes on to speak of vesical fistula, and, combining anatomy with surgery, explains in detail the relation of the bladder to the parts around, and then gives an account of the various operations which have been practised for the cure of these fistulæ.

He then narrates at length the different operations that have been performed for removing calculi, both by lithotomy and lithotrity, and in this list he mentions some—such as perineal lithotrity, *i. e.* lithotrity by means of an instrument introduced through an incision in the perinæum—which we should have thought might as well have been omitted.

To the subject of the physiology of the bladder Dr. Mercier informs us he has devoted special attention, and particularly to the absorbing powers of the mucous membrane. The principal conclusion, however, which he arrives at is no other than that which has commonly been held among surgeons, namely, that when the mucosa is sound and healthy its absorbing powers are

nil. This is well illustrated by an experiment mentioned by Sir Henry Thompson. In order to justify himself in having taught that the mucous membrane, unlike that of the rectum, has no absorbing power, he injected into the bladder of a patient who had chronic cystitis *four drachms* of Liq. Opii sed. This was repeated on four separate occasions, but no constitutional effects were produced. Subsequently twenty drops were given by the mouth, and the signs of the presence of opium in the system were produced most notably. (See 'Diseases of the Urinary Organs,' p. 198.)

Dr. Mercier's work concludes with an account of a case of extroversion of the bladder, in which M. Maisonneuve performed with success an ingenious plastic operation.

As a whole, the book is a poor one. It gives a commonplace account of the anatomy and surgery of the bladder, and neither on the one subject nor on the other does the author appear to have anything original to say, derived from his own investigations or from his own experience. It is a respectable thesis, and, if the author were a senior student, it would serve to show that he had made good use of his time.

Original Communication.

Notes on the Health Service of Armies during War. — By Deputy Surgeon-General Charles Alexander Gordon, M.D., C.B.

I select the term "Health Service" intentionally. It is in a measure our equivalent of the French "Service de Santé," and certainly more nearly represents the functions of a so-called medical department than anything else in common use, inasmuch as not only have the members of that service to practise medicine as part of their ordinary duties, but also surgery, often midwifery, among the families of soldiers and officers, and by no means seldom pharmacy. The great object of the service, however, is to preserve health. To recover it in the cases of those who have lost it, whether by sickness or by wounds, is doubtless a great and important mission, but for all military purposes the primary object is to preserve health and consequent efficiency among the troops. "The Health Service" of our army is therefore, in my view, the correct designation to apply to the department the principal duty of which is the preservation and restoration of health.

In the following remarks I endeavour to bring before the reader such particulars in regard to this branch in connection with some armies, as I have been able to obtain reference to. I am aware that in several points my information is far less complete than I could wish. It is by no means an easy task, however, to obtain details, and therefore I present my sketch as it is, in the hope of the palpable gaps in it being hereafter filled up by some other writer who, like myself, endeavours to seek for information from "our neighbours."

Russia.

The direction of the army sanitary service forms a special department under the ministry for war presided over by a medical director, namely, the surgeon-general. He distributes and recommends for promotion all below him except the medical officers of the service,

who are really advanced by their military superiors, although nominally on the recommendation of their departmental head.

The duties of the surgeon in hospital until lately included the treatment of the sick and wounded, the distribution of patients and internal arrangements of the wards; but the general arrangements of the establishment were conducted by a committee composed of an intendant, a surgeon, and a steward.

There are two classes of medical officers, namely, staff and regimental. The latter treat the slighter cases in the regimental infirmaries, where such an establishment exists. Severe cases are, however, sent to a military or civil hospital, where, although the patients may be visited by the regimental surgeon, he is permitted to have no voice in their treatment.

There are six medical grades, namely, 1, comprising the director of the department, the surgeons-general of armies, with the relative ranks of lieutenant-general and major-general; 2, surgeon-general of the body-guard, principal surgeons of military schools and of military hospitals of the sixth class, with the rank of major-general and brigadier-general; 3, surgeon-general of the cavalry of the second guard, surgeons-general of the corps of grenadiers, and of corps d'armée, principal surgeons of hospitals of the fourth and fifth class, with the rank of colonel; 4, surgeons of divisions, surgeons of hospitals of the third, second, and first class; surgeons, en second, of hospitals of the sixth, fifth, and fourth class; surgeons-major of corps of cadets, with relative rank of colonel and lieutenant-colonel; 5, surgeons-major of all regiments of infantry and cavalry of the guard, surgeons-major of batteries of artillery, of battalions of chasseurs, sappers and pontoniers of military schools, arsenals, and to hospitals in the capacity of medicin traitant, with the relative rank of lieutenant-colonel and major; 6, or junior class assistant-surgeons attached to battalions of the guard and line, to military schools, corps of cadets, and military hospitals, with the relative grade of captain, and, after five years, of major.

Medical officers of the army become eligible for honorary titles; thus, those of the first class have the title of excellency, and are admitted into the order of hereditary nobles, that is, receive peerages. Promotion takes place among the inferior grades usually by seniority, but by selection among the higher; retirement is permissible after twenty-five years' service, and after thirty-five years' full-pay service a medical officer becomes entitled to full-pay retirement. While serving, an increase of pay is granted at the end of every period of five years they may have passed in the same grade.

In time of war each corps-d'armée and each division has its own chief medical officer. The divisional chef has charge of the divisional field-hospitals; when two such establishments unite to form a temporary hospital, the senior of the two then taking command. On

service the sick and wounded are treated in five different kinds of hospitals, viz. the military lazarets, the mobile lazarets of divisions, the movable hospitals, the temporary hospitals, and the permanent stationary hospital. In times of peace regimental hospitals are formed under certain circumstances, as where the larger military hospitals do not exist, or, if existing, have not sufficient accommodation. The military lazarets are formed by the establishments with regiments. Such portions of them as are adapted for service are united so as to form the mobile divisional lazarets, the surplus being left in store. The functions of such establishments include, first, help to the sick on the line of march, and then transport to a hospital or divisional lazaret. During a siege, in a permanent camp, or with a detachment, they may, if necessary, be transformed into temporary hospitals.

The moveable divisional hospitals, formed by the fusion of the previous kinds, afford care to the sick and wounded during military operations, and transport to other hospitals, whether temporary or permanent. When the division is stationary they supply transport for the sick to the more distant establishments. Each lazaret is capable of accommodating 6 officers and 160 soldiers. It also provides for the accommodation of patients in tents, or in buildings requisitioned for the purpose. The tents connected with it are of the American pattern; the ground in the interior is covered with a cloth, and the brancards, provided with iron feet, serve as cots. The train comprises conveyances for the tents, for medical equipment, for food, &c., also for the sick and wounded. The carriages intended for the stores admit of being made available, under pressure, for transport of sick and wounded. The lazaret is under the absolute command of the chief medical officer of the division, its personnel, alike medical and administrative, being subordinate to him. The medical officers treating patients are furnished from regiments. Each regiment provides from one to four infirmiers, and an apothecary is selected from among those of the division.

The complete personnel of a lazaret is comprised as follows, viz.—I. *Medical.*—1 medical officer (chef), 4 surgeons, first class, 4 of second class, 1 apothecary (or dispenser), 8 infirmiers of the first class, 8 of the second class, 1 assistant compounder, in all 28 persons. II. *Administrative.*—1 commissary, 1 bookkeeper, 1 almoner, 1 deacon, 1 secretary, first class, 1 ditto, second class, in all 7 persons. III. *Workmen.*—2 tailors, 3 shoemakers, 2 carpenters, 2 joiners, 2 locksmiths, 2 blacksmiths, 2 under blacksmiths, 2 cartwrights, 2 saddlers, 2 farriers, in all 22 men. IV. *Brancardiers.*—1 commandant, 1 sergeant-major, 4 sous officers of the first class, 4 of the second class, 200 brancardiers, in all 210 men. V. *Supplementary.*—2 sous officers as storekeepers, and 50 men, including bakers and cooks, in all 52 men. VI. *Train.*—1 officer,

6 sous officers, 108 soldiers, in all 115 men, or, for all, 16 officers and 417 soldiers. There are 215 draft horses and 8 led horses. All the medical officers are also mounted. Thus the divisional establishment is complete in itself, and directly under the command of the medical chef.

The moveable hospitals are formed, whenever circumstances require, by the union of two or more divisional lazarets, and when established their functions are the same as the former. The temporary hospitals follow the army. Their number is determined by the strength of the force, they and the permanent establishments being capable of providing for one in eight of that strength; each temporary hospital is intended to accommodate 30 officers and 600 soldiers. The usual means of shelter provided in these establishments are huts; they are generally administered on the same principle as the permanent hospitals, but under some circumstances the medical and financial branches are conducted separately, the medical chef in such a case only superintending the former. These hospitals, placed at intervals, are connected with each other by the regular means of transport, and are so arranged as to afford temporary shelter to the sick and wouuded.

Their personnel consists of—I. *Commandant.* II. *Medical.*—1 Chief medical officer, 3 medical officers traitants of first class, 4 of second class, 6 infirmiers of the first class, 12 of second class, 1 apothecary, 3 assistant apothecaries of first class, and 3 of second class. III. *Administrative.*—1 instructor, 3 commissaries, 1 bookkeeper, 1 chief purveyor, 6 secretaries of the first class, 6 of the second, 1 almoner, 1 deacon. IV. *Superintendents of Wards.*—12 infirmiers, first class, 36 of second class, 90 auxiliary infirmiers. V. *Discipline.*—1 sergeant-major, 1 storekeeper for effects of patients, 1 other for hospital stores, 1 sous officer in charge of the punishments, 1 superintendent of the wash-house. VI. *Workmen.* 6 tailors, 6 shoemakers, 3 millers, 3 carpenters, 3 locksmiths, 3 wheelwrights, 3 blacksmiths, 3 saddlers, 3 farriers. VII. *Train.* 3 sous-officers, first class, 3 of second class, 54 soldiers. In all, 22 officers, 285 sous-officers and soldiers, besides 27 conveyances, 108 draft-horses, and 6 led horses. Like the moveable divisional hospital, the present establishment forms a unit in itself. It is under the command of a military officer, although, it is added, Russia will probably soon follow the example of Prussia and Italy in abolishing this anomaly and giving the medical officers all power over it.

Permanent Sedentary Hospitals.—Preparatory to a war the minister determines what hospitals shall be at the disposal of the chief medical officer of the army, and circumstances are held to decide not only the number of those to be selected, but also how far the several establishments, civil and military, shall be so utilised, with reference to the field of military operations.

In reviewing the ambulance establishments of the Russian army, its personnel is found not only to be more complete than the French, but even than the Prussian. The two moveable divisional lazarets in the Russian service, together with the four temporary hospitals which are connected with corps d'armée, comprise in all 58 medical officers, 8 officers, 2094 soldiers, to whom are to be added 200 labourers, making a total of 2360. There are also 150 conveyances of 4 horses, 16 of 2, or in all 166 conveyances and 660 horses. The extent of those establishments strikes us as wondrous, and yet the requirements of modern war render it necessary.

During an action the principal medical officer details a sufficient number of regimental medical officers for the mobile field hospitals. The carriages belonging to regiments and to the field hospitals unite in conveying wounded to the latter, and both sets of orderlies are similarly occupied. Further in rear of the army are the temporary hospitals, their number alone depending upon the requirements of the sick, as already observed. They are usually established in towns and villages, and vary in size according to circumstances, from those capable of accommodating 200 sick to those capable of receiving 650. In times of peace they form part of the establishments attached to the permanent hospitals, the latter being capable of receiving according to their class, numbers varying from 200 to 1200 patients.

Austria.

The medical service of the army is administered by a director-general of the rank of major-general, he being assisted by a council formed by professors in the school of military medicine. To each army corps there is a principal medical officer, whose duty is to superintend the professional details of the command, and to give professional attendance to the general. In battle he is expected to superintend the attendance upon and disposal of the wounded, but not himself to undertake manual duties in reference to them. The tactical unit being the brigade, the senior of the regimental surgeons in each takes the office of principal medical officer. If during battle the brigade acts independently he makes his own arrangements; if as part of the corps d'armée, he acts under the orders of the medical officer in charge of the whole. There are two sets of medical officers, namely, those unattached to regiments and those attached. The former are appointed to do duty in groups (compagnies de santé) in ambulances of corps and in war hospitals; the latter during battle collect in rear of the line of combat, one half at a point sufficiently near to afford first help, while the others, at a still greater distance, are in a position to yield their aid, as in the second line of assistance. Further in the rear are the regular ambulances of the corps, and behind those the war hospitals.

The detachment sanitaire (*Sanitats detachment*) is thus formed. In each company in the infantry a corporal and four men, as a minimum number, are trained during peace to be useful during war as brancardiers, carriers of the field companions, and so on, such as are most proficient being attached to military hospitals during peace. On service, but while a battle is not imminent, these men continue in the ranks, marching at the rear of their respective companies, but wear upon the arm a distinctive brassard. They are only armed with swords; they carry dressings and a water-bottle. On the eve of a battle each company, on the order of the brigadier-general, furnishes two of these trained men and each battalion a corporal; all are placed under the command of an officer selected for the purpose, and the united body form the "Sanitats detachment." During battle one set of the men are appointed as brancardiers for the removal of wounded from the field, another as carriers of bandages, &c., and when the necessity for their employment as such has ceased, they return to their ranks; the detachment is dissolved, to be reconstituted when required.

The brancardiers while searching for wounded proceed in bodies of three; two carry the brancard and its accessories, the third wire splints and other temporary appliances. They remove the severely wounded to the rear or to a place of shelter, and indicate to the more slightly injured the direction to take to the place of succour. Those who carry the dressings accompany the medical officers, their own knapsacks being placed in the regimental light carts. On the line of march their duty is to give assistance to weakly men and to the sick.

The organization of the Compagnies de Santé (Sanitats Truppe) appears to be somewhat similar to our Army Hospital Corps. During peace there are ten such companies united into a distinct corps under the command of an officer and charge of a medical officer; the duties of the latter being to instruct them and to see that the equipment, professional and otherwise, in their charge is properly kept. Men belonging to these companies are distributed among the larger military hospitals. During war the strength is increased, and a depôt is formed. The following represents the numbers for a corps d'armée:

Rank and functions.	Compagnie de Santé.		Depôt in war.
	In peace.	In war.	
Captain	1	1	1
Lieutenant	1	1	1
Sub-lieutenant	1	2	2
Surgeon	1	1	—
Sergeants-major	2	2	2
Conductors	4	5	4
Corporals	6	10	8
Chiefs of patrol	10	20	16
Soldiers	60	150	100
Trumpeters	1	2	1
Carpenters	—	5	1
Shoemakers	—	2	—
Officers' orderlies	4	5	4
Total	91	206	140

The purpose of the depôt is to supply the active companies with trained men during war. On active service each company with an army corps is divided into ten squads, five of which are attached to the five brigades constituting the corps, the remaining half, each consisting of a corporal, two chiefs of patrol, fifteen soldiers, and four carriages of two horses each, remain at the place of first assistance appointed for the brigade to which they are attached, the carriages being for the transport of the wounded. To each company eight cavalry soldiers are attached during war, their duties being to act as orderlies and communicate necessary information. The entire number of carriages to each amounts to twenty in peace and twenty-six in war, besides others belonging to the train; each waggon for wounded is capable of carrying two lying down, and four sitting up; it is drawn by two horses. The five waggons of four horses are each capable of carrying, upon *matrass* brancards, two wounded men, besides three sitting, or twelve sitting. The former are intended for the conveyance of men from the first to the second line of aid, the latter thence to the ambulance. There are besides four waggons of four horses for the transport of material, baggage of officers, registers, pay chest of the company; one covered carriage of four horses, five heavy waggons of two horses for baggage, and one field forge, in all thirty-six carriages per corps, besides the forge. On the march the compagnies are charged with the conveyance of sick or weakly men to the hospitals, or with their regiments, as the case may be. The men are, in fact, brancardiers and infirmiers. In the cavalry and artillery, there being no brancardiers attached to either, the removal of the wounded rests altogether with the compagnies de santé, the men and officers of which cannot be employed upon any other duty than that specially appertaining to them.

Besides the depôt company just alluded to for the supply of

personnel, there is for each corps d'armée a reserve for material, namely, the reserve sanitaire du corps (corps-sanitats-reserve). It is placed under the chief surgeon of the corps, and is intended to furnish medicines, instruments, and surgical appliances for the use of the first and second lines of help. This reserve, under the charge of an assistant-surgeon and apothecary, with four soldiers, has two waggons of four horses each for the conveyance of the stores. It follows the compagnies de santé on the march, and during battle remains near the place of help for the wounded.

The ambulance of the corps, having its independent organization, is intermediate between the places of dressing and the hospitals in the rear. Each such ambulance is intended to temporarily accommodate 150 patients, and to afford passing help and nourishment to 600 en route. Each corps has its ambulance, which follows it at a great distance, say fifteen or twenty miles, but remains in communication, so as to approach or fall back, according to circumstances. The following is the personnel of each ambulance, namely—

Administrative.—1 captain, 2 sergeant-majors, 1 sergeant, 2 corporas, 36 infirmiers.

Medical.—1 regimental medical officer, 2 superior and 2 inferior surgeons, and 2 aides hospitallers.

Guard.—1 corporal, 12 soldiers.

Servants.—6 orderlies for medical officers.

In addition to professional attendance it is charged with the transport of wounded, not only from the place of first help to its own position, but thence to the fixed hospitals in rear, for which purpose its personnel and carriages are as under, namely—

Personnel.—1 sergeant-major, 1 sergeant, 2 corporals, 37 soldiers, 1 farrier, 1 saddler.

Carriages.—10 of four horses each, and 4 covered; these being intended for the transport of wounded; and in addition, two conveyances provided by the train sanitaire.

The escadron du train sanitaire comprises two groups of personnel, namely, that employed with the conveyances in the field of battle, and those connected with the equipages in rear of it. It has no special carriages for the conveyance of wounded; those employed are alike suited for material of the squadron and for wounded. The following represents the composition of the escadron, viz.:

Designation.	Personnel, materiel, and horses.			
	Corps de santé.	Reserve.	Ambulance.	Total.
Officer, subaltern	1	...	...	1
Sergeants-major	1	...	1	2
Sergeants	1	...	1	2
Corporals	4	...	2	6
Soldiers	59	4	37	100
Veterinaire	1	...	...	1
Blacksmith	1	...	1	2
Saddlers	1	...	1	2
Officer's orderly	1	...	...	1
Saddle horses	11	...	5	16
Draft horses	96	8	60	164
Reserve horses	5	...	3	8
Waggons of four horses	1	2	14	17
„ two „	5	...	1	6
Cart (*chariot*)	...	...	1	1
Field forge	1	...	...	1

Thus we have (*a*) personnel medical distributed among regiments, and in ambulances; *b*, brancardiers, forming chiefly the detachment sanitaire, and infirmiers the compagne de santé; and (*c*) the rolling stock.

Agreeably to the organization of 1870, the direction of the whole is placed under the principal surgeon, the arrangement for the field being divided into two groups, namely, those for the first line, and those connected with the hospitals. The former are appointed per division, and are arranged so as to constitute, during battle, two places of first assistance, one of dressing, one ambulance, and a reserve, the base of the whole being the military base of the division. The principal medical officer has been accorded the power to take under his control civil medical men who appear on the field under the auspices of the red cross. The duties of the intendance are, moreover, limited to carrying out the requirements of the principal medical officers of corps and divisions. The compagnie de santé is modified in its organisation. A special detachment of infirmiers is attached to each division, and consists of 2 officiers, 1 surgeon-major, 2 surgeons of reserve, 1 sergeant-major comptable, 4 sergeants, 6 corporals, 10 exempts, 68 soldats de santé (infirmiers), 1 soldier of engineers, 5 orderlies for officers; total, 100 men. The rolling stock is composed of 5 covered waggons, 5 carts, and 11 carriages for transport of wounded. The 68 soldiers are divided into four groups; 15 proceed to each of the two places of first help, 30 to the place of dressing, and 8 to the ambulance. The train des équipages furnishes the compagnie de santé as may be required, and 4 cavalry men are attached as estafettes.

So long as a battle is not imminent, regimental medical officers remain with their battalions, &c.; when an action is expected, all quit them to repair to a place determined upon and ordered by the

general in command. There are usually two such places determined per division, and should an action take place these are the points where first help will be available for the wounded. Each regimental medical officer proceeding to the divisional rendezvous, is attended by two orderlies carrying dressings; the section de santé of the division sends fifteen infirmiers-brancardiers with a cavalry estafette, and four carriages of two horses for the transport of the wounded. The senior on the spot assumes the direction. It is the duty of the brancardiers to bring from the point to that spot all wounded who are unable to walk, returning under fire as quickly as possible, after having deposited each successive one, *and without respect* to nationality. If the distance becomes considerable, the brancardiers are formed into two groups, one to bring the wounded half way, the other to carry them to the place of assistance. Such medical officers as may be required to do so repair to the place of dressing, the carriages being always retained in readiness at the former, but with the poles turned to the rear, for the conveyance of the wounded to the latter. If the battle be successful both places of help are moved gradually forwards; if, on the contrary, it is unfortunate, it may be necessary to abandon wounded, surgeons, and attendants to the victors; the protecting ambulance flag being in such cases left flying.

The Place de Pansement (*Verhand-Platz*) is the centre for aid for all the wounded of the division; and, unless in exceptional cases only, one is established, and is as near the centre of the line as practicable, and at a distance in rear of three to five thousand paces, so as to be out of fire. It is established in such buildings as may be available, or at a farm, care being taken that abundance of water, beds, mattresses, straw and hay, are readily to be obtained, so that the more severely wounded may be suitably provided for until such time as they can be transferred to the ambulances. The position of the place de pansement is indicated beforehand by the chief of the staff. In the absence of such an arrangement, the medical officer, and the officer in command of the sanitary detachment, select a position and indicate it by a distinctive flag by day, a coloured lantern by night. The direction at the spot rests with the principal medical officer of the division, whose time and attention are not to be occupied by the performance of manual professional duty. The medical officers are apportioned by him as required, every separate group being under the direction of him who is the senior. A medical officer selected by the divisional p. m. o., to whom he acts as a kind of aide-de-camp, is charged with the direction and appointment of orderlies to the medical officers, the superintendence of convoys of wounded, the placement of wounded in the carriages for them, and as to the disposal of field panniers, instruments, appliances, &c.

The officer in command of the compagnie de santé directs all

matters of a non-medical nature; aided by sous officers he preserves general good order and conducts the removal of the wounded, their transport to the ambulance, and thence to the war hospitals. The officer of the train des equipages is always subordinate to him who commands the infirmieres, even when the former is senior in rank. His duty is to see to the services connected with the transport, supplies, forage, &c., between the place de secours and the place de pansement; in other words, between the first and second lines of assistance.

The medical personnel of the place de pansement consists of the divisional chief surgeon and the medical officers of regiments, all of whom repair thither, with the exception of three or four who are left at the place de secours in rear of the division; thus the services at both are performed altogether by the surgeons of regiments engaged. The inferior personnel comprises the bearers of a field companion attending each regimental medical officer, and thirty soldiers of the compagnie de santé.

At the place de pansement it is only intended that such urgent operations shall be performed as do not admit of further delay; thus the performance of resections is absolutely interdicted. Restoratives and comforts should, however, be given as may be required, and such as are so severely injured as not to be capable of removal attended to as far as may be practicable. All those who are capable of removal should, as soon as they are properly examined and attended to, be transported to the ambulances and hospitals in rear, the convoys being accompanied by soldats de santé in the proportion of one to fifty patients (a number that seems far too small considering the amount of attendance that is necessary).

If the army advances the place de pansement takes that of the place de secours. If it retreats the wounded and material are removed with the greatest rapidity practicable; or if the wounded, surgeons, and attendants, must be abandoned to the enemy, the Convention of Geneva makes full provision for the contingency. After a battle patrols of soldats de santé and brancardiers, accompanied by medical officers, traverse the field; they remove the wounded of both armies, and having done so, bury the dead. When the offices at the place de pansement have been completed, such of the medical officers as do not happen to be needed with the ambulance rejoin their several regiments. The materiel de santé de reserve remains during battle in the vicinity of the place de pansement, in view to supplying such articles as may be necessary for the treatment of the wounded.

The *ambulance divisionaire* (*Division Sanitats Ambulance*) is intermediate between the place de pansement and the war hospitals. According to the organization of 1864 there existed only one ambulance per corps d'armée, it being capable of receiving 150

wounded and giving temporary aid to 600 en route to the establishments further in rear. This ambulance constitutes an independent establishment under the charge of the chief medical officer of the corps d'armée, and does not furnish the ambulances for brigade use. It is also independent of the compagnie de santé. The divisional ambulance, on the contrary, is only a portion of the sanitary service of the division, unified and under the command of the divisional surgeon, and capable of receiving 50 cases of severe wounds, and temporarily relieving 200 in addition. Its special functions are to transport the wounded to the second line and to the stations d'évacuation, partly by means of hired or requisitioned conveyances, partly in its own carriages, and to take charge of such patients as may not be in a fit state to be removed. So long as the ambulance is united to the other part of the sanitary service of the division the command remains with the officer in command of the compagnie de santé; when it is separated the command passes to the officer commanding the detachment, who is himself responsible to the chief surgeon of the division. The articles of food required by the wounded are obtained from the magasins des vivres. In friendly countries they are purchased; in hostile districts they are obtained by requisition.

During the march the ambulance remains with the conveyances for the wounded and the carriages belonging to the place de pansement. In bivouac and in cantonments it is united to the sanitary services of divisions. If, when the division becomes engaged, there should happen to be a railway station at a short distance in its rear the ambulance should there establish itself. The ambulance should be 3000 paces in the rear of the place de pansement; it being itself intended to serve as a second place of that nature, where, sheltered from missiles, urgent operations may be performed. It should not, however, become a hospital, but the wounded should as soon as attended to be evacuated to those in the rear, where alone all such operations as are not of immediate urgency should be performed. Like all other establishments of the first line, it should be mobile, and capable of taking up, from time to time, such positions as may be demanded by the vicissitudes of battle. If the army advances it moves on to what was the place de pansement; if it retires it evacuates the wounded and so much of its material as may be possible. If there are in it wounded who cannot be removed on account of the severity of their wounds, they must be left with a sufficient establishment to take charge of them, including surgeons, attendants, stores, food, &c., an arrangement only practicable among civilised nations.

The reserve of matériel undergoes the same changes as the ambulance, but inasmuch as it pertains to a particular division and not to the corps d'armée, its changes are less frequent. It only

consists of two conveyances with a soldier in charge; it is his duty to issue stores as required by the surgeon of the division, under whose orders he is.

The second line or war hospitals.—These receive temporarily the sick and wounded, whom they evacuate as fast as possible to the fixed hospitals in the rear. They have their own independent organization, including personnel, matériel, and means of transport. Their personnel, however, is not drawn from the army, but from hospitals in the interior, on the requisition of the minister for war. Their number and importance vary according to the requirements of was; there are usually two or three of them per corps d'armée, but they do not follow its movements, remaining, as a rule, at a distance of three or four leagues in rear, and so placed as to maintain communication between the army and the frontier. While the army is on Austrian soil its special hospitals should be used as little as possible, the sick and wounded belonging to it being dispatched to the permanent hospitals of the country, with the exception of those who are too ill for transfer, or so slightly indisposed as to be likely to rejoin the ranks after short treatment. When the army advances the untransportable are either left in a civil hospital, or, in the absence of one, a sufficient establishment for their proper care is detached. When a battle is imminent they are directed to their several positions, either by orders from the general in command or by the principal medical officer. If the army should be forced to retreat, the hospitals not in active use should retire behind the nearest lines of defence and there prepare to receive the wounded; the other hospitals should carry with them so many of the wounded as can be transported, leaving such as are not together with the staff necessary for them.

The direction of the hospitals, like that of the others rested with the intendance, represented by a commission composed of a general or colonel, a commissary and a surgeon-major, the latter aided by a regimental surgeon who took his place when he was on other duty. The organization of 1870, however, suppressed this commission and delegated their direction to the principal medical officer in communication with, and subordinate to, the intendence, but with the responsibility over hospitals of the second line as well as the others. He was moreover charged with the distribution among them of resources placed at his disposal by societies of aid and to concert with the representatives of such societies. He is to communicate with the director of railways and with the intendant in regard to conveyance and other arrangements for wounded about to be evacuated. In fact, however, although the responsibility is upon the medical officer, the control and direction remains with the intendance. The following is the personnel of a hospital of the second line, namely:—

Administrative.

1 Captain.
3 Subaltern officers.
1 Comptable.
2 Adjutants.
1 Sergeant-Major.
4 Sergeants.
7 Corporals.
40 Infirmiers of the first class.
60 Infirmiers of the second class.
1 Armourer.

Religious.

1 Almoner.

Medical.

1 Regimental surgeon in charge.
3 Regimental medical officer in charge of wards.
3 Medical superior officers.
9 Aides hospitallers.

Servants.

13. Orderlies or medical officers.

An arrangement has been made whereby a hospital of the second line may consist of 600 beds, and be capable of sub-division into three of 200 each, with a superior medical officer at its head. The materiel for 500 beds is divided among fifteen waggons; that of 600 beds, divisible as stated, is carried in twenty-one waggons, or seven for each. Of these seven waggons, the first contains the instruments and surgical apparatus, dressings, &c.; the second the cooking utensils; the third the hospital utensils; the four others the bedding.

Les stations des malades.—Arrangements are made at points along lines of railways, and of navigable rivers, for the reception, temporarily, of sick whose state is such as to render rest necessary. In time of war similar arrangements are made in the country in which the army may be operating, the necessary arrangements being, in both cases, made by the intendance under the orders of the general in command.

The establishments of the third line comprise (*a*) the depôt of sanitary materiel; (*b*) the temporary hospitals; (*c*) the hospitals established by societies of aid; (*d*) the fixed hospitals in garrison, and the regimental hospitals. All military hospitals within range of the theatre of war are utilised for the service of the army.

Spain.

By Royal Decree dated 1862 the hierarchy of the corps de santé comprises the following ranks, namely—

Director-General . . .	ranking with	Major-General.
Inspector	„ „	Brigadier.
Sous-Inspectors, 1st class .	„ „	Colonel.
„ „ 2nd class .	„ „	Lieut.-Colonel.
Medicins Majors . . .	„ „	Commandant.
Assistant-Surgeons, 1st class .	„ „	Captain.
„ „ 2nd class .	„ „	Lieutenant.

The candidates for appointments have no rank.

The cadre of medical officers is increased or decreased according to the requirements of the army. To meet the necessities of sudden increase, auxiliaries and volunteers give their services, agreeably to prearrangement, to stationary depôts, garrisons, and to conscripts on their way to join their regiments. The director-general enjoys the same rights and privileges as do the directors general of military establishments. He directs in all that concerns the professional details of the army, after taking the views of the superior medical council. He is specially charged with the initiation of measures for the preservation of health of the troops, he submitting his propositions on this subject to government. The inspectors form the superior council, the director-general being president; they perform inspections at such times as they are ordered by him to do so. The sous inspectors are the chefs superieurs of the medical services in their several districts. They communicate directly with the captain-general in regard to all that concerns their service. They direct their own department in their district, and are responsible for its efficient working. They may provisionally suspend their subordinates in cases of dereliction of duty, reporting having done so to their captain-general and director-general. They inspect the hospitals in their several districts, and preside at invaliding boards.

Surgeon-majors are attached to hospitals, the senior for the time being in charge, and all the other medical officers connected with the establishment are under his orders. He has charge of all hygienic arrangements, as clothing, food, and treatment of the sick. He demands from the chef administratif whatever he deems to be required for the good of the sick, and in the event of the latter declining to comply, he reports the circumstance to the principal medical officer of the district. Assistant-surgeons perform the service with regiments; those of the first class in the special army and military schools; those of the second class in the infantry and cavalry. The apothecaries' service is distinct by itself.

Admission to the medical department takes place by public competition, candidates being doctors of or licensed to practise medicine, and under thirty years of age. Promotion beyond the grade of second class assistant-surgeon to that of sous inspector of the second class is given, two parts by seniority, and one by selection; beyond that rank altogether by selection. Literary or scientific merit, and special services performed, constitute claims for promotion by selection; but in order that an officer may be thus advanced, his name must be in the upper third or half of those in his grade, according to the rank from and to which he is about to be promoted, except in time of war; then eminent services are rewarded by advancement, irrespective of position on the list, provided that a medical officer has served three years in his grade. Eminent services in hospital, or the fact of their having been attacked by typhus fever in the performance of their duties are considered equivalent to distinguished service in the field with regard to promotion and retirement. The uniform of medical officers is different from that of the other corps of the army; it is handsome, and at the same time distinctive in regard to the several ranks.

The organization of the medical service, so remarkable in itself, has further been rendered complete by the institution of compagnies sanitaires for service as attendants, &c., in hospitals, and to serve as a cadre of compagnies de secours, necessary in times of war, and to follow the army. Each such company includes a captain and lieutenant, charged with their military instruction and discipline; an assistant-surgeon charged with their professional instruction, and of men of first and second class, the former being non-commissioned officers, the latter orderlies. The chef of each company is the sous inspector of the district, and respectively the senior medical officer of the station. The sanitary companies consist of men who continue their service entirely in them. They are held to be applicable, not only to Spain itself, but also to the forces serving in the Philippines and in Cuba.

Portugal.

The staff of the sanitary service consists of a surgeon-in-chief of the army, with the rank of colonel, two surgeons of divisions with that of lieutenant-colonels, and six brigadier-surgeons as majors. The surgeons-major rank with captains, the surgeons with lieutenants; these two grades are only with regiments and establishments, their numbers depending upon the needs of the service. The sanitary company (army hospital corps) consists of a captain, lieutenant, sub-lieutenant, and sixty privates, with their proportion of seven commissioned officers. The direction of the medical corps and sanitary service consists of two departments, one attached to the

war office, one to the commander-in-chief: the surgeon-in-chief directs the former, he being assisted by two staff-surgeons.

In time of war the division surgeons will be the sanitary officers of their several divisions, the brigade surgeons fulfilling similar duties; in times of peace both of them reside near head-quarters or at the seat of the united regimental hospitals. Surgeons who, owing to their state of health or age, are unable to serve in regiments are appointed to fortresses, the military arsenal, invalid hospital, and military college. The men of the health company are under the orders of the surgeon-in-chief; those in hospitals receive their orders from the directors of those establishments, the captain and subalterns who are selected from the inferior officers of the army having charge of discipline. The soldiers of this company are selected from among men employed in regimental hospitals, men wounded or otherwise disabled from active military service, but fit for duty in hospital, and civilians who wish to serve. They engage for eight years, at the end of which period they may re-engage for four more. They have the same privileges as and rank with the company of engineers, but will be liable for repeated offences to be sent to the ranks of the army.

The sanitary consulting committee of the army meets at Lisbon. It consists of the surgeon of the first military division, the director of the military hospital there, and the senior staff-surgeon of the troops in garrison. It attends only to work ordered by the minister of war, or to such as the surgeon-in-chief submits to it.

Promotion for all military surgeons will be usually by seniority, although scientific merit or extraordinary services will give individuals an additional claim. The surgeon-in-chief will recommend to government those who have rendered themselves worthy of honorary distinctions.

Hospitals in times of peace are permanent and regimental; in times of war, permanent and temporary. The direction of the two permanent hospitals at Lisbon and Oporto is entrusted to brigade surgeons. In each permanent military hospital the board of direction will consist of the director and two staff-surgeons. It will be entrusted with the funds, which will be received into a chest with three keys, one for each member of the board. The regimental hospitals of Elvas and Chanes, and other united regimental hospitals, will have a staff of employés from the health company, composed of clerks, buyers (stewards), keepers, nurses, cooks, and servants. In times of war temporary hospitals will be established at convenient stations, for the prompt and easy reception of sick or wounded from corps in operation. Their organization will be the same as that of the permanent hospitals. When a detachment is stationed at a place where no military hospital exists and where a regimental hospital cannot be opened, the surgeons in communica-

tion with the officer commanding will establish an infirmary, using the ambulance linen and clothing, and sending the severe cases of illness to the nearest civil hospital.

The ambulance of each infantry corps, both in peace and in war, consists of two ambulance carts according to pattern, 6 large stretchers, which can be taken to pieces, 2 small hand stretchers, and 30 beds complete.

Italy.

The medical service of the army of Italy has undergone the process of reorganization several times since 1850. In that year the separate classes of physicians and surgeons were fused in one; in 1856 modifications were made in the designation and relative ranks of the several grades and in regard to the admission of candidates; in 1861 a principal medical officer was appointed to each military district or for each corps d'armée, and in 1867 further changes took place. In accordance with the orders published in that year the following was the hierarchy of the department, namely—

1	President of Council . . .	ranks with	Major-General.
4	Inspectors	„ „	Colonel.
6	Medicins en chef . . .	„ „	Lieut.-Colonel.
28	Division Surgeons . . .	„ „	Major.
200	Regimental Surgeons 1st and 2nd class	„ „	Captain.
350	Battalion Surgeons, 1st and 2nd class	„ „	Lieutenant.

The pay of each of these grades, except the President and Inspectors, undergoes an increase after each period of five years in the several ranks. Promotion from one class to another in the same rank takes place by seniority; that of battalion surgeon to regimental surgeon; that of regimental surgeon to medicin directeur after examination; that from medicin directeur to medicin-en-chef of a department by selection purely. In the examinations for promotion that take place the three seniors in the rank below compete, and if after two such examinations an officer is found ineligible, he forfeits all further advancement.

The "sanitary corps" consists of (*a*) medical officers, and (*b*) compagnies de santé. The comité de santé is entirely consultative in its nature, in reference to questions bearing upon the health of the army, and its duties are to study all such matters and bring them to the notice of the minister for war. It consists of a president, the major-general medicin, and four colonels medicins, an apothecary, and a secretary.

The compagnies de santé are instituted with a view to provide for

the services of the military hospitals and ambulances in time of war. Their number is equal to that of the divisional hospitals, their numerical strength in proportion to the needs of those hospitals; they are commanded by the officers pertaining to those hospitals under the orders of their several principal medical officers.

The corps of comptables are charged with the duties of supply, subsistence, and accounts, not only in regiments but in hospitals. The ranks of this corps are supplied exclusively from those of officers and sous officers of the army.

In times of peace the medecins en chefs are attached to the principal military hospitals of their departments, in times of war to their corps d'armée, in connection with which they assume the superior direction of medical affairs. The medicins directeurs are the medical chiefs in the divisional hospitals beyond the departments, and take charge of divisions of corps d'armée. The surgeons of regiments and of battalions are employed without distinction in hospitals, ambulances, or regiments.

Apothecaries form a separate body. Up to a recent date the organization of this department was altogether according to the French model. The medical officers were in all things subordinate to the intendance. On service hospitals were directed by captains of the corps d'administration, in towns by an officer of even lower rank. The senior medical officers had no direct authority, professional or otherwise, upon their juniors, nor could they correspond with them except through the intendance, nor could they by right offer any comment to the intendance even should they find the patients insufficiently attended to. Before an expected battle they requested the intendance to order such surgeons as might be necessary to particular ambulances, and in concert with it made arrangements for the removal of the wounded and for attendance upon them. The organization comprises ambulances, temporary hospitals, and fixed hospitals.

Ambulances.—These are only divisional ambulances. Each comprises 7 medical officers, viz. 1 surgeon of division, 2 regimental surgeons, 4 battalion surgeons, 1 apothecary, 1 sous officer, 1 quarter-master, 1 serjeant, 1 corporal, 1 soldier to take charge of the patients who have been bled, 1 assistant apothecary, and 20 infirmiers; total 34 persons. The divisional ambulance for cavalry only include 13 persons, of whom 3 are surgeons.

Temporary hospitals are of three orders. The first contains 100 to 200 patients, the second 200 to 300, and the third 300 to 500. The personnel for a hospital of 100 patients is 1 surgeon-major, 5 assistant surgeons, 1 apothecary, 1 surgery man, 1 officer as director, 1 sous officer, 1 sergeant, 2 corporals, 2 soldiers for patients who have been bled, 17 infirmiers, in all 32 persons, to whom is

to be added an aumonier. These hospitals had a council of administration composed of the director as president, the officer of administration, and the senior medical officer as members.

On service there is at general head quarters a reserve of 10 surgeons and 16 infirmiers. The divisional ambulances are capable of being divided into sections for active work, and as reserve. The active section admits of being again divided into the light ambulance and its depôt, each section having two medical officers. It is not necessary to enter into more details in regard to the former condition of this service, as the events of 1870-71 on the continent have led to the introduction of important alterations in its entire constitution and mode of working.

By a decree dated 17th November, 1872, the powers and responsibilities of medical officers have been materially extended, and at the same time placed more upon a footing in accordance with the important duties required of them than they had previously been. In issuing the decree in question, the king, Victor Emanuel, followed the example shown by Germany, the government of Berlin having only shortly before instituted improvements the urgent necessity for which had become apparent in the great campaign of 1870-71.

According to the orders in question, the duties of director of each divisional military hospital will be performed by the principal surgeon of the hospital previously charged merely with the departmental details. To enable him to superintend the administration, he is invested with the authority of an officer in command of a regiment, in all that pertains to personnel and materiel of the establishment. The council of administration of the hospital will include the principal surgeon as president, the two medical officers next in seniority, and the purveyor (comptable) as members, the latter acting moreover as secretary. Regimental surgeons performing duty in the hospital become members of this committee according to their dates of seniority; and it is further added—all previous regulations contrary to the present decree are abrogated. The principal medical officer in each division is moreover charged with the supreme direction of all within such division, even to the financial concerns. In each hospital its separate accounts are kept, as also a pay chest, the latter provided with three keys, one to be retained by the senior medical officer, a second by a member of the committee, and the third by the secretary, who must also be treasurer. In other respects no change takes place in regard to the routine of performing duty and furnishing reports and returns.

Italy, struck, it is said, by the picture of the results of imperfect organization portrayed by the writer of the "Battle of Dorking," resolved to lose no time to improve that of her army in all its branches; accordingly, observing the successful working of the medi-

cal service in that of Prussia, has hastened to adopt that model with its very latest improvements.

In accordance with the provisions of the latest orders on the subject, the officers of the corps de santé militaire have actual rank, together with its rights and obligations, as in the case of "combattant" officers. Their duties, however, are generally departmental under all circumstances. In the hierarchy of the army the several grades of medical officers are enumerated thus: viz. major-general-medicin, colonel-medicin, lieutenant-colonel-medicin, major-medicin, capitaine-medicin, lieutenant-medicin, and sous lieutenant-medicin.

Switzerland.

The army of the Swiss Confederation, like the militia of England, is in ordinary times not actually embodied, although ready at all times to be so, together with all appliances and auxiliary services connected with it. Each canton furnishes its quota of troops, equipment, stores, transport, and ambulance establishment; officers of cantonal troops are also furnished by the canton, those of the staff being selected from among the whole, and employed under the commander-in-chief of the army. During peace the sick of the militia are treated in the civil hospital of their canton, and it is the happy privilege of the government to need no further military arrangements than such as are required for defence. For the latter purpose the medical arrangements of the army exist upon a very efficient footing.

When war breaks out, when battles cease, and the field is strewn with wounded, then it becomes indispensable to have in the vicinity establishments to which to transport the wounded, where they may receive every care, have necessary operations performed, and be treated until such time as it becomes possible to send them to the hospitals. Such is the object of ambulances or removable hospitals.

The personnel of the service de santé of the army is composed as follows, viz.:

1. The surgeon-in-chief with the rank of federal-colonel, that is, major-general, is charged with the superior direction and surveillance of the service de santé, its personnel and materiel.

2. The surgeons of divisions, with the rank of lieutenant-colonel or major, are charged with the superintendence of the service in their several divisions.

3. For the service of ambulances and hospitals, the surgeons of ambulances with the rank of captain-lieutenant and sub-lieutenant, the commissaries of ambulance, and the infirmiers.

4. For regimental service, the regimental medical officers, namely, one battalion surgeon with the rank of captain, one assistant-surgeon

field hospitals should be in sufficiently near proximity to be able, on the orders of the principal surgeon of the division being issued, to follow the division should it continue its advance, for the purpose of collecting and properly attending to such wounded as may in the hurry be overlooked or left at the places of first assistance by the ambulances which have to follow the movements of their respective brigades. If, at the time, the field hospitals should happen to be full of sick, these must be evacuated to other establishments with the least practicable delay, so that they may themselves follow the divisions to which they appertain. If this cannot be done entirely, at least one of their sections must follow.

4. *Evacuations and Reserve Hospitals.*

One of the most important functions of a good service de santé is the well-regulated organization of a service for evacuating the wounded as quickly as possible. The train sanitaire is an institution at least as indispensable as the detachment sanitaire. Not only is it necessary that the wounded should, as speedily as possible, receive the first aid, but it is equally essential that they should have the benefit of quickly being admitted into hospitals where more care and attention can be bestowed upon them than is practicable near the scene of hostilities, and where the evils of overcrowding must be carefully guarded against.

Instructed by the experience of the last great war, where the Germans obtained so great advantage from the plan they adopted of scattering the sick and wounded, it has been purposed in reference to Switzerland that the railway companies should be directed to construct their carriages of the third class with reference to the eventuality of their being required for the transport of sick or wounded, and that they be informed that in case of need the existing carriages might be required for the same purpose.

All the persons employed in the execution of the service de santé, including medical officers, commissaires, apothecaries, infirmiers, and brancardiers, constitute a special corps the command and direction of which are vested in the chief of that service. He distributes the personnel among regiments and sanitary establishments; he directs and superintends the instruction, professional and military, of the surgeons, controls the instruction of the troupe sanitaire, and proposes to the federal council the names of candidates for promotion. Subordinate to him is a staff composed of a chief of the staff, a chief of the hospital service, a chief of that of evacuations, of a delegate from voluntary aid societies, an apothecary, and lastly, adjutants and secretaries as may be required. Under his orders the divisional medical officers do duty. Each of them is entitled to the services of an adjutant and a secretary; also the surgeons in charge of brigades or directors of sanitary establishments.

The troupe sanitaire has its own mode of recruitment. The infirmiers are selected from among the more intelligent of the brancardiers. They are each provided with a water-bottle and six bandages. Medical men in possession of diplomas enter the army with the position of officers. They carry swords, and on service wear a tunic similar to the blouse worn in the Austro-Hungarian army. Each is provided, in addition to his pocket case, with a saddle bag containing articles for immediate use. They are all mounted while on service. There are no sanitary conveyances attached to the corps. To each medical officer there is attached an orderly (porte sac) charged with the carriage of needful apparatus and medicines. Each battalion will be provided with eight brancards.

On the subject of voluntary help the conference observes that the societies of aid are necessary in order to assist the official service de santé in that portion of its duty which consists in observing and preserving the troops in good sanitary condition, and still more, to help them in the exercise of their service properly so called. The latter object is obtained (*a*) by obtaining for the ambulances the use of hospitals and asylums, and necessary material; (*b*) in forming corps of evacuation, including transport and stations; (*c*) in making hospitals of their own, and in supplying administration and medical service in the military hospitals; (*d*) in facilitating the discharge of convalescents and invalids. It is added, however, that this association of duties need only be accepted on condition that the understanding is complete between the volunteer and the military medical element, and that the former shall be subordinate to the latter. Early in 1872 the chief of the service de santé submitted the following points to the military medical officers: each of whom was requested to give his opinion in regard to it, namely,

1. What modifications should be introduced among our ambulances, so that they may fulfil the duties of the detachment sanitaire during battle, and also those of field hospitals? or should the two functions be fulfilled by distinct and separate corps?

2. Is the present instruction of the sanitary personnel sufficient? Is it necessary that the surgeons should undergo a course of special sanitary training prior to their being appointed to the army?

3. Should the present case of instruments of surgeons be modified? If so, how?

4. Taking into account that the haversacs of the ambulance may be replenished whenever, during battle, the reserve stores are on the ground, are the apothecaries of corps really superfluous while the troops are cantoned, whether in time of war or during peace? Are the twenty medicaments proposed sufficient as regards the corps? What new medicaments are considered necessary?

5. Are the proposed forms of reports satisfactory?

field hospitals should be in sufficiently near proximity to be able, on the orders of the principal surgeon of the division being issued, to follow the division should it continue its advance, for the purpose of collecting and properly attending to such wounded as may in the hurry be overlooked or left at the places of first assistance by the ambulances which have to follow the movements of their respective brigades. If, at the time, the field hospitals should happen to be full of sick, these must be evacuated to other establishments with the least practicable delay, so that they may themselves follow the divisions to which they appertain. If this cannot be done entirely, at least one of their sections must follow.

4. *Evacuations and Reserve Hospitals.*

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Belgium.

The service de santé in the army of Belgium comprises medical officers, apothecaries, and veterinary surgeons. The personnel of the two former consists of 1 inspector general, 4 principal surgeons, 7 garrison surgeons, 28 regimental surgeons, 29 battalion of the first class, and 38 of the second class, 20 assistant surgeons; 1 principal apothecary, 8 apothecaries of the first class, 12 of the second, and 10 of the third. On a war footing there is a regimental surgeon for the staff of each regiment of infantry or artillery, and a battalion surgeon or assistant surgeon for the staff of each regiment of engineers. The various grades of the service de santé are assimilated with military ranks, the inspector-general as major-general, medicin en chef as colonel, principal surgeons as lieutenant colonels, surgeons of regiments as captains; but after ten years' service as majors, battalion surgeons, second captains, or lieutenants, according to service, the assistant surgeons as sub-lieutenants.

To enter as assistant surgeon the candidate must be 28 years of age, have spent six years in the study of the profession, and have passed as doctor of medicine. To obtain promotion to the rank of battalion surgeon, two years in the first grade and an examination as to fitness must be passed. Exchanges are allowed to take place between the medical officers of the army and those in the navy, although these services are distinct up to the rank of medicin de regiment inclusive; beyond that grade medical officers of both services compete for further promotion.

The service de santé is administered by an inspector-general, who is immediately responsible to the minister for war, all medical offices being, as regards departmental details, placed under him. Annual inspections take place by the medicins en chef and principaux, their inspections, however, being limited to sanitary establishments, and these, when accompanied by the intendant and officer commanding on the spot. Minute instructions are published on the subject of those inspections, which are of a very searching and formal nature. He also makes an equally careful inspection of the barracks occupied by troops, with regard to the sanitary arrangements connected with them. The medical officers are subject to military as well as to hierarchical discipline among themselves, and juniors are directed on all occasions, whether on or off duty, to salute their departmental superiors. The right of placing medical officers in arrest is accorded to their departmental seniors, and medical officers sit as members of courts martial for the trial of medical officers. They report to their own superiors on matters tending to affect the sanitation of the troops. Those who are absent from their stations, whether on leave or otherwise, have to report themselves to the military and medical authorities, in

whatever garrison they may be visiting. If on leave of absence beyond fifteen days per annum, they are reduced for such time to a rate of half-pay. Accidents and disabilities met with while in the discharge of duty are held to entitle to pension as wounds received in action.

The surgeon of a regiment conducts the medical affairs of the corps, and corresponds with his chief on professional details. He keeps an etiological register, as well as one for cases of granular eyelids among the men, the necessity for the latter seeming to indicate that sanitation in barracks admits of improvement. The surgeon is responsible to the colonel of his regiment; to them he offers such suggestions as may be received to preserve health, the officer commanding being the judge as to whether they are to be adopted or not. Once a week, in presence of the military officers on duty, they inspect the men in barracks. They are to be vaccinators of all in the regiment, but before subjecting a whole corps to the process of re-vaccination the sanction of the inspector-general has to be obtained. A medical officer of one corps may, on the recommendation of the senior medical officer, be ordered by the officer commanding in garrison to do duty with another corps. Besides the regular medical reports, medical officers transmit to the inspector-general accounts of any outbreak of sickness or other extraordinary occurrence that may take place. On the occasion of troops bathing a medical officer is in attendance, provided with the apparatus for the recovery of the apparently drowned; one medical officer per regiment accompanies the troops at drills; in ordinary times, however, medical officers only accompany the troops to whom they are attached. When troops are on a march the medical officer gives sanction to such men as are incapable of fatigue to precede the corps, or be admitted into hospital. He also recommends the men who become weak on the line of march to have their arms and accoutrements carried upon the light carts accompanying them. A medical officer always remains with the light carts to give needful help to soldiers who require to be carried.

The ambulances in the army of Belgium are represented—1, by the ambulance waggons which follow the head quarters of divisions and brigades; 2, those of medicaments of corps which remain with the head quarters of regiments; and 3, the knapsacks or saddle bags of ambulances confided to the medical officers of corps. The ambulance waggon contains various articles of medical and surgical stores, arranged in their separate boxes according to lists published in official regulations, the whole being equal to 1454 dressings. The regimental medicine chests for the field are prepared according to a standard list by medical officers when their corps receive orders to march, the necessary supplies being obtained from garrison stores and from the administration. In the infantry, cavalry, and artillery,

a certain number of knapsacks (sacs) and saddle bags are allowed for containing medicines and instruments actually needed on the field. The proportion of these varies according to branches of the same. Thus, for the regiment of carabineers there are 5; for the fifteen other regiments of infantry, each have four; for the two regiments of cuirassiers, each have two pairs of saddle bags; for the other five regiments of cavalry, each 3; for the four regiments of artillery, each 2 pairs. The sacs and saddle bags are under the charge of the medical officer. They are carried on the march by the orderlies of the surgeons if in the infantry, and on the orderlies' horses if in the cavalry.

In garrisons the direction of the hospitals rests with the principal surgeon; the infirmiers are under the regimental medical officers. The regimental medical officers take their turn in attending sick in the garrison hospitals, whether of their own regiment or of others, and under the authority of the principal surgeon. Once a month the medical officers hold a conference, at which they are, by regulations, expected to be present. In matters of administration of the hospital, medical officers are not permitted to have any voice, any suggestions they have to make having to be addressed by them to the commandant or intendant. Assistant surgeons, pharmaciens of the third class, and students, have to take their turn of duty in the hospitals as orderly officers. The regulations of the service contain a very important paragraph bearing upon inducement for medical officers to work. Two medals, of the value of 100 francs, will be conferred yearly upon the medical officer, veterinary surgeon, or apothecary, who will submit the best essay upon subjects connected with their respective branches. In connection with each hospital a library of scientific works is maintained, a sum varying from 200 to 400 francs being appropriated each year, by government, to keep them supplied with works.

United States.

The principles according to which the duties of the medical department of the American army are conducted comprise unity of action and responsibility confided to its officers. The department is complete in itself. It performs its functions under the orders of the surgeon-general, who is himself subordinate to the minister for war, but independent in regard to his special functions of other authority.

Every sick or wounded soldier, from the time he is brought to hospital, is in every respect under the charge of the medical service, including not only his professional treatment, but his transport, food and discipline. In order to carry out the duties

in all other respects, the medical officer in charge of a hospital has all the rights and authority of a commanding officer.

The formation of stationary and field hospitals, of ambulances, means of transport by rail or water, in fact, all administration of these services, is remitted to the medical department, the entire responsibility in regard to them resting with the director-general. All employés attached to the different hospitals, ambulances, or to transports of the sick, and all the functionaries employed in connection therewith, are under his authority and orders.

The medical officers enjoy, in all respects, the same rights and privileges as other or "combatant officers." They wear the same uniform, the same distinctive badges of rank, receive the same honours and advantages. All of them, whether attached to regiments or hospitals, perform their duties under the superintendence and authority of the head of their department, so that the medical officers are in no way incorporated in the regiments, and only receive their orders through their own departmental chiefs.

The personnel of the department capable of being increased in time of war is, under ordinary conditions, limited to the following, namely,

1	Surgeon-General . . .	ranking as Major-General.
1	Surgeon-General . . .	„ Brigadier-General.
1	Inspector	„ „
16	Inspectors .	with the rank of Colonel and Lieut.-Colonel.
170	Sergeant-Majors	„ Major, Captain, and Lieut.
6	Storekeepers.	

The service of the pharmacy is attended to by subordinate agents (stewards), who also perform the minor operations.

On service the medical department is organized on the footing of an independent hospital and an ambulance train for each division of three brigades. Sometimes three or more divisional hospitals are united under the charge of a medical director, assisted by an inspector, quartermaster, a commissary, and an officer of the ambulance trains. The advantages of such an organization are incontestable. They were demonstrated during the war of Secession, and the only matter for wonder is the tardiness with which a similar system is being adopted in European armies.

Dr. Chenu writes thus regarding this branch of the American army:—

"The entire control and administration of hospitals was confided to the medical department, and with such good results that never before in war had the mortality among the wounded been so small, never had hospital wards been so little crowded. In hospitals and ambulances the medical officer made his demands direct upon the

quartermaster-general's department or the commissariat, according to the nature of the requirements."

When the war began the medical department was only equal to about 20,000 troops. It was organized upon the French plan. When, after the capture of Fort Sumpter, the army had to be increased, volunteers were called for, the officers were selected by the men, but being ignorant of military duty, and especially of the art of preserving the health of their men, heavy losses in battle and by sickness were the results. Immediately, however, the medical service was placed upon a better and more extended system, committees of aid were everywhere appointed, and these, subsequently organized as the United States Sanitary Commission, supplied the sick and wounded not only with medical officers and attendants, but with all necessary supplies, and even means of transport and accommodation, besides furnishing means for protecting the health of the effective, and publishing a series of instructions for the guidance of men, officers, and surgeons in regard to hygiene, surgery, and medicine. This sanitary commission placed itself in connection with, and subordinate to, the official department; its declared object being the prevention, if possible, of loss of life by disease, such as France and England had to deplore in the Crimea.

The director of the medical service had declared that the organization of his department was unequal to the new conditions.

So little experienced were the military officers at the beginning of the war in the necessity for, or requirements of, hygiene, that on questions being put to them on the subject of food-cooking, ventilation, cleanliness, &c., as these bore upon the men, they replied that "their business was to fight, not to keep a boarding-house." The attendants upon the men were rough, untrained men, from the ranks of the army; the medical men selected in haste from civil life, without knowledge of military medicine or surgery. The sanitary commission controlled these conditions, including the ignorance of both officers and surgeons. The medical department was emancipated from the commissariat, and made entirely independent under its own dictator-general; large military hospitals were established at different points; the entire direction of personnel and materiel placed under the medical officers.

No sooner had the medical department been emancipated than improvements were introduced into the mechanical as well as other means for the comfort and well-being of the wounded. Steamers were fitted up for their transport, a medical officer being in charge of all departmental details, and having an ample staff for his duties. Carriages for their suitable conveyance were proposed, and those on lines of railway fitted up; and the question is asked, why were similar arrangements not made in France during the Crimean and Italian wars?—Because of the subordinate and dependent position

held by the medical service there. Another improvement effected by the Americans was in the arrangement of tents and huts as hospitals, and the result of all these measures was that on no former occasion in war had the mortality, by wounds and sickness, been so small.

In these hospitals the soldiers were led to feel that they were relieved from the surveillance and strictness of barrack life. Everything was made subordinate to the care of the sick. Gardens were formed around hospitals for the cultivation of antiscorbutic vegetables and of flowers. Soldiers' houses were established for the reception of sick and wounded men on furlough, where they could have board, free access to reading and smoking rooms, clean clothes, and, in fact, everything necessary for their comfort; every possible care was bestowed upon the soldier alike in health and when sick or wounded, with a result that 100,000 lives are usually considered to have been saved in this way.

Chronicle of Medical Science.

REPORT ON OBSTETRICS AND THE DISEASES OF WOMEN AND CHILDREN.

By W. S. Playfair, M.D., F.R.C.P.,
Professor of Obstetric Medicine in King's College; Physician for the Diseases of Women and Children to King's College Hospital; Examiner in Midwifery, &c., to the Royal College of Physicians.

1. *On Fatty Degeneration of the Uterus.* By Dr. Gagasy.
2. *Displacements of the Uterus Treated by Electricity.* By Dr. E. C. Mann.
3. *Amputation of the Cervix Uteri.* By Professor Otto v. Spiegelberg.
4. *Treatment of Flexions of the Uterus.* By Thomas Savage, M.D.
5. *The Employment of the Sponge Tent for the Relief of Flexions and Hypertrophy of the Uterus.* By Dr. Klencke.
6. *Gastrotomy for Uterine Tumours.* By M. Boinet.
7. *Ovariotomy during Acute Suppuration of an Ovarian Cyst, the result of Tapping; Rapid Recovery.* By T. Pridgin Teale.
8. *Removal of Ovarian Tumours by Enucleation.* By S. Logan and W. Fordyth Walter Burnham.
9. *On Cysts of the Par-Ovarium.* By Dr. Koeberlé.
10. *On Retro-uterine Hæmatocele.* By Dr. Fritsch.
11. *On Extirpation of the Inverted Uterus.* By Professor Martini.
12. *On Cauterization of the Uterine Cavity.* By Dr. Blanchard.
13. *On Change of Life and Insanity.* By Dr. H. Sutherland.
14. *On Forcible and Rapid Dilation of the Cervix Uteri.* By Dr. Ball.
15. *On the Diagnosis of Sub-acute Ovaritis.* By Dr. Tilt.
16. *On Perforation of the Uterus by the Sound.* By Dr. Dupuy.

1. The author records an instance occurring in a young woman, æt. 19. Five weeks previous to her admission she stumbled and fell on the abdomen. A swelling gradually formed, which at length prevented her from moving. It was tapped, but only a little sanguineous fluid exuded. She gradually became weaker, and died from exhaustion.

Post-mortem.—An extraordinarily hypertrophied uterus, in a state of fatty degeneration, was found to be the cause of the extensive swelling. The walls were three fingers' breadth thick, and studded

with fat-globules. The uterine mucous membrane was partly in a state of inflammation, partly loosened, and in places disintegrated.—*Allg. Wiener Med. Zeitung*, November 18th, 1873.

2. Dr. Mann reports four cases of prolapsus uteri of the first degree cured by electrical treatment. The causes of the prolapse were loss of elasticity of the uterine ligaments and atony of the vaginal walls and sphincter vaginæ. The negative electrode was placed in the uterus, and the positive externally over the uterus and its appendages, and the faradic current employed. He gives in detail the treatment of an old case of prolapsus, as illustrating the effects of electrical currents in restoring tone to the general system, and especially to the tissues in and about the pelvis. He thinks it well to combine the galvanic and faradic currents. In all cases, he says, nutrition is improved, and many nervous symptoms connected with the displacements are entirely relieved.—*New York Med. Record*, April, 1873.

3. The author gives us here the result of 60 observations, 53 of which were his own.

The conditions necessitating the operation were—carcinoma of the cervix, 22 cases; inflammatory hyperplastic affections, 7; conoidal cervix, causing sterility, 5; alteration of form of cervix, 10; hypertrophy with prolapsus, 10. Four varieties of operation were employed—eight times section by cutting instruments without suture; six times with simple suture, after Marion Sims; four times by suture; four times by the écraseur; and thirty-nine times by the galvano-caustic.

Of the 60 cases, 5 died from opening the peritoneal cavity, pelviperitonitis, hæmorrhage, septicæmia, and shock.

The author insists strongly on operating *in sitû*, not dragging the uterus down, as frequently advised; he prefers the galvano-caustic to other means, especially in cases of cancer, the cutting operations being best adapted for conical cervix.—*Archiv für Gynk.*, vol. v, part 3, 1873.

4. The object of this paper was to advocate the use of the intra-uterine stem. In all cases in which this plan was used the symptoms were improved, and great relief was given without any of the dangerous or serious after-effects which are sometimes seen to arise. They were used in 44 cases without a single bad symptom.—*Obstet. Journ.*, November, 1873.

5. The author records three instances of retroflexion and chronic induration of the cervix uteri, where the daily introduction of a sponge tent effected marked improvement.

He regards it as an artificial induction of the lochial condition in a minor degree, by means of which the involution of the organ to its normal size and condition is accomplished.—*Deutsche Klinik*, No. 32, 1873.

6. The author endeavours to show that gastrotomy should be rejected for uterine tumours when these are sessile, and especially when it is necessary to remove the uterus in whole or in part. The following are the conclusions to be drawn from this long memoir:—

In 14 gastrotomies, performed by surgeons who thought they had to deal with ovarian cysts, fibrous tumours more or less injured by the bistoury or trocar, were left *in sitû*, and the operation was abandoned. In spite of this, nine women recovered and five died. Of 23 cases of extirpation of fibro-cystic or fibrous tumours, we must distinguish the pediculated tumours, which alone gave 8 cases and 5 deaths, from the sessile tumours, 10 of which gave 10 deaths. Finally, 42 total extirpations of the tumour and womb gave 32 deaths and 10 recoveries. Hæmorrhage is the most frequent cause of death, and next to that peritonitis.—*Gaz. Hebdom.*, Nos. 8 to 29.

7. Mr. Teale relates an interesting case in which serious symptoms came on after tapping an ovarian cyst with the pneumatic aspirator; vomiting, shivering, and a rapid rise of temperature developed themselves, and resonant percussion was noted over the cyst, from which he diagnosed the formation of gas in its cavity, as a result of suppuration.

Ovariotomy was performed, part of the cyst being gangrenous. The patient made a rapid recovery. This is his seventh recorded operation.

8. The authors relate a case of ovariotomy performed by enucleation after the method recommended by Miner. After incision and separation of adhesion the cyst was stripped from the pedicle, not more than half a drachm of blood being lost. The patient made a good recovery.—*Amer. Jour. of Obst.*, July, 1873.

A similar case is recorded by Burnham, in which the operation was also successful.—*Boston Med. & Surg. Jour.*, July, 1873.

9. The author distinguishes cysts of the par-ovarium from true ovarian tumours both by their anatomical and clinical differences. They have few adhesions, and these are easily separated; neither the Fallopian tube nor the ovary, as a rule, are implicated. They are formed of a plain envelope of fibrous tissue, lined with a cylindrical and sometimes vibratile epithelium, and they contain a limpid, saline, and non-albuminous fluid. They have much less influence on the general health than ovarian tumours. At first they grow slowly, and subsequently with greater rapidity.—*Gaz. Méd. de Strasbourg*, No. 14, 1873.

10. In an elaborate *résumé* of this subject, in which the author refers to the opinions of Rokitansky, Huguier, Dolbeau, Tardieu, &c., he quotes the discrepancy of opinion as to its frequency.—Seiffert, 66 cases in 1272 diseases of women; Olshausen, 34 in 1145; Hugenberger, 0 in 3801. Fritsch observed it chiefly between the ages of twenty-one and forty-seven, and thinks it is of very exceptional occurrence among multiparæ. He discountenances puncturing.—*Volkmann's Sammlung Klin. Vortr.*, No. 56, 1873.

11. The author narrates a case in which he removed a uterus which had been inverted for three months, by means of an écraseur. The operation was performed in fifteen minutes, and very little blood was lost. Peritonitis ensued, lasting fourteen days, but the patient eventually made a good recovery. The parts removed consisted

of the fundus, body, and neck of the uterus, except the vaginal portion.—*Il Morgagni*, xiv, 8, 9.

12. The author agrees with those who attribute many cases of uterine disease to morbid states of the mucous membrane lining the body of the uterus. He considers the various methods of intra-uterine medication. Like all others who have studied the subject, he objects to intra-uterine injections, which are frequently followed by dangerous results. Any symptoms of peri-uterine inflammation should be considered a contra-indication of intra-uterine medication.

The method Dr. Blanchard prefers is the introduction through the cervix of a pencil composed of nitrate of silver and nitrate of potash, with which he obtains excellent results.—*Lyon Médicale*, Dec., 1873.

(There is nothing novel in this communication, but it is of interest as showing the increasing attention that is being paid to intra-uterine medication. The importance of considering the slightest symptom of peri-uterine inflammation as a formal contra-indication of the treatment was long ago insisted on by the reporter in his 'Lectures on Chronic Uterine Catarrh.'—W. S. P.)

13. The author contributes an interesting paper on the relations of the change of life to insanity. He arrives at the following conclusions:

1. That insanity occurring at the change of life is not usually caused by that condition *per se*, but is most frequently due to some other moral or physical cause coincident with that period.

2. That the age most liable to attack is forty-five years and two months.

3. That the onset of the insanity generally occurs one year after the cessation of menstruation.

4. That the married state does not seem to predispose to the disease.

5. Nor does the number of the patient's children have any predisposing effect.

6. The forms of insanity most common are melancholia, and more rarely mania.

7. There are a certain group of symptoms sufficiently characteristic to enable us to diagnose a case of climacteric insanity, independently of any knowledge of the history of the case.

8. The prognosis is decidedly favorable, recoveries being over 40 per cent. of those attacked.

9. The duration of the attack is usually more than three months, and less than three years. Complete recovery is not to be expected until twelve months after the commencement of the attack.

10. With regard to treatment, mild sedatives and aperients, a careful watchfulness of suicidal tendencies, and the observance of a quiet and regular course of life, are chiefly indicated.—*West Riding Asylum Reports*, vol. iii.

14. The author maintains that forcible dilation of the cervical canal is preferable to all other methods of treatment in cases of constriction. His plan is to introduce a succession of solid probes until he is able to get in one the size of a No. 7 catheter, after which he passes and expands a dilator devised for the purpose. The patient, of course, is anæsthetised. The results are said to have been most satisfactory in the numerous cases in which the operation has been practised.—*New York Medical Journal*, October, 1873.

15. The author believes the frequency of this disease to be underestimated. He finds that this, along with inflammation of the neck of the womb, is the most frequent source of sexual disease between the ages of fifteen and twenty-five years. The positive sign is of an oval lump beside the uterus, or in Douglas's pouch, which, on pressure, gives rise to an overpowering sickening sensation of pain and debility.—*Obst. Soc.*, October, 1873.

16. The author collects together all the cases in which this accident is supposed to have happened, and discusses the conditions under which it is most likely to occur. These are sub-acute metritis, certain morbid states, as cancer, and when the uterus is softened and undergoing involution after delivery. Out of seventeen cases he relates, curiously enough in none did any subsequent bad effects follow, but he supposes that fatal cases have not been published.—*Progrès Médical*, 1873.

(It is probable that in many of these instances the sound passed through the Fallopian tube, and did not really perforate the uterine tissue.—W. S. P.)

II.—On Pregnancy.

1. *Twin Pregnancy after Ovariotomy.* By Prof. Marzolo.
2. *On Gastrotomy after Extra-uterine Fœtation.* By Dr. F. de Ranse.
3. *Case of Twin Pregnancy in a Double Uterus.* By Dr. Perrault.
4. *Uterine Souffle perceptible by Palpation.* By Dr. Emil Prolter.
5. *On Intra-vaginal Auscultation for the Diagnosis of Recent Pregnancy.* By Dr. F. Verardini.

1. Prof. Francesco Marzolo, of Padua, performed ovariotomy (for the thirteenth time in Italy) in July, 1871, on a woman aged 34. He removed her left ovary. The patient got well, recovered strength, and returned to work. About a year afterwards symptoms of pregnancy appeared, and gestation went on without any bad symptoms. After a labour of two hours she was delivered of a girl (head presentation). In a short time a boy was born (footling). This is, we believe, the first example of a twin pregnancy after ovariotomy, and opens up some interesting physiological questions for discussion. —*Gaz. Méd. de Paris*, No. 44, 1873.

2. The author, treating of the operation of gastrotomy in extra-uterine fœtation, maintains that the placenta should always be removed. The difficulty of doing so is not worse than in removing

adhesions in a serious case of ovariotomy; he thinks also that the dangers of primary hæmorrhage are at least counterbalanced by the risk of sudden fatal secondary hæmorrhage, and the not less certain result of purulent infection. In a word, an almost certain death as the result of a placenta left in the abdomen ought to warrant any possible effort for its removal.—*Gaz. Méd. de Paris*, No. 52, 1873.

(It is needless to remark that the opinion here given is directly opposed to the rules laid down by our own leading authorities. The risks of removing the placenta are well known; the only chance of safety seems to be to leave it untouched, and prevent septicæmia by antiseptic injections.—W. S. P.)

3. This remarkable case occurred in a young woman twenty years of age. Labour being slow and the pains absent, version and subsequently application of the forceps to the after-coming head were resorted to. The abdomen was still large, and twin pregnancy was diagnosed. The placenta not separating, the hand was introduced and it was removed, and in searching over the fundus an opening was found in its upper and median part. Then, he says, he found another cervix uteri projecting into the uterus, just as the cervix projects into the vagina. Through this a second fœtus was felt presenting by the shoulder. Version was performed, and a second fœtus, weighing 9½ lb., removed. By a subsequent more complete examination M. Perrault convinced himself "that there were really two superimposed uteri, each with its distinct neck, and that the two fœtuses could not even have had direct relations with one another during their intra-uterine life, the one being placed in an inferior, the other in a superior compartment." The patient died of puerperal fever, but no autopsy was allowed to clear up this apparently inexplicable case.—*Lyon Médicale*, August 31, 1873.

4. The author has here *re*-discovered what Pajot years ago described as uterine souffle with shock. On placing the hand over the umbilical region of a pregnant woman a vibration, rhythmical and isochronous with the radial pulse, is detected; on moderate pressure the vibration disappears, and only an arterial pulsation is perceived. —*Arch. f. Gyn.*, v, 3, 1873.

5. The author states that intra-vaginal auscultation is the best method for determining the existence of recent pregnancy. The stethoscope, placed in contact with the neck of the uterus, permits, in the early periods of gestation, the recognition of a characteristic *bruit de souffle*—that of the placenta. This bruit is soft and prolonged, and when once heard is readily recognised. It is heard especially towards the beginning of pregnancy, and disappears towards the seventh month.—*Bullet. des Scienc. Méd.*, February, 1873.

III.—On Pregnancy and the Puerperal State.

1. *On the Statistics of the Rotunda Lying-in Hospital.* By Dr. Geo. Johnstone.
2. *Conversion of a Face Presentation into an ordinary Head Presentation.* By Dr. Schatz.
3. *On Chloral as an Anæsthetic during Labour.* By Dr. W. S. Playfair.
4. *On the Comparative Value of Forceps, of Turning, and of Premature Labour, in Contracted Pelvis.* By. Dr. A. MacDonald.
5. *On Artificial Premature Labour.* By Dr. Alex. Milne.
6. *On a Successful Case of Cæsarean Section, in which Elastic Sutures were applied to the Uterus.* By Dr. E. Valentinoldi.
7. *On the Hæmorrhage during Pregnancy in Cases of Placenta Prævia.* By Dr. Matthews Duncan.
8. *On the Spontaneous Separation of the Placenta when it is Prævia.* By Dr. Matthews Duncan.
9. *On the Preventive Treatment of Post-partum Hæmorrhage.* By Alfred McClintock, M.D.
10. *On Diseases of the Urinary Organs after Parturition and during Pregnancy.* By Prof. Olshausen.
11. *On Restoration of the Perinæum and Sphincter Ani Ruptured during Labour.* By T. Pridgin Teale, M.B.
12. *On Mischief accruing to the Child from Cranial Pressure during Labour.* By Dr. Radford.
13. *Case of Erysipelas followed by Puerperal Peritonitis.* By Dr. J. B. Crauford.

1. In a paper of great value the Master of the Rotunda discusses the results of a year's practice in that hospital. It is impossible to abstract the paper *in extenso*, as it goes over the whole range of obstetric practice, but we specially call attention to the author's views on the use of the forceps. It is well known that in former years the forceps were seldom used in that institution. Since Dr. Johnstone's energetic mastership the more modern practice of a frequent recourse to artificial delivery has been adopted, with the best results. Last year out of 1191 cases the forceps were used as often as 142 times, or rather more than 1 out of every 13 deliveries. In 36 cases the forceps were applied before the os was fully dilated; and as there are still many practitioners who consider this an unjustifiable practice, it may be advisable to quote Dr. Johnstone's remarks on the subject:—"Having adopted," he says, "this practice for the last two years, during which time we delivered 71 such cases, we are more and more convinced every day of its great advantage in saving the life both of mother and child. Of course, it is not without danger in unskilful hands, and should only be attempted by those who have acquired that great delicacy of touch so essential in the obstetrician, and who have considerable experience in the use of the

forceps; but if properly and carefully done it is perfectly safe.—*Dublin Jour. of Med. Scien.*, February, 1874.

2. The author objects to the usual method recommended, viz. pushing the face up by two fingers and so bringing down the occiput, or seizing the occiput by the hand or instruments and bringing it down, or a combination of the two preceding measures.

His method is to ascertain the exact position of the fœtus by external manipulation, then (1) seize the shoulders of the fœtus, raise them from the pelvis and to the side towards which the fœtal back is turned; (2) as soon as the shoulders and thorax have been brought into the longitudinal axis he ceases to push them up, but continues to direct them to the side of the fœtal back, counterpressure being kept up on the fundus.—*Arch. f. Gyn.*, v, 2, 1873.

3. In a lecture on the anæsthetic properties of chloral the author contrasts the action of chloroform and chloral. In his opinion the first is apt to do too much, and often is specially disadvantageous from its tendency to produce undue relaxation of the uterus. He finds chloral has not this effect; that it deadens without annulling pains, and that it may be given in the first stage of labour, when chloroform is usually inadmissible. Chloral is also specially useful in cases of rigid cervix, with distressing but useless pains. Under its action the spasmodically contracted os often relaxes remarkably.

It may be given in doses of fifteen grains, repeated every twenty minutes, up to three doses.—*Lancet*, February, 1874.

4. The author contributes a paper on the relative advantages of the various methods of managing labour in contracted pelvis, in which he arrives at the following conclusions:

1. Looking at the statistics of Spiegelberg and Litzmann, it seems exceedingly doubtful if the operation of inducing premature labour ought ever to be employed in cases of contracted pelvis.

2. That turning does not present any proved advantage to the mother over long forceps in cases of contracted flat pelvis, and is, undoubtedly, more dangerous to the child. That it is entirely unsuitable when the contraction is general, being much more dangerous to the mother than long forceps.

3. That in contracted pelvis, as a general rule, it is, on the whole, safer to let the case go on to the full term of utero-gestation, and then give the patient a fair trial, so as to ascertain what nature is like to accomplish unaided, without waiting so long as to allow the mother to run any unnecessary risk. Then, in case there is room for the introduction of forceps, they ought to be applied and delivery attempted by their means. If this is impossible, then delivery ought to be effected by cephalotripsy, craniotomy, or the Cæsarean section.—*Edin. Med. Journ.*, September, 1873.

5. The author of this paper makes an energetic protest against the modern views of Spiegelberg and other recent German writers, who give unfavorable statistics of the results to mother and child in the induction of premature labour, and who maintain that it is not nearly so useful as we are in the habit of supposing it to be. Dr.

Milne meets Dr. Spiegelberg's statistics with others derived from his own and others' practice, and strongly advocates the operation in all cases of contracted pelvis.—*Edin. Med. Journ.*, February, 1874.

6. The author relates a case of successful Cæsarean section for extreme rachitic deformity. He applied to the uterine wound sutures of elastic thread covered with silk. These, he thinks, favour union by adapting themselves to the contractions of the uterus, thus keeping the edges of the wound constantly in contact, and preventing the passage of blood and exudation into the peritoneal cavity.—*Gazetta delle Cliniche*, November, 1873.

7. Dr. Duncan maintains that the ordinary theories on this subject are incorrect:

1. That hæmorrhage occurs from the gradual expansion of the cervix as pregnancy advances, because it is now generally admitted that the cervix is not really taken up to form a portion of the uterine cavity.

2. That it occurs from separation, because the lower part of the uterus was specially developed in the latter months, while the placenta ceased to grow in proportions.

3. The converse theory, more recently advocated by Barnes, that the disproportionate growth was on the part of the placenta.

After giving his reasons for not agreeing with any of these views, Dr. Duncan proposes his own theory, which is that these hæmorrhages are not truly unavoidable, but accidental, and that their occurrence is favoured by the extraordinary anatomical conditions occurring in placenta prævia, as well as by other circumstances, such as the increased pressure of blood above what exists in ordinary situations of the after-birth. He considers, therefore, the whole pathology of placenta prævia to be nearly, if not quite, identical with that of accidental hæmorrhage. He states, also, that there are four ways in which hæmorrhage during pregnancy may occur:

1. By rupture of a utero-placental vessel at or above the internal os uteri. This is analogous to the source of hæmorrhage in some cases of uterine fibroid or polypus.

2. By rupture of a marginal utero-placental sinus within the area of spontaneous premature detachment, when the placenta is inserted, not centrally or covering the internal os, but with a margin at or near the os.

3. By partial separation of the placenta from a jerk or fall.

4. By partial separation of the placenta, in consequence of uterine pains producing a small amount of dilatation of the internal os. Such cases may be otherwise described as instances of miscarriages commencing, but arrested at a very early stage.—*Edin. Med. Journ.*, November, 1873.

8. Dr. Matthews Duncan, in a paper read before the Obstetrical Society, examines the mechanism of the detachment of the placenta in cases of unavoidable hæmorrhage. He arrived at the conclusion that in such cases the separation of the placenta was not produced, as is generally stated, by shrinking or contraction of the uterine

fibres, but by expansion of the cervix. The common error of authors arose from the supposition that the placenta was attached to the cervix, even near to the external os, which it never was. The process of detachment by expansion will go on till the internal os is dilated to a diameter of about four inches, and this may occupy a greater part of the whole duration of labour. He estimated that the area of spontaneous detachment by expansion was not more than two and a half inches from the centre of the os uteri, and that the usual estimate was far too great.—*Obst. Soc.*, October, 1873.

9. At the Dublin Obstetrical Society Dr. McClintock read a paper on the preventive measures to be employed when there was likely to be post-partum hæmorrhage. The conditions which determined the production of this accident were—1, deficiency of muscular contractility of the womb; 2, vascular excitement; 3, want of coagulable power in the blood. A rapid, jerking pulse, at the end of labour, indicated the probable occurrence of flooding. The experience of a woman's past labours afforded some clue to the possible inertia of the uterus. The presence of any tumour in the womb or unusual distension of its cavity, from twins or dropsy of the amnion, should also excite suspicion. Sharp, quick, abruptly ceasing pains, especially in the second stage, were also common forerunners of hæmorrhage. Extreme mental depression, and chloroform sometimes exerted a paralysing influence on the uterus. The prophylactic measures—to secure quietude of the circulation, and to allay local vascular excitement, were more open-air exercise, absence of stimulants, and regularity of the bowels. Digitalis and cooling medicines might be given, and, in plethoric persons, blood might be drawn from the arm, as strongly recommended by La Chapelle; but sometimes rapidity of the circulation depended on anæmia, and here the opposite plan of treatment must be adopted. When the character of the pains or the previous history of the patient furnishes ground for expecting hæmorrhage, reliance must be placed—in addition to the slow extraction of the fœtus and the following down of the uterus with the hand, &c.—on two measures, the letting off of the liquor amnii by the rupture of the membranes, and the administration of ergot of rye. The most effective resource was ergot of rye; it required to be given, however, in full doses (ʒij of the liquid extract) and a sufficient time before the expulsion of the child.—*Dub. Obs. Soc.*, December, 1873.

10. The author attributes the cystitis mainly to catheterization, which, besides irritating the mucous membrane, often admits air and lochia. As to nephritis, it is either catarrhal or interstitial and suppurative. The first is generally slight, terminating in one or two weeks by recovery. The symptoms are chiefly pain in the back, febrile disturbance, and albuminuria. He thinks it is often due to the propagation through the ureters of primary catarrh of the bladder.

Interstitial and suppurative nephritis is rare; only two instances were noticed by him.—*Beit. f. Geburt. u. Gyn.*, xi, 2, 1873.

11. In this paper Mr. Teale describes the mode of operation which

he has found most satisfactory. His chief efforts aim at giving solidity to the newly made perinæum. This he attains partly by making raw lateral surfaces, which are to be brought together by quilled sutures, broad towards the rectum, and chiefly by dissecting up the vaginal mucous membrane which rests on the rectum as a triangular flap, with its blunt apex forwards and its attached base backwards. The raised flap is kept in apposition with the vaginal edges of the apposed lateral raw surfaces by means of the stitches of the quilled sutures.—*Brit. Med. Jour.*, October, 1873.

12. The author's experience bears out Dr. Matthews Duncan's statement that serious injury to children sometimes arises from pressure on the cranium during labour. On a former occasion he has pointed out that such injury might arise from the use of the long forceps, and had described an instrument in which the compressive power was reduced to a minimum. He expresses the opinion that in considering the relative value of turning and forceps in contracted pelvis, preference should be given to the forceps, as pressure on the upper part of the cranium is less likely to be followed by evil consequences than pressure on the delicate structures at the base of the brain, which is the part most exposed to injury in dragging the base of the skull through the contracted brim.—*Brit. Med. Jour.*, November 7th, 1873.

13. Dr. Crauford illustrates the occasional connection between puerperal peritonitis and erysipelas by an interesting case. A patient cut her finger and erysipelas ensued. She was then in immediate expectation of her labour, which came on before the erysipelas was cured. Immediately afterwards the erysipelas disappeared from her arm, and severe peritonitis came on, which rapidly proved fatal. The author naturally attributes this to a metastasis.—*Amer. Jour. of Med. Sciences*, October, 1873.

IV.—Diseases of Children.

1. *Vaccination for Erectile Tumours.* By Dr. Blot.
2. *On Oxide of Zinc in the treatment of Diarrhœa in Children.* By Mr. S. Berry.
3. *On the Etiology of Malformation of the Intestine, and of Atresia Ani.* By Dr. Ahlfeldt.
4. *Congenital Closure of the Duodenum.* By Dr. Hempel.
5. *On Pneumonia in Children.* By Dr. William Stephenson.
6. *Case of Septum Ventriculorum as well as Foramen Ovale remaining open; Life prolonged to the twentieth year without Cyanosis.* By Dr. L. Gelau.
7. *A successful Case of Inflation in Intussusception.* By J. S. Affleck, M.D.
8. *On the Etiology of Pemphigus Neonatorum.* By Dr. G. Koch.
9. *General Tuberculosis in a Fœtus of seven and a half months.* By Dr. Chabrin.
10. *Diabetes Mellitus in Children.* By Dr. Senator.

11. *On the Therapeutics of New-born Children.* By Dr. Lerisier.
12. *Local Treatment of Gangrenous Vulvitis in Children by the Powder of Idioform.* By Dr. Parrot.
13. *On Tubal Hematemia in the Kidneys of New-born Children.* By Dr. Parrot.

1. The author combats the common practice of vaccinating erectile tumours with a view to cure. He states that if they bleed vaccination does not take, and when it does take only a small scar remains. Small spots may be cured in this way, but not nævi of any size, while serious hæmorrhage may follow the attempt at vaccination.—*Gaz. Hebdom.*, October, 1873.

2. Mr. Berry has every reason to be satisfied with the beneficial effects of oxide of zinc in the diarrhœa of children, especially in cases in which the cause appears to be some irritation of the nerve centres presiding over the alimentary canal. He believes that infantile diarrhœa is in a great measure due to a debilitated state of the nervous system, combined with a hyperæmic condition of the intestinal mucous membrane, as is shown by the readiness with which it is relieved by the oxide of zinc.—*Practitioner*, November, 1873.

3. The author gives us detailed observations, with explanatory plates, of a case of malformation. He insists upon the relation existing between the defects of development of certain portions of the intestines on the one hand, and of ectopia of the abdominal viscera on the other. This latter may be primitive, and due to well-recognised causes; they may induce consecutively imperforation of the anus.—*Arch. für Gyn.*, vol. v, pt. 2, 1873.

4. The author records a case where vomiting occurred every time milk or anything was taken; no meconium was passed; only bilious-looking slime, when an enema was administered. Death occurred on the sixth day. *Post-mortem*, the duodenum, in the centre of the descending portion, was found to be completely closed by a fibrous cord-like process. The lower portion of the bowel contained a small quantity of meconium. Above the obstruction the parts were enormously distended. The ductus choledochus and pancreatic duct opened into the lower half of the closed portion of the gut.—*Jahrb. f. Kind.*, 1873.

5. Dr. Stephenson contributes an interesting paper on this subject, in which he dwells on the extreme importance of accurate thermometric observations in children's diseases. He points out the peculiarities of the disease in children—the greater frequency of cases in which the physical signs remain latent for a longer period than is usual in adults, the occurrence of cases in which the physical signs throughout are slight, and the greater frequency of the affection attacking primarily and limited to the apex. In addition to the ordinary division of the disease into primary acute (croupous) or lobar and lobular (catarrhal) or broncho-pneumonia, he points out that the former divides itself into different types when viewed in relation to temperature, pulse, and physical signs. Catarrhal pneu-

monia has been recognised as a primary affection, unassociated with bronchitis, and causes complicating affections of the bronchi may be either broncho-pneumonia or bronchitis with true lobar or croupous pneumonia. The characters of the true acute pneumonia are—the immediate development of a high pyrexial state, which runs a pretty even course, showing but slight tendency to remission for five days, and then declining slightly for one or more days, and terminating by a well-marked crisis. In children above two years of age the author never finds delirium absent in the early stages, and in the absence of marked chest symptoms this may aid to differential diagnosis between this and other febrile states. The physical signs may be slight for some days, but never entirely absent. Primary apex pneumonia is very common in children, and should always be carefully sought for.—*Ed. Med. Journ.*, Jan., 1874.

6. The case was that of a prisoner who died suddenly, and in whom nothing abnormal had been noticed during life; the aperture in the septum ventriculorum admitted a finger readily. There was stenosis of the tricuspid. The pulmonary artery was much distended, its valves thickened, and the subject of fatty degeneration. The aorta was very constricted. A perforation the size of a fourpenny piece existed in the anterior mitral valve, nearly opposite the aperture in the septum ventriculorum.—*Inaug. Dissert. Berl.*, 1873.

7. Dr. Affleck relates an interesting case of invagination of the bowel in a child five months old, successfully treated by inflation. The symptoms were so well marked as to leave no doubt as to the accuracy of the diagnosis. After inflation had been continued for two or three minutes the child gave a sudden cry, and the air seemed to enter the bowel suddenly, and immediately afterwards the vomiting and other symptoms ceased. The child has since continued well. The case is peculiarly interesting on account of the child's age.—*Edin. Med. Journ.*, September, 1873.

8. The author observed in the course of three months eight cases which occurred exclusively in the practice of one and the same midwife. Five of the cases were breech presentations. No other cases occurred in Wiesbaden during this time. He attributes them to the midwife having communicated it from one to the other by handling the infants. Nothing is said as to whether the midwife herself was affected or had any wound on the hand.—*Jahrb. f. Kinderk.*, 1873.

9. The mother, aged 29, was decidedly phthisical. She gave birth to a living child at the seventh and a half month of her third pregnancy, which only survived its birth a short time, the mother also dying. In the mother tubercular lesions were chiefly found developed in the lungs; in the child the abdominal organs were specially affected, the liver, spleen, and epiploon being found full of granulations. The author explains this difference in the localisation of the lesions by the activity of the respective organs.—*Lyon Médicale*, July, 1873.

10. The author records two cases—one occurring in a boy aged 13, the other in a girl aged 12—a fatal issue resulting in both in-

stances very rapidly. He refers to six other cases where the result was similar—*Berlin. Klin. Woch.*, 1872, v, 78.

11. The author states that he has obtained such excellent results by administering remedies to new-born children through the maternal milk that he has ceased to give them directly. He has experimented on this subject on goats, administering to them fixed quantities of certain drugs, such as iron, antimony, arsenic, mercury, bismuth. Distinct traces of these can be discovered after a certain time in the milk, which thus becomes a vehicle for their exhibition. The details of these experiments are fully stated.—*Jahr. für Kinderkrank.*, July, 1873.

12. Dr. Parrot advises in this affection the application of the powder of iodoform, which is absolutely painless, and in three or four days arrests the progress of the ulcer and facilitates the appearance of granulations at its base. The ulcer should be carefully cleaned, and then filled with the powder, no part being left uncovered. If the ulcer is very moist it should be dressed twice a day. The treatment is said to have been very successful, the disease being arrested and the surrounding œdema rapidly diminishing.—*Journal de Médecine*, August, 1873.

13. The author proposes the name of tubal hematemia for a hitherto undescribed condition he has discovered in the kidneys of new-born children. It is characterised *clinically* by cerebral symptoms, bronze discoloration of the skin, alteration of the blood, and hematuria; *anatomically*, by the presence in the renal tubules of red globules arranged in a peculiar manner. This venal affection differs essentially from that which results from thrombosis of the emulgent veins, in which no globules are found in the tubules themselves. The disease is probably produced by some congenital blood dyscrasia.—*Arch. de Physiologie*, No. 5, 1873.

REPORT ON MATERIA MEDICA AND THERAPEUTICS.

By Robert Hunter Semple, M.D.,
Fellow of the Royal College of Physicians, Physician to the Bloomsbury Dispensary, London.

On the Use of Mercury in Syphilis. By Jonathan Hutchinson.—The debatable questions involved in the consideration of the uses of mercury in syphilis have been very carefully examined by Mr. Hutchinson in a paper lately read by him at the Hunterian Society of London, and the opinions he has expressed in favour of the use of the mineral in this disease appear to have been generally supported by the members. Mr. Hutchinson stated that his main wish in the composition of the paper was to bear an earnest protest against the lukewarmness and uncertainty pervading a large section of the profession in the present day as regards the utility of mercury in syphilis. He thought that even those who believed in

the drug employed it often too late, too sparingly, and in an inefficient manner, and that this practice imperilled every year the happiness and health of a great number of individuals, to say nothing of the danger to future generations. The causes of the present uncertainty in opinion and practice he attributed to the abuse of mercury in former times, to the fact that the early stages of syphilis admitted of spontaneous cure, and to the introduction of the use of iodide of potassium. Mr. Hutchinson expressed his own belief that the drug was a real antidote to the syphilitic poison, and that, if carefully and fully employed, it was capable of procuring its complete extinction, the facts recorded seeming to show that mercury really destroyed this poison, that it prevented its breeding in the blood if that process had not already taken place, and if it had, that it cut short its life in the tissues. Mr. Hutchinson embodied his views in a series of propositions tending to prove that mercury, if given when a chancre is just beginning to show specific induration, almost always prevents it from doing so; that when given after a sore has attained its full development it will equally, though not so rapidly, show its power, and that no induration will resist it; that if given to a patient who has an undoubted indurated chancre it will in all probability prevent the occurrence of any other constitutional symptoms; and that in cases where no mercury is given the disease often exhibits exceptional severity, as he had proved by instances lately under his own observation. When the cure of the disease was delayed the cause was that the antidote was imperfectly administered, and the very rare instances in which the disease continued in spite of profuse salivation depended probably on the fact that the salivation was premature.

Mr. Hutchinson further goes on to argue that mercury is probably a true vital antidote against the syphilitic virus, and is capable of effecting a real cure, and that this is proved in some cases by renewed susceptibility to contagion; that in order to secure the antidotal efficacy of the drug it is desirable to introduce a considerable quantity into the system, and to continue its use for a long period; that ptyalism, so far from being beneficial, ought to be carefully avoided, as it prevents the use of the remedy being sufficiently prolonged; that when the patient shows an idiosyncrasy peculiarly susceptible to mercury the indication is to reduce the dose rather than to omit the drug; that it is impossible to begin the administration of it too soon; that when secondary symptoms do occur after a mercurial course they are usually milder than when mercury is not used; that this metal possesses a remarkable power of delaying the secondary stage, even if it does not prevent it altogether; that there are some grounds for believing that tertiary symptoms are less frequent and less severe in persons who have been treated by mercury than in others; that mercury cautiously given does not in a great majority of cases do any injury to the general health, and that the doctrine of its real antidotal character in respect to syphilis ought to lead to its much more prolonged administration, with the hope of destroying utterly all lingering germs of the malady; that

iodide of potassium possesses little or no efficacy against either the primary or the secondary forms, and that the superiority of mercury is often most signally proved in cases which have entirely resisted the iodide of potassium; that it is of little consequence whether mercury is given by the mouth, by inunction, or by the vapour bath, provided that care be taken to avoid salivation or purging; that the doses usually given internally are for the most part too large; and that if one method of administration do not succeed satisfactorily another should be tried, and that in no case of difficulty should the vapour bath be forgotten.—*British Medical Journal*, January 24th, 1874.

On the Use of Tepid Baths in Diseases of the Chest, and particularly in Pulmonary Phthisis. By Dr. Souplet.—Dr. Souplet remarks that hitherto no proposition has ever been made to employ tepid and warm baths in chest diseases, but from the experiments he has lately made at the Hôpital de la Pitié, in Paris, under the superintendence of Professor Lasègue, he is convinced that those agents are not only innocuous in thoracic affections, but that they may be used with great and undoubted advantage. His conclusions are founded on more than two hundred cases of this kind of treatment, especially in phthisical patients. The temperature of a bath which may be called tepid cannot be absolutely fixed, but Dr. Souplet so regards it when the degree of heat is about 3° below that of the body; thus, taking the temperature of the body (on the Centigrade scale) at 38°, that of the tepid bath would be 35°. The duration of the bath should vary from twenty to forty-five minutes, but Dr. Souplet seldom found the patients willing to remain in it more than forty-five minutes, even in summer. In winter, precautions should be taken to prevent the patients from catching cold, and the most convenient time for taking the bath is an hour before meals, either in the forenoon or the evening. Dr. Souplet generally gives a bath every second day; but when the sweating is not diminished at the beginning of the treatment he gives one every day, and he has never found the sweating resist the third or fourth daily bath. It should be observed that the baths are given only as accessories to other treatment, and Dr. Souplet's cases had all been for some time in the hospital under the usual *régime* before the baths were employed, and thus their efficacy was determined.

As to the effects produced, it was found that on immersion in a bath the temperature of which was about 3° below that of the body the patient felt it neither cold nor hot, but comfortable; but if the difference was more considerable he felt a sensation of cold, and if, on the other hand, the temperature approached that of the body he felt it warm. Thus, a bath at 37°, or even 38° (Centigrade), is tepid and comfortable to a patient who is feverish, with a temperature of 40° to 41°, while it is warm to one whose temperature is normal. In general, at the commencement of the treatment the patient felt a little oppression at the chest, and there was accelerated respiration for a few minutes; but this condition soon passed away, and the respiration became normal, and at the third or fourth repetition of

the bath there was no further inconvenience. In patients who coughed much, this symptom was generally allayed at the end of a few minutes, the expectoration became easier, and they felt better in the water than in bed. At the same time the pulse diminished in frequency and the temperature gradually fell, and the more so as the feverish symptoms were greater before immersion. After the bath the patients were more cheerful, the breathing was easier, the appetite was better, the skin became cool, and the pulse was lowered. Dr. Souplet has known it reduced twelve, twenty, or even twenty-eight beats, and the temperature was sometimes lowered nearly 2° Centigrade. In cases of rapidly advancing phthisis, when the patients are being wasted by a continuous fever, this condition of comfort may last only three or four hours, but the patient nevertheless feels decidedly relieved; in those cases which proceed more slowly, with pseudo-intermittent fever, the shivering is retarded and the heat is often less intense at the first bath. The night sweats are diminished, and they are suppressed after the third or fourth bath, and, whatever may be their mode of action, the baths seem to regulate the function of the sudorific glands, and to restore them to their normal state. In phthisis, especially at its commencement, the patients feel, at the end of a short time, a general and well-marked improvement under the influence of the tepid baths, they cough much less, they sleep better, and they feel stronger. Dr. Souplet thinks that the improvement must in great measure be attributed to the change effected in the cutaneous respiration, for in phthisis the skin is habitually in a diseased state, being moist, pale, and deficient in elasticity, losing, in fact, some of its vitality and its perspiratory powers. The bath acts as a tonic, and invigorates the capillary circulation in the skin, which it also cleanses and relieves of any substance which, by being fixed in it, might embarrass its functions. The complementary respiration of the skin compensates, in some measure, for the incompleteness of the pulmonary respiration. In many cases where diarrhœa was present relief was afforded by the baths, and therefore this symptom does not contra-indicate the treatment. Dr. Souplet does not assert that tepid baths are sufficient to cure phthisis, but he thinks that they afford very great relief to the patients, especially at the commencement, by diminishing the temperature and lowering the frequency of the pulse; they relieve night sweats, increase the appetite, soothe nervous excitement, and promote sleep.—*Archives Générales de Médecine*, November, 1873.

On Inhalations of Hydrochlorate of Ammonia in Chronic Affections of the Air-passages. By Dr. Libermann.—In a paper read at the Société Médicale des Hôpitaux in Paris, Dr. Libermann relates the results of five years' experience of the treatment of chronic affections of the air-passages by the hydrochlorate of ammonia, used in the form of inhalation by the aid of an apparatus devised by Lœwin. This apparatus is intended to develope the hydrochlorate in the nascent state, and it consists of three vessels, one of which contains water, another hydrochloric acid, and another caustic ammonia.

By a peculiar arrangement of the tubes passing between the vessels and connecting them together the act of inhalation performed by the patient causes the vapours of the hydrochloric acid and of the ammonia to pass together into the water, and thence into the mouth. The smell of the hydrochlorate thus produced is disagreeable to some delicate individuals, and when this is the case it may be disguised by the addition of a few drops of some aromatic oil added to the water in one of the three vessels, and medicinal substances may also be added to fulfil particular indications.

The patient who uses this inhalation will feel a little pricking sensation as the gas enters the larynx, owing to the irritation of the mucous membrane. In certain forms of granular sore throat, extending to the nasal mucous membrane, the patients are recommended to pass the vapour from the back of the mouth through the nose. The first effect of the local application of the hydrochlorate is irritation of the mucous membrane, causing the fall and afterwards the renewal of the epithelium, as well as an increase of the normal or of the pathological secretion, and this irritation is shown by an exacerbation of all the symptoms for the first few days, but gradually the secretions become less abundant, the pain is relieved, and the mucous membrane returns to its normal state, often in a very short time. The general action of the hydrochlorate is shown by acceleration of the pulse, a rather agreeable sensation of heat and excitement, moisture of the skin sometimes amounting to abundant sweating, and lastly an increase of the renal secretion. The inhalation has, moreover, a remarkable sedative action on the pneumogastric nerves, for it relieves the cough and the tickling which are so disagreeable in certain forms of sore throat. Dr. Libermann has employed this form of inhalation in granular sore throat (*angine granuleuse*), chronic bronchitis, asthma, angina pectoris, and hooping-cough. In the first-named affection, which is the troublesome malady of singers, barristers, and others who are obliged to use their voices, the inhalations of the hydrochlorate were very successful. Out of 102 cases there was a complete cure in eighteen, a well-marked improvement in sixty-four, and a negative result in twenty. But Dr. Libermann divides his granular sore throat (*angine granuleuse*) into two forms—one of which is essentially inflammatory, local in its nature, and easily cured by the inhalations ; and the other, which is much more frequent, is dependent upon a constitutional taint, which he calls *herpetism*, and is never completely cured. But still, even in these cases of herpetic granular sore throat, the inhalations of hydrochlorate of ammonia often improved the local symptoms by diminishing the dryness of the throat and the sensation of burning and pricking constantly felt by the patients. They also seemed to improve the tone of the voice by acting on the vocal cords in a manner which Dr. Libermann investigated by the help of the laryngoscope. The aphonia or the hoarseness which always accompanies granular sore throat depends upon two causes, namely, the congestion of the vocal cords and their want of approximation. Seen by the laryngoscope at the time of inhala-

tion, the cords appear at first redder, but after a short time the congestion becomes much less than before, and eventually it sometimes entirely disappears. Besides this the hydrochlorate excites the contractility of the thyro-arytænoid muscles, and the vocal cords approximate and thus restore the tone and clearness of the voice.

In cases of deafness caused by chronic inflammation of the Eustachian tubes the inhalations were employed with partial success; in chronic bronchitis they were very useful when the disease was uncomplicated with emphysema; in nervous asthma, unaccompanied with emphysema or dilatation of the heart, they often afforded great relief, and sometimes cured the disease; in hooping-cough they were sometimes useful in allaying the cough; and in the only case of angina pectoris in which they were used they always diminished the duration of the paroxysm, but did not prevent its return.—*Bulletin Général de Thérapeutique*, October 30, 1873.

On the Febrifuge Properties of the Eucalyptus. By Dr. Burdel, of Sologne.—Dr. Burdel has previously communicated the results of his experience on the eucalyptus administered as a febrifuge in the marshy districts in which he practises, and he now offers some further observations on the same subject. He has lately administered the eucalyptus to 33 patients suffering from various kinds of intermittent fever, and the result was that there were 18 cures and 15 failures, and this corresponds with his previous experience, for in the preceding year (1872) he had 123 cases with 66 cures; but there was this difference, that among the latter cases there were only 11 cases of cure without relapse, whereas in 55 the fever reappeared, some after five days and others after nine days. Dr Burdel thinks that the difference of results depends upon the mode of administering the remedy and the care with which the treatment is conducted. The source from which the plant is supplied is an important point for consideration, for Dr. Burdel thinks that the eucalyptus of Corsica, of Algeria, and still more of Australia, must have more energetic properties than that brought from the south of France, owing to the greater heat of the former countries. The mode of administration was in pills containing 15 centigrammes (a centigramme is $\frac{1}{100}$ of a gramme, which is about 15 grains) given to the amount of from four to ten, according to the form of the fever, every day. But inasmuch as Dr. Burdel had found in his previous experience that the cases of relapse were very numerous, he guarded against this result by giving fresh doses of the drug at the time when the fever seemed to be disappearing, or he even supplemented its use by the employment of quinine. Hence it may be observed that Dr. Burdel does not implicitly rely on the eucalyptus as a febrifuge, and the practitioners in his district have arrived at the same conclusions as himself. In fact he has found that, although it is certainly a febrifuge, its action is tardy and far from being constant. In mild quotidians it succeeded in four fifths of the cases, in tertians only in three fifths, and in quartans it failed almost entirely. Dr. Burdel found that in the seasons when intermittents are most fre-

quent the relapses after the use of the eucalyptus happened much more frequently than after quinine; but still these relapses might be prevented by administering the drug more frequently after leaving it off for a few days. In ten cases he gave laurel in the same form as the eucalyptus, and he met with almost identical results. From his own experience Dr. Burdel's opinions of the value of the eucalyptus as a febrifuge are somewhat qualified, but he still thinks it may be useful among the population of poor districts, where the expense of quinine forms an objection to its use. The growth of the eucalyptus in marshy and aguish districts in France is not likely to be of any service in a sanitary point of view, because the tree requires a hot climate for its development and for the acquisition of its therapeutical properties.—*Bulletin Général de Thérapeutique*, December 30, 1873.

On the Employment of the Bromide of Potassium as an Auxiliary in the treatment of Intermittent Fevers. By Dr. Vallin, of the French Army.—Dr. Vallin does not intend to question the general efficacy of quinine in the treatment of intermittent fevers, but he observes that there are some rare cases where, in spite of the judicious and prolonged use of this alkaloid, the malady continues, and in such circumstances the bromide of potassium appears to be beneficial as a subordinate agent. A case seen by Dr. Vallin in the hospital of Batna, in Algeria, first drew his attention to the subject. A patient suffering from ague had been treated in vain by the sulphate of quinine, given by the mouth, in injections, and hypodermically; notwithstanding these and other similar measures the disease returned every morning at the same time and with great and extraordinary violence. Dr. Vallin was therefore induced to ask himself whether in such a case there was not an unusual complication of disorder of the nervous system together with the ordinary paludal cachexia, and hence he thought of employing the bromide of potassium, which appears to have the power of allaying spinal irritation, and is therefore used in epileptic and other kindred affections. At the end of three days after employing the bromide the fever disappeared for the first time for three weeks and did not reappear for a week. In six other cases he employed the same remedy, with results somewhat different, but generally satisfactory. He thinks that the bromide probably acts less against the periodicity of the fever than against some concomitant disorder of the cerebro-spinal functions; that perhaps an exaggerated sensibility of the spinal cord or some nervous exhaustion may favour the return of the paroxysms; and that the bromide may in such cases, by calming the nervous excitement, assist the action of the quinine. Whatever may be the explanation, the results were satisfactory in several cases which are recorded by Dr. Vallin; four were instances where the treatment was certainly beneficial, but in two others the results were doubtful, and in three more the treatment failed altogether. In an additional case mentioned, a ward attendant, who had suffered previously from attacks of fever, and subsequently had an attack of neuralgia which resisted quinine and hypodermic injections of morphia, was relieved most

materially by the use of the bromide of potassium in large doses, which not only seemed to cut short some of the paroxysms, but to render others more supportable, and to allow the renewed use of the sulphate of quinine and thus complete the cure.—*Bulletin Général de Thérapeutique*, November 30, 1873.

On the Use of Cold Baths in Typhoid Fever. By Professor Béhier.—In a clinical lecture lately delivered at the Hôtel Dieu, in Paris, Professor Béhier offers some observations, founded on practical experience, on the use of cold baths in typhoid fever. After giving an historical sketch of the origin and progress of this method of treatment, the Professor discusses the advantages which it is supposed to possess and the practical results which follow its adoption. It is found, in fact, that, by the use of a few baths administered in twenty-four hours, feverish excitement is reduced, the temperature of the body is lowered, and, indeed, all the alarming symptoms are relieved. Even when the case appears desperate, as when there is carphology and subsultus tendinum and all the other signs of profound nervous disturbance, the action of the cold water seems to be beneficial, the breathing becomes deeper, slower, and more energetic, the skin recovers its tone, the circulation becomes more regular, and the secretions are restored. The success which has been said to attend this treatment is marvellous, and, as a proof, Brand, as quoted by Professor Béhier, declares that in 170 cases so treated a cure was effected in all, and the same uniform success is recorded by other authors. Wunderlich, in Leipsig, shows that in sixteen years the cases treated without cold water presented a mortality of 18·1 per cent.; but in the four years from 1868 to 1872, when the cold water was used, the mortality was only 7·2 per cent., and Jürgensen, Ziemssen and Zimmermann, Liebermeister and Hagenbach, Riegel, and Stöhr, have exhibited results of the same satisfactory nature. Béhier, however, alludes to an objection which has been made to the use of the cold baths, namely, that they seem to cause intestinal hæmorrhage. It is rejoined that this symptom is not so serious as was once supposed. Béhier himself gives the particulars of two cases treated by the cold baths, and they both terminated favorably; they were of a very serious nature and gave rise to great anxiety, but their rapid and successful termination exhibited, not only the innocuous nature, but also the efficacy of the treatment. Béhier remarks that the small number of his cases will, perhaps, be considered as an objection to his conclusions, but he hopes that the experience of others may supply the deficiency, and he suggests that a plan which has had such successful results should be further investigated. He accordingly appeals to his pupils to repeat in their practice the experiments which they have seen, although on a small scale, in the wards of the Hôtel Dieu.—*Bulletin Général de Thérapeutique*, January 15, 1874.

On the Use of Hydrargyrum Oleinicum. By Dr. O. Martini, of Dresden.—This preparation, which is a chemical compound of oxide of mercury and oleic acid, was first brought into notice by Professor John Marshall, of London, in an essay on the use of oleate of mur-

cury and morphia as a local application in persistent inflammation. This compound is, in fact, a solution of oxide of mercury in oleic acid, or, in other words, an oleate of mercury dissolved in oleic acid, to which a certain proportion of morphia is added, the latter alkaloid being readily soluble in oleic acid, and forming with it a chemical compound. Mr. Marshall considered that this preparation was cleaner and more economical than the ordinary mercurial ointment, and, moreover, that it was more efficacious, inasmuch as it is a chemical compound instead of a mechanical mixture. The cases in which he used it were chiefly chronic inflammations of the joints and of the synovial membranes, rheumatic affections of the joints, periostitis, inflammation of the lymphatic glands, and several skin diseases. It was found to be also especially useful in syphilitic affections.

For about a year the Hydrargyrum Oleinicum has been used in Dresden instead of the ordinary mercurial ointment, and Dr. Martini has found it very efficacious. He employed it in forty cases of general syphilis in the town hospital of Dresden, the mode of application being by rubbing it into the skin. He thinks it preferable to the common ointment, as it is cleaner and is more easily rubbed in. It appears very seldom to cause salivation, although it is stated that further clinical experience is required on this point. Dr. Schumann, of Dresden, has found the Hydrargyrum Oleinicum very useful in iritis and retinitis, and he has had it rubbed in for months without any salivation being produced.—*Schimdt's Jahrbücher der Gesammten Medicin*, December 30, 1873.

On the Treatment of Varicose Ulcers by the local application of the Hypochlorites. By M. Panas, of the Hôpital Lariboisière.—The hypochlorite of lime (ClOCaO) contains two equivalents of oxygen, one of chlorine, and one of calcium, and when placed in contact with organic matters it is decomposed, chloride of calcium being formed and two equivalents of oxygen being liberated. The same kind of change ensues in the case of the hypochlorite of soda, sodium being in the place of calcium. The action of the chlorinated water on a wound may be regarded either as due to the application of a calcic chloride salt, or as furnishing a source of nascent oxygen, and M. Panas believes that the oxidizing action predominates. He supposes the existence of a large varicose ulcer of the leg, of long duration, with indurated edges, of a deep brown colour, surrounded with numerous varicose veins, and showing a dirty grey surface covered with fetid pus. When the chlorinated water is applied a series of changes ensues, for on the first day the gangrenous smell disappears, giving place to the characteristic smell of chlorine, and on the second or third day the ulcerated surface loses its grey appearance and begins to be of a slight rose tint, and the skin of the leg begins to whiten. This improvement goes on from day to day, and in about twelve or fifteen days the surface of the sore is altogether formed of fine, fleshy, strawberry-like granulations of a very bright arterial red colour and firm consistence; the surrounding skin, which had lost its suppleness, now regains that character, can be easily pressed, and the capillary circulation becomes very active.

In a few days more the ulceration is entirely filled up by fleshy granulations of a bright red colour, and its circumference becomes more and more healthy, until the most deep and extensive sores are entirely cured. M. Panas has treated more than two hundred varicose ulcers of the leg by the chlorinated water, and he has always found that the improvement coincides with the arterialisation of the blood circulating in the ulcers, an effect produced by the oxidizing influence of the hypochlorite of lime placed in contact with the tissues. M. Panas is confident that the oxygen in the nascent state is the true curative agent, and he compares the results with those obtained by M. Laugier and M. Demarquay by means of pure oxygen applied to gangrenous limbs. Ulceration, according to M. Panas, may be regarded, strictly speaking, as a molecular gangrene, due to defect of oxygenation of the blood, and the nascent oxygen supplies this defect.—*Journal de Thérapeutique*, January 25, 1874.

On the Action and Uses of Croton-Chloral Hydrate. By Dr. Oscar Liebreich, Professor of Materia Medica in the University of Berlin.—Croton-chloral is formed by the action of chlorine on aldehyde, as has been demonstrated by Drs. Krämer and Tinner. It is necessary to mention that this body has no relation to croton oil, although its chemical constitution proves it to be the chlorated aldehyde of crotonic acid. In external appearance croton-chloral differs from hydrate of chloral by its small, glittering, crystalline tablets, and it is only sparingly soluble in water. Its action is somewhat similar to that of hydrate of chloral, but it differs in its physiological effects. Dr. Liebreich has administered this substance to insane persons during a maniacal paroxysm, and they have been thrown into a deep sleep, their pulse and respiration being unchanged for hours together, and he has seen the same effect produced in healthy persons. In some cases of tic douloureux the pain has ceased before sleep was produced, but Dr. Liebreich thinks that the effects are only palliative in this disease. Still, he prefers the croton-chloral to morphia because its effects are less detrimental to the constitution; he has never observed any unfavorable action of the croton-chloral on the stomach or any other organ, although he has made frequent experiments to test its action. The indications of the use of the croton-chloral hydrate, according to Dr. Liebreich, are (1) in cases where hydrate of chloral is inapplicable on account of heart disease, (2) in cases of neuralgia affecting the fifth pair of nerves, and (3) in cases where very large doses of chloral are necessary to produce sleep, and in these cases he recommends the addition of croton-chloral to hydrate of chloral.

Dr. Liebreich has discovered that in the action of croton-chloral it is not the first but the second product of decomposition which is brought into activity, owing to the first being too rapidly destroyed. Croton-chloral, when subjected to the influence of an alkali, first forms allyl-chloroform, a trichlorated body, which is rapidly decomposed into a bichlorated one called bichlor-allylene. Now, Dr. Liebreich has ascertained that bichlorated substances act on the brain, spinal cord, and medulla oblongata, but not on the heart, which explains the fact that both respiration and circulation remain

unaltered in man by a medicinal dose of croton-chloral hydrate. This substance will, no doubt, be further examined, especially in its physiological and therapeutical characters.—*British Medical Journal*, December 20, 1873.

On the Comparative Action of Opium and its Alkaloids. By Dr. Laborde.—Dr. Laborde observes that opium is a compound or amalgamation of a great number of principles which are not even yet entirely known, but with which we are sufficiently acquainted to be justified in stating that they differ widely from one another in their action on the animal organism. Of the six following alkaloids of opium, namely, morphia, codeia, narceia, thebaia, papaverina, narcotina, only three possess a soporific power, namely morphia, codeia, and narceia, the rest being wholly destitute of this property. But not only are the last three (thebaia, papaverina, and narcotina) destitute of soporific power, but they possess, according to Dr. Laborde, a toxical action indicated by convulsive effects. Hence he argues that only certain alkaloids of opium should be employed in practice, and that they ought to be substituted for laudanum and the other ordinary preparations containing a great number of principles which are antagonistic in their properties to one another. Those three alkaloids which have no soporific power and which cause convulsions should be omitted altogether from practice, and only the three others should be employed. After recording experiments on the lower animals which seem to favour the above physiological views, Dr. Laborde lays down the following propositions, namely—1. That the officinal preparations of opium commonly used are likely to cause more real and serious danger than is generally supposed, a circumstance that depends on the possible and even frequent predominance of the toxical and convulsive action of some of the principles the drug contains. 2. That the alkaloids ought, as far as possible, to be substituted for the preparations of opium itself. 3. That narceia and morphia ought to be preferred to the other alkaloids, both on account of their inferior toxical action and the safety with which they may be administered; and 4. That codeia should be employed only with extreme caution, if not wholly abandoned, owing to the insidious nature of its toxical action.

In reference to narceia, Dr. Laborde remarks that in order to secure the safety and efficacy of its operation it should be as pure as possible, and unfortunately this condition cannot always be warranted, owing to the imperfection of the chemical processes at present employed for obtaining it. But this imperfection arises mainly from the restricted use of the alkaloid, and would be removed if it were more common. Dr. Laborde recommends narceia particularly in some diseases of infancy, especially hooping-cough, the nocturnal paroxysms of which may be often completely suppressed or at least much relieved by its use. But morphia, after all, is admitted by Dr. Laborde to be the most certain and rapid in its effects of all the immediate principles of opium, although its action requires to be carefully watched.—*Bulletin Général de Thérapeutique*, October 30 and December 15 and 30, 1873.

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