ing that "meddlesome midwifery is bad," but I have been urged to its consideration by the opinions expressed by Hegar, Boxall, and Cullingworth, that in private practice there has as yet been no improvement. If this be true, or even partially true, it proves that those who undertake the care of parturient women are not yet alive to the responsibilities of their calling, and I have no doubt that a faithful adherence to the principles, the development of which I have briefly sketched, will result in a vast saving of most valuable lives, and will prevent you individually from standing—as many of us have done in the past—helpless spectators of a fatal malady, which an accusing conscience whispers might have been averted.

ART. IX.—*The Teaching of Materia Medica.*^a By
WALTER G. SMITH, M.D., President of the Section of
Pharmacology and Therapeutics, British Medical
Association, 1900.

IN bidding you a hearty welcome to the meetings of this Section I desire, at the same time, to express my grateful acknowledgment of the honour done me by the Council of the British Medical Association in inviting me to act as your President.

It is 25 years since the Association has held its annual meeting in East Anglia, and I confidently expect that this meeting, convened in the closing year of the 19th century, will be productive of much pleasure and profit to all who take part in it.

The title of our Section is Pharmacology and Therapeutics. When we consider that therapeutics dates from the beginnings of medicine, and that the ultimate aim and meaning of all our medical education and scientific culture is the alleviation of suffering and the cure of disease, does it not seem surprising that it was not until the year 1884 that, at the suggestion of Dr. Whitla, a separate section of therapeutics was instituted at the Belfast meeting?

^aBeing an Address delivered at the opening of the Section of Pharmacology and Therapeutics at the Annual Meeting of the British Medical Association at Ipswich, July-August, 1900.

And I have to note; not only the tardy official recognition of therapeutics, but also the fact that it has not enjoyed fixity of tenure, for, in 1890, at the Birmingham meeting, with its 12 sections, an address on therapeutics was, it is true, delivered by Sir W. Broadbent, but no separate section was allotted to therapeutics, which was tacked on to medicine. Likewise, neither at Newcastle-on-Tyne, in 1893; at Bristol, in 1894; nor at Carlisle, in 1896, did therapeutics find a home for itself.

Dr. T. J. MacLagan presided over the new Section of Therapeutics at the Belfast meeting in 1884, and took as the subject of his address the Methods of Therapeutic Research. In this address he clearly enunciated the limits and utility of the three lines of inquiry which have been followed in the past, and must be pursued in the future—viz.,

1. Experiments on lower animals.
2. Statistical observations of the results of treatment; and
3. Individual observations at the bedside.

TEACHING OF MATERIA MEDICA.

The rise and growth of the science of pharmacology, which was founded by Bichat and Magendie early in the century, has made it plain that all correct appreciation of the mode of action of drugs must be based upon physiology and pathology.

The new departure has gradually leavened our conceptions of therapeutics, and renders the teaching of this branch alike more intelligible to the student and more satisfactory to the teacher.

I well remember the time when attendance upon *materia medica* lectures was a dreary enough obligation, and the course was to students perhaps the least popular in the entire curriculum.

Comparing the teaching of *materia medica* and therapeutics 30 years ago with the present time, three features stand out prominently:—

1. The retrogression of descriptive *materia medica* in its restricted meaning.
2. The establishment of special courses in practical

pharmacy at the Medical Schools, conducted in suitable laboratories.

3. The development of pharmacology in its present acceptation—*i.e.*, the scientific investigation of the modes of action of drugs.

In regard to the place of pharmacology in the medical curriculum, and the best mode of teaching medical students, I heartily join with Dr. Bradbury (Address to Section of Pharmacology and Therapeutics, Portsmouth, 1899) in protesting against undue neglect of what may be termed old-fashioned *Materia Medica*—*i.e.*, description of the *essential* properties and chemical nature of drugs so far as these elucidate the action of the remedy or its relations to prescribing.

A modern course of lectures on *Materia Medica* should most certainly be founded on the bed-rock of pharmacology—*i.e.*, physiology, but there is still room—nay, I think necessity—for practical demonstration of the physico-chemical properties of drugs, and we need not even be ashamed of inculcating the utility of some familiarity at least with the pages of the “British Pharmacopœia,” which it is the fashion of some to despise or decry.

Thanks to the labours of physiologists and pharmacologists on the one hand, and of organic chemists on the other hand, it is now possible, and even comparatively easy, to give an interesting and practically useful course of lectures on *materia medica* and *therapeutics* to medical students, but not earlier than their third year. I venture to affirm that it is entirely the fault of the lecturer, and not of his subject, if he does not succeed in quickening the dry bones of *Materia Medica*, and in awakening and maintaining the lively attention of his class.

With a little thought and trouble numerous simple experiments, chiefly chemical, can be shown in illustration of the more important physiological and therapeutical properties of drugs. Take, for example, antipyretics and their modes of action, or the local action of astringents and caustics, experimentally illustrated by the reactions of various acids and metallic salts upon solution of albumen; or, again, take the group of “aromatic compounds” where

it is possible to give a brief but comprehensive survey of the general chemical and physiological relations of the subdivisions of this great group—viz., hydrocarbons, phenolic compounds, acids, and nitrogen derivatives (alkaloids, &c.).

And in this aromatic group, which includes the anti-pyretic drugs, there is abundant opportunity for drawing attention to many interesting points in illustration of the connection between physiological action and chemical constitution.

PHYSIOLOGICAL ACTION AND CHEMICAL CONSTITUTION.

Since the properties and motions of molecules which determine physical properties depend upon the motions and properties of atoms which determine chemical reactions, the same common laws must govern both physical and chemical phenomena.

And no one can doubt that the properties of the most complex compounds depend upon and are intimately correlated with the properties and configurations of the atoms and molecules of which the aggregates are built up.

This fascinating subject, which received its impetus in Great Britain from the labours of Crum Brown and Fraser, has not escaped the attention of former speakers at meetings of this Association, for, at the Brighton meeting of 1896, Sir T. Lauder Brunton delivered an attractive address on the connection between chemical constitution and physiological action, and Sir W. Broadbent upon more than one occasion (in 1890, and again in 1895) has likewise referred to this topic, which he rightly esteems as one of fundamental significance.

Bit by bit—here a little, there a little—we are gathering the kind of material which can best help us to gain insight into the principles of therapeutics.

True, we may have to wait a good while before a stately edifice can be built up, but none the less does it hold true that the problems of therapeutics, and for that matter, of all biology, are, at the root of things, essentially chemical or physico-chemical, in so far as we are at all able to interpret them, or refer them to general laws.

To give an example or two:—

Some of the fatty hydrocarbons are in themselves tasteless, but let us introduce the radicals OH (hydroxyl), NH₂ (amidogen), or NO₂, and lo! we get colour, odour, or taste conferred upon the molecules. For a compound to have a sweet taste it must contain at least two oxygen atoms (and every electro-positive group must be united to an electro-negative group). Thus all polyatomic alcohols are sweet (*i.e.*, glycol, glycerine, &c.), and aromatic sugars, *e.g.*, have a bitter taste (Sternberg, *Chem. Centralbl.*, 1899).

Again, look at the group $\text{C}_6\text{H}_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{NH} \end{smallmatrix}$ —viz., ortho-benzoyl-imide. As including it we have these compounds:—

1.—Anthranilic acid, $\text{C}_6\text{H}_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{N} \end{smallmatrix} \begin{smallmatrix} \text{OH} \\ \diagup \quad \diagdown \\ \text{H} \end{smallmatrix}$, and its methyl-ester, $\text{C}_6\text{H}_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{NH} \end{smallmatrix} \text{O CH}_3$ has a *smell* of orange blossom oil.

2. Indigotin, $\text{C}_{16}\text{H}_{10}\text{N}_2\text{O}_2 \begin{smallmatrix} \text{C}_6\text{H}_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{NH} \end{smallmatrix} \text{C} \\ \text{C}_6\text{H}_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{NH} \end{smallmatrix} \text{C} \end{smallmatrix} \parallel$ has an intense *blue colour*.

3. Saccharin, $\text{C}_6\text{H}_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{SO}_2 \end{smallmatrix} \text{NH}$, is an intensely *sweet* substance; and, lastly,

4. Ox-indole, $\text{C}_8\text{H}_7\text{NO} \text{C}_6\text{H}_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{NH} \end{smallmatrix} \text{CH}_2$ is a constituent of essential oil of jasmine flowers, associated with anthranilic methyl-ester.

So we find that different effects produced upon the senses of *smell*, *taste*, and *sight* are coincident with differences of arrangement in the molecules of the respective compounds, which are all built around a common nucleus (Watson Smith).

Innumerable difficulties still await an answer—*e.g.*, Why should saccharin, which is an “ortho” compound, be so sweet, while the “para” compounds are devoid of sweetness? Still we can assert that great progress has been made in expressing the laws of mixture, combination, solution, dissociation, and chemical transformation on a generalised basis, and chemistry and chemical physics are gradually being brought under the sway of dynamical laws.

PHYSICAL CHEMISTRY AND THERAPEUTICS.

Within the last 15 years the remarkable and daring theories of van't Hoff and his followers upon the nature of dilute solutions, based upon certain physical data (viz., osmotic pressure, alterations of the boiling point and freezing point), together with Arrhenius' hypothesis of ionic dissociation, have largely engaged the attention of physicists and chemists; nor have they failed to make their impress upon pharmacological investigations.

The earliest reference I have noted in pharmacological work to van't Hoff's important researches is contained in a paper by Hofmeister (*Zur Lehre von der Wirkung der Salze. Archiv f. exper. Pathol. und Pharmak.* Bd. xxv., 1889).

In the same journal (Bd. xxix., 1892) is a suggestive paper by Dreser, "Ueber Diurese und ihre Beeinflussung durch pharmakologische Mittel."

In this connection I may specially refer to Dr. C. R. Marshall's excellent summary of the "Ion" question, published in the *Practitioner*, February, 1898. In this paper, which broached the subject for the first time in an English medical journal, he gave an abstract of Krönig & Paul's theory of the action of antiseptics in the light of the electrolytic dissociation theory, and also of Loeb's views on the physiological effect of various radicals.

But, furthermore, we have to take into account, not only the number and kind of atoms in the molecule, and their interior arrangement and grouping (constitution), but certain physical properties of compounds previously inexplicable have found their explanation in another development of chemical theory which has proved extraordinarily fertile. I refer to stereo-chemistry—i.e., the doctrine of the spatial configuration of the molecule. This theory has done much to elucidate the difficult problems of isomerism in organic chemistry, and we cannot doubt that it will shed light upon chemical transformations occurring in the organism. Dr. Emil Fischer has published in the *Zeitsch. f. physiolog., Chem.*, 1899, an important paper, in which he seeks, in conjunction with Thierfelder, to explain the selective action

exhibited by the enzymes either in effecting fermentation or in producing hydrolysis.

It is well known, for example, that a glucoside, *e.g.*, salicin, may be attacked by one enzyme (emulsin) and not by another (yeast enzyme), and accordingly Fischer and Thierfelder conceive the hypothesis that between the enzymes and those substances which they attack there must exist a correspondence in molecular configuration, which they compare to that of a lock and its key.

And again, of two isomeric sugars closely allied (*e.g.*, glucose and xylose), one (glucose) may be oxidised in the body or converted into glycogen, whereas the other (xylose) may pass unaltered through the system.

All these various methods of investigation are to be welcomed by us as tending to aid in the unravelling of pharmacological problems. Yet, although we shall ever strive to combine science with practice, we need not run away with the notion that pharmacology will surely inaugurate the golden era of therapeutics, and enable us to give a satisfactory reason for each medicine we prescribe.

In the future, as at present, it will probably always hold true that, in order to meet the complex and shifting needs of the daily practice of our profession, pharmacology must be wedded to careful and well-balanced clinical observation, and practical therapeutics not infrequently outruns pharmacology, for, as Dr. Cuming well remarked in his scholarly presidential address at the Belfast meeting in 1884, "The true dignity as well as the great attraction of our studies lies in their practical usefulness." And Bacon has said—"They be the best physicians which, being learned, incline to the traditions of experience, or, being empirics, incline to the methods of learning."

But here we are constantly made to feel our difficulties and limitations, and the wise physician is not addicted to boasting of his therapeutic successes. In therapeutics, as in theology, opposite conclusions can be drawn from the same text.

What are we to say to such a fact as this?

In the *Practitioner* some months ago there appeared a highly interesting series of papers upon pneumonia and its

treatment. Yet, upon a definite, and apparently simple point—viz., the administration of opium in acute pneumonia, two men, whose powers of observation have been developed to the highest possible degree by constant exercise for more than half a century, expressed diametrically opposite opinions. While Sir Samuel Wilks announced his firm belief in opium, Sir William Gairdner was of opinion that in most cases opium in pneumonia is a remedy to be entirely distrusted, and even severely proscribed.

A PROTEST.

One word in conclusion. The flood tide of discovery of new synthetic chemical remedies has, together with a few treasures which have risen on its crest, also washed on shore much rubbish of a pseudo-scientific sort.

Are we not daily worried with samples, and with advertisements and circulars from eagerly competing firms, announcing new drugs or novel combinations, which, perhaps, are used chiefly by those who do not know how to employ the old ones. Scarcely are they advertised once before they are elbowed away by importunate new comers.

The advertisement is headed with an enigmatical name standing over an appalling chemical formula, and probably ornamented with a structural or graphic diagram. All this is backed up by a plausible show of original experimental work, and ends with a "full literature." In a pamphlet lately issued about some newfangled preparations of iron, 62 literary references were appended, and a well-known and reputable drug firm advertised in a recent number of the *British Medical Journal* more than 20 of its special preparations, some of which probably most of us never heard of. And not only are we plagued with innumerable circulars which choke our waste paper baskets, but we are tormented during our consulting hours at home by the visits of smooth-tongued touting agents of many of the large firms.

This most objectionable practice is on the increase. It should, in my humble opinion, be stamped out by the medical profession, and I avail myself of this public opportunity to protest against it.

For some time past I have made it an invariable rule, and

given directions accordingly, that I will not receive or interview the agent or representative of any drug firm, no matter how famous. If by chance or sheer audacity one of these gentry does find his way into my consulting room he very speedily finds his way out again.

I entirely sympathise with the writer of the indignant letter, headed "Chemists' Travellers," and signed "M.D., M.S.," *British Medical Journal*, May, 1900, p. 1263.

With such thoughts in our mind, ought we not hearken to the admonition of St. Paul, and "henceforth be no more children, tossed to and fro, and carried about with every wind of doctrine."

ART. X.—*Portrush from a Medical Point of View.*^a

By JOHN CHARLES MARTIN, M.D., B.Ch., B.A., Univ. Dubl., President of the North of Ireland Branch of the British Medical Association.

SITUATION OF THE TOWN.

I WOULD invite your attention to what may be called "Portrush from a medical practitioner's point of view," as distinguished from the way this town and the North of Ireland generally are treated in the popular handbooks and guides of the day. In the first place, allow me to point out that the town itself is built on a rocky peninsula jutting into the sea in a direction almost due N.W., the neck of the promontory being a deposit of sand of considerable depth, widening out in opposite directions as it approaches and joins the mainland into two fine beaches, one running more or less south for about a mile, the other east for a distance fully twice as far. The situation of these beaches, with the elevated house-covered rock between them, holds out certain advantages which I do not believe have been fully realised—namely, that it is almost always possible to get a spot on one beach or the other for young children and people who are not strong to enjoy themselves, sheltered from whatever quarter the wind may happen to be blowing.

^a Read before the Twenty-second Annual Meeting of the North of Ireland Branch of the British Medical Association, held at Portrush, Co. Antrim, on Thursday, July 5, 1900.